

# Interma 2018



## Programme Book



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## Welcome

On behalf of the Management Committee, it is our great pleasure to welcome you to Singapore for the IEEE International Magnetism Conference in Asia, INTERMAG 2018.

INTERMAG is the premier Conference on all aspects of applied magnetism. It has the tradition of bringing international researchers together, to discuss the latest developments in magnetism. With the aim of keeping that tradition and high standard, we have arranged the Conference program with a range of oral and poster presentations, invited talks and symposia, a tutorial session, two special evening sessions and exhibits. The presentation topics range from fundamental science to applied magnetism, including advances in magnetic recording, spintronics, energy and power technologies, biomagnetism, and the emerging fields of Internet-of-Things and smart living. All members of the international scientific community interested in new developments in magnetism and associated technologies are invited to attend INTERMAG 2018.

Singapore is located at the tip of the Malay Peninsula. Singapore's tropical climate welcomes both leisure and business travelers all year round. The island republic's excellent infrastructure enables visitors to enjoy its many sites and attractions in a safe, clean and green environment. This tiny island-state is also remarkably culturally diverse. Visitors can taste the foods of Chinatown or Little India, visit a historic mosque on Arab Street, stroll or cruise along the Singapore River, and enjoy the wildlife of the Singapore Zoo Night Safari or the Jurong Bird Park. Finish it off with fireworks and a beautiful view of the city from the Marina Bay Sands Hotel. We hope you will have the opportunity to explore Singapore during the Conference.

On behalf of the Management Committee of INTERMAG 2018, we wish all INTERMAG 2018 participants a fruitful and enjoyable stay in Singapore.

Sara Majetich  
S. N. Piramanayagam (Prem)  
Conference General Chairs

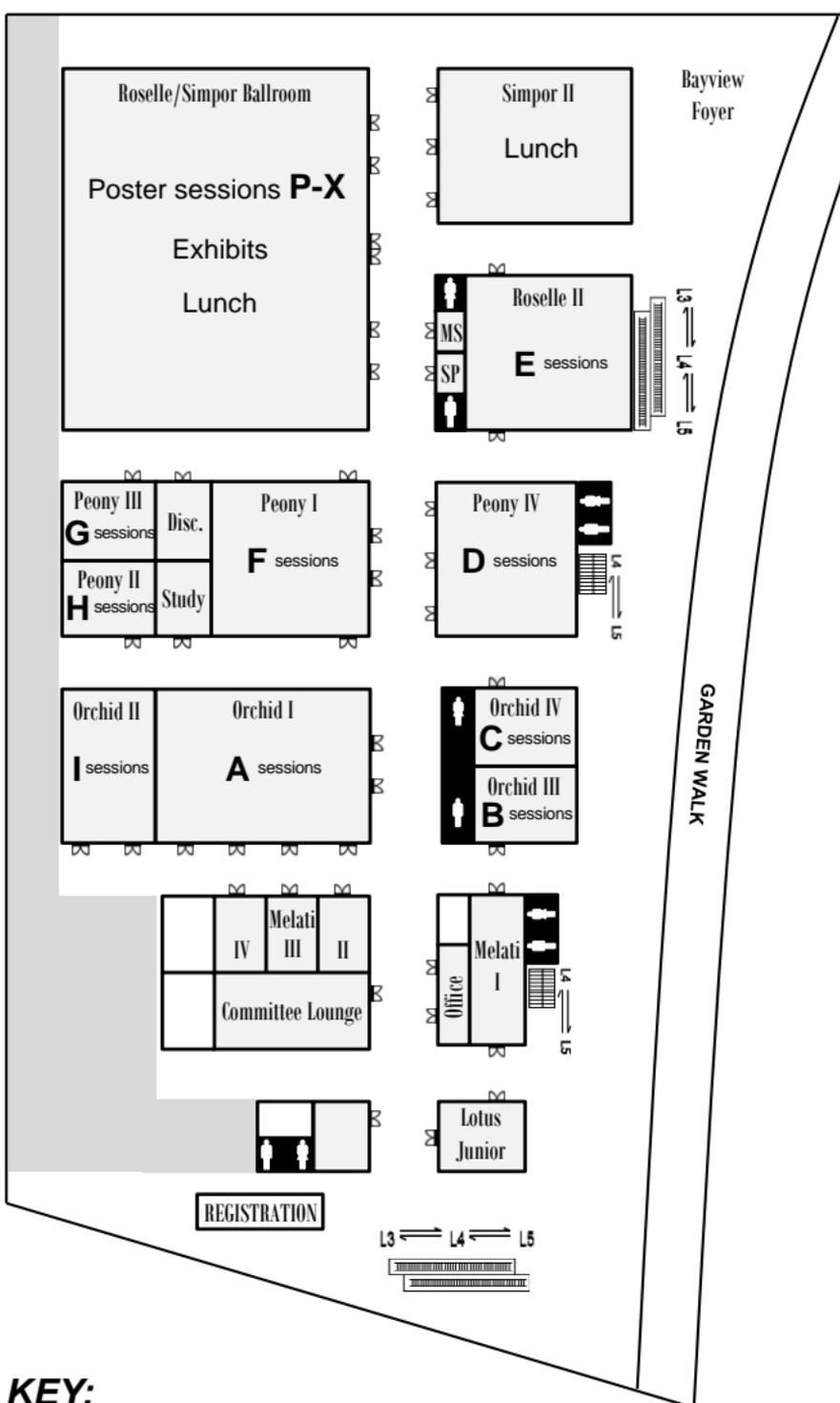
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# Venue and Map

The technical program and exhibits of INTERMAG 2018 are being held in Marina Bay Sands (MBS) Expo and Convention Centre. We wish to highlight to the participants that the Marina Bay Sands Hotel and Sands Expo and Convention Centre are located next to each other and that the Conference is held in the **Sands Expo & Convention Centre**.

The location of each session is based on the second letter of the session ID. ( *E.g.* Session BF will be held in the Peony I room. )



## KEY:

SP – Speaker practice room

Study – Quiet study area

Disc. – Discussion room (first come first served)

Office – Conference secretariat

MS – IEEE Magnetics Society office

Melati, Lotus – Committee meeting rooms

## ***Location***

Marina Bay Sands Expo & Convention Centre is located in the heart of Singapore's business and entertainment district. A convenient 20-minute ride from Changi Airport and in the heart of the central business district area, Marina Bay Sands is just minutes away from popular cultural and leisure spots like Chinatown, Little India and Orchard Road. Well-served by the transport system with a train station just at its doorstep, it has never been more convenient for you to experience Singapore.

## ***Transportation***

### **Car and Taxi:**

Sands Expo & Convention Centre is situated at 10 Bayfront Avenue, and is also accessible by vehicle via Sheares Avenue. From Changi Airport, you can reach us in a 20-minute direct drive along the East Coast Parkway (ECP) expressway, which leads directly into Sheares Avenue across the Benjamin Sheares Bridge.

### **MRT Train Services:**

Marina Bay Sands is linked directly to CE1/DT16 Bayfront Station on the Circle Line and Downtown Line of Singapore's Mass Rapid Transit (MRT) train system. MRT services to/from Bayfront Station operate daily from (approximately) 6:00 am to 12:00 am midnight.

Exits at Bayfront Station:

- **Exits C & D** - Connect to The Shoppes at Marina Bay Sands (1 minute walk), Sands Expo & Convention Centre (3 minute walk), the Hotel (5 minute walk), Sands SkyPark (10 minute walk), ArtScience Museum (10 minute walk), and Mastercard Theatre (10 minute walk). Signs direct the way to each location and other attractions at Marina Bay Sands.
- **Exit E** - Connects to Sands Expo & Convention Centre.

### **Bus Services**

Marina Bay Sands is serviced by the following bus routes:

- 97 / 106 / 518 / 133 / 502 (every day)
- 97E / 502A / 518A (every day except Sat, Sun & public holidays)
- NR1 / NR6 (late night Fri, Sat & eve of public holidays)

# Registration

All INTERMAG 2018 attendees, including invited speakers, must pay registration fees. Registration should be done in advance via the online system at <https://goo.gl/1n9Cka>. Incomplete or incorrect payments will be considered late and the onsite rates will be collected onsite.

Onsite registrations during the Conference will be at the onsite rates listed below. Onsite payments are by credit card or cash (SGD only).

	Onsite registration fee
Full Registration IEEE Member	1000 SGD
Full Registration Non-IEEE Member	1220 SGD
Student/Retiree/Life IEEE Member	510 SGD
Student/Retiree Non-IEEE Member	605 SGD

Student registrants should be prepared to show a confirmation of their student status (student ID card or similar) when they pick up their conference materials at the registration desk.

**Lunch is provided each day (Tue-Fri) for each registered participant in the Exhibits/Poster Area (Roselle and Simpor II ballrooms)**

## Registration Cancellation Policy:

Cancellations of advanced registrations must be submitted in writing and received before 9:00 am GMT on Sunday, March 25, 2018. Refunds of the original payment, less a SGD 80 service fee, will be mailed to the original registrant following the Conference. Later cancellations will not be refunded.

For a registrant who has paid the registration fee in advance but cannot attend the Conference, attendee substitution can be made at any time, either online or at the Onsite Registration Desk. Onsite substitutes must bring authorization of their substitution in writing from the original registrant.

## ***Registration Desk***

The Registration Desk will be located at Lotus Foyer on Level 4 of the Sands Expo & Convention Center. It will be open during the following hours:

Monday, April 23:	2:00 pm – 6:00 pm
Tuesday, April 24:	7:30 am – 6:00 pm
Wednesday, April 25:	7:30 am – 6:00 pm
Thursday, April 26:	7:30 am – 6:00 pm
Friday, April 27:	7:30 am – 4:00 pm

Many thanks to Singulus Technologies AG for sponsoring registration lanyards.



## ***Badge Policy***

When you check in at the Registration Desk, you will receive a personalized name badge. It enables you to access all Conference areas. All attendees will be required to wear their name badges to enter the Technical Sessions, Exhibits and Special Conference Events.

# Special Conference Events

## ***Coffee Service and Bierstuben***

Coffee service will be available Tuesday through Friday mornings starting at 8:30am in the Poster and Exhibits Hall (Roselle/Simpor Ballroom).

Join your colleagues at the traditional Bierstube, which will take place on Tuesday and Thursday evenings from 5:00 pm - 6:00 pm in the Poster and Exhibits Hall.

Many thanks to Materion Corporation for partial sponsorship of the Bierstuben.



## ***Tutorial Session***

**Monday, April 23**  
**3:30 pm - 5:45 pm**

**Orchid I-II**

This session will present tutorials on recent advances in antiferromagnetic films and their applications. The first speaker will introduce antiferromagnetic materials in their film form. The second speaker will explain the detection of antiferromagnetic ordering using synchrotron radiation. The third speaker will discuss spintronic device applications of the antiferromagnetic films. The tutorials will not only be accessible to those with no background in the subjects, but they will also provide comprehensive and timely summaries to specialists in the field. The tutorial session is organized by the Education Committee of the IEEE Magnetics Society.

- **Kevin O’Grady**, University of York, UK  
“Characterisation of Antiferromagnets”
- **Elke Arenholz**, Lawrence Berkeley National Laboratory, USA  
“Making the Invisible Visible: Probing Antiferromagnetic Order in Novel Materials”
- **Tomas Jungwirth**, Academy of Sciences, Czech Republic & University of Nottingham, UK  
“Antiferromagnetic Devices”

## ***Symposia***

- AA Compensated Spintronics
- BA Synchrotron X-Ray and Neutron Sciences for Magnetism
- CA Skyrmions for the Future
- DA Magnetism in Biomedicine: Where Next?
- EA Novel Hard Magnetic Materials and Their Applications
- EE Symposium on recent advances and Future Challenges of Computational Magnetism

- FA Topological and Collective Magnetic Phenomena  
GA The Present and Future of STT-MRAM  
HA Atoms, Molecules and Interfaces for Spin Quantum Engineering

## ***Special Evening Session***

**Tuesday, April 24**  
**5:30 pm – 7:00 pm**

**Orchid I**

### **HOW TO GET A JOB IN INDUSTRY, ACADEMIA OR GOVERNMENT LABORATORY**

Chairs: Usha Varsheny and Albrecht Jander

This special evening session will focus on jobs in magnetics research. The three panelists, with distinguished leadership positions in industry, academia and government laboratory, will provide perspectives and advice on how to prepare for, and apply to, research positions. An extended question-and-answer period will follow their presentations. Although this session is primarily intended for prospective and recent graduates, all conference attendees are encouraged to participate.

#### *Panelists:*

- **Dr. Steve Hwang,**  
Vice President of Product Development,  
Seagate Technology
- **Dr. Liesl Folks,**  
Dean, School of Engineering and Applied  
Sciences, University at Buffalo
- **Dr. Lucian Prejbeanu,**  
Executive Director, SPINTEC, CEA

# ***Plenary Session and Award Ceremony***

**Wednesday, April 25**  
**4:00 pm – 6:00 pm**

**Orchid I-II**

Session Chairs: Sara Majetich and S. N. (Prem) Piramanayagam

Awards Chair: Burkard Hillebrands

## **IEEE Magnetics Society Achievement Award**

### **Professor Roy Chantrell**

For contributions to the theory of interacting spin systems and application to the understanding of magnetic recording media and ultrafast magnetization processes

## **IEEE Magnetics Society Early Career Award**

### **Dr. Anjan Soumyanarayanan**

For contribution to tailoring interfacial interactions to generate and manipulate room temperature topological spin structures

## **IEEE Magnetics Society Distinguished Service Award**

### **Professor Kevin O'Grady**

For advancing international participation and inclusive representation in the IEEE Magnetics Society

## **Newly elected Fellows of the IEEE**

- **Hideo Ohno, Tohoku University**, for contributions to materials and device design for spintronics

## **2018 Magnetics Society Distinguished Lecturers**

- **Yoshichika Otani**, University of Tokyo, "Spin Conversion Phenomena in Spintronics"
- **Mitsuteru Inoue**, Toyohashi University of Technology, "Magnetic Phase Interference in Artificial Magnetic Lattices: Functions and Applications to Optical, High-Frequency, and Spin Wave Devices"
- **Can-Ming Hu**, University of Manitoba, "Cavity Spintronics"
- **Alison B. Flatau**, University of Maryland, "Structural Magnetostrictive Alloys: From Flexible Sensors to Energy Harvesters and Magnetically Controlled Auxetics"

## **Plenary Lecture**

**Wednesday, April 25**  
**5:00 pm – 6:00 pm**

**Orchid I-II**

### **SPINTRONICS NANODEVICES**

**Professor Hideo Ohno**

Tohoku University, Sendai, Japan

#### **Abstract:**

Development of spintronics nonvolatile nanodevices and their integration with CMOS circuits are critical to realize standby power free, low-power consumption, yet high performance integrated circuits for Internet-of-Things (IoT), high performance computing and artificial intelligence. Endurance and low supply-voltage operation make these spintronics device capable of being used in the place of current volatile working memories such as DRAM and SRAM and beyond. The magnetic tunnel junction (MTJ), a two-terminal nonvolatile spintronic device that can scale down to 20 nm with the perpendicular-easy-axis CoFeB-MgO system, is the device most widely employed for such a purpose. I will review the development of MTJs, and discuss about its ultimate scalability below 10 nm by showing MTJs with current induced switching and high thermal stability in the range of 4-8 nm. I will then describe the work on three-terminal devices that separate the write current path from the read current path. Here I focus on devices that utilize spin-orbit torque arising from structures involving heavy metals as well as from antiferromagnets; the latter is shown to operate as analog memory suitable for neuromorphic applications.

#### **Biography:**

Professor Hideo Ohno, is an internationally renowned physicist, recognized for his extensive work on spintronic devices. He currently serves as the director of the Research Institute of Electrical Communication and a vice president of Tohoku University. Professor Ohno has been selected to serve as president of Tohoku University starting in April 2018.

Appointed as professor at Tohoku University in 1994, Ohno holds B.S., M.S. and Ph.D. degrees from the University of Tokyo. He spent time as a graduate student at Cornell University in 1979 and was a visiting scientist at IBM T. J. Watson Research Center from 1988 to 1990. From 1982 to 1994 he was appointed as lecturer and then associate professor at Hokkaido University.

Professor Ohno has received the IBM Japan Science Award (1998), the IUPAP Magnetism Prize (2003), Japan Academy Prize (2005), Presidential Prize for Research Excellence,

Tohoku University (2005), Agilent Technologies Europhysics Prize (2005), Thomson Reuters Citation Laureate (2011), JSAP Outstanding Achievement Award (2012), and the IEEE David Sarnoff Award (2012). He was a distinguished lecturer for the IEEE Magnetics Society in 2009 and has recently been elevated to Fellow of the IEEE “for contributions to materials and device design for spintronics.”

## ***Plenary Reception***

**Wednesday, April 25, Sands Ballroom, Level 5  
6:15 pm – 7:45pm**

Invitation from Sara Majetich and  
S. N. (Prem) Piramanayagam,  
Conference General Chairs of INTERMAG 2018:

Following the Plenary Lecture, a Plenary Reception will be held for all registered participants of INTERMAG 2018. This reception is supported by the IEEE Magnetics Society, Singapore Tourism Board and Nanyang Technological University, Singapore. All registered participants are cordially invited to attend and celebrate the achievements of our award winners and to network with your colleagues. A Western/Chinese/Indian vegetarian buffet will be served. Accompanying guests have the option to buy a Reception Ticket at the Onsite Registration Desk no later than noon on Tuesday, April 24, 2018.

## ***Meet the Experts Lunch***

**Thursday, April 26  
12:00 – 1:30 pm**

**Simpor II**

Student and post-doc participants of the Conference are invited to join experts in their field at lunch time on Thursday for informal discussion. Prior registration is mandatory. To see a list of available “experts” and to sign up for a table, please visit:

[bit.ly/MeetTheExperts2018](http://bit.ly/MeetTheExperts2018)

This event is sponsored  
by Capres A/S and Evico  
Magnetics.



**evicomagnetics**

# **IEEE Magnetics Society Annual Meeting**

**Thursday, April 26**  
**5:00 pm – 6:00 pm**

**Lotus Junior**

This meeting is particularly open to all INTERMAG participants. Come to learn more about what the IEEE Magnetics Society is doing to support and strengthen the Magnetics Community. By joining the IEEE Magnetics Society, you become part of the world's best-known magnetics organization and benefit of discounts on registration for conferences as well as educational, technical and other professional benefits. Your suggestions and feedback are most welcome! Beverage and light food will be provided.

## **Special Evening Session**

**Thursday, April 26**  
**5:30 – 7:00 pm**

**Orchid I**

### **PANEL DISCUSSION: THE FUTURE OF INFORMATION STORAGE AND MEMORY TECHNOLOGIES**

Session Chair: Jingsheng Chen

This Special Evening Session features executives from the leading hard disk drive and memory companies discussing the state of the art and future directions of magnetic storage and memory technology. Each will present their vision and roadmap of technology development. What revolutionary approaches will extend the dominance of the hard disk in mass data storage? How and when will magnetic random access memory (MRAM) become competitive? What breakthroughs are still anticipated to keep these technologies growing at historic trends?

The session will be conducted as a panel discussion, with an extended question and answer period following the presentations of the panelists.

#### *Panelists:*

- **Dr. Ed Gage**  
Vice President, Seagate Research Group
- **Dr. Thao A Nguyen**  
Senior Vice President of Head Operation,  
Western Digital Corporation
- **Dr. Danny Shum**  
Fellow eNVM, Technology Development &  
Research, GLOBALFOUNDRIES Singapore

## **Women's Networking Event**

**Thursday, April 26**  
**6:00 pm – 7:30 pm**

**Bayview Foyer**  
**(behind Simpor II)**

As has been the tradition, the IEEE Magnetics Society will be sponsoring a Networking Reception for women in the magnetism community. This is a great opportunity to become acquainted with other women in the profession and to discuss a range of topics including leadership, work-life balance, and professional development. At the reception you will also have the opportunity to form small dinner groups, build new friendships and expand your professional network. All graduate students, researchers and retirees are encouraged to attend. For questions, please contact Pallavi Dhagat (dhagat@oregonstate.edu).

## **Next Generation Magnetics Network**

**Thursday, April 26**  
**7:00 pm – 8:30 pm**

**Lotus Junior**

All students at the graduate and post-doctoral level are invited for a social event featuring coffee and snacks hosted by the Next Generation Magnetics Group! This initiative aims to promote networking among young researchers and provide resources for career development. Come find out a little more about us and help to shape the future of this organization. For more information, please contact Joachim Gräfe (graefe@is.mpg.de).

Event is sponsored by  GLOBALFOUNDRIES

## **Sponsors**

The INTERMAG 2018 Conference Committee would like to gratefully thank the following sponsors (in alphabetical order):

### **Gold sponsor:**

Western Digital

### **Silver sponsors:**

Seagate Technology

Tokyo Electron Ltd

### **Other sponsors and partner:**

CAPRES – *Meet the Experts*

evico magnetics GmbH – *Meet the Experts*

Globalfoundries Singapore –

*Young Professionals Network*

Materion – *Bierstube on Tuesday*

Singulus Technologies AG – *Lanyards*

Tokyo Electron Ltd – *Best Poster Award*

Anexus – *Best Poster Award*

Western Digital – *Art in Magnetism*

## Exhibits

Suppliers of instrumentation, materials, process tools, and other products and services will exhibit their latest offerings for professionals in magnetism and associated technologies. The exhibit will be located in Simpor/Roselle Ballrooms adjacent to the poster sessions. The Exhibit Hall will also be the site of coffee service, Bierstube etc.

### ***Exhibit Opening Hours***

Monday, April 23	6:00 pm – 7:00 pm
Tuesday, April 24	8:30 am – 6:00 pm
Wednesday, April 25	8:30 am – 4:00 pm
Thursday, April 26	8:30 am – 6:00 pm
Friday, April 27	8:30 am – 4:30 pm

### ***List of Exhibitors***

(in alphabetical order)

- aNexus
- Bartington Instruments
- CAPRES
- Evatec AG
- GMW Associates
- Hakuto Singapore Pte Ltd
- Hprobe
- Intlvac Inc
- IOP Publishing
- Kurt J. Lesker
- Lake Shore Cryotronics
- Materion
- Metrolab Technology SA
- MicroSense, LLC
- MicroXact Inc.
- NanoScan
- Neoark Corporation
- OHT Inc.
- Premier Solutions
- Quantum Design
- Raith Nanofabrication
- Singulus Technologies AG
- Scia Systems GmbH
- SmartTip BV
- Springer Nature
- ULVAC Singapore
- Zurich Instruments

The INTERMAG 2018 Management Committee would like to acknowledge and thank participation of the exhibitors.

## Wireless Access

Wireless access will be available in the Conference area including the Poster/Exhibit Hall. An access code and relevant instructions will be posted onsite. The speed of connection serves basic purposes, such as emailing, and may be limited due to the high number of expected attendees.

## Speakers Practice Room

Speakers may use the Speaker Practice Room to practice their presentation and test their computer connections with the in-house equipment prior to their individual presentations. Audiovisual equipment (LCD projector and screen) will be available for speakers to use from Monday through Friday. Speakers are encouraged to use this facility to practice their presentation, either alone or with colleagues.

## Oral Sessions

All oral sessions will be held on Level 4 of the Sands Expo & Convention Center from 9:00 am to 12:00 pm in the morning and 2:00 pm to 5:00 pm in the afternoon on Tuesday through Friday (except Wednesday, when the abbreviated afternoon session will run from 2:00 pm – 4:00 pm) The detailed order and locations of talks are listed in this program book, also accessible via the Conference web and mobile apps.

Contributed oral presentations are 15 minutes per speaker (including 3 minutes for questions), while invited presentations are 30 minutes per speaker (including 5 minutes for questions).

**All oral presentations are to be made using the speaker's own laptop.** The Conference will provide the LCD projector and screen, laser pointer, and microphone in each oral session room. The display aspect ratio is 4:3 (not widescreen). There will also be a multi-port switchbox in each session room so that speakers can connect their laptops during the question period of the previous speaker.

Only standard PC-style VGA connections to the LCD projector will be supplied (**not HDMI**). Presenting authors must supply any adaptor required for their computer. In particular, Mac OS users must make sure that they have the correct adaptor plug.

Presenters are encouraged to test their connections and display settings in the Speaker Practice Room (see venue map) prior to their presentations.

Speakers should check in with the Session Chair at least five minutes before the scheduled start of the session. Session Chairs have the responsibility of reporting "No-Shows" to the Publication Committee. Papers associated with no-show presentations will not be published in the special INTERMAG issue of the IEEE Transactions on Magnetics.

## ***IEEE Magnetics Society Best Student Presentation Award***

Following the establishment of this prestigious prize by the IEEE Magnetics Society in 2008, the selection of the six finalists for INTERMAG 2018 has been made after full review of all students entering the competition. This selection has been based on the quality and likely impact of the work, with preference given to students who are within one year of graduation and who are, and whose advisors are, current members of the IEEE Magnetics Society. The six finalists will receive a cash award from the Magnetics Society as well as recognition for their achievement. The eventual winner will be selected by a transnational panel of scientists who will assess each presentation according to the following criteria:

1. The quality/impact of the work
2. The student's contribution/involvement in the work
3. The quality of student's presentation

Each of the criteria will make an equal contribution to the assessment. The panel evaluation process will be overseen by the Chair of the IEEE Magnetics Society Education Committee and the Chair of the Honors and Awards Committee. The award will be made to the student achieving the highest overall ranking in the three criteria.

The six finalists of INTERMAG 2018 are:

***Jérémy Létang***

AE-01 (Tuesday, 09:00, Roselle II)

***Hiroki Taniguchi***

AD-03 (Tuesday, 09:30, Peony IV)

***Mohammad Zahedinejad***

AI-11 (Tuesday, 11:45, Orchid II)

***Mario Fratzl***

BC-01 (Tuesday, 14:00, Orchid IV)

***Dédalo Sanz-Hernández***

BF-05 (Tuesday, 15:00, Peony I)

***Xueying Zhang***

CD-03 (Wednesday, 09:30, Peony IV)

## Poster Sessions

All poster sessions will be held in the Simpor/Roselle Ballroom on Level 4 of the Sands Expo & Convention Center. Posters will be displayed from 8:30 am - 11:30 am for morning sessions, and 1:30 pm - 4:30 pm for afternoon sessions. Posters should be set up at least 15 minutes before the session starts and must be removed by the authors promptly at the end of their session. Posters not removed will be discarded.

The maximum poster size is 0.85 meters wide by 1.2 meters high (33 inches wide by 46 inches high). You must include the title and authors on the poster. The Conference provides a small sign designating the paper to be posted on each board and adhesive strips for attaching your poster to the board.

Poster presentations will consist of well-prepared visual materials about the work posted on a designated board. An author of the digest must be available to present details and answer questions during the selected poster session times. If a poster is posted but none of the authors is present, the Session Chairs will count the presentation as a "No-Show". Papers associated with no-show presentations will not be published in the special INTERMAG issue of the IEEE Transactions on Magnetics.

### ***Best Poster Awards***

Best Poster Awards will be given to recognize excellence in research and presentation. There will be one award made for each morning and afternoon session of the Conference. The awards will be made in the last hour of each poster session. The award consists of a SGD 100 cash prize and an award certificate. A ribbon will also be attached to the winning posters. Winning posters will be prominently displayed throughout the remainder of the Conference.

All posters will be eligible for nomination for this award provided that they meet the requirements and guidelines for poster presentations. Selections will be based on the level of the research, quality of the poster, and clarity of the presentation.

Nominations will be made by the individual Session Chairs. The final decision will be made by the Poster Award Committee after reviewing the nominated posters.

## Student Travel Grants

The IEEE Magnetics Society awards travel grants of up to \$1000 each to a limited number of students wishing to attend INTERMAG 2018. These grants are intended to partially offset travel costs. Support is for current graduate students only. Post-doctoral workers and undergraduate students are ineligible. Students who have previously received travel support from the Magnetics Society are also ineligible.

Preference is given to student members of the Magnetics Society. Preference is also given to students nearing completion of their studies and presenting conference papers. The student's supervisor must also be a member of the Magnetics Society. The student's supervisor must write a letter of endorsement for the applicant. A second letter of endorsement from a full member of the Magnetics Society is also required.

Travel grants are a reimbursement for actual expenses. Thus, the students must attend the Conference and submit receipts to the Student Travel Coordinator, which then are processed and reimbursed by IEEE. Reimbursement will be made at the Conference.

Shortly after the Conference, grant recipients must submit a short account of their experience for possible inclusion in the IEEE Magnetics Society newsletter.

## Additional Information

Complete and up-to-date Conference information can be found at:  
[www.intermag2018.com](http://www.intermag2018.com)

The Conference language is English.

### ***Camera, Cell Phone and Video Recording Policy***

By registering for this meeting, all attendees acknowledge that they may be photographed by Conference personnel while at events, and that those photos may be used for promotional purposes, in Conference publications and websites, and on social media sites. Any recording of sessions (audio, video, still photography, etc.) intended for personal use, distribution, publication, or copyright is strictly prohibited. Attendees violating this policy may be asked to leave the session.



# IEEE Magnetics Society

President	Manuel Vazquez
Vice President	Pallavi Dhagat
Secretary/Treasurer	Masahiro Yamaguchi
Past-President	Bruce Terris

## ***Elected IEEE Magnetics Society Administrative Committee Members***

***Terms expiring December 31, 2018:*** K. Gao; G. Ju; D. Jiles; O. Kazakova; V. Mazauric; K. Nakagawa; M. Pasquale; and R. Stamps.

***Terms expiring December 31, 2019:*** A. Adeyeye; D. Altbir; Y. Kubota; C-H. Lai; S. Mangin; M. Ruehrig; R. Sommer; and J. Sykulski.

***Terms expiring December 31, 2020:*** C. Dennis; P. Fischer; S. Greaves; M. Klauj; J. Lau; H. Nembach; T. Ono; and T. Thomson.

***Appointed Committee Chairs:*** P. Andrei; O. Chubykalo-Fesenko; B. Hillebrands; A. Hirohata; L. Lewis; P.W.T. Pong; R. Schaefer; B. Stadler; B. Terris; D. Wei; and M. Wu.

***Other Appointed Members:*** G. Hatch, P. Kabos, H. Muraoka and T. McKinnon

***Council Representatives:*** R. Goldfarb and A. Zeller (Supercond.); I. Nlebedim (Engagement with Young Professionals); J. Kosel (Sensors); J-P Wang and J.A. Incorvia (Nanotechnology).

## ***Joining the Magnetics Society***

By joining the IEEE Magnetics Society, you become a part of the world's best-known magnetics organization.

- You gain access to local Chapter events, technical activities and can sponsor students for Conference travel grants.
- You will be recognized as being part of the established and vibrant IEEE technical community
- And you will receive a large discount on Conference registrations, including INTERMAG 2018.

Joining is easy: Go to [www.ieeemagnetics.org](http://www.ieeemagnetics.org) and follow the links prior to registering for the Conference.

Whether you are a member or not, we cordially invite you to stop by our Membershiup Table to share with us your experiences and to learn about all the advantages that the IEEE Magnetics Society offers to its members.

We are looking forward to meeting you at INTERMAG 2018.

## **Social Media**

The IEEE Magnetics Society and its sponsored Conferences have an active and wide social media presence.



### **IEEE Magnetics Society**

Facebook Page: @ieeemagsoc

<https://www.facebook.com/IEEEMagSoc/>

Facebook Group

<https://www.facebook.com/groups/IEEEMagSoc/>

Twitter: @IEEEMagSoc

Linkedin Page:

<https://www.linkedin.com/company/ieee-magnetics-society/>

Linkedin Group:

<https://www.linkedin.com/groups/3835192>

### **Intermag Conference**

Facebook Page: @Intermagconf

<https://www.facebook.com/Intermagconf/>

Twitter: @Intermagconf

### **Conference on Magnetism and Magnetic Materials**

Facebook Page: @MMMConference

<https://www.facebook.com/MMMConference/>

Twitter: @MMMConf

# Conference Management Committee

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## Conference Local Support

INTERMAG 2018 is being held in Singapore for the first time and we would like to thank various organizations and people for their help in making this happen. INTERMAG 2018 has greatly benefited from the financial support of Singapore Exhibitions and Conventions Beruau (SECB) and Nanyang Technological University (NTU), Singapore. IEEE Magnetics Singapore Chapter has been helpful right from the beginning. We would like to particularly thank several students who submitted an entry for the logo design competition. The winners, Tanmay Dutta and Yu Jiawei, were helpful even at the later stages in the design of cover page for program book. The experience and support of local Conference organizers, Meeting Matters International has been very useful.

## Future Conferences

### **21st International Conference on Magnetism (ICM 2018)**

July 15-20, 2018, San Francisco, USA

### **2019 Joint MMM/Intermag Conference**

January 14-18, 2019, Washington DC, USA

### **2019 Conference on Magnetism and Magnetic Materials**

November 4-8, 2019, Las Vegas, USA

### **2020 Intermag Conference**

May 4-8, 2020, Montreal, Canada

### **2020 Conference on Magnetism and Magnetic Materials**

November 16-20, 2020, Fort Lauderdale, USA

### **2021 Intermag Conference**

April 26-30, 2021, Lyon, France

### **2022 Joint MMM/Intermag Conference,**

January 14-18, 2022, New Orleans, USA

### **2022 Conference on Magnetism and Magnetic Materials**

October 31-Nov. 4, 2022, Minneapolis, USA

### **2023 Conference on Magnetism and Magnetic Materials**

October 30-November 3, 2023, Dallas, USA

# Program at a Glance

ID	Title	Time	Location	Type
<b>Monday Afternoon, April 23</b>				
TU	Tutorial session: Antiferromagnetic Spintronics	3:30	Orchid I-II	Tutorial
<b>Tuesday Morning, April 24</b>				
AA	Compensated Spintronics	9:00	Orchid I	Symp.
AB	Rare Earth Transition Metal Borides I	9:00	Orchid III	Oral
AC	Microscopy, Imaging and Characterization I	9:00	Orchid IV	Oral
AD	Spin-orbitronics I	9:00	Peony IV	Oral
AE	Skyrmions, Vortices & Magnetisation Dynamics	9:00	Roselle II	Oral
AF	Magnetic Recording: Components and Architecture	9:00	Peony I	Oral
AG	Electrical Machines and Control I	9:00	Peony III	Oral
AH	Sensors: Fundamental Developments and Materials I	9:00	Peony II	Oral
AI	Emerging and Interdisciplinary Applications I	9:00	Orchid II	Oral
AP	Bio-imaging and Bio-detection II	8:30	Simpdor/ Roselle	Poster
AQ	High Frequency Magnetic Materials and Devices I	8:30	Simpdor/ Roselle	Poster
AR	Magneto-electronic Devices	8:30	Simpdor/ Roselle	Poster
AS	Nanoparticles and Nanostructured Arrays	8:30	Simpdor/ Roselle	Poster
AT	Permanent Magnet and Reluctance Machines I	8:30	Simpdor/ Roselle	Poster
AU	Permanent Magnet and Reluctance Machines II	8:30	Simpdor/ Roselle	Poster
AV	Soft Magnetic Materials I	8:30	Simpdor/ Roselle	Poster
AW	Transformers and Inductors: Modelling I	8:30	Simpdor/ Roselle	Poster
<b>Tuesday Afternoon, April 24</b>				
BA	Synchrotron X-Ray and Neutron Sciences for Magnetism	2:00	Orchid I	Symp.
BB	Soft Magnetic Materials II: Amorphous and Nanocrystalline Materials	2:00	Orchid III	Oral
BC	Bio-imaging and Bio-detection I	2:00	Orchid IV	Oral
BD	Magnetic Tunnel Junction and Spin Orbit Torque	2:00	Peony IV	Oral
BE	Spin Injection and Spin Torque Oscillators	2:00	Roselle II	Oral
BF	Nanowires, Nanoparticles and Clusters	2:00	Peony I	Oral
BG	Linear Motors I	2:00	Peony III	Oral
BH	Sensors: Frontier Applications I	2:00	Peony II	Oral
BI	Computational Magnetism: Micromagnetics and Ab-initio Calculations	2:00	Orchid II	Oral
BP	TMR, VCMA and Multiferroic Materials I	1:30	Simpdor/ Roselle	Poster
BQ	Energy Assisted Recording and Recording Media	1:30	Simpdor/ Roselle	Poster
BW	TMR, VCMA and Multiferroic Materials II	1:30	Simpdor/ Roselle	Poster
BR	Magnetic Oxide and Alloy Films	1:30	Simpdor/ Roselle	Poster

BS	Permanent Magnet and Reluctance Machines III	1:30	Simpdor/ Roselle	Poster
BT	Permanent Magnet and Reluctance Machines IV	1:30	Simpdor/ Roselle	Poster
BU	Rare Earth Transition Metal Borides II	1:30	Simpdor/ Roselle	Poster
BV	Spin-orbitronics II	1:30	Simpdor/ Roselle	Poster

#### Tuesday Evening, April 24

XA	How to Get a Job in Industry, Academia or Government Lab	5:30 PM	Orchid I	Special
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#### Wednesday Morning, April 25

CA	Skyrmions for the Future	9:00	Orchid I-II	Symp.
CB	Soft Magnetic Materials III: Crystalline Materials	9:00	Orchid III	Oral
CC	Microscopy, Imaging and Characterization II	9:00	Orchid IV	Oral
CD	Domain Wall Dynamics	9:00	Peony IV	Oral
CE	High Frequency Magnetic Materials and Devices II	9:00	Roselle II	Oral
CF	Magnetisation Dynamics I	9:00	Peony I	Oral
CG	Modelling of Machines I	9:00	Peony III	Oral
CH	Transformers and Inductors	9:00	Peony II	Oral
CP	Magnetic Therapies and Nanomedicine I	8:30	Simpdor/ Roselle	Poster
CQ	Domain Walls and Skyrmions	8:30	Simpdor/ Roselle	Poster
CR	Fundamental Properties and Cooperative Phenomena I	8:30	Simpdor/ Roselle	Poster
CS	Hard Magnets I	8:30	Simpdor/ Roselle	Poster
CT	Linear Motors II	8:30	Simpdor/ Roselle	Poster
CU	Linear Motors III	8:30	Simpdor/ Roselle	Poster
CV	Sensors: Frontier Applications II	8:30	Simpdor/ Roselle	Poster
CW	Sensors: Fundamental Developments and Materials II	8:30	Simpdor/ Roselle	Poster

#### Wednesday Afternoon, April 25

DA	Magnetism in Biomedicine: Where Next?	2:00	Orchid I-II	Symp.
DB	Magnetic Fluids and Organic Magnetic Materials I	2:00	Orchid III	Oral
DC	Spin-transport with Topological Materials	2:00	Orchid IV	Oral
DD	Neuromorphic Computing	2:00	Peony IV	Oral
DE	Antiferromagnetic Spintronics	2:00	Roselle II	Oral
DF	Heat Assisted Recording Physics	2:00	Peony I	Oral
DG	Energy Harvesters and Generators I	2:00	Peony III	Oral
DH	Permanent Magnet and Reluctance Machines V	2:00	Peony II	Oral
PL	Awards Ceremony and Plenary Talk	4:00	Orchid I-II	Plenary

#### Thursday Morning, April 26

EA	Novel Hard Magnetic Materials and Their Applications	9:00	Orchid I	Symp.
EB	Magneto-elastic and Magneto-optic Materials	9:00	Orchid III	Oral

EC	GMR, TMR, and Multiferroic Materials	9:00	Orchid IV	Oral
ED	Spin-orbitronics III	9:00	Peony IV	Oral
EE	Recent Advances and Future Challenges of Computational Magnetism	9:00	Roselle II	Symp.
EF	Energy Assisted Recording	9:00	Peony I	Oral
EG	Shielding, Electromagnetic Compatibility, Motors and Generators I	9:00	Peony III	Oral
EH	Magnetic Semiconductors and Oxides	9:00	Peony II	Oral
EI	Magnetic Therapies and Nanomedicine II	9:00	Orchid II	Oral
EP	Exchange Coupling, Superconductivity and Electronic Structure I	8:30	Simpdor/ Roselle	Poster
EQ	Ferrite Materials and Applications	8:30	Simpdor/ Roselle	Poster
ER	Magnetic Bearings, and Levitation	8:30	Simpdor/ Roselle	Poster
ES	Magnetic Gears	8:30	Simpdor/ Roselle	Poster
ET	Magnetisation Dynamics II	8:30	Simpdor/ Roselle	Poster
EU	Micromagnetics I	8:30	Simpdor/ Roselle	Poster
EV	Microscopy, Imaging and Characterization III	8:30	Simpdor/ Roselle	Poster
EW	Sensors: New Sensing Principles	8:30	Simpdor/ Roselle	Poster

#### Thursday Afternoon, April 26

FA	Topological and Collective Magnetic Phenomena	2:00	Orchid I	Symp.
FB	Hard Magnetic Materials and Processing I	2:00	Orchid III	Oral
FC	TMR, VCMA and Switching	2:00	Orchid IV	Oral
FD	Magneto-caloric Materials I	2:00	Peony IV	Oral
FE	Patterned Films and Elements	2:00	Roselle II	Oral
FF	Spin Waves I	2:00	Peony I	Oral
FG	Magnetic Bearings, Gears and Levitation	2:00	Peony III	Oral
FH	Analysis and Optimisation of Electrical Machines I	2:00	Peony II	Oral
FI	Fundamental Properties and Cooperative Phenomena II	2:00	Orchid II	Oral
FP	Circuit Analysis of Transformers	1:30	Simpdor/ Roselle	Poster
FQ	Hard Magnetic Materials and Motor Applications	1:30	Simpdor/ Roselle	Poster
FR	Magnetic Fluids and Organic Magnetic Materials II	1:30	Simpdor/ Roselle	Poster
FS	Magneto-elastic Materials	1:30	Simpdor/ Roselle	Poster
FT	Modelling of Machines II	1:30	Simpdor/ Roselle	Poster
FU	Modelling of Machines III	1:30	Simpdor/ Roselle	Poster
FV	Spin Waves and Optical Magnetisation Switching	1:30	Simpdor/ Roselle	Poster
FW	Transformers and Inductors: Modelling II	1:30	Simpdor/ Roselle	Poster

#### Thursday Evening, April 26

YA	Panel Discussion: The Future of Memory Technologies	5:30	Orchid I	Special
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Friday Morning, April 27				
GA	The Present and Future of STT-MRAM	9:00	Orchid I	Symp.
GB	Nanostructured Hard Magnetic Materials	9:00	Orchid III	Oral
GC	Magnetisation Switching and Magnon-Photon Coupling	9:00	Orchid IV	Oral
GD	Spin-orbitronics IV	9:00	Peony IV	Oral
GE	Exchange Coupling, Superconductivity and Electronic Structures II	9:00	Roselle II	Oral
GF	Spin Waves II	9:00	Peony I	Oral
GG	Modelling of Machines V	9:00	Peony III	Oral
GH	High Speed Machines II	9:00	Peony II	Oral
GI	Recording Systems and Head-Disk Interface	9:00	Orchid II	Oral
GP	Electrical Machines and Control II	8:30	Simpdor/ Roselle	Poster
GQ	Emerging and Interdisciplinary Applications II	8:30	Simpdor/ Roselle	Poster
GR	Hard Magnetic Materials and Processing II	8:30	Simpdor/ Roselle	Poster
GS	High Speed Machines I	8:30	Simpdor/ Roselle	Poster
GT	Hysteresis Modelling I	8:30	Simpdor/ Roselle	Poster
GU	Inductors	8:30	Simpdor/ Roselle	Poster
GV	Modelling of Machines IV	8:30	Simpdor/ Roselle	Poster
GW	Ultrathin Films and Surface Effects I	8:30	Simpdor/ Roselle	Poster

Friday Afternoon, April 27				
HA	Atoms, Molecules & Interfaces for Spin Quantum Engineering	2:00	Orchid I	Symp.
HB	Hard Magnets II	2:00	Orchid III	Oral
HC	Magnetic Tunnel Junctions and STT-MRAM	2:00	Orchid IV	Oral
HD	Spin Injection and Transport	2:00	Peony IV	Oral
HE	Dynamics of Skyrmions	2:00	Roselle II	Oral
HF	Ultrathin Films and Surface Effects II	2:00	Peony I	Oral
HG	Permanent Magnet and Reluctance Machines VII	2:00	Peony III	Oral
HH	Hysteresis Modelling II	2:00	Peony II	Oral
HI	Transformers and Inductors: High Frequency Effects	2:00	Orchid II	Oral
HP	Ab-initio Calculations	1:30	Simpdor/ Roselle	Poster
HQ	Analysis and Optimisation of Electrical Machines II	1:30	Simpdor/ Roselle	Poster
HR	Energy Harvesters and Generators II	1:30	Simpdor/ Roselle	Poster
HS	Shielding, Electromagn. Compatibility, Motors & Generators II	1:30	Simpdor/ Roselle	Poster
HT	Micromagnetics II	1:30	Simpdor/ Roselle	Poster
HU	Permanent Magnet and Reluctance Machines VI	1:30	Simpdor/ Roselle	Poster
HV	Recording Systems: Coding and Head-Disk Interface	1:30	Simpdor/ Roselle	Poster
HW	Magneto-caloric Materials II	1:30	Simpdor/ Roselle	Poster
HX	Power Transformers	1:30	Simpdor/ Roselle	Poster

**Session TU**  
**TUTORIAL ON ANTIFERROMAGNETIC**  
**SPINTRONICS**

Atsufumi Hirohata, Chair  
University of York, York, United Kingdom

3:30

- TU-01. Characterisation of Antiferromagnets. (Invited)** *K. O'Grady<sup>1</sup> and G. Vallejo-Fernandez<sup>1</sup> 1. University of York, York, United Kingdom*

4:15

- TU-02. Making the Invisible Visible: Probing Antiferromagnetic Order in Novel Materials. (Invited)** *E. Arenholz<sup>1,2</sup> 1. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. Material Sciences and Engineering, University of California, Berkeley, CA, United States*

5:00

- TU-03. Antiferromagnetic Devices. (Invited)** *T. Jungwirth<sup>1,2</sup> 1. Institute of Physics, Academy of Sciences of the Czech Republic, Praha, Czechia; 2. School of Physics and Astronomy, University of Nottingham, Nottingham, United Kingdom*

**Session AA**  
**SYMPOSIUM ON COMPENSATED SPINTRONICS**

Michael Coey, Chair  
Trinity College Dublin, Dublin, Ireland

9:00

- AA-01. Compensated ferromagnetic Heusler compounds for antiferromagnetic spintronics. (Invited)** *C. Felser<sup>1</sup>, G. Fecher<sup>1</sup>, R. Stinshoff<sup>1</sup>, A. Nayak<sup>1</sup> and M. Coey<sup>2</sup> 1. Solid State Chemistry, Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 2. Physics, Trinity College Dublin, Dublin, Ireland*

9:30

- AA-02. New functionality in half-metallic  $Mn_2Ru_xGa$  close to compensation. (Invited)** *Y. Lau<sup>1,2</sup> 1. Department of Physics, The University of Tokyo, Tokyo, Japan; 2. National Institute for Materials Science (NIMS), Tsukuba, Japan*

10:00

- AA-03. Ultrafast spin dynamics in antiferromagnets. (Invited)**  
*O. Gomonay*<sup>1</sup>, *T. Jungwirth*<sup>2</sup> and *J. Sinova*<sup>1,2</sup> *1. Institute of physics, Johannes Gutenberg University, Mainz, Germany;*  
*2. Institute of Physics ASCR, Praha, Czechia*

10:30

- AA-04. Electrical detection of reversed antiferromagnetic states switched by unidirectional current pulses. (Invited)**  
*J. Godinho*<sup>1,2</sup>, *H. Reichlova*<sup>1</sup>, *D. Kriegner*<sup>1,2</sup>, *K. Olejnik*<sup>1</sup>,  
*Z. Soban*<sup>1</sup>, *V. Novak*<sup>1</sup>, *R. Otxoa*<sup>3</sup>, *P. Roy*<sup>3</sup>, *T. Jungwirth*<sup>1,4</sup> and  
*J. Wunderlich*<sup>3,1</sup> *1. Institute of Physics ASCR, Prague, Czechia;*  
*2. Faculty of Mathematics and Physics, Charles University, Prague, Czechia;*  
*3. Hitachi Cambridge Laboratory, Hitachi Europe LTD, Cambridge, United Kingdom;*  
*4. School of Physics and Astronomy, University of Nottingham, Nottingham, United Kingdom*

11:00

- AA-05. Spin Current Generation, Detection, and Transport with Antiferromagnets. (Invited)** *Z. Wei*<sup>1,2</sup>, *M. Jungfleisch*<sup>1,3</sup>,  
*W. Jiang*<sup>1,4</sup>, *H. Saglam*<sup>1,5</sup>, *F. Freimuth*<sup>6</sup>, *J. Sklenar*<sup>1,7</sup>, *J. Pearson*<sup>1</sup>,  
*J. Ketterson*<sup>7</sup>, *Y. Mokrousov*<sup>6</sup> and *A. Hoffmann*<sup>1</sup> *1. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States;*  
*2. Department of Physics, Oakland University, Rochester, MI, United States;*  
*3. Physics Department, University of Delaware, Newark, DE, United States;*  
*4. State Key Laboratory of Low-Dimensional Quantum Physics, and Department of Physics, Tsinghua University, Beijing, China;*  
*5. Department of Physics, Illinois Institute of Technology, Chicago, IL, United States;*  
*6. Peter Grünberg Institut and Institute for Advanced Simulation, Forschungszentrum Jülich, Jülich, Germany;*  
*7. Department of Physics and Astronomy, Northwestern University, Evanston, IL, United States*

11:30

- AA-06. Spin Transport in Speromagnets: Disordered Spintronic Materials with Antiferromagnetic Correlations. (Invited)**  
*B.L. Zink*<sup>1</sup> *1. Physics & Astronomy, University of Denver, Denver, CO, United States*

TUESDAY  
MORNING  
9:00

ORCHID III

### Session AB

## RARE EARTH TRANSITION METAL BORIDES I

*Jinbo Yang*, Co-Chair  
Peking University, Beijing, China

*Weibin Cui*, Co-Chair  
Northeastern University, Shenyang, China

9:00

- AB-01. Electronic states and magnetic properties around the grain boundary in Nd-Fe-B sintered magnets studied by first-principles calculations.** *Y. Tatetsu*<sup>1</sup> and *Y. Gohda*<sup>1</sup>  
*1. Department of Materials Science and Engineering, Tokyo Institute of Technology, Yokohama, Japan*

9:15

- AB-02. A novel approach of substitution of Ce for Nd in preparing  $R_2Fe_{14}B$  nanocrystalline magnets with high coercivity.** L. Zha<sup>1</sup>, Z. Liu<sup>1</sup>, G. Tian<sup>1</sup>, K. Li<sup>1</sup>, M. Xue<sup>1</sup>, Z. Shao<sup>1</sup>, H. Zhao<sup>1</sup>, Y. Zhang<sup>1</sup>, W. Yang<sup>1</sup>, Y. Lai<sup>1</sup>, G. Qiao<sup>1</sup>, X. Li<sup>1</sup>, L.S. Ding<sup>1</sup>, S. Liu<sup>1</sup>, H. Du<sup>1</sup>, C. Wang<sup>1</sup>, J. Han<sup>1</sup>, Y. Yang<sup>1</sup> and J. Yang<sup>1,2</sup>  
1. State Key Laboratory for Mesoscopic Physics, School of Physics, Beijing, China; 2. Collaborative Innovation Center of Quantum Matter, Beijing, China

9:30

- AB-03. Magnetic performance change of multi-main-phase Nd-Ce-Fe-B magnets by diffusing (Nd, Pr)H<sub>x</sub>.** W. Zhang<sup>1</sup>, T. Ma<sup>1</sup>, B. Peng<sup>1</sup> and M. Yan<sup>1</sup> 1. School of Materials Science and Engineering, Zhejiang University, Hangzhou, China

9:45

- AB-04. Coercivity enhancement of multi-main-phase Ce-Fe-B magnets by spark plasma sintered technique and dual alloy method.** Q. Jiang<sup>1</sup>, W. Lei<sup>1</sup>, S. Rehman<sup>1</sup>, Q. Zeng<sup>1</sup>, L. He<sup>1</sup>, X. Hu<sup>1</sup>, L. Zhang<sup>1</sup>, M. Zhong<sup>1</sup>, S. Ma<sup>1</sup>, W. Cui<sup>2</sup> and Z. Zhong<sup>1</sup>  
1. Jiangxi University of Science and Technology, Ganzhou, China; 2. Northeast University, Shenyang, China

10:00

- AB-05. Nd-Fe-B films with perpendicular magnetic anisotropy and extremely large room temperature coercivity.** C. Ma<sup>1</sup>, S. Wang<sup>1</sup>, A. Morisako<sup>1</sup>, S. Piramanayagam<sup>2</sup> and X. Liu<sup>1</sup>  
1. Faculty of Engineering, Shinshu University, Nagano, Japan; 2. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore

10:15

- AB-06. Development of non-rare earth grain boundary diffusion process for Nd-Fe-B permanent magnets.** Z. Liu<sup>1</sup>, Q. Zhou<sup>1</sup>, H. Zeng<sup>1</sup>, H. Yu<sup>1</sup>, X. Zhong<sup>1</sup> and X. Che<sup>1</sup> 1. School of Materials Science and Engineering, South China University of Technology, Guangzhou, China

10:30

- AB-07. Low spin reorientation transition temperature, high coercivity, Nd<sub>2</sub>(Fe,Co,Cr)<sub>14</sub>B based hard magnetic nanoparticles.** V. Chaudhary<sup>1</sup>, Y. Zhong<sup>1</sup>, H. Parmar<sup>1</sup>, X. Tan<sup>1</sup> and R.V. Ramanujan<sup>1</sup> 1. Nanyang Technological University, Singapore, Singapore

10:45

- AB-08. Effect of impurities on magnetic properties in Nd-Fe-B particles synthesized by reduction-diffusion process.** D. Kim<sup>1,2</sup>, V. Galkin<sup>1,2</sup> and K. Haider<sup>1,2</sup> 1. Korea Institute of Materials Science, Changwon, The Republic of Korea; 2. DMR CRC, Korea Institute of Geoscience and Mineral Resources, Daejeon, The Republic of Korea

11:00

- AB-09. Coercivity enhancement of hot-pressed magnet prepared by HDDR Nd-Fe-B powders using Pr-Cu eutectic alloys diffusion.** *T. Song*<sup>1</sup>, *X. Tang*<sup>1</sup>, *W. Yin*<sup>1</sup>, *R. Chen*<sup>1</sup> and *A. Yan*<sup>1</sup>  
*1. Ningbo Institute of Industrial Technology, Chinese Academy of Sciences, Ningbo, China*

11:15

- AB-10. Corrosion of Co,Al-alloyed NdFeB magnetic nanostructures processed by microwave synthesis.** *H. Parmar*<sup>1</sup>, *X. Tan*<sup>1</sup>, *Y. Zhong*<sup>1</sup>, *V. Chaudhary*<sup>1</sup>, *D. Peng*<sup>1</sup>, *Y. Huang*<sup>1</sup> and *R.V. Ramanujan*<sup>1</sup>  
*1. Nanyang Technological University, Singapore, Singapore*

11:30

- AB-11. Mechanism for the enhancement of magnetic properties of Nd-Fe-B, after the addition of Pr, Dy and Tb.** *K. Haider*<sup>1,2</sup>, *V. Galkin*<sup>1,2</sup>, *Y. Kang*<sup>3</sup> and *D. Kim*<sup>1,2</sup>  
*1. Development of Mineral Resources, Korea Institute of Geoscience and Mineral Resources, Daejeon, The Republic of Korea; 2. Powder & Ceramics Division, Korea Institute of Materials Science, Changwon, The Republic of Korea; 3. Department of Chemistry, Sogang University, Seoul, The Republic of Korea*

11:45

- AB-12. Magnetic Properties of NdFeB Alloys Obtained by Gas Atomization Technique.** *G. Sarriegui*<sup>1,2</sup>, *J.M. Martín*<sup>1,2</sup>, *M. Ipatov*<sup>3</sup>, *A.P. Zhukov*<sup>4,5</sup> and *J. Gonzalez*<sup>5</sup>  
*1. Materials and Manufacturing, CEIT-IK4, San Sebastián, Spain; 2. Tecnun (University of Navarra), San Sebastián, Spain; 3. SgiKER (Magnetic Measurements), University of the Basque Country, San Sebastián, Spain; 4. IKERBASQUE Foundation, Bilbao, Spain; 5. Department Materials Physics, Faculty of Chemistry, University of the Basque Country, San Sebastián, Spain*

TUESDAY  
MORNING  
9:00

ORCHID IV

### Session AC

## MICROSCOPY, IMAGING AND CHARACTERIZATION I

Xiaoyan Zhong, Chair  
Tsinghua University, Beijing, China

9:00

- AC-01. Quantitative magnetic measurement by electron magnetic chiral dichroism with high spatial resolution in the transmission electron microscope. (Invited)** *J. Zhu*<sup>1</sup> and *D. Song*<sup>1</sup>  
*1. Tsinghua University, Beijing, China*

9:30

- AC-02. Stable skyrmion states at room temperature confined in corrals of artificial surface pits fabricated by a focused electron beam.** *T. Matsumoto*<sup>1</sup>, *Y. So*<sup>2</sup>, *Y. Kohno*<sup>3</sup>, *Y. Ikuhara*<sup>1,4</sup> and *N. Shibata*<sup>1,4</sup> *1. The University of Tokyo, Tokyo, Japan; 2. Akita University, Akita, Japan; 3. JEOL, Ltd., Tokyo, Japan; 4. Japan Fine Ceramic Center, Nagoya, Japan*

9:45

- AC-03. Tuning Magnetic Domains with Ion-beam Irradiation in Co/Pd Multilayer.** *A. Talapatra*<sup>1</sup>, *A. Chelvane*<sup>2</sup>, *C. Günther*<sup>3,4</sup>, *S. Eisebitt*<sup>4,3</sup>, *T. Shibayama*<sup>5</sup> and *J. Mohanty*<sup>1</sup> *1. Physics, Indian Institute of Technology Hyderabad, Hyderabad, India; 2. Defence Metallurgical Research Laboratory, Hyderabad, India; 3. Technical University Berlin, Berlin, Germany; 4. Max Born Institute, Berlin, Germany; 5. Hokkaido University, Sapporo, Japan*

10:00

- AC-04. Directly observed dynamics of distorted vortex cores including asymmetric Bloch walls utilizing soft X-ray microscopy.** *M. Im*<sup>1</sup>, *H. Han*<sup>2</sup>, *M. Jung*<sup>3</sup>, *P. Fischer*<sup>1</sup>, *J. Hong*<sup>3</sup> and *K. Lee*<sup>2</sup> *1. LBNL, Berkeley, CA, United States; 2. UNIST, Ulsan, The Republic of Korea; 3. Daegu Gyeongbuk Institute of Science & Technology (DGIST), DAEGU, The Republic of Korea*

10:15

- AC-05. Calibrated MFM: electrostatic compensation of  $\mu$ -coils.** *C. Barton*<sup>1</sup>, *R. Puttock*<sup>1,2</sup>, *H. Corte-León*<sup>1</sup>, *M. Gerken*<sup>3</sup>, *A. Manzin*<sup>5</sup>, *V. Neu*<sup>4</sup>, *H. Schumacher*<sup>3</sup> and *O. Kazakova*<sup>1</sup> *1. Quantum Science, National Physical Laboratory, Teddington, United Kingdom; 2. Physics department, Royal Holloway, Egham, United Kingdom; 3. Physikalisch-Technische Bundesanstalt, Braunschweig, Germany; 4. IFW Dresden, Dresden, Germany; 5. INRIM, Torino, Italy*

10:30

- AC-06. Off-axis electron holography for the quantitative study of magnetic properties of nanostructures: from the single nanomagnet to the complex device. (Invited)** *C. Gatel*<sup>1</sup>, *B. Warot-Fonrose*<sup>1</sup>, *M. Casanove*<sup>1</sup>, *A. Masseur*<sup>1</sup>, *N. Biziere*<sup>1</sup>, *F.B. Bonilla*<sup>2</sup>, *L. Lacroix*<sup>2</sup>, *A. Meffre*<sup>2</sup> and *T. Blon*<sup>2</sup> *1. CEMES, CNRS, University of Toulouse, Toulouse, France; 2. Laboratoire de Physique et Chimie des Nano-objets - INSA, Toulouse, France*

11:00

- AC-07. Atomic-plane resolved magnetic circular dichroism by transmitted electrons.** *Z. Wang*<sup>1</sup> and *X. Zhong*<sup>1</sup> *1. School of Materials Science and Technology, Tsinghua University, Beijing, China*

11:15

**AC-08. Effect of annealing on the structural and magnetic properties of CoMnSi investigated by X-ray diffraction and X-ray absorption fine structure measurements.** R. Kou<sup>2,1</sup>, J. Gao<sup>2</sup>, Y. Ren<sup>1</sup>, S. Heald<sup>1</sup>, B. Fisher<sup>1</sup> and C. Sun<sup>1</sup> *1. Argonne National Laboratory, Argonne, IL, United States; 2. Key Laboratory of Electromagnetic Processing of Materials (Ministry of Education), Northeastern University, Shenyang, China*

11:30

**AC-09. Spatially resolved investigation of all optical magnetization switching in TbFe alloys.** M.A. Mawass<sup>1</sup>, A. Arora<sup>1,5</sup>, O. Sandig<sup>3</sup>, C. Luo<sup>2</sup>, A.A. Ünal<sup>1,4</sup>, F. Radu<sup>1</sup>, S. Valencia<sup>1</sup> and F. Kronast<sup>1</sup> *1. Department Materials for Green Spintronics, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany; 2. Department of Physics, University of Regensburg, Regensburg, Germany; 3. Institut für Experimentalphysik, Freie Universität Berlin, Berlin, Germany; 4. Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany; 5. Institut für Physik und Astronomie, Universität Potsdam, Potsdam, Germany*

11:45

**AC-10. A Magnetic Field Camera for Real-Time Subsurface Imaging Applications.** A.B. Suksmo<sup>1,2</sup>, D. Danudirdjo<sup>1</sup>, R.P. Prastio<sup>1</sup>, A.D. Setiawan<sup>3</sup> and D. Rahmawati<sup>1</sup> *1. School of Electrical Engineering and Informatics, Institut Teknologi Bandung, Bandung, Indonesia; 2. ITB Research Center on ICT (PPTIK-ITB), Institut Teknologi Bandung, Bandung, Indonesia; 3. School of Electrical Engineering, Telkom University, Bandung, Indonesia*

TUESDAY  
MORNING  
9:00

PEONY IV

**Session AD  
SPIN-ORBITRONICS I**

Wanjun Jiang, Chair  
Tsinghua University, Beijing, China

9:00

**AD-01. Modulated spin orbit torque in a Pt/Co/Pt/YIG multilayer by nonequilibrium proximity effect.** Q. Liu<sup>1</sup>, K. Meng<sup>1</sup>, X. Xu<sup>1</sup>, J. Miao<sup>1</sup>, Y. Wu<sup>1</sup>, J. Chen<sup>1</sup> and Y. Jiang<sup>1</sup> *1. School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China*

9:15

**AD-02. Spin orbit torque and topological Hall effect in MnX(X=Ga or Al)/heavy metal bilayers.** K. Meng<sup>1</sup>, J. Zhao<sup>2</sup> and Y. Jiang<sup>1</sup> *1. University of Science and Technology of China, Beijing, China; 2. Institute of Semiconductors Chinese Academy of Sciences, Beijing, China*

9:30

- AD-03. Strong suppression of spin Hall effects induced by spin fluctuations.** *H. Taniguchi*<sup>1\*</sup>, *T. Arakawa*<sup>1,2</sup>, *T. Taniguchi*<sup>1</sup>, *Y. Niimi*<sup>1,2</sup> and *K. Kobayashi*<sup>1,2</sup> *1. Graduate School of Science, Osaka University, Toyonaka, Japan; 2. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan*

9:45

- AD-04. Symmetry and magnitude of intrinsic spin-orbit torques in the half-Heusler alloy PtMnSb.** *J. Mendil*<sup>1</sup>, *J. Kriefft*<sup>2</sup>, *P. Dao*<sup>1</sup>, *C. Avci*<sup>5</sup>, *M.H. Aguirre*<sup>3</sup>, *K. Rott*<sup>2</sup>, *J. Schmalhorst*<sup>2</sup>, *F. Freimuth*<sup>4</sup>, *G. Reiss*<sup>2</sup>, *T. Kuschel*<sup>2</sup> and *P. Gambardella*<sup>1</sup>  
*1. Department of Materials, ETH Zurich, Zurich, Switzerland; 2. Center for Spinelectronic Materials and Devices, Department of Physics, Bielefeld University, Bielefeld, Germany; 3. Instituto de Nanociencia de Aragón & Laboratorio de Microscopías Avanzadas, Dpto. de Física de Materia Condensada, Universidad de Zaragoza, Zaragoza, Spain; 4. Peter Grünberg Institut and Institute for Advanced Simulation, Forschungszentrum Julich and JARA, Julich, Germany; 5. Massachusetts Institute of Technology, Materials Science and Engineering, Cambridge, MA, United States*

10:00

- AD-05. Anomalous Hall effect in fully compensated half-metallic Mn<sub>2</sub>Ru<sub>x</sub>Ga thin films. (Invited)** *C. Fowley*<sup>1</sup>, *K. Rode*<sup>2</sup>, *Y. Lau*<sup>2</sup>, *N. Thiagarajah*<sup>2</sup>, *D. Betto*<sup>2</sup>, *K. Borisov*<sup>2</sup>, *G. Atcheson*<sup>2</sup>, *E. Kampert*<sup>1</sup>, *Z. Wang*<sup>1</sup>, *Y. Yuan*<sup>1</sup>, *S. Zhou*<sup>1</sup>, *J. Lindner*<sup>1</sup>, *P.S. Stamenov*<sup>2</sup>, *M. Coey*<sup>2</sup> and *A. Deac*<sup>1</sup> *1. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. School of Physics, AMBER and CRANN, Trinity College Dublin, Dublin, Ireland*

10:30

- AD-06. A Comparative Study on Spin-Orbit Torque Efficiencies from W/ferromagnetic and W/ferrimagnetic Heterostructures.** *T. Wang*<sup>1</sup>, *C. Pai*<sup>1</sup>, *H. Yen*<sup>1</sup>, *T. Chen*<sup>1</sup> and *C. Wu*<sup>1</sup> *1. Material Science and Engineering, National Taiwan University, New Taipei City, Taiwan*

10:45

- AD-07. All-Optical Measurements of Spin Hall Angles in Tungsten and Tantalum.** *S. Mondal*<sup>1</sup>, *S. Choudhury*<sup>1</sup>, *J. Sinha*<sup>1</sup> and *A. Barman*<sup>1</sup> *1. S. N. Bose National Centre for Basic Sciences, Kolkata, India*

11:00

- AD-08. Demonstration of unidirectional spin Hall magnetoresistance by using naturally oxidized Cu.** *G. Okano*<sup>1</sup> and *Y. Nozaki*<sup>1,2</sup> *1. Department of Physics, Keio University, Yokohama, Japan; 2. Center for Spintronics Research Network, Keio University, Yokohama, Japan*

11:15

- AD-09. Dzyaloshinskii-Moriya interaction and spin-orbit torques for controlling skyrmions in Co-based trilayers.** *J. Hanke*<sup>1,2</sup>, *F. Freimuth*<sup>2</sup>, *S. Bluegel*<sup>2</sup> and *Y. Mokrousov*<sup>2</sup> *1. Institut für Physik, Johannes Gutenberg University, Mainz, Germany; 2. Peter Grünberg Institut and Institute for Advanced Simulation, Forschungszentrum Julich, Juelich, Germany*

11:30

**AD-10. Spin-orbit effective fields in CoTb single layer.** *L. Liu<sup>1</sup>, J. Deng<sup>1</sup>, J. Yu<sup>1</sup>, C. Zhou<sup>1</sup> and J. Chen<sup>1</sup>* *1. Materials Science and Engineering, National University of Singapore, Singapore*

11:45

**AD-11. Chiral magnetization switching induced by spin orbit torque in Pt/Co/Ta structure.** *S. Li<sup>1</sup> and W. Lew<sup>1</sup>* *1. School of Physics and Physical Science, Nanyang Technological University, Singapore, Singapore*

TUESDAY  
MORNING  
9:00

ROSELLE II

**Session AE**  
**SKYRMIONS, VORTICES & MAGNETISATION**  
**DYNAMICS**

Teruo Ono, Chair  
Kyoto University, Uji, Japan

9:00

**AE-01. Modulation of chaotic nanocontact vortex oscillators.** *J. Létang<sup>1\*</sup>, T. Devolder<sup>1</sup>, S. Petit-Watelot<sup>2</sup>, K. Bouzehouane<sup>3</sup>, V. Cros<sup>3</sup> and J. Kim<sup>1</sup>* *1. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Sud, Université Paris-Saclay, Orsay, France; 2. Institut Jean Lamour, CNRS, Université de Lorraine, Vandoeuvre Lés Nancy, France; 3. Unité Mixte de Physique, CNRS, Thales, Université Paris-Sud, Université Paris-Saclay, Palaiseau, France*

9:15

**AE-02. Magnetic vortex dynamics and frequency tunability in Cr-implanted permalloy disks.** *L. Ramasubramanian<sup>1,2</sup>, A. Kakay<sup>1</sup>, C. Fowley<sup>1</sup>, O. Yildirim<sup>3</sup>, P. Matthes<sup>4</sup>, R. Böttger<sup>1</sup>, J. Lindner<sup>1</sup>, J. Fassbender<sup>5</sup>, S. Gemming<sup>1,2</sup>, S.E. Schulz<sup>2,4</sup> and A. Deac<sup>1</sup>* *1. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. TU Chemnitz, Chemnitz, Germany; 3. Empa-Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland; 4. Fraunhofer Institute for Electronic Nano Systems, Chemnitz, Germany; 5. Institute for Physics of Solids, TU Dresden, Dresden, Germany*

9:30

**AE-03. Stability and manipulation of magnetic skyrmions. (Invited)** *G. Finocchio<sup>1</sup>* *1. University of Messina, Messina, Italy*

10:00

- AE-04. Entropy-limited topological protection of skyrmions.** *(Invited)* J. Wild<sup>1</sup>, T. Meier<sup>1</sup>, S. Pöllath<sup>1</sup>, M. Kronseder<sup>1</sup>, A. Bauer<sup>2</sup>, A. Chacon<sup>2</sup>, M. Halder<sup>2</sup>, M. Schowalter<sup>3</sup>, A. Rosenauer<sup>3</sup>, J. Zweck<sup>1</sup>, J. Müller<sup>4</sup>, A. Rosch<sup>4</sup>, C. Pfleiderer<sup>2</sup> and C. Back<sup>1,2</sup> *1. Universität Regensburg, Regensburg, Germany; 2. Technical University of Munich, Munich, Germany; 3. University of Bremen, Bremen, Germany; 4. University of Cologne, Köln, Germany*

10:30

- AE-05. Tunable geometrical frustration in magnonic vortex crystals.** C. Behncke<sup>1,2</sup>, C.F. Adolff<sup>1,2</sup>, S. Wintz<sup>3</sup>, M. Hänze<sup>4,5</sup>, B. Schulte<sup>5</sup>, M. Weigand<sup>6</sup>, S. Finizio<sup>3</sup>, J. Raabe<sup>3</sup> and G. Meier<sup>2,5</sup> *1. Institute of Applied Physics, University of Hamburg, Hamburg, Germany; 2. The Hamburg Centre for Ultrafast Imaging, Hamburg, Germany; 3. Paul Scherrer Institut, Villigen, Switzerland; 4. Max Planck Institute for Solid State Research, Stuttgart, Germany; 5. Max Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany; 6. Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

10:45

- AE-06. Static and dynamic behavior of Interlayer exchange coupled Ni<sub>80</sub>Fe<sub>20</sub>/Ru Continuous Films and Nanowires.** L. Xiong<sup>1</sup> and A. Adeyeye<sup>1</sup> *1. National University of Singapore, Singapore*

11:00

- AE-07. Three-dimensional localized spin textures in chiral magnets.** *(Invited)* H. Du<sup>1,2</sup> and M. Tian<sup>1,2</sup> *1. High Magnetic Field Laboratory of Chinese Academy of Sciences, Hefei, China; 2. Collaborative Innovation Center of Advanced Microstructures, Nanjing University, Nanjing, China*

11:30

- AE-08. Development of the New Measurement Technique for Spin Dynamics of Magnetic Thin Films.** Y. Endo<sup>1,2</sup>, O. Mori<sup>3</sup>, S. Yabukami<sup>4</sup>, R. Utsumi<sup>3</sup> and Y. Shimada<sup>3</sup> *1. Department of Electrical Engineering, Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Center for Spintronics Research Network, Tohoku University, Sendai, Japan; 3. Toei Scientific Industrial Co Ltd., Sendai, Japan; 4. Faculty of Engineering, Tohoku Gakuin University, Sendai, Japan*

11:45

- AE-09. Effects of Anisotropic Dipolar Interaction on Spin-Wave Dynamics in Ni<sub>80</sub>Fe<sub>20</sub> Nanodot Arrays with Honeycomb and Octagonal Lattice Symmetries.** S. Mondal<sup>1</sup>, S. Barman<sup>2</sup>, S. Choudhury<sup>1</sup>, Y. Otani<sup>3</sup> and A. Barman<sup>1</sup> *1. S. N. Bose National Centre for Basic Sciences, Kolkata, India; 2. Institute of Engineering and Management, Kolkata, India; 3. Institute for Solid State Physics, University of Tokyo, Kashiwa, Japan*

**Session AF**  
**MAGNETIC RECORDING: COMPONENTS AND**  
**ARCHITECTURE**

Ganping Ju, Chair  
Seagate, Cupertino, CA, United States

9:00

- AF-01. Comparison between Interlaced, Shingled, and Conventional Heat Assisted Magnetic Recording. (Invited)** S. Hernandez<sup>1</sup>, S.D. Granz<sup>1</sup>, Z. Liu<sup>1</sup>, P. Krivosik<sup>2</sup>, P. Huang<sup>3</sup>, G. Ju<sup>3</sup>, T. Rausch<sup>1</sup> and E. Gage<sup>1</sup> 1. Seagate Research Group, Seagate Technology, Shakopee, MN, United States; 2. Recording Head Operations, Seagate Technology, Bloomington, MN, United States; 3. Recording Media Operations, Seagate Technology, Fremont, CA, United States

9:30

- AF-02. Reader noise due to thermally driven asymmetric oscillations.** A. Stankiewicz<sup>1</sup>, T. Pipathanapoompr<sup>2,4</sup>, K. Subramanian<sup>3</sup> and A. Kaewrawang<sup>4</sup> 1. Seagate Technology, Bloomington, MN, United States; 2. Seagate Technology, Korat, Thailand; 3. Seagate Technology, Shakopee, MN, United States; 4. Department of Electrical Engineering, Khon Kaen University, Khon Kaen, Thailand

9:45

- AF-03. Probe-based Spin Torque Transfer Device for Writing Hard Disks.** J. Hong<sup>2</sup>, O. Lee<sup>3</sup>, K. Dong<sup>4</sup>, S. Khizroev<sup>5</sup>, L. You<sup>2</sup> and J. Bokor<sup>1</sup> 1. University of California, Berkeley, Berkeley, CA, United States; 2. Huazhong University of Science & Technology, Wuhan, China; 3. Korea Institute of Science and Technology, Seoul, The Republic of Korea; 4. China University of Geosciences, Wuhan, China; 5. Florida International University, Miami, FL, United States

10:00

- AF-04. Large magnetoresistive outputs in Heusler alloy-based CPP-GMR sensors using with AgInZnO spacers.** T. Nakatani<sup>1</sup>, T. Sasaki<sup>1</sup>, Y. Sakuraba<sup>1</sup> and K. Hono<sup>1</sup> 1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan

10:15

- AF-05. Tailoring epitaxially grown exchange spring Fe/L10-FePt multilayers as perpendicular recording media.** A. Syed Mohd<sup>1</sup>, S. Pütter<sup>1</sup>, S. Mattau<sup>1</sup> and T. Brückel<sup>1,2</sup> 1. Jülich Centre for Neutron Science (JCNS) at MLZ, Forschungszentrum Jülich GmbH, Garching, Germany; 2. Jülich Centre for Neutron Science JCNS and Peter Grünberg Institut, JCNS-2, PGI-4: Scattering Methods, Forschungszentrum Jülich GmbH, Jülich, Germany

10:30

- AF-06. Data Temperature and Future Data Storage Architecture.** *(Invited) K. Gao<sup>2,1</sup> 1. Energy Systems, Argonne National Laboratory, Argonne, IL, United States; 2. International Business and Technology Service, North Oaks, MN, United States*

11:00

- AF-07. CoPt capped FePtC based ECC media for HAMR.** *T. Dutta<sup>1,2</sup>, S. Piramanayagam<sup>3</sup>, M. Saifullah<sup>2</sup>, C.S. Bhatia<sup>1</sup> and H. Yang<sup>1</sup> 1. Electrical and Computer Engineering, National University of Singapore, Singapore; 2. Institute of Material Research and Engineering, Singapore, Singapore; 3. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*

11:15

- AF-08. Order-disorder Temperature of MnGa Thin Films on Glass Substrate.** *C. Huang<sup>1</sup>, Y. Chen<sup>2</sup>, S. Wang<sup>1</sup> and A. Sun<sup>2</sup> 1. Institute of Materials Science and Engineering, National Taipei University of Technology, Taipei, Taiwan; 2. Chemical Engineering and Materials Science, Yuan Ze University, Taoyuan, Taiwan*

11:30

- AF-09. Controlling Size Distribution of FePt Nuclei by Tuning Sputtering Conditions.** *B. Zhou<sup>1,2</sup>, B. Varaprasad<sup>1,3</sup>, E. Zhang<sup>1,2</sup>, D. Laughlin<sup>1,2</sup> and J. Zhu<sup>1,3</sup> 1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

11:45

- AF-10. Influence of Stress and Strain on the  $L_1_0$ -ordered Phase Formation in FePt Thin film.** *M. Futamoto<sup>1</sup>, T. Shimizu<sup>1</sup>, M. Nakamura<sup>1</sup> and M. Ohtake<sup>1</sup> 1. EECE, Chuo University, Shinjuku, Japan*

**Session AG**

**ELECTRICAL MACHINES AND CONTROL I**

Jiadan Wei, Co-Chair

Nanjing University of Aeronautics and Astronautics, Nanjing, China

Andrew Knight, Co-Chair

University of Calgary, Calgary, AB, Canada

**9:00**

- AG-01. Design of a Novel Variable-stiffness Permanent Magnetic Mechanism for Flexible Robots.** *M. Zhang*<sup>1</sup>, *L. Fang*<sup>2</sup> and *F. Sun*<sup>3</sup> *1. School of Mechanical Engineering and Automation, Northeastern University, Shenyang, China; 2. Faculty of Robot Science and Engineering, Northeastern University, Shenyang, China; 3. School of Mechanical Engineering, Shenyang University of Technology, Shenyang, China*

**9:15**

- AG-02. Two-Converters Based Synchronous Operation and Control of a Brushless Doubly-Fed Reluctance Machine.** *R. Rebeiro*<sup>1</sup> and *A. Knight*<sup>1</sup> *1. Electrical Engineering, University of Calgary, Calgary, AB, Canada*

**9:30**

- AG-03. A Novel Two-Phase Excitation Switched Reluctance Motor with Symmetrical Winding Distribution.** *Y. Zhu*<sup>1</sup>, *C. Yang*<sup>1</sup> and *Y. Zhang*<sup>1</sup> *1. Tianjin University of Science and Technology, Tianjin, China*

**9:45**

- AG-04. Rotor Design Optimization of a new Flux Assisted consequent Pole Spoke type Permanent Magnet Torque Motor for low speed applications.** *M. Onsal*<sup>1</sup>, *Y. Demir*<sup>1</sup> and *M. Aydin*<sup>1,2</sup> *1. R&D, MDS Motor Ltd., Kocaeli, Turkey; 2. Mechatronics Engr., Kocaeli University, Kocaeli, Turkey*

**10:00**

- AG-05. Manufacturing Condition and Variations of Soft Magnetic Composite Cores for Application in PM Motors Based on Taguchi Method.** *G. Lei*<sup>1</sup>, *Y. Guo*<sup>1</sup> and *J. Zhu*<sup>1</sup> *1. University of Technology Sydney, Sydney, NSW, Australia*

**10:15**

- AG-06. Design of Cryogenic Permanent Magnet Synchronous Motor for Submerged Liquefied Natural Gas Pump.** *C. Guo*<sup>1</sup>, *S. Huang*<sup>1</sup>, *J. Wang*<sup>1</sup> and *Y. Feng*<sup>1</sup> *1. College of Electrical & Information Engineering, Hunan University, Changsha, China*

**10:30**

- AG-07. Study on Optimal Current Allocation Strategy for Doubly Salient Electromagnetic Machine based on Particle Swarm Optimization.** *A. Wang*<sup>1</sup>, *Z. Chen*<sup>1</sup>, *H. Li*<sup>1</sup> and *C. Zhang*<sup>1</sup> *1. Department of Electrical Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China*

10:45

- AG-08. A Novel Coupled Auto-transformer and Magnetic Control Soft Starter for Super Large Capacity High Voltage Motor.** J. Yuan<sup>1</sup>, C. Wang<sup>1</sup>, Y. Zhu<sup>1</sup>, H. Zhou<sup>1</sup>, L. Wei<sup>1,2</sup>, C. Tian<sup>1</sup>, Y. Gao<sup>3</sup>, K. Muramatsu<sup>3</sup> and B. Chen<sup>1</sup> *1. Electrical and Engineering, Wuhan University, Wuhan, China; 2. Department of Electrical Engineering, Graduate School of Engineering, Kyoto University, Kyoto, Japan; 3. Department of Electrical and Electronic Engineering, Saga University, Saga, Japan*

11:00

- AG-09. A novel vector control strategy for six-phase induction motor with low torque ripples and harmonic currents.** H. Heidari<sup>1</sup>, A. Taheri<sup>1</sup> and M. Holakooie<sup>1</sup> *1. University of Zanjan, Zanjan, The Islamic Republic of Iran*

11:15

- AG-10. A Novel Dual-Sided PM Variable Flux Memory Machine.** H. Yang<sup>1</sup>, H. Lin<sup>1</sup>, Z. Zhu<sup>2</sup>, S. Lyu<sup>1</sup> and K. Wang<sup>1</sup> *1. School of Electrical Engineering, Southeast University, Nanjing, China; 2. Department of Electronic and Electrical Engineering, The University of Sheffield, Sheffield, United Kingdom*

11:30

- AG-11. Analysis of Torque Characteristics of A Parallel Hybrid Excitation Machine Drives with Sinusoidal and Rectangular Current Excitations.** Y. Wu<sup>1</sup>, L. Sun<sup>1</sup>, Z. Zhang<sup>1</sup>, Z. Miao<sup>1</sup> and C. Liu<sup>1</sup> *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

11:45

- AG-12. Improved Analytical Eddy Current Loss Modelling Considering Carrier Harmonics towards Maximum Efficiency Control of PMSM- Drive Systems.** A. Balamurali<sup>1</sup>, C. Lai<sup>1</sup>, H. Dhulipati<sup>1</sup>, V. Loukanov<sup>2</sup> and N. C. Kar<sup>1</sup> *1. University of Windsor, Windsor, ON, Canada; 2. D&V Electronics Ltd., Woodbridge, ON, Canada*

TUESDAY  
MORNING  
9:00

PEONY II

**Session AH**

**SENSORS: FUNDAMENTAL DEVELOPMENTS AND MATERIALS I**

James Deak, Chair  
MultiDimension Technology Co., Ltd, Zhangjiagang, China

9:00

- AH-01. Integrated NEMS Magnetolectric Sensors and Antennas. (Invited)** N. Sun<sup>1</sup> *1. ECE, Northeastern University, Boston, MA, United States*

9:30

- AH-02. Giant photo-Hall effect in metals.** *A. Ruotolo*<sup>1,2</sup> and *D. Li*<sup>1,2</sup>  
1. City University of Hong Kong, Kowloon, Hong Kong; 2. City University Shenzhen Research Institute, Shenzhen, China

9:45

- AH-03. Magneto-optical magnetic field sensor based on magnetoplasmonic crystal.** *N. Gusev*<sup>1,3</sup>, *A. Kalish*<sup>1,4</sup>, *V. Belotelov*<sup>1,4</sup>, *G.A. Knyazev*<sup>1,4</sup>, *P. Kapralov*<sup>1,3</sup>, *P. Vetoshko*<sup>1,2</sup> and *A. Zvezdin*<sup>1,3</sup> 1. Russian Quantum Center, Moscow, Russian Federation; 2. Kotelnikov Institute of Radioengineering and Electronics Russian Academy of Sciences, Moscow, Russian Federation; 3. Prokhorov General Physics Institute Russian Academy of Sciences, Moscow, Russian Federation; 4. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russian Federation

10:00

- AH-04. Phase Transitions in Spin-Crossover Thin Films Probed by Graphene Transport Measurements.** *J. Dugay*<sup>1</sup>, *M. Aarts*<sup>2</sup>, *M. Giménez-Marqués*<sup>1</sup>, *T. Kozlova*<sup>2</sup>, *H. Zandbergen*<sup>2</sup>, *E. Coronado*<sup>1</sup> and *H. van der zant*<sup>2</sup> 1. Molecular Materials, Institute of Molecular Science (ICMol), Paterna, Spain; 2. Department of Quantum Nanoscience, Delft University of Technology, Delft, Netherlands

10:15

- AH-05. Custom-designed GMR- and TMR-sensor functionalities via oblique-incidence deposition.** *S. Willing*<sup>1,2</sup>, *K. Schlage*<sup>2</sup>, *L. Bocklage*<sup>2,3</sup>, *G. Meier*<sup>4,3</sup> and *R. Roehlsberger*<sup>2,3</sup> 1. PIER Helmholtz Graduate School, Hamburg, Germany; 2. Deutsches Elektronen-Synchrotron (DESY), Hamburg, Germany; 3. The Hamburg Centre for Ultrafast Imaging, Hamburg, Germany; 4. Max-Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany

10:30

- AH-06. Magnetic tunnel junctions with perpendicular synthetic antiferromagnetic CoPt pinned layers for magnetic sensors with wide dynamic range.** *T. Ogasawara*<sup>1</sup>, *M. Oogane*<sup>1</sup>, *M. Tsunoda*<sup>2</sup> and *Y. Ando*<sup>1</sup> 1. Department of Applied Physics, Tohoku University, Sendai, Japan; 2. Department of Electronic Engineering, Tohoku University, Sendai, Japan

10:45

- AH-07. Magnetic Sensor Using Spin-orbit Torque Effective Field as Transverse Bias.** *Y. Xu*<sup>1</sup>, *Y. Yang*<sup>1</sup>, *Z. Luo*<sup>1</sup> and *Y. Wu*<sup>1</sup>  
1. Electrical and Computer Engineering, National University of Singapore, Singapore

11:00

- AH-08. Co/Pd Multilayer Structure for Hydrogen Sensing.** *J. Liang*<sup>1</sup>, *K. Chang*<sup>1</sup>, *K. Chen*<sup>1</sup> and *Y. Tseng*<sup>1</sup> 1. Materials Science & Engineering, National Chiao Tung University, Hsin-chu, Taiwan

11:15

- AH-09. Enhanced annealing stability of exchange biased pinned layer in magnetic tunnel junctions using a thin Ta/Ru/Ta/Ru underlayer for analog sensor applications.** *K. Okamoto<sup>1</sup>, Y. Fuji<sup>1</sup>, Y. Higashi<sup>1</sup>, S. Kaji<sup>1</sup>, T. Nagata<sup>1</sup>, S. Baba<sup>1</sup>, A. Yuzawa<sup>1</sup> and M. Hara<sup>1</sup>* 1. *Corporate Reserch & Development Center, Toshiba Corporation, Saiwai-ku, Kawasaki, Japan*

11:30

- AH-10. Modification of Ce valence states by Y/Dy co-doping of CeO<sub>2</sub> nano-particles for effective Electrical and Sensing properties.** *C. Madhusudan<sup>1,2</sup>* 1. *Department of Physics, Osmania University, Hyderabad, India;* 2. *S.R.R Govt. Arts & Science College, Karimnagar, India*

11:45

- AH-11. Dural Field Frequency Mixing in Piezoelectric/ Piezomagnetic Laminates at Acoustic Resonance.** *P. Li<sup>1</sup>, L. Bian<sup>2</sup>, Y. Wen<sup>1</sup>, X. Ji<sup>1</sup>, T. Han<sup>1</sup> and Y. Wang<sup>1</sup>* 1. *Instrument Science and Engineering, Shanghai Jiaotong University, Shanghai, China;* 2. *Mechanical Engineering, Nanjing Technology University, Nanjing, China*

TUESDAY  
MORNING  
9:00

ORCHID II

**Session AI**  
**EMERGING AND INTERDISCIPLINARY**  
**APPLICATIONS I**

Albrecht Jander, Chair  
Oregon State University,

9:00

- AI-01. Highly and tunable spin-to-charge conversion in 2D electron gas at LaAlO<sub>3</sub>/SrTiO<sub>3</sub> interfaces. (Invited)** *J. Rojas-Sánchez<sup>1</sup>, E. Lesne<sup>2</sup>, Y. Fu<sup>3</sup>, S. Oyarzun<sup>3</sup>, D. Vaz<sup>2</sup>, E. Jacquet<sup>2</sup>, J. George<sup>2</sup>, L. Vila<sup>3</sup>, S. Petit-Watelot<sup>1</sup>, A. Barthélémy<sup>2</sup>, H. Jaffres<sup>2</sup>, M. Bibes<sup>2</sup> and A. Fert<sup>2</sup>* 1. *Institut Jean Lamour - CNRS - Univ. Lorraine, Nancy, France;* 2. *Unité Mixte de Physique, CNRS, Thales, Univ. Paris-Sud, Université Paris-Saclay, Palaiseau, France;* 3. *Spintec, Institut Nanosciences et Cryogenie, Univ. Grenoble Alpes, CEA, CNRS, Grenoble, France*

9:30

- AI-02. An Electromagnetic Field Reduction Method for Inductive Power Transfer in Transportation System.** *J. Kim<sup>1</sup>, K. Kim<sup>1</sup> and S. Ahn<sup>1</sup>* 1. *The Cho Chun Shik Graduate School for Green Transportation, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea*

9:45

- AI-03. **Optimal Design of Quadrature-Shaped Pickup for Omnidirectional Wireless Power Transfer.** Z. Zhang<sup>1</sup>, B. Zhang<sup>1</sup>, R. Tong<sup>1</sup>, W. Ai<sup>1</sup>, S. Chang<sup>1</sup> and J. Wang<sup>1</sup> *1. School of Electrical and Information Engineering, Tianjin University, Tianjin, China*

10:00

- AI-04. **A 3D-Printing Magnetic Forward Method for Objects in Motion.** Y. Sui<sup>1</sup> and K. Liu<sup>1</sup> *1. Jilin University, Changchun, China*

10:15

- AI-05. **Fabrication technology of low-propagation-loss plasmonic waveguide containing a ferromagnetic metal.** V. Zayets<sup>1</sup>, H. Saito<sup>1</sup> and S. Yuasa<sup>1</sup> *1. Spintronics Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

10:30

- AI-06. **Area Efficient Multi Level Cell SOT-MRAM with Shared Diode for High Density Memories Applications.** K.A. Ahmed<sup>1,2</sup>, L. Fei<sup>1</sup>, S.Y. Lua<sup>1</sup> and C. Heng<sup>2</sup> *1. NVM, Data Storage Institute, Singapore, Singapore; 2. ECE, National University of Singapore, Singapore*

10:45

- AI-07. **Rowhammer for Spin Torque based Memory: Problem or not?** S. Agarwal<sup>1</sup>, H. Dixit<sup>3</sup>, D. Datta<sup>1</sup>, M. Tran<sup>2</sup>, D. Houssameddine<sup>2</sup>, D. Shum<sup>2</sup> and F. Benistant<sup>2</sup> *1. GLOBALFOUNDRIES Engineering Pvt. Ltd, Bangalore, India; 2. GLOBALFOUNDRIES Singapore Pte. Ltd, Singapore, Singapore; 3. GLOBALFOUNDRIES, 400 Stone Break Rd Extension, Malta, NY, United States*

11:00

- AI-08. **Artificial neural network based on spin-wave coupled spin torque oscillators.** H. Arai<sup>1,2</sup> and H. Imamura<sup>1</sup> *1. Spintronics RC, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki, Japan; 2. JST-PRESTO, Kawaguchi, Saitama, Japan*

11:15

- AI-09. **Spin-Hall effects and unconventional Anomalous Hall Effects in transition-metal based metallic spintronic multilayers for THz Emission.** H. Jaffres<sup>1</sup>, T. Dang<sup>1</sup>, Q. Barbedienne<sup>1</sup>, H. Nong<sup>2</sup>, J. Tignon<sup>2</sup>, N. Reyren<sup>1</sup>, J. George<sup>1</sup>, S. Collin<sup>1</sup>, L. Vila<sup>3</sup>, L. Divay<sup>4</sup>, P. Bortolotti<sup>4</sup> and S. Dhillon<sup>2</sup> *1. Unité Mixte de Physique CNRS-Thales, Palaiseau, France; 2. Laboratoire Pierre Aigrain, ENS, Equipe THZ & Infrarouge, PARIS, France; 3. INAC/SP2M, CEA-Université Grenoble-Alpes, GRENOBLE, France; 4. Thales Research & Technology, Palaiseau, France*

- AI-10. Investigation of intrinsic large anomalous Nernst effect in Co-based Heusler compounds for novel energy harvesting applications.** *Y. Sakuraba*<sup>1,2</sup>, K. Hyodo<sup>3</sup>, S. Mitani<sup>1</sup> and A. Sakuma<sup>3</sup> 1. *National Institute for Materials Science (NIMS), Tsukuba, Japan*; 2. *JST-PRESTO, Saitama, Japan*; 3. *Tohoku University, Sendai, Japan*

- AI-11. Mutually synchronized 2D spin Hall nano-oscillator arrays.** *M. Zahedinejad*<sup>1\*</sup>, A.A. Awad<sup>1</sup>, S. Muralidhar<sup>1</sup>, M. Dvornik<sup>1</sup> and J. Åkerman<sup>1</sup> 1. *Physics, University of Gothenburg, Gothenburg, Sweden*

TUESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

### Session AP

## BIO-IMAGING AND BIO-DETECTION II (Poster Session)

Neil Telling, Co-Chair

Keele University, Stoke-on-Trent, United Kingdom

Alfredo García-Arribas, Co-Chair

Universidad del País Vasco, UPV/EHU, Leioa, Spain

- AP-01. Histamine Magnetic Test for Wine.** *M. Rivas*<sup>1</sup>, A. Moyano<sup>1,3</sup>, M. Salvador<sup>1,4</sup>, J.C. Martínez-García<sup>1</sup>, M. Fernández<sup>2</sup> and M.C. Blanco-López<sup>3</sup> 1. *Physics Department, University of Oviedo, Gijón, Spain*; 2. *Dairy Research Institute of Asturias, CSIC, Villaviciosa, Spain*; 3. *Physical and Analytical Chemistry Department, University of Oviedo, Oviedo, Spain*; 4. *Institute of Structure of Matter, National Research Council, Rome, Italy*
- AP-02. Microstructure engineering of polymer-based magnetic composites for microfluidic devices.** *D. Le Roy*<sup>1</sup>, M. Samir<sup>2</sup>, V. Dupuis<sup>1</sup> and A. Deman<sup>2</sup> 1. *Institut Lumière Matière, Villeurbanne, France*; 2. *Institut des Nanotechnologies de Lyon, Villeurbanne, France*
- AP-03. Temperature dependence of transverse relaxivity of the nanoparticle contrast agents for MRI: different magnetic cores and coatings.** *O. Kaman*<sup>1</sup>, V. Herynek<sup>2</sup>, P. Veverka<sup>1</sup>, L. Kubickova<sup>1</sup>, M. Pashchenko<sup>1,3</sup>, J. Kulickova<sup>1</sup> and Z. Jirak<sup>1</sup> 1. *Institute of Physics, Czech Academy of Sciences, Praha, Czechia*; 2. *Institute for Clinical and Experimental Medicine, Praha, Czechia*; 3. *Faculty of Mathematics and Physics, Charles University, Praha, Czechia*

- AP-04. A Novel  $1\text{H}/3\text{He}$  Dual-Tuned Transmit Coil at Ultra-low Field MRI Designed by Using Electromagnetic Field and Radio Frequency Circuit Co-Simulation Method.** *Y. Dou*<sup>1,2</sup>, *Y. Li*<sup>2</sup>, *J. Xu*<sup>1</sup>, *Q. Chen*<sup>2</sup>, *L. Wang*<sup>1</sup>, *X. Zhang*<sup>3</sup>, *N. Li*<sup>2</sup>, *C. Luo*<sup>2</sup> and *F. Du*<sup>2</sup> *1. School of Electrical Engineering and Automation, Hefei University of Technology, Hefei, China; 2. Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China; 3. Department of Radiology and Biomedical Imaging, University of California San Francisco, San Francisco, DC, United States*
- AP-05. Peak to Peak Voltage Detector Type MI Gradiometer for Real Time Alpha Rhythm Measurement.** *J. Ma*<sup>1</sup> and *T. Uchiyama*<sup>1</sup> *1. Graduate School of Engineering, Nagoya University, Nagoya, Japan*
- AP-06. A Theoretical and Simulational Study on the Chemical Shift Effects on the Magnetic Susceptibility of Iron at Ultra-Short Echo Times.** *X. Lu*<sup>1</sup>, *J. Zhu*<sup>1</sup>, *Z. Wang*<sup>1</sup>, *S. Wei*<sup>1</sup>, *H. Wang*<sup>1</sup> and *W. Yang*<sup>1</sup> *1. Institute of Electrical Engineering, Chinese Academy of Science, Beijing, China*
- AP-07. Magnetic-Fluorescent  $\text{Fe}_3\text{O}_4@$ Chitosan-Graphene Quantum Dots Nanocomposites for Dual-Modal nanoprobe of Fluorescence and Magnetic Resonance Imaging.** *Y. Li*<sup>1</sup>, *K. Wang*<sup>1</sup>, *X. Xu*<sup>1</sup> and *Y. Jiang*<sup>1</sup> *1. University of Science and Technology Beijing, Beijing, China*
- AP-08. Asymmetric Gradiometer System for Magnetocardiograms Measuring Without Magnetic Shielding.** *Q. Wang*<sup>1</sup>, *J. Du*<sup>2,1</sup> and *T. Song*<sup>1</sup> *1. Department of Bioelectromagnetism, Institute of Electrical Engineering, Chinese Academy of Sciences, Beijing, China; 2. University of Chinese academy of sciences, Beijing, China*
- AP-09. Demonstration of low-field unilateral nuclear magnetic resonance (NMR) for future medical diagnostics.** *N. Prabhu Gaunkar*<sup>1</sup>, *S. Utsuzawa*<sup>2</sup>, *M. Mina*<sup>1</sup>, *Y. Song*<sup>2</sup> and *D.C. Jiles*<sup>1</sup> *1. Department of Electrical and Computer Engineering, Iowa State University, Ames, IA, United States; 2. NMR Fluids Division, Schlumberger-Doll Research, Boston, MA, United States*
- AP-10. Noise reduction in magnetocardiograph based on time-shift PCA just using measurement data.** *M. Iwai*<sup>1</sup> and *K. Kobayashi*<sup>1</sup> *1. Science and engineering, Iwate University, Morioka, Japan*
- AP-11. Quantitative component selection method using attractor analysis for noise reduction by ICA of magnetocardiogram.** *K. Kobayashi*<sup>1</sup> and *M. Iwai*<sup>1</sup> *1. Faculty of Science and Engineering, Iwate University, Morioka, Iwate, Japan*

- AP-12. Electromagnetic Field and Radio Frequency Circuit Co-simulation Approach for Strongly Coupled Coil Array in Magnetic Resonance Imaging.** *N. Li*<sup>2,1</sup>, *S. Liu*<sup>2</sup>, *F. Du*<sup>2,1</sup>, *Q. Chen*<sup>1</sup>, *C. Luo*<sup>1</sup>, *Y. Dou*<sup>1</sup>, *X. Zhang*<sup>3,4</sup> and *Y. Li*<sup>1</sup> *1. Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China; 2. Department of Biomedical Engineering, Chongqing University of Technology, Chongqing, China; 3. Department of Radiology and Biomedical Imaging, University of California, San Francisco, CA, United States; 4. UCSF/UC Berkeley Joint Graduate Group in Bioengineering, San Francisco, CA, United States*
- AP-13. Improving Tip Position Estimation Accuracy of Gastric Tube by Compensating Geomagnetic Field with Offset Coils.** *T. Sasayama*<sup>1</sup>, *Y. Gotoh*<sup>2</sup> and *K. Enpuku*<sup>1</sup> *1. Kyushu University, Fukuoka, Japan; 2. Oita University, Oita, Japan*
- AP-14. Effect of Gd<sub>5</sub>Si<sub>4</sub> ferromagnetic nanoparticle sizes on T<sub>1</sub>, T<sub>2</sub> and T<sub>2</sub>\* relaxation in MRI.** *S. Hunagund*<sup>1</sup>, *J. Rosenberg*<sup>2</sup>, *S.M. Harstad*<sup>1</sup>, *A.A. El-Gendy*<sup>3</sup>, *S. Gupta*<sup>4</sup>, *V. Pecharsky*<sup>5,4</sup> and *R.L. Hadimani*<sup>1</sup> *1. Department of Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. The National High Magnetic Field Laboratory, Florida State University, Tallahassee, FL, United States; 3. Dept. of Physics, University of Texas at El Paso, El Paso, TX, United States; 4. Iowa State University, Ames Laboratory, US Department of Energy, Ames, IA, United States; 5. Dept. of Material Science and Engineering, Iowa State University, Ames, IA, United States*

TUESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session AQ**  
**HIGH FREQUENCY MAGNETIC MATERIALS AND DEVICES I**  
**(Poster Session)**

Zhongming Zeng, Chair

Suzhou Institute of Nano-tech and Nano-bionics, CAS, Suzhou, China

- AQ-01. Analysis and Optimization of a New Structure for Wireless Charging System of Electric Vehicles.** *Z. Li*<sup>1</sup> and *J. Yi*<sup>1</sup>  
*1. College of Traffic Engineering, Hunan University of Technology, Zhuzhou, China*
- AQ-02. Influence of the phase structure on the acoustic and optical mode ferromagnetic resonance of FeNi stripe domain films.** *D. Cao*<sup>1</sup>, *L. Pan*<sup>2</sup>, *Y. Song*<sup>1</sup>, *X. Cheng*<sup>2</sup>, *H. Feng*<sup>2</sup>, *C. Zhao*<sup>2</sup>, *Q. Li*<sup>1</sup>, *J. Xu*<sup>1</sup>, *S. Li*<sup>1</sup>, *Q. Liu*<sup>2</sup> and *J. Wang*<sup>2</sup> *1. College of Physics, Qingdao University, Qingdao, China; 2. Lanzhou University, Lanzhou, China*
- AQ-03. Indirect Permeability Measurements using a ‘Strip-coil’ for Co<sub>0.6</sub>Zn<sub>0.4</sub>Fe<sub>1.7</sub>Mn<sub>0.3</sub>O<sub>4</sub>.** *U. Chaudhuri*<sup>1</sup>, *M. Kumari*<sup>1</sup> and *R. Mahendiran*<sup>1</sup> *1. Physics, National University of Singapore, Singapore*

- AQ-04. Microwave absorption properties of polymeric ferrite core-shell nanocomposites.** K. Song<sup>1</sup>, K. Seo<sup>1</sup> and J. Jung<sup>1</sup>  
*1. Chemistry, Gangneung-Wonju National University, Gangneung city, The Republic of Korea*
- AQ-05. High frequency magnetic loss in nanogranular FeCoTiO films with different history of induced uniaxial anisotropy.** Y. He<sup>1</sup>, Y. Wang<sup>1</sup>, Z. Zhong<sup>1</sup>, H. Zhang<sup>1</sup> and F. Bai<sup>1</sup>  
*1. University of Electronic Science and Technology, State Key Laboratory of Electronic Thin Films and Integrated Devices, Chengdu, China*
- AQ-06. Foldover effect in spin-wave optoelectronic active ring resonators.** V. Vitko<sup>1</sup>, A. Nikitin<sup>1</sup>, A.B. Ustinov<sup>1</sup> and B.A. Kalinikos<sup>1</sup>  
*1. Saint-Petersburg Electrotechnical University "LETI", Saint Petersburg, Russian Federation*
- AQ-07. Effect of annealing on the structural and FMR properties of epitaxial YIG thin films grown by RF magnetron sputtering.** B. Bhoi<sup>1</sup>, N. Venkataramani<sup>2</sup>, R. Aiyar<sup>1</sup>, S. Prasad<sup>3</sup> and M. Kostylev<sup>4</sup>  
*1. Center for Research in Nanotechnology and Science, Indian Institute of Technology Bombay, Mumbai, India; 2. Metallurgical Engineering & Materials Science (MEMS), Indian Institute of Technology Bombay, Mumbai, India; 3. Dept of Physics, Indian Institute of Technology Bombay, Mumbai, India; 4. Physics, The University of Western Australia (M013), Perth, WA, Australia*
- AQ-08. Design of an implantable antenna operating at ISM band using magneto-dielectric material.** Z. Luan<sup>1</sup>, L. Liu<sup>2</sup>, W. Zong<sup>2</sup>, Z. Jin<sup>2</sup>, D. Cao<sup>1</sup>, H. Lin<sup>3</sup>, N. Sun<sup>3</sup> and S. Li<sup>1</sup>  
*1. Physics, Qingdao University, Qingdao, China; 2. Electronics and information, Qingdao University, Qingdao, China; 3. Northeastern University, Boston, MA, United States*
- AQ-09. Electromagnetic Noise Suppression Composite Sheet Made of Hexagonal Ferrite Particles.** M. Sato<sup>1</sup>, R. Sai<sup>1</sup>, Y. Miyazawa<sup>1</sup>, A. Takahashi<sup>1</sup> and M. Yamaguchi<sup>1,2</sup>  
*1. New Industry Creation Hatchery Center, Tohoku University, Sendai, Japan; 2. Department of Electrical Engineering, Tohoku University, Sendai, Japan*
- AQ-10. Enhancement of Phase-Shifting Nonreciprocity in Metamaterial Lines Loaded with Comb-Shaped Stubs Supporting Slow Wave Propagation of Edge Guided Modes.** T. Ueda<sup>1</sup>, K. Okamoto<sup>1</sup>, J. Yamauchi<sup>1</sup> and T. Itoh<sup>2</sup>  
*1. Electrical Engineering and Electronics, Kyoto Institute of Technology, Kyoto, Japan; 2. Electrical Engineering Department, University of California, Los Angeles, Los Angeles, CA, United States*
- AQ-11. Synthesis and Microwave Absorbing Property of SrZn<sub>x</sub>Fe<sub>(2-x)</sub>Fe<sub>16</sub>O<sub>27</sub> (0.0 ≤ x ≤ 1.0).** J. You<sup>1</sup>, S. Choi<sup>1</sup>, S. Lee<sup>1</sup> and S. Yoo<sup>1</sup>  
*1. Material science and engineering, Seoul National University, Seoul, The Republic of Korea*
- AQ-12. Transport, magneto-optical and micromagnetic characterization of domain-wall resonance (DWR) in giant magnetoimpedance strain and magnetic field sensors.** G. Büttel<sup>1</sup> and U. Hartmann<sup>1</sup>  
*1. Institute of Experimental Physics, University of Saarland, Saarbrücken, Germany*

- AQ-13. New Measurement Method of Broadband Permittivity and Permeability of Non-Solid Materials in Small Quantity.** K. Miura<sup>1</sup>, Y. Odagiri<sup>1</sup>, T. Umesaka<sup>1</sup>, D. Suzue<sup>1</sup> and H. Osada<sup>1</sup>  
1. Faculty of Science and Engineering, Iwate University, Morioka, Japan
- AQ-14. Comparative Analysis of Core Loss Calculation Methods for Magnetic Materials Under Nonsinusoidal Excitations.** Y. Li<sup>1</sup>, S. Yue<sup>1</sup> and Q. Yang<sup>2</sup> 1. Hebei University of Technology, Tianjin, China; 2. Electrical Engineering, Tianjin Polytechnic University, Tianjin, China
- AQ-15. Design and Analysis of a Novel High Frequency 2-D Magnetization Structure with Ultra-Thin Silicon Steel Sheet.** Y. Li<sup>1</sup>, Y. Dou<sup>1</sup>, C. Zhang<sup>1</sup>, A. Li<sup>1</sup> and J. Zhu<sup>2</sup> 1. Hebei University of Technology, Tianjin, China; 2. Electrical engineering, University of Technology, Sydney, Sydney, NSW, Australia
- AQ-16. High-frequency magnetic and dielectric properties of CaO-SiO<sub>2</sub> codoped NiZnCo spinel ferrites.** Z. Zheng<sup>1</sup>, Y. Li<sup>1</sup>, T. Liu<sup>1</sup>, Q. Xiang<sup>1</sup> and Q. Feng<sup>1</sup> 1. School of Information Science and Technology, Southwest Jiaotong University, Chengdu, China

TUESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session AR**  
**MAGNETO-ELECTRONIC DEVICES**  
**(Poster Session)**  
Yumeng Yang, Chair  
National University of Singapore, Singapore

- AR-01. Radiation Hardening Techniques for SOT-MRAM Peripheral Circuitry.** B. Wang<sup>1,2</sup>, Z. Wang<sup>1</sup>, C. Hu<sup>2</sup>, Y. Zhao<sup>2</sup>, Y. Zhang<sup>1</sup> and W. Zhao<sup>1</sup> 1. Beihang University, Beijing, China; 2. Beijing Micoelectronics Technology Institute, Beijing, China
- AR-02. Magnetization uniformity and threshold current of out-of-plane precession in spin-torque oscillator with synthetic ferrimagnet free layer under perpendicular magnetic field: Micromagnetic simulation study.** T. Kanao<sup>1</sup>, T. Nagasawa<sup>1</sup>, H. Suto<sup>1</sup> and K. Mizushima<sup>1</sup> 1. Corporate Research & Development Center, Toshiba Corporation, Kawasaki, Japan
- AR-03. Fabrication of  $L_1_0$ -MnAl thin films with high perpendicular magnetic anisotropy for STT-MRAM.** M. Parvin<sup>1</sup>, M. Kubota<sup>1</sup>, M. Oogane<sup>1</sup>, M. Tsunoda<sup>2</sup> and Y. Ando<sup>1</sup> 1. Applied Physics, Graduate School of Engineering, Tohoku University, Sendai-shi, Japan; 2. Electronic Engineering, Tohoku University, Sendai, Japan

- AR-04. Hybrid memory layer with low Curie temperature CoPd/Pd multilayer for high-density magnetic random access memory cells.** *W. Zhao*<sup>1</sup>, *T. Kimura*<sup>1</sup>, *T. Kato*<sup>1</sup>, *D. Oshima*<sup>3</sup>, *Y. Sonobe*<sup>2</sup>, *Y. Kawato*<sup>2</sup> and *S. Iwata*<sup>3</sup> *1. Department of Electronics, Nagoya University, Nagoya, Japan; 2. Samsung R&D Institute Japan, Yokohama, Japan; 3. Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan*
- AR-05. Magnetic Properties of Mn-based Heusler alloy films with Ru doping.** *L. Ren*<sup>1</sup>, *Y. Zheng*<sup>1</sup>, *Y. Liu*<sup>1</sup> and *K. Teo*<sup>1</sup> *1. Department of Electrical & Computer Engineering, National University of Singapore, Singapore*
- AR-06. Reducing the switching current with a Dzyaloshinskii-Moriya interaction in nanomagnets with perpendicular anisotropy.** *S. Takamatsu*<sup>1</sup>, *K. Yamada*<sup>2</sup> and *Y. Nakatani*<sup>1</sup> *1. University of Electro-Communications, Chofu, Japan; 2. Gifu University, Gifu, Japan*
- AR-07. Effect of the damping constant on switching time distribution in the magnetic tunnel junction.** *J. Moon*<sup>1</sup>, *T. Lee*<sup>2</sup> and *C. You*<sup>3</sup> *1. Department of Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 2. New Memory Device and Process Integration Group, SK hynix, Icheon, The Republic of Korea; 3. Department of Emerging Materials Science, Daegu Gyeongbuk Institute of Science and Technology, Daegu, The Republic of Korea*
- AR-08. Proposal of an ultra-fast all spin logic device based on RE-TM ferrimagnetic material.** *Z. Zheng*<sup>1,2</sup>, *Y. Zhang*<sup>1,2</sup>, *Z. Zhang*<sup>1,2</sup>, *J. Nan*<sup>1,2</sup>, *K. Zhang*<sup>1,2</sup>, *J. Klein*<sup>3</sup>, *D. Ravelosona*<sup>3</sup>, *Y. Zhang*<sup>1,2</sup> and *W. Zhao*<sup>1,2</sup> *1. Fert Beijing Institute, Beihang University, Beijing, China; 2. School of Electrical and Information Engineering, Beihang University, Beijing, China; 3. Center for Nanoscience and Nanotechnology, University of Paris-Sud, Orsay, France*
- AR-09. Evaluation of ultrahigh-speed magnetic memories using field-free spin orbit torque.** *Z. Wang*<sup>1</sup>, *L. Chang*<sup>1</sup>, *X. Lin*<sup>1</sup>, *J. Yang*<sup>1</sup>, *Y. Zhang*<sup>1</sup> and *W. Zhao*<sup>1</sup> *1. Beihang University, Beijing, China*
- AR-10. Observation of local spin signals at room temperature in germanium lateral devices.** *M. Tsukahara*<sup>1</sup>, *M. Yamada*<sup>1</sup>, *T. Naito*<sup>1</sup>, *Y. Fujita*<sup>1</sup>, *S. Yamada*<sup>1,2</sup>, *K. Sawano*<sup>3</sup> and *K. Hamaya*<sup>1,2</sup> *1. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan; 3. Advanced Research Laboratories, Tokyo City University, Todoroki, Japan*
- AR-11. Proposal for Multi-gate Spin Field Effect Transistor (Spin-FET).** *G. Wang*<sup>1</sup>, *Z. Wang*<sup>2,3</sup>, *J. Klein*<sup>1</sup> and *W. Zhao*<sup>3,2</sup> *1. Centre de Nanosciences et de Nanotechnologies, Université Paris Saclay, Orsay, France; 2. Spintronics Interdisciplinary Center, Beihang University, Beijing, China; 3. Fert Beijing Institute, Beihang University, Beijing, China*

- AR-12. Estimating the spin relaxation time of platinum by second harmonic electrical transport measurement.** C. Fang<sup>1</sup>, C. Wan<sup>1</sup>, A. Hoffmann<sup>2</sup>, B. Tao<sup>1</sup>, H. Wu<sup>1</sup> and X. Han<sup>1</sup> *1. State Key Lab of Magnetism, Institute of Physics, Beijing, China; 2. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States*
- AR-13. Spin Dice Based on Orthogonal Spin Transfer Devices.** X. Li<sup>1</sup> and L. You<sup>1</sup> *1. School of Optical and Electronics Information, Huazhong University of Science and Technology, WuHan, China*
- AR-14. Magnetization behaviors of magnetic tunnel junctions driven by the spin-orbit torque.** T. Wu<sup>1</sup> *1. Graduate School of Materials Science, National Yunlin University of Science and Technology, Douliu, Taiwan*
- AR-15. Recognizing and memorizing patterns with delayed feed-back spin-torque nano-oscillators.** M. Riou<sup>4</sup>, J. Torrejon<sup>4</sup>, F. Abreu Araujo<sup>4</sup>, G. Khalsa<sup>1</sup>, M. Stiles<sup>1</sup>, S. Tsunegi<sup>2</sup>, K. Yakushiji<sup>2</sup>, A. Fukushima<sup>2</sup>, H. Kubota<sup>2</sup>, S. Yuasa<sup>2</sup>, D. Querlioz<sup>3</sup>, V. Cros<sup>4</sup> and J. Grollier<sup>4</sup> *1. National Institute of Standards and Technology, Gaithersburg, MD, United States; 2. National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 3. Centre de nanosciences et nanotechnologies, Université Paris-Sud, Orsay, France; 4. Unité Mixte de Physique CNRS/Thales, Palaiseau, France*

TUESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session AS**  
**NANOPARTICLES AND NANOSTRUCTURED**  
**ARRAYS**  
**(Poster Session)**

Joachim Gräfe, Co-Chair  
Max Planck Institute for Intelligent Systems, Stuttgart, Germany  
Valeria Rodionova, Co-Chair  
Immanuel Kant Baltic Federal University, Kaliningrad, Russian Federation

- AS-01. Domain structure and magnetic properties of magnetostatically coupled epitaxial Co nanostripe arrays with induced anisotropy.** A. Kozlov<sup>1</sup>, A. Kolesnikov<sup>1</sup>, E. Pustovalov<sup>1</sup>, A.S. Samardak<sup>1</sup> and L. Chebotkevich<sup>1</sup> *1. School of Natural Sciences, Far Eastern Federal University, Vladivostok, Russian Federation*
- AS-02. Exchange bias in Co/CoO core-shell nanowires: roles of antiferromagnetic grain size distribution and interfacial spin glass.** X. Wen<sup>1</sup>, K. Gandha<sup>3</sup>, P. Liu<sup>2</sup> and J. Yang<sup>1</sup> *1. Physics, Peking University, Beijing, China; 2. Physics, University of Texas at Arlington, Arlington, TX, United States; 3. Ames Laboratory, US Department of Energy, Ames, IA, United States*

- AS-03. Synthesis and magnetic investigation of CoCr<sub>2</sub>O<sub>4</sub>/Ni hybrid core-shell nanowires.** W. Li<sup>1</sup>, C. Wang<sup>3</sup>, X. Zhang<sup>1</sup>, M. Irfan<sup>1</sup>, U. Khan<sup>1</sup>, Y. Liu<sup>2</sup> and X. Han<sup>1</sup> 1. State Key Lab of Magnetism, Institute of Physics, Beijing, China; 2. Tongji University, Shanghai, China; 3. Tongji University, Shanghai, China
- AS-04. Magneto-thermodynamic properties and anomalous magnetic phase transition in FeRh nano-wires.** K. Matsumoto<sup>1</sup>, M. Kimata<sup>2</sup>, K. Kondou<sup>3</sup>, R.C. Temple<sup>4</sup>, C.H. Marrows<sup>4</sup> and Y. Otani<sup>1,3</sup> 1. Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan; 2. Institute for Material Research, Tohoku University, Sendai, Japan; 3. Center for Emergent Matter Science, RIKEN, Wako, Japan; 4. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom
- AS-05. Atomic pair ordering and strain relaxation in thermally and vacuum Annealed NiCu nanowires prepared in Al<sub>2</sub>O<sub>3</sub> nanoporous templates.** N. Ahmad<sup>1</sup> and Q. abbas<sup>1</sup> 1. Physics, International Islamic University, Islamabad, Pakistan
- AS-06. Controlled growth of Fe<sub>3</sub>O<sub>4</sub> nanopillars and their magnetic properties.** M. Guan<sup>1</sup>, G. Dong<sup>1</sup>, Z. Zhou<sup>1</sup> and M. Liu<sup>1</sup> 1. Xi'an Jiaotong University, Xi'an, China
- AS-07. Effect of size on multiferroic SmMn<sub>2</sub>O<sub>5</sub> nanorods.** T. Hsu<sup>1</sup>, C. Yang<sup>1</sup>, C. Yang<sup>1</sup>, Y. Tung<sup>1</sup>, C. Kao<sup>1</sup>, W. Wu<sup>1</sup> and K. Lin<sup>2</sup> 1. Physics, Chung Yuan Christian University, Taoyuan City, Taiwan; 2. Department of Chemical Engineering and Material Science, Yuan Ze University, Zhongli, Taiwan
- AS-08. Fabrication of high-density metal alloy nanodots by a facile block copolymer inclusion method.** T. Maity<sup>1</sup>, T. Ghoshal<sup>2</sup> and S. Roy<sup>1</sup> 1. Tyndall National Institute, Cork, Ireland; 2. University College Cork, Cork, Ireland
- AS-09. One-Pot Synthesis and Surface Modification of Lauric-Acid-Capped CoFe<sub>2</sub>O<sub>4</sub> Nanoparticles.** Y. Teng<sup>1</sup> and P. Pong<sup>1</sup> 1. Electrical and Electronical Engineering, The University of Hong Kong, Hong Kong
- AS-10. Enhanced photocatalytic degradation of tri-chlorophenol by Fe<sub>3</sub>O<sub>4</sub>@TiO<sub>2</sub>@Au photocatalyst under visible-light.** K. Song<sup>1</sup>, K. Choi<sup>2</sup>, B. Park<sup>3</sup> and J. Jung<sup>1</sup> 1. Chemistry, Gangneung-Wonju National University, Gangneung city, The Republic of Korea; 2. Institute of Biomaterials, Kwangwoon University, Seoul, The Republic of Korea; 3. Department of Electrical & Biological Physics, Kwangwoon University, Seoul, The Republic of Korea
- AS-11. Solvothermal Synthesis of Uniform Water-Soluble Fe<sub>3</sub>O<sub>4</sub> Nanoparticles.** S. Lee<sup>1</sup>, Y. Chen<sup>1</sup> and A. Sun<sup>1</sup> 1. Chemical Engineering and Materials Science, Yuan Ze University, Taoyuan, Taiwan
- AS-12. Synthesis of Triangular Shaped Single Crystalline Magnetite Nanoparticles and Their Magnetorheological Response.** D. Bae<sup>1</sup>, W. Han<sup>1</sup>, C. Gao<sup>1</sup>, Y. Dong<sup>1</sup> and H. Choi<sup>1</sup> 1. Dept. of Polymer Science and Engineering, Inha University, Incheon, The Republic of Korea

- AS-13. Structure and magnetic properties of MnBi nanoparticles prepared by laser ablation and arc discharge method.** X. Wang<sup>1</sup>, H. Qian<sup>2</sup>, P. Si<sup>1</sup>, Y. Yang<sup>2</sup>, C. Choi<sup>2</sup>, J. Park<sup>2</sup>, X. Wang<sup>1</sup>, H. Ge<sup>1</sup>, K. Shinde<sup>2</sup> and K. Chung<sup>2</sup> *1. China Jiliang University, Hangzhou, China; 2. Korea Institute of Materials Science, Changwon, The Republic of Korea*
- AS-14. Organization and magnetic properties of FePt nanoparticles deposited on graphene/Ir moiré pattern.** F. Tournus<sup>1</sup>, P. Capiod<sup>1</sup>, L. Bardotti<sup>1</sup>, A. Tamion<sup>1</sup>, O. Boisron<sup>1</sup>, C. Albin<sup>1</sup>, V. Dupuis<sup>1</sup>, G. Renaud<sup>2</sup> and P. Ohresser<sup>3</sup> *1. Institut Lumière Matière, Université Lyon 1 & CNRS, Villeurbanne, France; 2. CEA-INAC, Grenoble, France; 3. Synchrotron SOLEIL, Gif sur Yvette, France*
- AS-15. Research on Eddy Current Testing of Functional Polymer Composite Material.** Z. Cai<sup>2</sup> and C. Liu<sup>1</sup> *1. Province-Ministry Joint Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability, Hebei University of Technology, Tianjin, China; 2. East China Jiaotong University, Nanchang, China*

TUESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session AT**  
**PERMANENT MAGNET AND RELUCTANCE**  
**MACHINES I**  
**(Poster Session)**

Hui Yang, Co-Chair  
Southeast University, Nanjing, China  
TW Ching, Co-Chair  
University of Macau, Macau, China

- AT-01. Optimal Design of Asymmetric Step-Sloping Notches for Reduce the Cogging Torque of Single Phase BLDC Motor.** D. Kim<sup>1,2</sup>, Y. Park<sup>1,2</sup>, J. So<sup>1,2</sup> and Y. You<sup>3</sup> *1. Electrical Control Engineering, Suncheon National University, Suncheon, The Republic of Korea; 2. Greenenergy Laboratory, Suncheon National University, Suncheon, The Republic of Korea; 3. Honam University, Gwangju, The Republic of Korea*
- AT-02. Comparison of Electromagnetic Characteristics of Linear Oscillating Actuator according to Magnetic Flux Path.** C. Kim<sup>1</sup>, G. Jang<sup>1</sup>, S. Seo<sup>1</sup>, J. Ahn<sup>3,1</sup>, S. Jeong<sup>2</sup> and J. Choi<sup>1</sup> *1. electrical engineering, Chungnam National University, Daejeon, The Republic of Korea; 2. R&D, LG Electronics, Seoul, The Republic of Korea; 3. R&D, MAGNETAR, Deajeon, The Republic of Korea*
- AT-03. Analysis of Flux Reversal Permanent Magnet Machines with Different Consequent-Pole PM Topologies.** H. Li<sup>1</sup> and Z. Zhu<sup>1</sup> *1. Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom*

- AT-04. Influence of Aluminum Die-Cast Rotor Porosity on the Efficiency of Induction Machines.** *J. Yun*<sup>2,1</sup> and *S. Lee*<sup>1</sup>  
1. Korea University, Seoul, The Republic of Korea; 2. Hyundai Electric Co., LTD, Yongin, The Republic of Korea
- AT-05. Influence of Cooling Air Flow Velocity on Temperature Rise and Output Power for Permanent Magnet Servo Motor.** *G. Zhao*<sup>1</sup>, *X. Gao*<sup>1</sup>, *Y. Wang*<sup>1</sup> and *B. Bai*<sup>1</sup> 1. Shenyang University of Technology, Shenyang, China
- AT-06. The Method for Reducing Intrinsic Shaft Voltage by Suitable Selection of Pole-arc Coefficient in Fractional Slot Permanent Magnet Synchronous Machines.** *B. Peng*<sup>1</sup>, *X. Wang*<sup>1</sup> and *W. Zhao*<sup>1</sup> 1. Shandong University, Jinan, China
- AT-07. Comparison of Rotor Eddy Current Losses in Fractional-Slot Concentrated-Winding IPM machines with Different Rotor Topology.** *L. Cong*<sup>1,2</sup>, *X. Li*<sup>1</sup> and *L. Wu*<sup>2</sup> 1. College of Electrical Engineering, Guangxi University, Nanning, China; 2. School of Automation and Electrical Engineering, Linyi University, Linyi, China
- AT-08. Design and Analysis of A Mechanical Flux-varying PM Machine with Auto-rotary PMs.** *X. Liu*<sup>1</sup>, *Z. Zhang*<sup>1</sup>, *H. Xu*<sup>1</sup>, *J. Xiao*<sup>1</sup> and *Z. Liu*<sup>1</sup> 1. School of Electrical Engineering and Automation, Jiangxi University of Science and Technology, Ganzhou, China
- AT-09. Development of Variable Stress Applying System for Shrink Fitting of Stator Housing in IPM Motor.** *J. Kitao*<sup>1</sup>, *J. Aizawa*<sup>1</sup>, *M. Nakano*<sup>1</sup>, *M. Yamada*<sup>1</sup> and *A. Daikoku*<sup>1</sup>  
1. Mitsubishi Electric Corp., Hyogo, Japan
- AT-10. Study on structure aimed at low vibration of 16-pole 18-slot IPM motor for Mild-HEV.** *Y. Hirai*<sup>1</sup> 1. Motor Drive Laboratory, Tokyo City University, Tokyo, Japan
- AT-11. Torque Improvement in Partitioned Stator Wound Field Switched Flux Machine By Using Assisted Ferrites.** *Z. Wu*<sup>1</sup> and *Z. Zhu*<sup>1</sup> 1. Electronic and Electrical Engineering, The University of Sheffield, Sheffield, United Kingdom
- AT-12. Rotor Shape Optimization for Improving Torque Performance of PM-Assisted Wound Field Synchronous Machine.** *W. Chai*<sup>1</sup>, *B. Kwon*<sup>1</sup> and *T.A. Lipo*<sup>2</sup> 1. Hanyang University, ANSAN, The Republic of Korea; 2. University of Wisconsin–Madison, Madison, WI, United States
- AT-13. Torque Ripple Improvement for Ferrite-Assisted Synchronous Reluctance Motor by Using Asymmetric Flux-barrier Arrangement.** *M. Xu*<sup>1</sup>, *G. Liu*<sup>1</sup> and *W. Zhao*<sup>1</sup>  
1. Jinagsu university, Zhenjiang, China
- AT-14. Influence of Magnetic Saturation and Rotor Eccentricity on Back-EMF of Novel Hybrid-excited Stator Slot Opening Permanent Magnet Machine.** *M. Zheng*<sup>1</sup>, *Z. Zhu*<sup>1</sup>, *S. Cai*<sup>1</sup>, *H. Li*<sup>1</sup> and *Y. Liu*<sup>1</sup> 1. Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom

**AT-15. Design and Analysis of Variable Flux Memory Motor with Series-Parallel Structure Considering Permanent Magnet Load-Line.** *J. Song*<sup>1</sup>, *Y. Kim*<sup>2</sup> and *S. Jung*<sup>1</sup> *1. Department of Electronic, Electrical and Computer Engineering, Sungkyunkwan University, Suwon-si, The Republic of Korea; 2. Department of Electrical Engineering, Chosun University, Gwangju, The Republic of Korea*

**AT-16. Design and Verification of 80kW Traction Motor for EV.** *H. Kim*<sup>1</sup>, *K. Jung*<sup>2</sup> and *J. Moon*<sup>1</sup> *1. Rotating Machinery Center, Korea Testing Certification, Gunpo-si, The Republic of Korea; 2. Automotive Engineering, Hanyang University, Seoul, The Republic of Korea*

TUESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session AU**  
**PERMANENT MAGNET AND RELUCTANCE**  
**MACHINES II**  
**(Poster Session)**

*Daohan Wang*, Co-Chair  
Shandong University, Shandong, China  
*Hongmei Li*, Co-Chair  
Hefei University of Technology, Hefei, China

**AU-01. Design of slit-like flux barriers to improve space harmonic distribution in a slit stator motor.** *Y. Yokoi*<sup>1</sup>, *R. Hashizume*<sup>1</sup> and *T. Higuchi*<sup>1</sup> *1. Nagasaki University, Nagasaki, Japan*

**AU-02. A New Modular Flux-Concentrated Doubly Salient Machine with PMs in Both Stator Yoke and Slot Openings.** *Q. Wang*<sup>1</sup> and *S. Niu*<sup>1</sup> *1. Department of Electrical Engineering, The Hong Kong Polytechnic University, Hung Hom, Hong Kong*

**AU-03. Rotor Structure for Reducing Demagnetization of Magnet and Torque Ripple in a PMA-synRM with Ferrite Permanent Magnet.** *Y. Kong*<sup>1</sup>, *M. Lin*<sup>1</sup>, *G. Yang*<sup>1</sup> and *K. Liu*<sup>1</sup> *1. Engineering Research Center for Motion Control of MOE, Southeast University, Nanjing, China*

**AU-04. Electromagnetic Performance Analysis of Hybrid Excited Segmental Rotor Flux Switching Machine.** *Y. Yang*<sup>1</sup>, *J. Chen*<sup>1</sup>, *B. Yan*<sup>1</sup>, *X. Wang*<sup>1</sup> and *C. Zhu*<sup>1</sup> *1. Shandong University, Jinan, China*

**AU-05. Performance Analysis of Suspension Force and Torque in an IBPMSM with V-shape PMs for Flywheel Batteries.** *B. Su*<sup>1</sup>, *X. Sun*<sup>1</sup>, *G. Lei*<sup>2</sup>, *Z. Yang*<sup>1</sup>, *J. Zhu*<sup>2</sup>, *Y. Guo*<sup>2</sup> and *K. Diao*<sup>1</sup> *1. Automotive Engineering Research Institute, Jiangsu University, Zhenjiang, China; 2. School of Electrical, Mechanical and Mechatronic Systems, University of Technology, Sydney, Sydney, NSW, Australia*

- AU-06. Characteristic analysis of a consequent-pole motor with vernier structure using ferrite magnets.** M. Choi<sup>2</sup>, B. Han<sup>1</sup> and B. Kim<sup>1</sup> 1. *Electrical, Electronic and Control Engineering, Gunsan National University, South Korea, Gunsan, The Republic of Korea;* 2. *Electrical System R&D Team Assistant Research Engineer, Jeonbuk Institute of Automotive Convergence Technology, South Korea, Gunsan, Jeollabuk-do, The Democratic People's Republic of Korea*
- AU-07. Static Characteristics of Hybrid Excitation Machine with Parallel Magnetic Path.** J. Zhang<sup>1</sup>, Z. Xu<sup>1</sup>, Y. Jiang<sup>1</sup> and W. Hua<sup>1</sup> 1. *School of Electrical Engineering, Southeast University, Nanjing, China*
- AU-08. A Double-Rotor Consequent-Pole Vernier Permanent-Magnet Machine with Toroidal-Winding Arrangement for Hybrid Electric Vehicles.** C. Lee<sup>1</sup> 1. *Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA, United States*
- AU-09. Efficiency-Enhanced Variable Flux Reluctance Machine with Reduced Excitation Coils for Electric Vehicles.** X. Zhao<sup>1</sup> and S. Niu<sup>1</sup> 1. *Electrical Engineering, The Hong Kong Polytechnic University, Kowloon, Hong Kong*
- AU-10. Parametric Optimization of Flux Focusing Type Double Stator and Single Rotor Axial Flux Permanent Magnet Motor.** Q. Syed<sup>1</sup> and I. Hahn<sup>1</sup> 1. *Electrical Drives and Machines, University of Erlangen-Nürnberg, Erlangen, Germany*
- AU-11. Comparative Assessments of Flux-switching PM Motor Drives for EV Applications.** C. Liu<sup>1</sup>, C. Hwang<sup>2</sup>, Y. Chao<sup>2</sup>, H. Chang<sup>3</sup> and C. Hong<sup>4</sup> 1. *Electrical Engineering, National Sun Yat-sen University, Kaohsiung, Taiwan;* 2. *Electrical Engineering, Feng Chia University, Taichung, Taiwan;* 3. *Automatic Control Engineering, Feng Chia University, Taichung City, Taiwan;* 4. *Ph.D. Program in ECE., Feng Chia University, Taichung, Taiwan*
- AU-12. Analysis and improvement of a variable flux hybrid-permanent-magnet synchronous machine.** Y. Hu<sup>1,2</sup>, B. Chen<sup>1,2</sup>, B. Zhou<sup>1</sup>, Y. Xiao<sup>1</sup> and M. Wang<sup>1</sup> 1. *Gree Electric Appliances Inc. of Zhuhai, Zhuhai, China;* 2. *State Key Laboratory of Air-Conditioning Equipment and System Energy Conservation, Zhuhai, China*
- AU-13. A Simplified Rotor-Shape Optimization Method for IPM Motor to Torque Ripple Reduction.** G. Yu<sup>1</sup>, J. Li<sup>1</sup>, Y. Xu<sup>1</sup>, J. Zou<sup>1</sup>, L. Xiao<sup>1</sup> and H. Lan<sup>1</sup> 1. *Harbin Institute of Technology, Harbin, China*
- AU-14. Design for an Six-Phase Synchronous Reluctance Motor Mounted with Centrifugal Compressor Using Multiobjective Optimization Methods.** C. Lin<sup>1</sup> and C. Hwang<sup>2</sup> 1. *Electrical Engineering, National United University, Miaoli, Taiwan;* 2. *Department of Electrical Engineering, Feng Chia University, Taichung, Taiwan*

- AU-15. Design and investigation of a V-shaped Permanent Magnet Vernier Motor with enhanced Flux-Modulated effect and Low Torque Ripple.** Y. Chen<sup>1</sup> and L. Quan<sup>1</sup> *1. Electrical Engineering, School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*
- AU-16. A Novel Wide Speed Range Permanent Magnetic Machine Based on Mechanical Flux Weakening Control.** Y. Mao<sup>1</sup> and S. Niu<sup>1</sup> *1. Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

TUESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session AV**  
**SOFT MAGNETIC MATERIALS I**  
**(Poster Session)**

Nobuyoshi Imaoka, Co-Chair  
Advanced Industrial Science and Technology, Nagoya, Japan  
Shinpei Yamamoto, Co-Chair  
Advanced Industrial Science and Technology, Nagoya, Japan

- AV-01. CoFe-Based Amorphous Microwires for GMI Sensor Applications.** P. Sarkar<sup>1,2</sup>, F. Yuan<sup>3</sup>, M. Lai<sup>2</sup>, J. Jeng<sup>4</sup> and C. Lu<sup>1</sup> *1. Department of Mechanical Engineering, National Taipei University of Technology, Taipei, Taiwan; 2. iSentek Inc, Taipei, Taiwan; 3. iSentek Inc., New Taipei City, Taiwan; 4. Department of Mechanical Engineering, National Kaohsiung University of Applied Sciences, Kaohsiung, Taiwan*
- AV-02. Stress Induced Domain Wall Motion in FeCo microwires for Energy Harvesting.** S. Bhatti<sup>1</sup>, C. Ma<sup>2</sup>, X. Liu<sup>2</sup> and S. Piramanayagam<sup>1</sup> *1. School of Physical and Mathematical Science, Nanyang Technological University, Singapore, Singapore; 2. Department of Electrical and Computer Engineering, Shinshu University, Nagano, Japan*
- AV-03. Magnetic Property of Amorphous Magnetic Thin Ribbon and its Laminated Bulk under the Tensile and Compressive Stress.** T. Mizuta<sup>1</sup>, Y. Tani<sup>1</sup> and K. Fujiwara<sup>2</sup> *1. Mitsubishi Electric Corporation, Amagasaki, Japan; 2. Doshisha University, Kyotanabe, Japan*
- AV-04. Fabrication and evaluation of composite magnetic core using iron-based amorphous alloy powder with different particle-size distribution.** N. Yabu<sup>1</sup>, K. Sugimura<sup>1</sup>, Y. Inagaki<sup>1</sup>, D. Ueda<sup>1</sup>, M. Sonehara<sup>1</sup> and T. Sato<sup>1</sup> *1. Faculty of Engineering, Shinshu University, Nagano, Japan*
- AV-05. Analysis of cutting technology influence on the magnetic anisotropy in grain-oriented steel based on the orientation distribution functions.** G. Paltanea<sup>1</sup>, V. Manescu (Paltanea)<sup>1</sup>, L. Dumitru<sup>1</sup> and H. Gavrilă<sup>1</sup> *1. Electrical Engineering Department, University Politehnica of Bucharest, Bucharest, Romania*

- AV-06. Effects of Annealing in Magnetic Field or under Tensile Stress on the Magnetic Properties of Fe-based Amorphous Magnetic Material.** *T. Todaka*<sup>1</sup>, *I. Uesugi*<sup>1</sup> and *T. Sato*<sup>1</sup>  
*1. Division of Electrical and Electronic Engineering, Faculty of Science and Technology, Dept. of Innovative Engineering, Oita University, Oita, Japan*
- AV-07. Analysis of dynamic permeability and energy loss of ring-shaped Fe-Ga alloy.** *L. Weng*<sup>1</sup>, *W. Li*<sup>1</sup>, *X. Cao*<sup>1</sup>, *S. Liang*<sup>1</sup> and *B. Wang*<sup>1</sup> *1. The State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*
- AV-08. Magnetization reversal of helical Co and CoFe nanosprings.** *D. Nam*<sup>1</sup>, *A. Samardak*<sup>2</sup>, *Y. Jeon*<sup>1</sup>, *S. Kim*<sup>1</sup>, *A. Davydenko*<sup>2</sup>, *A. Ognev*<sup>2</sup>, *L. Chebotkevich*<sup>2</sup>, *A.S. Samardak*<sup>2,3</sup> and *Y.K. Kim*<sup>1</sup>  
*1. Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 2. School of Natural Sciences, Far Eastern Federal University, Vladivostok, Russian Federation; 3. Center for Spin-Orbitronic Materials, Korea University, Seoul, The Republic of Korea*
- AV-09. Degradation of static and dynamic magnetic properties of non-oriented steel sheets by cutting.** *V. Manescu (Paltanea)*<sup>1</sup>, *G. Paltanea*<sup>1</sup>, *E. Ferrara*<sup>2</sup>, *F. Fiorillo*<sup>2</sup> and *I. Nemoianu*<sup>1</sup>  
*1. Electrical Engineering Department, University Politehnica of Bucharest, Bucharest, Romania; 2. Nanoscience and Materials Division, Istituto Nazionale di Ricerca Metrologica, Torino, Italy*
- AV-10. Magnetic properties of exchange coupled Fe-Ni/Fe<sub>22</sub>Ni<sub>78</sub> double-layered films.** *J. Kaji*<sup>1</sup>, *H. Aramaki*<sup>1</sup>, *K. Koda*<sup>1</sup>, *K. Takashima*<sup>1</sup>, *T. Yanai*<sup>1</sup>, *M. Nakano*<sup>1</sup> and *H. Fukunaga*<sup>1</sup>  
*1. Nagasaki University, Nagasaki, Japan*
- AV-11. Investigation of dynamic and continuous heat treatment on the magnetic losses of non-oriented electrical steels.** *J. Fuzer*<sup>1</sup>, *P. Kollar*<sup>1</sup>, *S. Martinkova*<sup>1</sup>, *F. Kovac*<sup>2</sup> and *I. Petryshynets*<sup>2</sup> *1. Institute of Physics, P.J. Safarik University, Kosice, Slovakia; 2. Division of Metals Systems, Institute of Materials Research, Kosice, Slovakia*
- AV-12. NiFe<sub>2</sub>O<sub>4</sub> Nano-Hollow Spheres with Improved Magnetic and Dielectric Properties.** *D. Mandal*<sup>1</sup> and *K. Mandal*<sup>1</sup>  
*1. Condensed Matter Physics and Material Sciences, S.N. Bose National Centre for Basic Sciences, Kolkata, India*
- AV-13. Magnetic material deterioration of non-oriented electrical steels as a result of plastic deformation considering residual stress distribution.** *N. Leuning*<sup>1</sup>, *S. Steentjes*<sup>1</sup>, *H. Weiss*<sup>2</sup>, *W. Volk*<sup>2</sup> and *K. Hameyer*<sup>1</sup> *1. Institute of Electrical Machines (IEM), RWTH Aachen University, Aachen, Germany; 2. Institute of Metal Forming and Casting (utg), Technische Universität München, Munich, Germany*

- AV-14. Magnetic properties and crystal structure of high-purity Fe- (6, 6.5, 7) mass%Si alloys.** *K. Matsuyama*<sup>1</sup>, *I. Sasaki*<sup>1</sup>, *S. Nakagawa*<sup>1</sup>, *H. Era*<sup>1</sup>, *M. Takezawa*<sup>1</sup>, *Y. Horibe*<sup>1</sup>, *S. Hata*<sup>2</sup>, *C. Kaidou*<sup>3</sup>, *T. Ogawa*<sup>4</sup> and *S. Kubo*<sup>5</sup> *1. Kyushu Institute of Technology, Kitakyushu, Japan; 2. Kyushu University, Fukuoka, Japan; 3. National Institute of Technology, Kitakyusyu College, Kitakyusyu, Japan; 4. Fukuoka Industrial Technology Center, Kitakyusyu, Japan; 5. Kagoshima University, Kagoshima, Japan*
- AV-15. Soft Magnetic Thin Films Laminations on Various Silicon Wafer Trench Geometries.** *D.J. Cronin*<sup>1,2</sup>, *P. McCloskey*<sup>1</sup>, *A. Masood*<sup>1</sup> and *C. O'Mathuna*<sup>1</sup> *1. Integrated Magnetics, Tyndall National Institute, Cork, Ireland; 2. University College Cork, Cork, Ireland*
- AV-16. Effect of growth conditions on the Soft Magnetostrictive properties of thin Fe-Co-Cr films.** *S. Baco*<sup>1</sup>, *Q.A. Abbas*<sup>1</sup>, *Z. Leong*<sup>1</sup>, *T. Hayward*<sup>1</sup>, *N. Morley*<sup>1</sup> and *T. Thomson*<sup>2</sup> *1. Material Science and Engineering, The University of Sheffield, Sheffield, United Kingdom; 2. School of Computer Science, University of Manchester, Manchester, United Kingdom*

TUESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

### Session AW

## TRANSFORMERS AND INDUCTORS: MODELLING I (Poster Session)

Cheng-Tsung Liu, Chair

National Sun Yat-Sen University, Kaohsiung, Taiwan

- AW-01. Effect of Magnetic Annealing on Magnetic Characteristic of Amorphous Wound Core.** *T. Sato*<sup>1</sup> and *T. Todaka*<sup>1</sup> *1. Oita University, Oita, Japan*
- AW-02. Numerical Simulation of Particle Motion Inside Nano-Modified Transformer by Multi-Scale LBM-FDM Method.** *L. Xuan*<sup>1</sup>, *F. Zeng*<sup>1</sup>, *X. Guan*<sup>1</sup> and *H. Peng*<sup>1</sup> *1. School of Electrical Engineering, Wuhan University, Wuhan, China*
- AW-03. An Efficient Finite Element Modeling for Stray Loss Calculation in Power Transformer Tank Using Impedance Boundary Condition.** *K. Park*<sup>1</sup>, *S. Hahn*<sup>1</sup> and *H. Ahn*<sup>2</sup> *1. Electrical Engineering, Dong-A University, BUSAN, The Republic of Korea; 2. R&D Center, Power & Industrial Systems Performance Group, Hyosung Corporation, Changwon, The Republic of Korea*
- AW-04. Relationship Between Drive Frequency and Load Characteristics in Bidirectional Contactless Power Transfer for Electric Vehicles.** *T. Takura*<sup>1</sup> and *H. Matsuki*<sup>2</sup> *1. Tohoku Institute of Technology, Sendai, Japan; 2. Tohoku University, Sendai, Japan*

- AW-05. Insulation Materials Test and Electric Field Analysis for 330 kV IOCT used in Traction Network.** *B. Bai<sup>1</sup>, Q. Wang<sup>1</sup>, D. Chen<sup>1</sup>, X. He<sup>1</sup>, T. Fu<sup>2</sup> and Q. Ma<sup>2</sup>* 1. *Shenyang University of Technology, Shenyang, China;* 2. *TBEA Shenyang Transformer Group Co. Ltd, Shenyang, China*
- AW-06. A Study on Increase of Core Loss Ratio and Inductance According to Construction of Induction Heater for Electric Vehicle.** *J. Kang<sup>1</sup>, Z. Wang<sup>1</sup> and K. Kim<sup>1</sup>* 1. *Dept. of Electrical Engineering, Hanbat National University, Daejeon, The Republic of Korea*
- AW-07. A Novel Magnetic Valve Structure for Magnetically Controlled Reactor.** *M. Liu<sup>1,2</sup>, S. Wang<sup>2</sup>, Y. Li<sup>1</sup> and J. Li<sup>2</sup>* 1. *State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China;* 2. *State Key Laboratory of Control and Simulation of Power System and Generation Equipments, Tsinghua University, Beijing, China*
- AW-08. Characteristic Analysis of a 100kW class High Frequency Transformer Using a Magnetic Equivalent Circuit Method.** *H. Lee<sup>2,1</sup>, S. Oh<sup>2</sup>, J. Cho<sup>2</sup>, S. Kim<sup>2</sup>, J. So<sup>1,3</sup>, Y. Park<sup>1,3</sup> and D. Kim<sup>1,3</sup>* 1. *Electrical Control Engineering, Suncheon National University, Suncheon, The Republic of Korea;* 2. *Korea Electronics Technology Institute, Gwanju, The Republic of Korea;* 3. *Greenenergy Laboratory, sunchon national university, Suncheon, The Republic of Korea*
- AW-09. Simulation and Impact Analysis of Remanent Flux on Power Transformer Inrush Current.** *W. Ge<sup>1</sup> and Y. Wang<sup>2</sup>* 1. *School of Control and Mechanical Engineering, Tianjin Chengjian University, Tianjin, China;* 2. *State Key Lab of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*
- AW-10. A Study on the Loss Analysis according to the Switching State of Single-Phase 3kW Transformerless Solar Inverter.** *P. Je-Seok<sup>1,2</sup>, P. Young-Un<sup>1,2</sup> and D. Kim<sup>1,2</sup>* 1. *Electrical Control Engineering, Suncheon National University, Suncheon, The Republic of Korea;* 2. *Suncheon National University, Greenenergy Laboratory, Sunchon, The Republic of Korea*
- AW-11. Design and Fabrication of Rotary Magnetostrictvie Energy Harvester for Knee-joint wearable applications.** *B. Yan<sup>1</sup>, J. Hong<sup>1</sup> and C. Zhang<sup>2</sup>* 1. *Guangdong University of Technology, Guangzhou, China;* 2. *Harbin Institute of Technology, Harbin, China*

**Session BA**  
**SYMPOSIUM ON SYNCHROTRON X-RAY AND  
NEUTRON SCIENCES FOR MAGNETISM**

Chengjun Sun, Chair  
Argonne National Laboratory, Argonne, IL, United States

**2:00**

- BA-01. New opportunities for characterizing magnetic systems using next-generation synchrotron radiation sources. (Invited) J. Lang<sup>1</sup>** *1. X-Ray Science Division, Argonne National Laboratory, Argonne, IL, United States*

**2:30**

- BA-02. Ultrafast and Very Small: Discover Nanoscale Magnetism With Picosecond Time Resolution Using X-Rays. (Invited) H. Ohldag<sup>1</sup>** *1. Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Laboratory, Menlo Park, CA, United States*

**3:00**

- BA-03. Neutron Scattering on Magnetic Thin Films. (Invited) Y. Liu<sup>1</sup>** *1. Neutron Sciences Directorate, Oak Ridge National Laboratory, Oak Ridge, TN, United States*

**3:30**

- BA-04. Polarized Neutron Reflectometry of Epitaxial Fe[0.25 + x] Pt[0.75 - x] Layers. (Invited) G.J. Mankey<sup>1</sup>, G.L. Causer<sup>2,3</sup>, D.L. Cortie<sup>2,3</sup>, X. Wang<sup>2</sup>, H. Zhu<sup>3</sup>, M. Ionescu<sup>3</sup> and F. Klöse<sup>4</sup>** *1. Physics and Astronomy, University of Alabama, Tuscaloosa, AL, United States; 2. Institute for Superconducting and Electronic Materials, University of Wollongong, Lucas Heights, NSW, Australia; 3. Australian Nuclear Science and Technology Organisation, Lucas Heights, NSW, Australia; 4. Guangdong Technion-Israel Institute of Technology, Shantou, China*

**4:00**

- BA-05. Characterization of Magnetic Nanostructures with Polarized Neutron and Resonant X-ray scattering. (Invited) S. Sinha<sup>1</sup>** *1. Physics, University of California San Diego, La Jolla, CA, United States*

**4:30**

- BA-06. Imaging the statics and dynamics of sub-10nm skyrmions using x-ray holography and scanning transmission x-ray microscopy. (Invited) F. Buettner<sup>1</sup>** *1. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

**Session BB**

**SOFT MAGNETIC MATERIALS II: AMORPHOUS  
AND NANOCRYSTALLINE MATERIALS**

Peter Kollar, Chair

P. J. Safarik University, Faculty of Science, Institute of Physics,  
Kosice, Slovakia

**2:00**

- BB-01. Influence of annealing time on structural and magnetic properties in Fe-Co-Si-B-P-Cu.** *M. Kuhnt*<sup>1</sup>, *M. Amalraj*<sup>2</sup>, *K. Pradeep*<sup>2</sup>, *M. Marsilius*<sup>3</sup>, *T. Strache*<sup>3</sup>, *C. Polak*<sup>3</sup> and *G. Herzer*<sup>3</sup> *1. Department of Materials Science, Technische Universität Darmstadt, Darmstadt, Germany; 2. Materials Chemistry, RWTH Aachen University, Aachen, Germany; 3. Vacuumschmelze GmbH & Co.KG, Hanau, Germany*

**2:15**

- BB-02. Fabrication and properties of under 10  $\mu\text{m}$  sized amorphous powders of high  $B_s$  soft magnetic alloy for high frequency applications.** *T. Suzuki*<sup>1,2</sup>, *P. Sharma*<sup>1</sup>, *L. Jiang*<sup>1</sup>, *Y. Zhang*<sup>3</sup> and *A. Makino*<sup>1</sup> *1. Tohoku University, New Industry Creation Hatchery Center (NICHe), Sendai, Japan; 2. Sendai R&D Center, Sendai, Japan; 3. Tohoku University, Institute for Materials Research, Sendai, Japan*

**2:30**

- BB-03. Nanostructured Soft Magnetic Multilayers with Tunable Properties for On-Chip Micro-Magnetic Devices.** *C. Falub*<sup>1</sup>, *R. Hida*<sup>2</sup>, *M. Meduna*<sup>3,4</sup>, *M. Bless*<sup>1</sup>, *J. Richter*<sup>1</sup>, *H. Rohrmann*<sup>1</sup>, *T. Nadig*<sup>1</sup> and *M. Padrun*<sup>1</sup> *1. Evatec AG, Trübbach, Switzerland; 2. CEA-LETI/Minatec, Grenoble, France; 3. Department of Condensed Matter Physics, Masaryk University, Brno, Czechia; 4. CEITEC, Masaryk University, Brno, Czechia*

**2:45**

- BB-04. Magnetic Properties of Annealed Amorphous Alloys (Fe-rich) Obtained by Gas Atomization Technique.** *K.L. Alvarez*<sup>2,3</sup>, *J.M. Martín*<sup>1,2</sup>, *M. Ipatov*<sup>4</sup>, *L. Dominguez*<sup>5</sup> and *J. Gonzalez*<sup>6</sup> *1. Materials and Manufacturing, CEIT-IK4, San Sebastián, Spain; 2. Tecnun (University of Navarra), San Sebastián, Spain; 3. Escuela de Ingeniería Mecánica, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile; 4. SGIker (Magnetic Measurements), University of the Basque Country, San Sebastián, Spain; 5. Escuela de Ingeniería de Gipuzkoa, University of the Basque Country, San Sebastián, Spain; 6. Department Materials Physics, Faculty of Chemistry, University of the Basque Country, San Sebastián, Spain*

**3:00**

- BB-05. Novel making method of high resistive surface layer of Fe-based amorphous alloy powder by surface-modification using two-step acid solution process.** *K. Sugimura*<sup>1</sup>, *N. Yabu*<sup>1</sup>, *M. Sonehara*<sup>1</sup> and *T. Sato*<sup>1</sup> *1. Faculty of Engineering, Shinshu University, Nagano, Japan*

- BB-06. Comparison of magnetostatic and magnetoimpedance properties for amorphous ribbons, wires and glass-coated microwires.** *N.S. Perov<sup>1,2</sup>, Y.A. Alekhina<sup>1</sup>, L.A. Makarova<sup>1</sup>, M.F. Khajrullin<sup>1</sup>, I.A. Baraban<sup>2</sup> and V.V. Rodionova<sup>2,3</sup>*  
*1. Faculty of Physics, magnetism department, Lomonosov MSU, Moscow, Russian Federation; 2. Institute of Physics & Technology and STP "Fabrika", Immanuel Kant Baltic Federal University, Kaliningrad, Russian Federation; 3. National University of Science and Technology «MISIS», Moscow, Russian Federation*

- BB-07. Tunable structural and magnetic properties of single- and multiphase glass-coated microwires.** *V. Rodionova<sup>1,2</sup>, I.A. Baraban<sup>1</sup> and N.S. Perov<sup>1,3</sup>*  
*1. STP "Fabrika", Immanuel Kant Baltic Federal University, Kaliningrad, Russian Federation; 2. National University of Science and Technology «MISIS», Moscow, Russian Federation; 3. Lomonosov Moscow State University, Moscow, Russian Federation*

- BB-08. Magneto-optical observations of amorphous glass-coated microwires: role of topography.** *K. Richter<sup>2</sup>, A. Thiaville<sup>1</sup> and R. Varga<sup>2</sup>*  
*1. Université Paris-Sud, Orsay, France; 2. University of Pavol Jozef Safarik, Kosice, Slovakia*

- BB-09. Comparison between two methods to measuring the magnetic flux density in soft magnetic materials at high frequencies.** *Y. Wang<sup>1</sup>, X. Zhang<sup>1</sup>, L. Chen<sup>1</sup>, C. Liu<sup>1</sup> and Z. Wang<sup>1</sup>*  
*1. Hebei University of Technology, Tianjin, China*

- BB-10. Thickness dependent high frequency properties of multistripe patterned FeCoBSi magnetic films.** *L. Zhang<sup>1</sup>, Y. Liu<sup>1</sup>, H. Zheng<sup>1</sup>, W. Zhu<sup>1</sup>, M. Zhang<sup>1</sup>, P. Zhou<sup>1</sup>, H. Chen<sup>1</sup>, X. Wang<sup>1</sup>, H. Lu<sup>1</sup>, J. Xie<sup>1</sup> and L. Deng<sup>1</sup>*  
*1. School of Microelectronics and Solid-State Electronics, University of Electronic Science and Technology of China, Chengdu, China*

- BB-11. Microwave behaviour of metacomposites containing CNTs-coated ferromagnetic microwires.** *Y. Luo<sup>1</sup>, S. Wei<sup>1</sup>, D. Estevez<sup>1</sup>, F. Qin<sup>1</sup> and H. Peng<sup>1</sup>*  
*1. Material Science and Engineering, Zhejiang University, Hangzhou, China*

- BB-12. Collective behavior of nanograins in Co-substituted Fe-based nanocrystalline alloys.** *G. Manginas<sup>1</sup>, G. Ababei<sup>1</sup>, A. Damian<sup>1</sup>, G. Stoian<sup>1</sup>, M. Grigoras<sup>1</sup>, M. Tibu<sup>1</sup>, H. Chiriac<sup>1</sup>, T.A. Ovari<sup>1</sup> and N. Lupu<sup>1</sup>*  
*1. National Institute of Research and Development for Technical Physics, Iasi, Romania*

**Session BC**  
**BIO-IMAGING AND BIO-DETECTION I**

Daniel Ortega Ponce, Chair  
IMDEA Nanociencia, Madrid, Spain

**2:00**

**BC-01. Magneto-paper composites for low-cost two-way valves and other active  $\mu$ Pads.** *M. Fratzl<sup>1,3\*</sup>, B. Chang<sup>2</sup>, S. Oyola-Reynoso<sup>2</sup>, G. Blaire<sup>3</sup>, S. Delshadi<sup>3,4</sup>, O. Cugat<sup>3</sup>, M. Thuo<sup>2</sup>, J. Bloch<sup>5</sup> and N. Dempsey<sup>1</sup>* *1. Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, Grenoble, France; 2. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States; 3. Univ. Grenoble Alpes, CNRS, Grenoble, France; 4. Univ. Grenoble Alpes, CNRS, Inserm, Grenoble, France; 5. Univ. Grenoble Alpes, CNRS, Grenoble INP\*, 3SR, Grenoble, France*

**2:15**

**BC-02. Vertical hydrodynamic focusing for cell counting with a magnetoresistive cytometer.** *A. Chicharo<sup>4,1</sup>, L. Barnsley<sup>2,3</sup>, M. Martins<sup>4</sup>, A. Taouallah<sup>1,4</sup>, B. Silva<sup>4</sup>, S. Cardoso de Freitas<sup>5</sup>, L. Dieguez<sup>4</sup>, B. Espiña<sup>4</sup> and P. Freitas<sup>4,5</sup>* *1. Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal; 2. Jülich Centre for Neutron Science at Heinz Maier-Leibnitz Zentrum, Forschungszentrum Jülich GmbH, Garching, Germany; 3. Institute of Biomedical Engineering, University of Oxford, Oxford, United Kingdom; 4. INL - International Iberian Nanotechnology Laboratory, Braga, Portugal; 5. INESC-MN, Lisbon, Portugal*

**2:30**

**BC-03. Magnetic Micro/Nano Structures for Biological Detection and Manipulations. (Invited)** *C. Li<sup>1</sup>, B. Chen<sup>1</sup>, Y. He<sup>1</sup>, C. Hou<sup>1</sup>, H. Huang<sup>1</sup> and Z. Wei<sup>1</sup>* *1. National Tsing Hua University, Hsinchu, Taiwan*

**3:00**

**BC-04. Magnetic sensing of Antimony bioactivity through Antimony bearing Ferrihydrite bioreduction.** *A. Zegeye<sup>1</sup>, C. Chang<sup>2</sup>, M. Abdelmoula<sup>3</sup> and T. Hauet<sup>2</sup>* *1. LIEC, Université de Lorraine, Nancy, France; 2. Institut Jean Lamour, Université de Lorraine, Nancy, France; 3. LCPME, Université de Lorraine, Nancy, France*

**3:15**

**BC-05. Novel Electromagnet for MRI Applications.** *J. Alonso-Valdesueiro<sup>1</sup>, B. Sisniega<sup>1</sup> and J. Collantes<sup>1</sup>* *1. Electricity and Electronics, University of the Basque Country (UPV/EHU), Leioa, Spain*

3:30

- BC-06. Marrying Nanomagnetism with RNA Sequencing of Single Cancer Cells. (Invited) S.X. Wang<sup>1,2</sup> and C. Ooi<sup>3,4</sup>** *1. Materials Science and Engineering, Stanford University, Stanford, CA, United States; 2. Electrical Engineering, Stanford University, Stanford, CA, United States; 3. A\*STAR, Singapore, Singapore; 4. Chemical Engineering, Stanford University, Stanford, CA, United States*

4:00

- BC-07. Development of Peak to Peak Voltage Detector Type MI Gradiometer for Magnetocardiography. J. Ma<sup>1</sup> and T. Uchiyama<sup>1</sup>** *1. Graduate School of Engineering, Nagoya University, Nagoya, Japan*

4:15

- BC-08. Eddy Current-TMR Sensor for micro-motion detection of orthopaedic implants. R.P. Khokle<sup>1</sup>, S. Cardoso de Freitas<sup>2</sup>, K. Esselle<sup>1</sup>, M. Heimlich<sup>1</sup>, F. Franco<sup>2</sup> and D. Bokor<sup>3</sup>** *1. Engineering, Macquarie University, Sydney, NSW, Australia; 2. INESC-MN - Microsistemas e Nanotecnologias, Lisbon, Portugal; 3. Faculty of Medicine, Macquarie University, Sydney, NSW, Australia*

4:30

- BC-09. On-chip magnetophoretic concentration of Malaria-infected red blood cells and hemozoin nanocrystals. M. Giacometti<sup>2</sup>, L.B. Callegari<sup>1</sup>, A. Collovini<sup>2</sup>, M. Monticelli<sup>1</sup>, C. Rinaldi<sup>1</sup>, D. Petti<sup>1</sup>, G. Ferrari<sup>2</sup>, M. Sampietro<sup>2</sup>, A. Dimasi<sup>2</sup>, M. Piola<sup>2</sup>, G.B. Fiore<sup>2</sup> and R. Bertacco<sup>1</sup>** *1. Department of Physics, Politecnico di Milano, Milano, Italy; 2. DEIB, Politecnico di Milano, Milano, Italy*

4:45

- BC-10. Effect of anti-LGR5 MicroBeads on CoFeB/Ta/CoFeB spin valve switching. O. Koplak<sup>1</sup>, A.A. Aristov<sup>2</sup>, R. Morgunov<sup>2,3</sup> and S. Mangin<sup>4</sup>** *1. Laboratory of Nanomaterials Spectroscopy, Institute of Problems of Chemical Physics, Chernogolovka, Russian Federation; 2. Tambov State Technical University, 392000, Tambov, Russia, Tambov, Russian Federation; 3. Institute of Problems of Chemical Physics, 142432, Chernogolovka, Moscow, Russia, Chernogolovka, Russian Federation; 4. Institut Jean Lamour, UMR 7198 CNRS, University de Lorraine, France, Nancy, France*

**Session BD**  
**MAGNETIC TUNNEL JUNCTION AND SPIN ORBIT  
TORQUE**

Yihong Wu, Chair  
National University of Singapore, Singapore

**2:00**

- BD-01. Voltage controlled magnetic tunnel junction based 3D-crosspoint memory with step shaped pulse for reliable write operation.** *K. Ikegami<sup>1</sup>, S. Fujita<sup>1</sup>, T. Nozaki<sup>3</sup>, T. Yamamoto<sup>3</sup>, S. Yuasa<sup>3</sup> and Y. Suzuki<sup>3,2</sup>* *1. Toshiba Corporation, Kawasaki, Japan; 2. Graduate School of Engineering Science, Osaka University, Osaka, Japan; 3. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

**2:15**

- BD-02. Nanoscale spin-orbit torque devices with Co/Pt multilayers for wide-temperature range applications.** *B. Jinnai<sup>1</sup>, S. Fukami<sup>1</sup>, H. Sato<sup>1</sup> and H. Ohno<sup>1</sup>* *1. Tohoku University, Sendai, Japan*

**2:30**

- BD-03. Novel approach for nano-patterning magnetic tunnel junctions stacks: A route towards high density STT-RAM application. (Invited)** *I.L. Prejbeanu<sup>1,2</sup>, V. Nguyen<sup>1,2</sup>, P. Sabon<sup>1,3</sup>, J. Chatterjee<sup>1,2</sup>, N. Perrissin<sup>1,2</sup>, S. Lequeux<sup>1,2</sup>, L. Tillie<sup>1,4</sup>, S. Auffret<sup>1,2</sup>, R.C. Sousa<sup>1,2</sup>, E. Gautier<sup>1,3</sup>, L. Vila<sup>1,2</sup> and B. Dieny<sup>1,2</sup>* *1. Université Grenoble Alpes, Grenoble, France; 2. INAC-SPINTEC, CEA, Grenoble, France; 3. SPINTEC, CNRS, Grenoble, France; 4. CEA-LETI, Grenoble, France*

**3:00**

- BD-04. Voltage-control spintronics memory (VoCSM) with potential cell-size of 4F<sup>2</sup> using in-plane magnetic tunnel junction.** *S. Shirotori<sup>1</sup>, H. Yoda<sup>1</sup>, Y. Ohsawa<sup>1</sup>, M. Shimizu<sup>1</sup>, A. Buyandalai<sup>1</sup>, K. Koi<sup>1</sup>, T. Inokuchi<sup>1</sup>, N. Shimomura<sup>1</sup>, H. Sugiyama<sup>1</sup>, Y. Kato<sup>1</sup>, S. Oikawa<sup>1</sup>, M. Ishikawa<sup>1</sup>, A. Tiwari<sup>1</sup> and A. Kurobe<sup>1</sup>* *1. Toshiba corporation, Kawasaki, Japan*

**3:15**

- BD-05. Ultra Low Power Composite Free Layer Spin-Orbit Torque MRAM.** *W. Hsu<sup>1</sup>, R. Bell<sup>1</sup> and R.H. Victora<sup>1</sup>* *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

**BD-06. Low frequency noise in vortex spin torque nano-oscillators.**

*S. Wittrock*<sup>1</sup>, *S. Tsunegi*<sup>2</sup>, *K. Yakushiji*<sup>2</sup>, *A. Fukushima*<sup>2</sup>, *H. Kubota*<sup>2</sup>, *P. Bortolotti*<sup>1</sup>, *U. Ebels*<sup>3</sup>, *S. Yuasa*<sup>2</sup>, *G. Cibiel*<sup>4</sup>, *E. Rubiola*<sup>5</sup> and *V. Cros*<sup>1</sup> *1. Unité Mixte de Physique CNRS/Thales, Palaiseau, France; 2. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Ibaraki 305-8568, Japan; 3. Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, INAC, SPINTEC, 38000 Grenoble, France; 4. Centre National d'Études Spatiales (CNES), 31401 Toulouse, France; 5. Time-Frequency department, CNRS FEMTO-ST, Université de Franche Comté, 25030 Besançon, France*

3:45

**BD-07. Non-local damping and perpendicular magnetic anisotropy in Hf/CoFeB/MgO.**

*J. Lourembam*<sup>1</sup>, *A. Ghosh*<sup>1</sup>, *M. Zeng*<sup>1</sup>, *S. Wong*<sup>2</sup>, *Q. Yap*<sup>1</sup> and *S. Lim*<sup>1</sup> *1. Non volatile memory, Data Storage Institute, Singapore, Singapore; 2. Material Science Lab, Data Storage Institute, Singapore, Singapore*

4:00

**BD-08. A thermally robust perpendicular magnetic tunnel junction with the FeTa decoupling layer.**

*J. Yu*<sup>1</sup>, *X. Wang*<sup>1</sup> and *H. Fukuzawa*<sup>1</sup> *1. Emerging Memories, Institute of Microelectronics, A\*STAR, Singapore, Singapore*

4:15

**BD-09. Effect of MgO interface in double barrier CoFeB MTJ structures.**

*S. Srivastava*<sup>1</sup>, *A.P. Chen*<sup>1</sup>, *T. Dutta*<sup>1</sup>, *R. Ramaswamy*<sup>1</sup>, *M. Saifullah*<sup>2</sup>, *K. Yamane*<sup>3</sup>, *J. Son*<sup>1,3</sup>, *K. Lee*<sup>3</sup>, *P. Yang*<sup>1</sup> and *H. Yang*<sup>1</sup> *1. National University of Singapore, Singapore; 2. Agency for Science, Technology, and Research, Institute of Materials Research and Engineering, Singapore, Singapore; 3. GLOBALFOUNDRIES Singapore Pte. Ltd., Singapore, Singapore*

4:30

**BD-10. Withdrawn**

4:45

**BD-11. Effect of stray field from adjacent bits of high-density STT-MRAM on switching current.**

*S. Itai*<sup>1</sup>, *T. Kai*<sup>1</sup>, *M. Nakayama*<sup>1</sup>, *T. Daibou*<sup>1</sup> and *J. Ito*<sup>1</sup> *1. Institute of Memory Technology Research & Development, Toshiba Memory Corporation, Kawaksaki, Japan*

**Session BE**

**SPIN INJECTION AND SPIN TORQUE OSCILLATORS**

Ciarán Fowley, Chair

Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany

**2:00**

- BE-01. Effects of spin-orbit torque on the magnon gas. (Invited)** V.E. Demidov<sup>1</sup>, S. Urazhdin<sup>2</sup>, B. Divinskiy<sup>1</sup> and S.O. Demokritov<sup>1</sup> *1. Institute for Applied Physics, University of Muenster, Muenster, Germany; 2. Emory University, Atlanta, GA, United States*

**2:30**

- BE-02. Current-Induced Superparamagnetism in CoFeB Nanodots.** A.M. Abdelgawad<sup>1</sup>, B. Parks<sup>2</sup> and S. Majetich<sup>2</sup> *1. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Physics, Carnegie Mellon University, Pittsburgh, PA, United States*

**2:45**

- BE-03. Out-of-plane auto-oscillation in spin Hall oscillator with additional polarizer.** T. Taniguchi<sup>1</sup> *1. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan*

**3:00**

- BE-04. Engineering lateral nanostructures for the study of spin accumulation phenomena, giant magnetoresistance, spin Hall effect, and sensors. (Invited)** J. Attané<sup>1</sup>, L. Vila<sup>1</sup>, A. Marty<sup>1</sup>, G. Zahnd<sup>1</sup>, T. Van Pham<sup>1</sup>, P. Noel<sup>1</sup> and W. Saverio-Torres<sup>1</sup> *1. Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP\*, INAC, SPINTEC, Grenoble, France*

**3:30**

- BE-05. Robust electrical mutual synchronization of spin torque oscillators.** S. Tsunegi<sup>1</sup>, T. Taniguchi<sup>1</sup>, R. Lebrun<sup>2</sup>, K. Yakushiji<sup>1</sup>, A. Fukushima<sup>1</sup>, J. Grollier<sup>2</sup>, V. Cros<sup>2</sup>, S. Yuasa<sup>1</sup> and H. Kubota<sup>1</sup> *1. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Palaiseau, France; 2. Unité Mixte de Physique CNRS, Thales, Univ. Paris Sud, Université Paris-Saclay, Palaiseau, France*

**3:45**

- BE-06. Micromagnetic Analysis of Emission Power in Spin Torque Oscillator: Influence of Diameter and Interlayer Exchange Coupling.** T. Tanaka<sup>1</sup>, A. Furuya<sup>1</sup>, Y. Uehara<sup>1</sup>, K. Shimizu<sup>1</sup>, J. Fujisaki<sup>1</sup>, T. Ataka<sup>1</sup>, C. Yoshida<sup>1</sup>, H. Oshima<sup>2</sup>, H. Kubota<sup>3</sup> and H. Imamura<sup>3</sup> *1. Fujitsu Limited, Kawasaki, Japan; 2. Fujitsu Laboratories Limited, Atsugi, Japan; 3. National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

4:00

- BE-07. Influence of MgO Tunnel Barrier thickness in 3-terminal Spin Hall Nano-Oscillators.** *M. Tarequzzaman*<sup>1,2</sup>, T. Boehnert<sup>1</sup>, A. Jenkins<sup>1</sup>, J. Borme<sup>1</sup>, E. Paz<sup>1</sup>, R. Ferreira<sup>1</sup> and P. Freitas<sup>1,2</sup>  
1. Nanoelectronics (Spintronics), International Iberian Nanotechnology Laboratory (INL), Braga, Portugal; 2. Physics Department, Instituto Superior Tecnico (IST) – Universidade de Lisboa, Lisbon, Portugal

4:15

- BE-08. Spin torque diode with perpendicular anisotropy used for passive demodulation of FM digital signals.** *S. Louis*<sup>2</sup>, V.S. Tiberkevich<sup>1</sup>, J. Li<sup>2</sup>, O. Prokopenko<sup>3</sup> and A.N. Slavin<sup>1</sup>  
1. Physics, Oakland University, Rochester, MI, United States; 2. Electrical and Computer Engineering, Oakland University, Rochester, MI, United States; 3. Faculty of Radio Physics, Electronics and Computer Systems, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine

4:30

- BE-09. The reversible spin texture of ferroelectric GeTe for a tunable source of spin currents.** *C. Rinaldi*<sup>1,2</sup>, S. Varotto<sup>1</sup>, M. Asa<sup>1</sup>, J. Slawinska<sup>3</sup>, J. Fujii<sup>4</sup>, G. Vinai<sup>4</sup>, S. Cecchi<sup>5</sup>, D. Di Sante<sup>6</sup>, R. Calarco<sup>5</sup>, I. Vobornik<sup>4</sup>, G. Panaccione<sup>4</sup>, S. Picozzi<sup>3</sup> and R. Bertacco<sup>1</sup>  
1. Physics, Politecnico di Milano, Milano, Italy; 2. IFN-CNR, Milan, Italy; 3. CNR-SPIN, Chieti, Italy; 4. CNR-IOM, Trieste, Italy; 5. Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany; 6. Institut für Theoretische Physik und Astrophysik, Universität Würzburg, Würzburg, Germany

4:45

- BE-10. Charge pumping induced by magnetic texture dynamics in Weyl semimetals.** *Y. Araki*<sup>1,2</sup> and K. Nomura<sup>1</sup>  
1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan

TUESDAY  
AFTERNOON  
2:00

PEONY I

### Session BF

## NANOWIRES, NANOPARTICLES AND CLUSTERS

Paola Tiberto, Chair

Istituto Nazionale di Ricerca Metrologica (INRIM), Torino, Italy

2:00

- BF-01. Anisotropy and coercivity analysis in tetragonal (Cu,Co) Fe<sub>2</sub>O<sub>4</sub> particles.** *H. Latiff*<sup>1,2</sup>, T. Devillers<sup>1</sup>, H. Yanagihara<sup>2</sup>, N. Dempsey<sup>1</sup> and D. Givord<sup>1</sup>  
1. Université Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, 38000 Grenoble, France; 2. Institute of Applied Physics, University of Tsukuba, 305-8573 Tsukuba, Japan

2:15

- BF-02. The effect of surface spin disorder on magnetic properties of Fe/Fe<sub>x</sub>O<sub>y</sub> core-shell nanoparticles.** M. Lostun<sup>1</sup>, D. Herea<sup>1</sup>, M. Grigoras<sup>1</sup>, G. Ababei<sup>1</sup>, I. Ghemes<sup>1</sup> and N. Lupu<sup>1</sup> *1. National Institute of Research and Development for Technical Physics, Iasi, Romania*

2:30

- BF-03. Magnetic Properties NFO-BTO and NFO-BSTO Nanocomposites.** T. Parida<sup>1</sup>, M. B S<sup>2</sup> and G. Markandeyulu<sup>1</sup> *1. Physics, Indian Institute of Technology Madras, Chennai, India; 2. Metallurgical and Materials Engineering, Indian Institute of Technology Madras, Chennai, India*

2:45

- BF-04. Topological control of the magnetic and magneto-transport properties of 3D interconnected nanofiber networks.** T. da Câmara Santa Clara Gomes<sup>1</sup>, J. De La Torre Medina<sup>2</sup>, Y. Velázquez-Galván<sup>1</sup>, J. Martínez-Huerta<sup>3</sup>, A. Encinas<sup>1</sup> and L. Piraux<sup>1</sup> *1. Institute of Condensed Matter and Nanosciences, Université catholique de Louvain, Louvain-La-Neuve, Belgium; 2. Instituto de Investigaciones en Materiales - Unidad Morelia, Universidad Nacional Autónoma de México, Morelia, México; 3. División de Materiales Avanzados, Instituto Potosino de Investigación Científica y Tecnológica, San Luis Potosí, México*

3:00

- BF-05. Information Transfer and Trapping in a 3D Nano-printed Domain-wall Conduit. (Invited)** D. Sanz-Hernández<sup>1\*</sup>, R.F. Hamans<sup>2</sup>, J. Liao<sup>1</sup>, A. Welbourne<sup>1</sup>, R. Lavrijsen<sup>2</sup> and A. Fernández-Pacheco<sup>1</sup> *1. Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom; 2. Department of Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands*

3:30

- BF-06. From vanishing interaction to superferromagnetic dimerization: Experimental determination of interaction lengths for embedded Co clusters.** F. Tournus<sup>1</sup>, A. Hillion<sup>1</sup>, A. Tamion<sup>1</sup>, C. Albin<sup>1</sup> and V. Dupuis<sup>1</sup> *1. Institut Lumière Matière, Université Lyon 1 & CNRS, Villeurbanne, France*

3:45

- BF-07. The role of topologically non-trivial structures in magnetization processes of diameter modulated nanowires.** J. Fernandez-Roldan<sup>1</sup>, C. Bran<sup>1</sup>, R. Perez del Real<sup>1</sup>, M. Vázquez<sup>1</sup> and O. Chubykalo-Fesenko<sup>1</sup> *1. Instituto de Ciencia de Materiales de Madrid, CSIC, Madrid, Spain*

4:00

- BF-08. Multisegmented cylindrical nanowires: from designed domain configuration to controlled stepped domain wall propagation. (Invited)** C. Bran<sup>1</sup>, E. Berganza<sup>1</sup>, J. Fernandez-Roldan<sup>1</sup>, M. Jaafar<sup>1</sup>, R. Perez del Real<sup>1</sup>, A. Asenjo<sup>1</sup>, O. Chubykalo-Fesenko<sup>1</sup> and M. Vázquez<sup>1</sup> *1. Institute of Materials Science of Madrid, CSIC, Madrid, Spain*

4:30

- BF-09. Magnetic-field-induced domain wall propagation in modulated-diameter cylindrical nanowires.** J. Fernandez-Roldan<sup>2</sup>, A. De Riz<sup>1</sup>, B. Trapp<sup>3</sup>, C. Thirion<sup>3</sup>, J. Toussaint<sup>3</sup>, O. Fruchart<sup>1</sup> and D. Gusakova<sup>1</sup> *1. SPINTEC, Univ. Grenoble Alpes, CNRS, CEA, Grenoble, France; 2. Institute of Materials Science of Madrid (ICMM-CSIC), Madrid, Spain; 3. Institut NEEL, Univ Grenoble Alpes, CNRS, Grenoble, France*

4:45

- BF-10. Dominance of shape anisotropy among magnetostatic interaction and Magnetocrystalline anisotropy in electrodeposited (FeCo)<sub>1-x</sub>Cu<sub>x</sub>(X=0.1-0.5) Ternary Alloy Nanowires.** N. Ahmad<sup>1,2</sup>, M. Zahid Shafiq<sup>1</sup>, S. Khan<sup>3</sup>, R. Sharif<sup>4</sup>, A. Safeer<sup>3</sup>, A. Majid<sup>5</sup>, S.A. Shah<sup>6</sup> and K. Javed<sup>6</sup> *1. Physics, International Islamic University, Islamabad, Pakistan; 2. University of Chinese Academy of Sciences, Beijing, China; 3. Spintronics Laboratory, Department of Physics, International Islamic University, Islamabad, Pakistan; 4. Physics, University of Engineering and Technology, Lahore, Pakistan; 5. Physics, University of Gujrat, Gujrat, Pakistan; 6. Physics, FC College University, Lahore, Pakistan*

TUESDAY  
AFTERNOON  
2:00

PEONY III

### Session BG LINEAR MOTORS I

Yacine Amara, Chair  
Universite de Le Havre, Le Havre, France

2:00

- BG-01. Design Optimization and Performance Comparison of Two Linear Motor Topologies with PM-less Tracks. (Invited)** S. Aleksandrov<sup>1</sup>, T. Overboom<sup>1</sup> and E. Lomonova<sup>1</sup> *1. Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands*

2:30

- BG-02. A Three-Phase Tubular Permanent-Magnet Linear Machine with Hybrid Halbach/Axially-Magnetized Permanent Magnets.** Y. Sui<sup>1,2</sup>, P. Zheng<sup>1</sup>, Z. Yin<sup>1</sup> and J. Zhao<sup>2</sup> *1. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China; 2. School of Mechatronics Engineering, Harbin Institute of Technology, Harbin, China*

2:45

- BG-03. Design A Linear Flux-Switching Permanent Magnets Machine for Wave Energy Harvesting.** Y. Zou<sup>1</sup> *1. Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, China*

3:00

- BG-04. Torque Characteristics of Interior Permanent Magnet Spherical Actuators.** *K. Takahara*<sup>1</sup>, *K. Hirata*<sup>1</sup> and *N. Niguchi*<sup>1</sup>  
*1. Osaka University, Suita-city, Japan*

3:15

- BG-05. Force Estimation Method for a Magnetic Lead-Screw-Driven Linear Actuator.** *A. Heya*<sup>1</sup>, *Y. Nakata*<sup>2</sup>, *M. Sakai*<sup>1</sup>, *H. Ishiguro*<sup>2</sup> and *K. Hirata*<sup>1</sup> *1. Department of Adaptive Machine Systems, Osaka University, Suita, Japan; 2. Department of Systems Innovation, Osaka University, Toyonaka, Japan*

3:30

- BG-06. Performance Investigation of a five-phase Multi-segment primary PMLSM for Ropeless Elevator.** *Q. Jiang*<sup>1</sup> and *Q. Lu*<sup>1</sup>  
*1. Zhejiang University, Hangzhou, China*

3:45

- BG-07. A Novel Linear Stator PM Vernier Machine with Spoke-Type Magnets.** *A. Nematsaberi*<sup>1</sup> and *J. Faiz*<sup>1</sup>  
*1. Electrical and Computer Engineering, University of Tehran, Tehran, The Islamic Republic of Iran*

4:00

- BG-08. Development of a new rotary flux switching transverse flux machine with the ability of linear motion.** *C. Liu*<sup>1,3</sup>, *Y. Wang*<sup>1</sup>, *J. Zhu*<sup>2</sup>, *Y. Guo*<sup>2</sup>, *G. Lei*<sup>2</sup> and *S. Wang*<sup>1</sup> *1. Hebei University of Technology, Tianjin, China; 2. University of Technology Sydney, Sydney, NSW, Australia; 3. PMG Fussen GmbH, Fussen, Germany*

4:15

- BG-09. Quantitative Comparison of Novel Dual-PM Linear Motors for Ropeless Elevator System.** *H. Fan*<sup>1</sup>, *K. Chau*<sup>1</sup>, *C. Liu*<sup>2</sup> and *T. Ching*<sup>3</sup> *1. Electrical and Electronic engineering, The University of Hong Kong, Hong Kong Island, Hong Kong; 2. School of Energy and Environment, City University of Hong Kong, Hong Kong; 3. Faculty of Science and Technology, University of Macau, Macao, Macao*

4:30

- BG-10. Design, control, and comparison of low-energy solenoid valve actuators.** *J. van Dam*<sup>1</sup>, *B. Gysen*<sup>1</sup>, *M. Dhaens*<sup>2</sup> and *E. Lomonova*<sup>1</sup> *1. Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands; 2. Advanced Chassis Research, Tenneco Automotive bvba, Sint-Truiden, Belgium*

4:45

- BG-11. Design and Analysis of a Planar Flux-Switching Permanent Magnet Motor.** *H. Hu*<sup>1</sup>, *G. Cao*<sup>1</sup>, *S. Huang*<sup>1</sup>, *C. Wu*<sup>1</sup>, *J. Guo*<sup>1</sup>, *D. Liang*<sup>2</sup> and *R. Mai*<sup>3</sup> *1. Shenzhen Key Laboratory of Electromagnetic Control, Shenzhen University, Shenzhen, China; 2. School of Electrical Engineering, State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Xi'an, China; 3. School of Electrical Engineering, Southwest Jiaotong University, Chengdu, China*

**Session BH**  
**SENSORS: FRONTIER APPLICATIONS I**

Antonio Ruotolo, Chair  
City University of Hong Kong, Kowloon, Hong Kong

2:00

- BH-01. The Ultimate Compact Packaging Technology based on Magneto-resistive devices for a minimum source-sensor distance.** *F. Franco*<sup>1,2</sup>, *R. Dias*<sup>3</sup>, *J. Gaspar*<sup>3</sup>, *T. Materne*<sup>4</sup>, *T. Becker*<sup>4</sup>, *S. Cardoso de Freitas*<sup>1,2</sup> and *P. Freitas*<sup>1,3</sup>  
*1. INESC-MN, Lisbon, Portugal; 2. Instituto Superior Técnico, Lisbon, Portugal; 3. INL, Braga, Portugal; 4. BOGEN Electronic, Berlin, Germany*

2:15

- BH-02. Busbar current transducer with suppression of external fields and gradients.** *P. Ripka*<sup>1</sup>, *A. Chirtsov*<sup>1</sup> and *J. Vyhnanek*<sup>1</sup>  
*1. Czech Technical University, Prague, Czechia*

2:30

- BH-03. Small Eddy Current Testing Sensor Probe using Tunneling Magneto-resistance Sensors for Detection of Cracks in Steel Structures.** *K. Tsukada*<sup>1</sup>, *M. Hayashi*<sup>1</sup>, *Y. Nakamura*<sup>1</sup>, *K. Sakai*<sup>1</sup> and *T. Kiwa*<sup>1</sup> *1. Okayama University, Okayama, Japan*

2:45

- BH-04. Nondestructive testing of wire rope based on shoving magnetic field structure.** *X. Yan*<sup>1</sup> and *D. Zhang*<sup>1</sup> *1. Electrical Engineering and Electronics, Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, China*

3:00

- BH-05. Magnetic detection of steel corrosion at a buried position near the ground level using a magnetic resistance sensor.** *K. Tsukada*<sup>1</sup>, *T. Tomioka*<sup>1</sup>, *S. Wakabayashi*<sup>1</sup>, *K. Sakai*<sup>1</sup> and *T. Kiwa*<sup>1</sup> *1. Okayama University, Okayama, Japan*

3:15

- BH-06. Remote Underwater Animal Monitoring Magnetic Sensor System.** *A. Kaidarova*<sup>2</sup>, *S. Amara*<sup>2</sup>, *M. Karimi*<sup>2</sup>, *A. Shamim*<sup>2</sup>, *N. Gerald*<sup>1</sup>, *C. Duarte*<sup>1</sup> and *J. Kosel*<sup>2</sup> *1. Red Sea Research Center (RSRC), King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia; 2. Computer, Electrical and Mathematical Sciences & Engineering (CEMSE), King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

3:30

- BH-07. High-performance micro magnetic sensors installed in wearable electronic compasses and I-o-T magnetic sensors promoting new information society - Amorphous Wire CMOS IC Magneto-Impedance Sensors -. (Invited)**  
*K. Mohri<sup>1,2</sup> 1. Graduate School of Engineering, Nagoya University, Nagoya, Japan; 2. Division of Research, Nagoya Industrial Science Research Institute, Nagoya, Japan*

4:00

- BH-08. A localization method of submarines by using an airborne three-axis magnetometer carried on cruising aircraft.**  
*Y. Shangguan<sup>1</sup>, J. Yuan<sup>1</sup> and J. Zou<sup>1</sup> 1. Dept. of Electrical Engineering, Tsinghua University, Beijing, China*

4:15

- BH-09. Efficient wireless power transmission to medical implant using Wiegand sensor.** *K. Takahashi<sup>1</sup>, T. Yamada<sup>1</sup> and Y. Takemura<sup>1</sup> 1. Yokohama National University, Yokohama, Japan*

4:30

- BH-10. Accurate Position Detection in Wireless Power Transfer Using Magnetoresistive Sensors for Implant Applications.**  
*W. Han<sup>1</sup>, K. Chau<sup>1</sup>, C. Jiang<sup>1</sup> and W. Liu<sup>1</sup> 1. Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong*

4:45

- BH-11. Traffic Flow and Vehicle Speed Measurements using Magnetoresistive Sensors.** *B. Santos<sup>1</sup>, Y. Bo<sup>2</sup>, O. Chun Lian<sup>1</sup> and Y. Zhimin<sup>1</sup> 1. Non-volatile Memory, Data Storage Institute, Singapore, Singapore; 2. Institute of High Performance Computing, Singapore, Singapore*

TUESDAY  
AFTERNOON  
2:00

ORCHID II

### Session BI

## COMPUTATIONAL MAGNETICS: MICROMAGNETICS AND AB-INITIO CALCULATIONS

Andrivo Rusdyi, Chair  
National University of Singapore, Singapore

2:00

- BI-01. GPU-Accelerated Atomistic Energy-Barrier Calculations for Skyrmion Annihilation.** *P.T. Heistracher<sup>1</sup>, C. Abert<sup>1</sup>, F. Bruckner<sup>1</sup>, C. Vogler<sup>1</sup> and D. Suess<sup>1</sup> 1. Physics of Functional Materials, University of Vienna, Vienna, Austria*

- BI-02. Effect of dipolar interactions on magnetization reversal process using ultra-large-scale micromagnetics simulation.** *H. Tsukahara*<sup>1</sup>, *K. Iwano*<sup>1</sup>, *C. Mitsumata*<sup>2</sup>, *T. Ishikawa*<sup>1</sup> and *K. Ono*<sup>1</sup> *1. High Energy Accelerator Research Organization, Tsukuba, Japan; 2. National Institute for Materials Science (NIMS), Tsukuba, Japan*

2:30

- BI-03. Withdrawn**

2:45

- BI-04. Novel micromagnetic approach for self-consistent modeling of magnetization and temperature dynamics.** *O. Chubykalo-Fesenko*<sup>1</sup>, *D. Serantes*<sup>2</sup>, *P. Nieves*<sup>3</sup>, *C. Muñoz-Mendez*<sup>2</sup> and *R.W. Chantrell*<sup>4</sup> *1. Instituto de Ciencia de Materiales de Madrid, CSIC, Madrid, Spain; 2. Universidad de Santiago de Compostela, Santiago de Compostela, Spain; 3. Universidad de Burgos, Burgos, Spain; 4. University of York, York, United Kingdom*

3:00

- BI-05. Simulation of the Novel Magnetic Response of the Perpendicular Synthetic Ferrimagnet Ni<sub>3</sub>Pt/Ir/Co using VAMPIRE.** *J.N. Scott*<sup>1</sup>, *W.R. Hendren*<sup>1</sup>, *R. Bowman*<sup>1</sup>, *R.W. Chantrell*<sup>2</sup> and *R.F. Evans*<sup>2</sup> *1. Queen's University Belfast, Belfast, United Kingdom; 2. University of York, York, United Kingdom*

3:15

- BI-06. Evaluation of Thermal Stability of Spin-Transfer Torque based Magnoresistive Random-Access Memory for Cache Applications in Advanced Technology Nodes.** *H. Dixit*<sup>1</sup>, *S. Agarwal*<sup>1</sup>, *D. Datta*<sup>1</sup>, *A. Jacob*<sup>2</sup>, *D. Shum*<sup>3</sup> and *F. Benistant*<sup>3</sup> *1. Globalfoundries Engineering Pvt. Ltd., Bangalore, India; 2. Globalfoundries, Malta, NY, United States; 3. Globalfoundries Singapore Pte. Ltd., Singapore, Singapore*

3:30

- BI-07. Stable Bloch point in helimagnetic nanostructures containing boundary between grains with different chirality.** *M. Beg*<sup>1,2</sup>, *D.I. Cortes*<sup>2</sup>, *R. Pepper*<sup>2</sup>, *M. Bisotti*<sup>2</sup>, *G. Downing*<sup>2</sup>, *B. Atie*<sup>2</sup>, *O. Hovorka*<sup>2</sup> and *H. Fangohr*<sup>1,2</sup> *1. European XFEL GmbH, Schenefeld, Germany; 2. Faculty of Engineering and the Environment, University of Southampton, Southampton, United Kingdom*

3:45

- BI-08. The effect of antisite disorder on magnetic and magnetocaloric properties of Ni-Co-Mn-In alloys: ab initio and Monte Carlo studies.** *V. Sokolovskiy*<sup>1</sup>, *V. Buchelnikov*<sup>1</sup> and *P. Entel*<sup>2</sup> *1. Condensed matter, Chelyabinsk State University, Chelyabinsk, Russian Federation; 2. Duisburg-Essen University, Duisburg, Germany*

- BI-09. Analysis of switching times distributions for uniaxial magnetic particles.** *M. d'Aquino*<sup>1</sup>, *C. Serpico*<sup>2</sup> and *V. Scalera*<sup>2</sup>  
 1. *Dipartimento di Ingegneria, Università degli Studi di Napoli "Parthenope", Napoli, Italy;* 2. *DIETI, University of Naples Federico II, Naples, Italy*

- BI-10. Ab initio prediction of giant perpendicular magnetic anisotropy at Fe/CuIn<sub>1-x</sub>Ga<sub>x</sub>Se<sub>2</sub> interface.** *K. Masuda*<sup>1</sup>, *S. Kasai*<sup>1</sup>, *Y. Miura*<sup>1,2</sup> and *K. Hono*<sup>1</sup>  
 1. *National Institute for Materials Science (NIMS), Tsukuba, Japan;* 2. *Electrical Engineering and Electronics, Kyoto Institute of Technology, Kyoto, Japan*

TUESDAY

SIMPOR/ROSELLE BALLROOM

AFTERNOON

1:30

**Session BP****TMR, VCMA AND MULTIFERROIC MATERIALS I  
(Poster Session)**

Xiufeng Han, Chair

Institute of Physics, Chinese Academy of Sciences, Beijing, China

- BP-01. Coexistence of Large Voltage Controlled Magnetic Anisotropy, Large Surface Anisotropy, and Large TMR by a new MTJ structure having MgO/CoFeB/Ir/CoFeB.** *S. Oikawa*<sup>1</sup>, *Y. Saito*<sup>1</sup>, *H. Yoda*<sup>1</sup>, *Y. Kato*<sup>1</sup>, *A. Tiwari*<sup>1</sup>, *M. Ishikawa*<sup>1</sup>, *N. Shimomura*<sup>1</sup>, *K. Koi*<sup>1</sup>, *T. Inokuchi*<sup>1</sup>, *H. Sugiyama*<sup>1</sup>, *M. Shimizu*<sup>1</sup>, *S. Shirotori*<sup>1</sup>, *A. Buyandalai*<sup>1</sup>, *Y. Ohsawa*<sup>1</sup> and *A. Kurobe*<sup>1</sup>  
 1. *Corporate R&D Center, Toshiba Corporation, Kawasaki, Japan*
- BP-02. Ionic Liquid Gating Modulation of Diluted Magnetic Semiconductor (Zn, Mn)O Thin Films.** *H. Wong*<sup>1</sup>, *S. Ng*<sup>1</sup>, *Y. Liu*<sup>1</sup>, *K. Lam*<sup>1</sup>, *K. Chan*<sup>1</sup>, *W. Cheng*<sup>1</sup>, *D. von Nordheim*<sup>2</sup>, *C. Mak*<sup>1</sup>, *B. Ploss*<sup>2</sup> and *C. Leung*<sup>1</sup>  
 1. *Department of Applied Physics, The Hong Kong Polytechnic University, Hong Kong, Hong Kong;* 2. *Department of SciTec, University of Applied Sciences Jena, Jena, Germany*
- BP-03. Development of all spinel magnetic tunnel junctions: epitaxial Fe<sub>3</sub>O<sub>4</sub>/MgAl<sub>2</sub>O<sub>4</sub>/Fe<sub>3</sub>O<sub>4</sub>(001) structure.** *T. Tainosho*<sup>1</sup>, *H. Yanagihara*<sup>1</sup> and *H. Sukegawa*<sup>2</sup>  
 1. *Applied physics, University of Tsukuba, Tsukuba, Japan;* 2. *Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan*
- BP-04. Large enhancement of magneto-dielectric effect in Co–MgF<sub>2</sub> nano-composites by small addition of Si.** *Y. Cao*<sup>1</sup>, *N. Kobayashi*<sup>2</sup>, *S. Ohnuma*<sup>1,2</sup> and *H. Masumoto*<sup>1</sup>  
 1. *Frontier Research Institute for Interdisciplinary Science, Tohoku University, Sendai, Japan;* 2. *Research Institute for Electromagnetic Materials, DENJIKEN, Sendai, Japan*

- BP-05. Giant zero-biased magnetoelectric coupling characteristics in flexible Metglas/poly(vinylidene fluoride) heterostructures.** Y. Long<sup>1</sup>, J. Qiu<sup>1</sup>, X. He<sup>1</sup>, Q. Chang<sup>1</sup>, Z. Hu<sup>1</sup> and H. Liu<sup>1</sup> *1. College of Optoelectronic Engineering, Chongqing University, Chongqing, China*
- BP-06. Study of magnetic and electrical properties of Zn<sub>0.9</sub>Mn<sub>0.1</sub>Fe<sub>2</sub>O<sub>4</sub>-BaTiO<sub>3</sub> multiferroic composites.** A. Farheen<sup>1</sup> and R. Singh<sup>1</sup> *1. School of Physics, University of Hyderabad, Hyderabad, India*
- BP-07. Theory of electrically tunable thin-film electromagnetic crystals based on a coplanar waveguide.** A.A. Nikitin<sup>1,2</sup>, A. Nikitin<sup>1,2</sup>, A.B. Ustinov<sup>1</sup>, E. Lähderanta<sup>2</sup> and B.A. Kalinikos<sup>1</sup> *1. Physical Electronics and Technology, St. Petersburg Electrotechnical University, St. Petersburg, Russian Federation; 2. Laboratory of Physics, Lappeenranta University of Technology, Lappeenranta, Finland*
- BP-08. Dielectric relaxation and conduction mechanism of magnetoelectric hexaferrite BaFe<sub>10.2</sub>Sc<sub>1.8</sub>O<sub>19</sub>.** R. Tang<sup>1</sup>, Q. Zhu<sup>1</sup> and X. Su<sup>1</sup> *1. College of Physics, Optoelectronics and Energy, Soochow University, Suzhou, China*
- BP-09. Magnetodielectric effects in multiferroic M-type hexaferrite thin films.** R. Tang<sup>1</sup>, Q. Zhu<sup>1</sup>, X. Su<sup>1</sup> and H. Yang<sup>2</sup> *1. College of Physics, Optoelectronics and Energy, Soochow University, Suzhou, China; 2. School of Science, Nanjing University of Aeronautics and Astronautics, Nanjing, China*
- BP-10. Room-temperature multiferroic properties of 0.5LaFe<sub>0.5</sub>Co<sub>0.5</sub>O<sub>3</sub>-Bi<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub> thin films.** J. Su<sup>1,2</sup> *1. Qingdao University, Qingdao, China; 2. Nanjing University, Nanjing, China*

TUESDAY  
AFTERNOON  
1:30

SIMPOR/ROSELLE BALLROOM

**Session BQ**  
**ENERGY ASSISTED RECORDING AND**  
**RECORDING MEDIA**  
**(Poster Session)**

Stephanie Hernandez, Chair  
Seagate Technology, Shakopee, MN, United States

- BQ-01. Micromagnetic model analysis of spin-torque oscillator (STO) integrated into recording write head for microwave-assisted magnetic recording—Oscillation of STO vs. rise time of in-gap field—.** Y. Kanai<sup>1</sup>, R. Itagaki<sup>1</sup>, S. Greaves<sup>2</sup> and H. Muraoka<sup>2</sup> *1. Information and Electronics Engineering Department, Niigata Institute of Technology, Kashiwazaki, Japan; 2. RIEC, Tohoku University, Sendai, Japan*
- BQ-02. Effect of SIL magnetic design on STO optimization in MAMR.** I. Tagawa<sup>1</sup> *1. Electrical and Electronics, Tohoku Institute of Technology, Sendai, Japan*

- BQ-03. Magnetic recording using a spin torque oscillator.** *S. Greaves*<sup>1</sup>. *Tohoku University, Sendai, Japan*
- BQ-04. Columnar Structural FePt films with Good Perpendicular Anisotropy Grown on TiNZrO Intermediate Layer.** *K. Dong*<sup>1</sup>, *F. Jin*<sup>1</sup>, *W. Mo*<sup>1</sup> and *J. Song*<sup>1</sup>. *1. School of Automation, China University of Geosciences, Wuhan, China*
- BQ-05. Study of Erase Band and Write Performance in Shingled Magnetic Recording with Exchanged Coupled Composite Media.** *J. Chen*<sup>1,4</sup>, *G. Xie*<sup>1,2</sup>, *K. Luo*<sup>1</sup>, *W. Cheng*<sup>1</sup>, *P. Lu*<sup>1,4</sup> and *Y. Wang*<sup>3</sup>. *1. Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, Wuhan, China; 2. Key Lab of Jiangxi Province for Numerical Simulation and Emulation Technology, Gannan Normal University, Ganzhou, China; 3. Electrical and Computer Engineering Department, Carnegie Mellon University, Pittsburgh, PA, United States; 4. Key Laboratory of Information Storage System (School of Computer Science and Technology, Huazhong University of Science and Technology), Ministry of Education of China, Wuhan, China*
- BQ-06. Lattice Mismatch Induced Oscillatory Feature Size and its Impact on the Physical Limitation of Grain Size.** *J. Deng*<sup>1</sup>, *H. Li*<sup>1</sup>, *K. Dong*<sup>5</sup>, *R. Li*<sup>2</sup>, *Y. Peng*<sup>3</sup>, *G. Ju*<sup>3</sup>, *J. Hu*<sup>4</sup>, *G. Chow*<sup>1</sup> and *J. Chen*<sup>1</sup>. *1. Materials Science and Engineering, National University of Singapore, Singapore; 2. Key Laboratory of Magnetic Materials and Devices & Zhejiang Province Key Laboratory of Magnetic Materials and Application Technology, Ningbo, China; 3. Seagate Technology, Fremont, CA, United States; 4. Singapore Institute of Manufacturing Technology, Singapore, Singapore; 5. School of Automation, China University of Geoscience, Wuhan, China*
- BQ-07. Magnetic properties and microstructure of [FePt-Mg(Ti, Ta, Zr, Nb, B)O] granular films.** *J. Tsai*<sup>1</sup>, *Y. Chen*<sup>1</sup>, *C. Pi*<sup>1</sup>, *Y. Wu*<sup>1</sup>, *C. Chang*<sup>1</sup> and *G. Varvaro*<sup>2</sup>. *1. Department of Materials Science and Engineering, National Chung Hsing University, Taichung, Taiwan; 2. nM2-Lab, Istituto di Struttura della Materia, CNR, Monterotondo Scalo (Roma), 00015, Roma, Italy*
- BQ-08. First order reversal curves and intrinsic parameter determination for magnetic materials: limitations of hysteron-based approaches in correlated systems.** *S. Ruta*<sup>1</sup>, *O. Hovorka*<sup>2</sup>, *K. Wang*<sup>3</sup>, *P. Huang*<sup>3</sup>, *G. Ju*<sup>3</sup> and *R.W. Chantrell*<sup>1</sup>. *1. Physics, University of York, York, United Kingdom; 2. Faculty of Engineering and the Environment, University of Southampton, Southampton, United Kingdom; 3. Seagate Technology, Fremont, CA, United States*
- BQ-09. Magnetization Reversal of antiferromagnetically coupled (Co/ Ni) and (Co/ Pt) Multilayers.** *A.Y. AlSubhi*<sup>1</sup>. *1. Physics, Sultan Qaboos University, Muscat, Oman*
- BQ-10. In-plane components of FePt nanogranular films on MgO underlayer with and without carbon segregant.** *J. Wang*<sup>2,1</sup>, *Y. Takahashi*<sup>1</sup> and *K. Hono*<sup>1</sup>. *1. Research Center for Magnetic and Spintronic Materials, Magnetic Materials Gr., National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. International Center for Young Scientists (ICYS), National Institute for Materials Science (NIMS), Tsukuba, Japan*

**BQ-12. Ion beam patterning of ultrathin  $\text{Li}_0\text{-MnGa}$  (001) film grown on CoGa buffer layer.** *Y. Horie<sup>1</sup>, D. Oshima<sup>1</sup>, T. Kato<sup>1</sup> and S. Iwata<sup>1</sup> 1. Nagoya University, Nagoya-shi, Japan*

**BQ-13. Exchange coupling through a Pt spacer to enable ultrafast memory devices.** *C.A. Lambert<sup>2,1</sup>, J. Gorchon<sup>1</sup>, Y. Yang<sup>1</sup>, A. Pattabi<sup>1</sup>, R. Wilson<sup>1</sup>, J. Bokor<sup>1</sup> and S. Salahuddin<sup>1</sup> 1. EECS, UC Berkeley, Berkeley, CA, United States; 2. Materials Science, ETH Zürich, Zürich, Switzerland*

**BQ-14. Thermomdiffusion and the replenishment phenomena of PFPEs for the application of heat-assisted magnetic recording.** *P. Chung<sup>1</sup> 1. Energy Engineering, Inje University, Gimhae-si, The Republic of Korea*

**BQ-11. Reduction of intergranular exchange coupling for CoPt- $\text{B}_2\text{O}_3$  granular media by employing a RuCoCr-oxide buffer layer with oxide of various melting points.** *K. Tham<sup>1</sup>, R. Kushibiki<sup>1</sup>, T. Kamada<sup>1</sup>, S. Hinata<sup>2</sup> and S. Saito<sup>2</sup> 1. Tanaka Kikinzoku Kogyo, Sendai, Japan; 2. Tohoku University, Sendai, Japan*

**BQ-15. Investigation Nonlinear GPR Target for BCJR Algorithm on Perpendicular HAMR Channel with Volterra Model.** *W. Wongtrairat<sup>1</sup>, T. Sopon<sup>1</sup>, S. Wongsuthavas<sup>2</sup>, S. Sophan<sup>1</sup> and P. Supnithi<sup>3</sup> 1. Faculty of Engineering and Architecture, Rajamangala University of Technology Isan (RMUTI), Nakhonratchasima, Thailand; 2. Faculty of Science and Liberal Arts, Rajamangala University of Technology Isan (RMUTI), Nakhonratchasima, Thailand; 3. Faculty of Engineering, King Mongkut's Institute of Technology Ladkrabang (KMUTL), Bangkok, Thailand*

TUESDAY  
AFTERNOON  
1:30

SIMPOR/ROSELLE BALLROOM

### Session BW

## TMR, VCMA AND MULTIFERROIC MATERIALS II (Poster Session)

Shiheng Liang, Chair

Institute of physics, Chinese Academy of Sciences, Beijing, China

**BW-01. Voltage control of perpendicular exchange bias in Pt/IrMn/Co/(Co/Pt)<sub>2</sub>/Ta/PMN-PT(011) multiferroic heterostructures.** *Q. Yang<sup>1</sup>, Z. Hu<sup>1</sup>, Z. Zhou<sup>1</sup>, S. Zhao<sup>1</sup> and M. Liu<sup>1</sup> 1. Xi'an Jiaotong University, Xi'an, China*

**BW-02. Voltage switching of perpendicular magnetic anisotropy in (Co/Pt)<sub>3</sub>/PZN-PT heterostructures at room temperature.** *B. Peng<sup>1</sup>, M. Feng<sup>1</sup>, Q. Yang<sup>1</sup>, Y. Zhang<sup>1</sup> and M. Liu<sup>1</sup> 1. Xi'an Jiaotong University, Xi'an, China*

**BW-03. High isotropic Terfenol-D/PZT magnetoelectric sensor based on ring nested structure.** *X. Wu<sup>1</sup>, J. Ouyang<sup>1</sup>, W. Wang<sup>1</sup>, Y. Ren<sup>1</sup>, S. Chen<sup>1</sup> and X. Yang<sup>1</sup> 1. School of Optical and Electronic Information, Huazhong University of Science and Technology, WuHan, China*

- BW-04. Preparation and Characterization of Permalloy and Cobalt Doped BiFeO<sub>3</sub> Hybrid Core-shell nanostructures.** *K. Javed*<sup>1,2</sup>, N. Ahmad<sup>3</sup>, M. Shahzad<sup>1</sup> and S. Shah<sup>1</sup> 1. *Physics, Forman Christian College, Lahore, Pakistan*; 2. *Institute of Physics, Chinese Academy of Sciences, Beijing, China*; 3. *Department of Physics, FBAS, International Islamic University, Islamabad, Pakistan*
- BW-05. Large Magnetoelectric coupling in a Y-type hexaferrite.** *Y. Yang*<sup>1,2</sup>, *K. Jiang*<sup>1</sup>, *J. Li*<sup>1</sup>, *C. Duan*<sup>2</sup>, *X. Wang*<sup>1</sup> and *H. Ge*<sup>1</sup> 1. *College of Materials Science and Engineering, Zhejiang Province Key Laboratory of Magnetism, China Jiliang University, Hangzhou, Hangzhou, China*; 2. *Key Laboratory of Polar Materials and Devices, Ministry of Education, East China Normal University, Shanghai, Shanghai, China*
- BW-06. Resistive switching in Pt/BiFeO<sub>3</sub>/SrRuO<sub>3</sub>/SrTiO<sub>3</sub> heterostructures.** *T. Wang*<sup>1</sup>, *W. Cheng*<sup>1,2</sup>, *C. Wang*<sup>1</sup>, *H. Wang*<sup>2</sup>, *Y. Hao*<sup>1</sup> and *X. Miao*<sup>1,2</sup> 1. *School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, China*; 2. *Wuhan National Research Center for Optoelectronics, Huazhong University of Science and Technology, Wuhan, China*
- BW-07. Integrated Thin-Film Magnetoelectric Waveguide with Tunable Resonance Frequency.** *A. El-Ghazaly*<sup>2</sup>, *J. Evans*<sup>3</sup>, *N. Sato*<sup>1</sup>, *N. Montross*<sup>3</sup>, *R.M. White*<sup>4</sup> and *S.X. Wang*<sup>1,4</sup> 1. *Electrical Engineering, Stanford University, Stanford, CA, United States*; 2. *Electrical Engineering and Computer Science, University of California Berkeley, Berkeley, CA, United States*; 3. *Radiant Technologies, Inc., Albuquerque, NM, United States*; 4. *Materials Science and Engineering, Stanford University, Stanford, CA, United States*
- BW-08. Study of magneto-dielectric behaviour in Haldane spin chain Ho<sub>2</sub>BaNiO<sub>5</sub>.** *S.K. Upadhyay*<sup>1</sup> and *E.V. Sampathkumaran*<sup>1</sup> 1. *Department of Condensed Matter Physics and Material Science, Tata Institute of Fundamental Research, Mumbai, MUMBAI, India*
- BW-09. Prediction of Room Temperature Oxygen Vacancy-mediated Multiferroicity in a Cobalt-substituted Perovskite.** *M.C. Onbasli*<sup>1</sup> 1. *Dept. of Electrical and Electronics Engineering, Koc University, Istanbul, Turkey*
- BW-10. Magnetoelectric characteristics in three-phase magnetostrictive/piezoelectric composites with different high permeability materials.** *L. Chen*<sup>1</sup> and *Y. Wang*<sup>2</sup> 1. *Key Lab of Computer Vision and Intelligent Information System, Chongqing University of arts and sciences, ChongQing, China*; 2. *School of Electronic Information and Electric Engineering, Shanghai Jiao Tong University, Shanghai, China*
- BW-11. High-Performance Photovoltaic Readable Ferroelectric Nonvolatile Memory Based on La Doped BiFeO<sub>3</sub> Films.** *D. Li*<sup>1</sup>, *D. Zheng*<sup>1</sup>, *C. Jin*<sup>1</sup> and *H. Bai*<sup>1</sup> 1. *Tianjin University, Tianjin, China*

**Session BR**  
**MAGNETIC OXIDE AND ALLOY FILMS**  
**(Poster Session)**

Jiafeng Feng, Chair

Institute of Physics, Chinese Academy of Sciences, Beijing, China

- BR-01. Enhancement of magnetoresistance by cobalt substitution in double exchange ferromagnets:  $\text{Pr}_{0.6}\text{Sr}_{0.4}\text{Mn}_{1-x}\text{Co}_x\text{O}_3$  ( $x = 0, 0.05$  and  $0.1$ ).** A. Chanda<sup>1</sup> and R. Mahendiran<sup>1</sup> *1. Department of Physics, National University of Singapore, Singapore*
- BR-02. Increased Curie temperature induced by orbital ordering in  $\text{La}_{0.67}\text{Sr}_{0.33}\text{MnO}_3/\text{BaTiO}_3$  superlattices.** Z. Quan<sup>1</sup>, F. Zhang<sup>1</sup>, B. Wu<sup>1</sup>, G. Zhou<sup>1</sup> and X. Xu<sup>1</sup> *1. Shanxi Normal University, Linfen, China*
- BR-03. Electrical Conduction Mechanism for Investigation of Charge Ordering in  $\text{Nd}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$ .** A. Swain<sup>1</sup> and V. Gorige<sup>1</sup> *1. School of Physics, University of Hyderabad, Hyderabad, India*
- BR-04. Withdrawn**
- BR-05. Large Magnetoresistance in Diode Assisted ZnCoO Device.** K. Zhang<sup>1,2</sup>, Y. Zhang<sup>1,2</sup>, Z. Zhang<sup>1,2</sup>, Z. Zheng<sup>1,2</sup>, J. Nan<sup>1,2</sup>, G. Wang<sup>1,2</sup>, Y. Wang<sup>1,2</sup>, W. Yun<sup>1,2</sup> and W. Zhao<sup>1,2</sup> *1. Fert Beijing Institute, Beihang University, Beijing, China; 2. School of Electronics and Information Engineering, Beihang University, Beijing, China*
- BR-06. Negative spin Hall magnetoresistance in antiferromagnetic  $\text{Cr}_2\text{O}_3/\text{Ta}$  bilayer at the low temperature region.** Y. Ji<sup>1</sup>, J. Miao<sup>1</sup>, K. Meng<sup>1</sup>, J. Chen<sup>1</sup>, X. Xu<sup>1</sup>, Y. Wu<sup>1</sup> and Y. Jiang<sup>1</sup> *1. School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China*
- BR-07. Effect of sputtering conditions on the in plane and out of plane magnetic properties of tetragonal  $\text{Mn}_2\text{VGa}$  Heusler alloy films.** P.V. Midhunlal<sup>1</sup>, A. Chelvane<sup>2</sup>, A. Talapatra<sup>3</sup>, J. Mohanty<sup>3</sup>, J. Joseph<sup>4</sup>, A. Rajani Kanth<sup>4</sup> and N. Harish Kumar<sup>1</sup> *1. Department of Physics, IIT Madras, Chennai, India; 2. Defense Metallurgical Research Laboratory, Hyderabad, India; 3. Department of Physics, IIT Hyderabad, Hyderabad, India; 4. School of Physics, Univesity of Hyderabad, Hyderabad, India*
- BR-08. Structural, magnetic and transport properties of half-metallic quaternary Heusler alloy  $\text{CoRuMnSi}$ : Theory and Experiment.** V. Yenugonda<sup>1</sup>, D. Rani<sup>1</sup>, S. Samatham<sup>1</sup>, A. Alam<sup>1</sup> and S. K. G.<sup>1</sup> *1. Departmnet of Physics, Indian Institute of Technology Bombay, Mumbai, India*

**BR-09. Possible spin gapless semiconductor type behaviour in CoFeMnSi epitaxial thin films.** *V.K. Kushwaha*<sup>1</sup>, *J. Rani*<sup>1</sup>, *A. Tulapurkar*<sup>2</sup> and *C. Tomy*<sup>1</sup> *1. Physics Department, Indian Institute of Technology Bombay, Powai, India; 2. Department of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India*

**BR-10. Interplay between structure and anisotropic magnetoresistance in Ta/NiFe/Ta thin films.** *H.W. Chang*<sup>1</sup>, *M. Chan*<sup>2</sup>, *D. Wei*<sup>2</sup>, *C. Wang*<sup>3</sup> and *C. Ouyang*<sup>4</sup> *1. Department of Physics, National Chung Cheng University, Taichung, Taiwan; 2. National Taipei University of Technology, Taipei, Taiwan; 3. Department of Applied Physics, Tunghai University, Taichung, Taiwan; 4. Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan*

**BR-11. Different Phase Mn<sub>2</sub>Ga films introduced by varying the Cr buffer thickness.** *Y. Zheng*<sup>1</sup>, *Y. Liu*<sup>1</sup>, *L. Ren*<sup>1</sup> and *K. Teo*<sup>1</sup> *1. Electrical and Computer Department, National University of Singapore, Singapore*

**BR-12. Generation of Néel field in anti-ferromagnetic nanowire by a sloped electric field.** *K. Kubota*<sup>1</sup>, *K. Yamada*<sup>2</sup> and *Y. Nakatani*<sup>1</sup> *1. Graduate school of Informatics and Engineering, University of Electro-Communications, Chofu, Japan; 2. Faculty of Engineering, Gifu University, Gifu, Japan*

**BR-13. XMCD study of ultra-thin Co<sub>2</sub>FeAl film.** *X. Zhang*<sup>1</sup>, *W. Liu*<sup>2</sup>, *L. He*<sup>1</sup> and *Y. Xu*<sup>1,2</sup> *1. Nanjing University, Nanjing, China; 2. University of York, York, United Kingdom*

TUESDAY  
AFTERNOON  
1:30

SIMPOR/ROSELLE BALLROOM

**Session BS**  
**PERMANENT MAGNET AND RELUCTANCE**  
**MACHINES III**  
**(Poster Session)**

*Xiao Liu*, Co-Chair  
Hunan University, Changsha, China  
*Xiaofeng Ding*, Co-Chair  
Beihang University, Beijing, China

**BS-01. Reliability Comparison of Stator-Permanent Magnet Machine and Rotor Permanent Magnet Machine.** *W. Li*<sup>1</sup> and *M. Cheng*<sup>1</sup> *1. School of Electrical Engineering, Southeast University, Nanjing, China*

**BS-02. Torque Analysis and Improvement of Single-Phase Asymmetric-Stator-Pole Doubly Salient Permanent Magnet Machine.** *M. He*<sup>1</sup>, *W. Xu*<sup>1</sup> and *C. Ye*<sup>1</sup> *1. School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan, China*

- BS-03. Suppression of Irreversible Demagnetization under Motor Operation by Preliminarily Demagnetizing of Neodymium Bonded Magnet in In-Wheel Axial-Gap Motor.** *S. Nagano*<sup>1</sup>, *M. Takemoto*<sup>1</sup>, *S. Ogasawara*<sup>1</sup>, *K. Orikawa*<sup>1</sup>, *W. Hino*<sup>2</sup> and *K. Takezaki*<sup>2</sup> *1. Graduate School of Information Science and Technology, Hokkaido University, Sapporo, Japan; 2. Dynax Corporation, Chitose, Japan*
- BS-04. Study of Dual Airgap Stator and Rotor Permanent Magnet Machines with Halbach Array Configurations Using Phase-group Concentrated-coil Windings.** *D. Chen*<sup>1</sup>, *L. Fang*<sup>1</sup>, *Z. Feng*<sup>1</sup> and *B. Bai*<sup>1</sup> *1. School of Electrical Engineering, Shenyang University of Technology, Shenyang, China*
- BS-05. Unexpected Parasitic Torque Ripple Component Analysis in PMSM according to Parallel Winding Pattern Considering Eccentricity.** *D. Lee*<sup>2</sup>, *C. Jeong*<sup>2</sup>, *S. Lee*<sup>2</sup> and *J. Hur*<sup>2</sup> *2. Electrical Engineering Incheon National University, Incheon, China*
- BS-06. A Study of New Design Process of Spoke Type Permanent Magnet Synchronous Motor Considering Post Assembly Magnetization Performance.** *S. Lee*<sup>1</sup>, *H. Kong*<sup>2</sup> and *W. Kim*<sup>3</sup> *1. Intelligent Information Technology Fusion, Busan University of Foreign Studies, Busan, The Republic of Korea; 2. Gachon University, Seongnam, The Republic of Korea; 3. Gachon University, Seongnam, The Republic of Korea*
- BS-07. Development of IE4 Class Line-Start Permanent Magnet Motor from a Small Three Phase Induction Motor.** *S. Rhyu*<sup>1</sup>, *S. Khaliq*<sup>1</sup>, *K. Lee*<sup>1</sup> and *R. Kim*<sup>1</sup> *1. Intelligent Mechatronics Research Center, Korea Electronics Technology Institute, Bucheon, The Republic of Korea*
- BS-08. Design and Analysis of a Two-phase BLDC Motor with Hybrid Permanent Magnet Material for Only-pull Drive Technique.** *T. Yazdan*<sup>1</sup> and *B. Kwon*<sup>1</sup> *1. Electronic Systems Engineering, Hanyang University, Ansan-si, The Republic of Korea*
- BS-09. Comparative Studies of Modular PMSMs with Symmetrical or Asymmetrical Six-Phase Windings.** *L. Cheng*<sup>1</sup>, *Y. Sui*<sup>1</sup>, *P. Zheng*<sup>1</sup>, *Z. Yin*<sup>1</sup> and *R. Ma*<sup>1</sup> *1. Harbin Institute of Technology, Harbin, China*
- BS-10. Research on Flux Density Fluctuation for Brushless Double Rotor Flux-Switching Permanent Magnet Motor Considering Low Magnetic Coupling.** *Z. Xiang*<sup>1</sup> *1. School of electrical and information engineering, Jiangsu University, Zhen Jiang, China*
- BS-11. Development of Differing Extent Mesh Adaptive Direct Search applied for Optimal Design of Spoke-Type PMSM.** *D. Lee*<sup>2</sup> and *S. Jung*<sup>1</sup> *1. Sungkyunkwan University, Suwon, The Republic of Korea; 2. Department electrical and computer engineering, University of Illinois at Urbana-Champaign, Champaign, IL, United States*

- BS-12. Comparative Study of Serial and Parallel PM Axial Field Flux-switching Memory Machines.** N. Li<sup>1,2</sup>, M. Lin<sup>1</sup>, J. Zhu<sup>2</sup>, G. Yang<sup>1</sup> and Y. Kong<sup>1</sup> *1. School of Electrical Engineering, Southeast University, Nanjing, China; 2. School of Electrical and Data Engineering, University of Technology Sydney, Sydney, NSW, Australia*
- BS-13. Magnetic and Mechanical Characteristics of Electric Motor according to the Weld-laminated Core and the Bond-laminated Core.** D. Kim<sup>1</sup>, M. Park<sup>1</sup>, M. Yoon<sup>1</sup>, J. Sim<sup>1</sup> and J. Hong<sup>1</sup> *1. Automotive engineering, Hanyang University, Seoul, The Republic of Korea*
- BS-14. A Novel Demagnetization Fault Detection Technique for IPMSM using Voltage angle.** Z. Ullah<sup>1</sup> and J. Hur<sup>1</sup> *1. Department of electrical engineering, Incheon National University, Incheon, The Republic of Korea*
- BS-15. Design of IPMSM for Minimization of Electromagnetic Vibration.** I. Jang<sup>1</sup> *1. Hyundai Mobis, Yongin-si, The Republic of Korea*
- BS-16. Optimal Design of a Switched Reluctance Motor with Magnetically Disconnected Rotor Modules Using a Design of Experiments - Differential Evolution (DOE-DE) Finite Element Analysis (FEA) based Method.** V. Rallabandi<sup>1</sup>, J. Wu<sup>1</sup>, D.G. Dorrell<sup>2</sup>, P. Zhou<sup>3</sup> and D. Ione<sup>1</sup> *1. Electrical and Computer Engineering, University of Kentucky, Lexington, KY, United States; 2. Discipline of Electrical, Electronics and Computer Engineering, University of KwaZulu-Natal, Durban, South Africa; 3. ANSYS Inc., Pittsburgh, PA, United States*

TUESDAY  
AFTERNOON  
1:30

SIMPOR/ROSELLE BALLROOM

**Session BT**  
**PERMANENT MAGNET AND RELUCTANCE**  
**MACHINES IV**  
**(Poster Session)**

Zhejie Liu, Chair  
ARTC, Singapore, Singapore

- BT-01. A novel variable flux permanent magnet synchronous machine with quasi-series magnet configuration and passive flux barrier.** S. Zhang<sup>1</sup>, P. Zheng<sup>1</sup>, Y. Liu<sup>1</sup>, M. Wang<sup>1</sup>, G. Qiao<sup>1</sup> and F. Liu<sup>1</sup> *1. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China*
- BT-02. Torque Improvement of External-Rotor Permanent Magnet Machine Using Flux Concentrated Rotor.** Q. Li<sup>1</sup> and T. Fan<sup>1</sup> *1. Institute of Electrical Engineering, Chinese Academy of Sciences, BeiJing, China*

- BT-03. Robust hybrid type permanent magnet traction motor against irreversible demagnetization at high temperature.** C. Jeong<sup>1</sup> and J. Hur<sup>1</sup> *1. Incheon National University, Incheon, The Republic of Korea*
- BT-04. Elimination of Sub-harmonic in Stator MMF of 18-slot/10-pole PM Machines by Employing Unequal Slot and Uneven Turns per Coil.** H. Sun<sup>1</sup> and X. Chen<sup>1</sup> *1. Electrical Engineering, Nanjing University of Aeronautics and Astronautics, NanJing, China*
- BT-05. A high continuous torque density external rotor surface permanent magnet machine for in-wheel application.** Y. Li<sup>1</sup>, T. Fan<sup>1</sup>, Q. Li<sup>1</sup>, X. Wen<sup>1</sup> and X. Zhuang<sup>2</sup> *1. Institute of Electrical Engineering, Chinese Academy of Sciences, Beijing, China; 2. Beijing First-rate New Energydrive Technology, Beijing, China*
- BT-06. Design and Analysis a New Wide Speed Range Permanent Magnet Motor Capable of High Efficiency Over Wide Speed Ranges.** X. Zhu<sup>1</sup> and L. Ge<sup>1</sup> *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*
- BT-07. Design method of permanent magnetic loop return magnetic system and application in vehicle relay.** H. Liang<sup>1</sup>, H. Yu<sup>1</sup>, X. Ye<sup>1</sup> and G. Zhai<sup>1</sup> *1. Harbin Institute of Technology, Harbin, China*
- BT-08. Analysis on the starting and Synchronization Capabilities for a Novel 6/8 Pole Changing Line-Start Permanent Magnet Synchronous Motor.** M. Tian<sup>1</sup>, X. Wang<sup>1</sup>, W. Zhao<sup>1</sup> and C. Li<sup>1</sup> *1. School of Electrical Engineering, Shandong University, Ji'nan, China*
- BT-09. Investigation of a Transverse-flux Flux-reversal Motor with Consequent-pole Configuration.** B. Kou<sup>1</sup>, X. Yang<sup>1</sup>, Y. Zhou<sup>1</sup>, J. Luo<sup>1</sup> and H. Zhang<sup>1</sup> *1. Harbin Institute of Technology, Harbin, China*
- BT-10. Torque Improvement of Five-Phase Halbach Permanent Magnet Machines Considering Third-Harmonic Flux Density.** L. Zhang<sup>1</sup> and L. Liu<sup>1</sup> *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*
- BT-11. A High Power Factor Vernier Machine with Coil-Pitch of Two Slot Pitches.** Y. Liu<sup>1</sup>, H. Li<sup>1</sup> and Z. Zhu<sup>1</sup> *1. The University of Sheffield, Sheffield, United Kingdom*
- BT-12. A Study on Hall Sensor Fault Signal Compensation Algorithm to Prevent Irreversible Demagnetization of Hall Sensor Faults.** D. Lee<sup>1</sup>, B. Kim<sup>1</sup>, S. Lee<sup>1</sup>, J. Lee<sup>1</sup> and D. Kang<sup>1</sup> *1. Convergence System Engineering, keimyung university, Daegu, The Republic of Korea*
- BT-13. Efficiency Optimization for IPMSM Considering Hysteresis Loss.** T. Ishikawa<sup>1</sup> *1. Electronics and Informatics, Gunma University, Kiryu, Japan*

- BT-14. Comparison of the Power Factor of SMPM and SM Vernier Outer Runner Machines for Traction Applications.** *D. Thyroff<sup>1</sup>, C. Hittinger<sup>1</sup> and I. Hahn<sup>1</sup> 1. Institute of Electrical Machines and Drives, University of Erlangen-Nuremberg, Erlangen, Germany*
- BT-15. Comparative Parameters Investigation of Composite Solid Rotor Applied to Line-Start Permanent-Magnet Synchronous Motors.** *B. Yan<sup>1</sup>, Y. Yang<sup>1</sup> and X. Wang<sup>1</sup> 1. School of Electrical Engineering, Shandong University, Ji'nan, China*
- BT-16. Multi-sensor Fusion Based Permanent Magnet Demagnetization Detection in Permanent Magnet Synchronous Machines.** *M. Zhu<sup>1</sup>, W. Hu<sup>1</sup>, S. Mukundan<sup>1</sup> and N. C. Kar<sup>1</sup> 1. Electrical and Computer Engineering, University of Windsor, Windsor, ON, Canada*

TUESDAY  
AFTERNOON  
1:30

SIMPOR/ROSELLE BALLROOM

### Session BU

## RARE EARTH TRANSITION METAL BORIDES II (Poster Session)

Minggang Zhu, Co-Chair

Central Iron & Steel Res., Beijing, China

Satoshi Hirosawa, Co-Chair

National Institute for Materials Science, Tsukuba, Japan

- BU-01. PLD-fabricated Nd-Fe-B film magnets on Si substrates with Si oxide layer.** *Y. Yamaguchi<sup>1</sup>, D. Shimizu<sup>1</sup>, A. Yamashita<sup>1</sup>, T. Yanai<sup>1</sup>, M. Nakano<sup>1</sup> and H. Fukunaga<sup>1</sup> 1. Nagasaki University, Nagasaki, Japan*
- BU-02. Increase in nucleation field of nanocrystalline Nd-Fe-B magnets due to strengthening of exchange interaction - computer simulation -.** *T. Harada<sup>1</sup>, T. Yanai<sup>1</sup>, M. Nakano<sup>1</sup> and H. Fukunaga<sup>1</sup> 1. Nagasaki University, Nagasaki, Japan*
- BU-03. Investigation on texture, magnetic properties and inhomogeneities of hot deformed Nd-Fe-B magnet.** *H. Li<sup>1</sup>, Q. Wu<sup>1</sup>, M. Yue<sup>1</sup>, X. Xu<sup>1</sup>, J. Liang<sup>1</sup> and J. Zhang<sup>1</sup> 1. College of Materials Science and Engineering, Beijing University of Technology, Beijing, China*
- BU-04. The effect of ambient pressure of annealing process on magnetic properties and surface microstructure of sintered Nd-Fe-B magnet.** *X. Yang<sup>1,2</sup>, S. Guo<sup>1</sup>, J. Zeng<sup>1,2</sup>, Q. Zhang<sup>1,2</sup>, G. Ding<sup>1</sup>, J. Di<sup>1,2</sup> and A. Yan<sup>1</sup> 1. Ningbo Institute of Industry Technology, CAS, Ningbo, China; 2. University of Chinese Academy of Sciences, Beijing, China*

- BU-05. Improved coercivity enhancement of sintered Nd-Fe-B magnets by TbH<sub>2</sub> grain boundary diffusion with Al aiding.** J. Di<sup>1,2</sup>, S. Guo<sup>1</sup>, G. Ding<sup>1</sup>, L. Cai<sup>3</sup>, X. Yang<sup>1,2</sup>, K. Chen<sup>1,2</sup>, R. Chen<sup>1</sup> and A. Yan<sup>1</sup> *1. Ningbo Institute of Material Technology and Engineering, Chinese Academy of Sciences, Ningbo, China; 2. University of Chinese Academy of Sciences, Beijing, China; 3. Ningbo Jinji Magnetic Material Co., Ltd, Ningbo, China*
- BU-06. Thermal resistance of hot-deformed Nd-Fe-B magnets doped with Pr-Cu powders.** X. Tang<sup>1</sup>, C. Jin<sup>1</sup>, W. Yin<sup>1</sup>, R. Chen<sup>1</sup> and M. Li<sup>1</sup> *1. Ningbo Institute of Industrial Technology, Chinese Academy of Science, Ningbo, China*
- BU-07. Enhanced coercivity of Nd-Ce-Y-Fe-B sintered magnets by adding (Pr, Nd)-H powders.** B. Peng<sup>1</sup>, Y. Liu<sup>1</sup>, J. Jin<sup>1</sup> and M. Yan<sup>1</sup> *1. Department of Materials Science and Engineering, Zhejiang University, Hangzhou, China*
- BU-08. Spin reorientation, magnetic viscosity and exchange coupling effects of the Nd-Ce-Fe-B sintered magnets prepared by single-main-phase and dual-main-phase alloy methods.** Z. Jiang<sup>1</sup>, Y. Fang<sup>1</sup>, R. Han<sup>1</sup>, T. Liu<sup>1</sup>, M. Zhu<sup>1</sup> and W. Li<sup>1</sup> *1. Functional Materials Research Institute, Central Iron and Steel Research Institute, Beijing, China*
- BU-09. Effects of Ta doping and Ce reduction on the magnetic properties and thermal stability of Ce-Fe-B alloys.** J. Zhang<sup>1</sup>, L. Zhao<sup>1</sup>, X. Liao<sup>1</sup>, H. Zeng<sup>1</sup> and Z. Liu<sup>1</sup> *1. South China University of Technology, Guangzhou, China*
- BU-10. Coercivity enhancement of hot-deformed NdFeB magnets by doping R<sub>80</sub>Ga<sub>20</sub> (R= Pr, Dy, Tb) alloys.** Y. Lee<sup>1</sup>, Y. Wong<sup>1</sup>, H.W. Chang<sup>1</sup> and W.C. Chang<sup>1</sup> *1. Department of physics, National Chung Cheng University, Chiayi, Taiwan*
- BU-11. Distinctive diffusion behaviors observed in Dy-Fe-Ga intergranular added sintered Nd-Fe-B.** J. Zeng<sup>1,2</sup>, S. Guo<sup>1</sup>, X. Yang<sup>1,2</sup>, G. Ding<sup>1</sup> and A. Yan<sup>1</sup> *1. Ningbo Institute of Industrial Technology, CAS, Ningbo, China; 2. University of Chinese Academy of Science, Beijing, China*
- BU-12. Effects of La substitution on the crystal structure and intrinsic magnetic properties of MM-Fe-B alloy (MM = La, Ce, Pr, Nd).** W. Liu<sup>1</sup>, Z. Zhang<sup>1</sup>, Z. Li<sup>1</sup>, D. Zhang<sup>1</sup>, H. Zhang<sup>1</sup>, M. Yue<sup>1</sup>, Q. Lu<sup>1</sup>, Q. Wu<sup>1</sup> and Y. Li<sup>1</sup> *1. Beijing University of Technology, Beijing, China*
- BU-13. Effects of (Nd,Pr)H<sub>x</sub> intergranular addition on the mechanical properties of Nd-Pr-Ce-Fe-B sintered magnets.** J. Jin<sup>1</sup>, Z. Qian<sup>1</sup>, G. Bai<sup>1</sup>, B. Peng<sup>1</sup>, Y. Liu<sup>1</sup> and M. Yan<sup>1</sup> *1. material science and engineering, Zhejiang University, Hangzhou, China*
- BU-14. Study on recycling technology for waste MQ bonded Nd-Fe-B magnets.** M. Liu<sup>1</sup>, Y. Zhang<sup>1</sup>, W. Liu<sup>1</sup>, D. Zhang<sup>1</sup> and M. Yue<sup>1</sup> *1. Beijing University of Technology, Beijing, China*

**Session BV**  
**SPIN-ORBITRONICS II**  
**(Poster Session)**

Pan He, Chair  
National University of Singapore, Singapore

**BV-01. Negative spin Hall magnetoresistance effect in Pt/GdIG.**

*H. Zhao<sup>1</sup> and D. Wu<sup>1</sup> 1. Physics, Nanjing University, Nanjing, China*

**BV-02. Injection locking of constriction-based spin Hall**

**nano-oscillators.** *T. Hache<sup>1,2</sup>, T. Weinhold<sup>1,3</sup>, S. Arekapudi<sup>2</sup>, O. Hellwig<sup>1,2</sup>, J. Fassbender<sup>1,3</sup> and H. Schultheiss<sup>1,3</sup>*

*1. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden - Rossendorf, Dresden, Germany;*

*2. Institute of Physics, TU Chemnitz, Chemnitz, Germany;*

*3. TU Dresden, Dresden, Germany*

**BV-03. Vectorial Observation of the Spin Seebeck Effect in NiFe<sub>2</sub>O<sub>4</sub>**

**Thin Films.** *Z. Li<sup>1,4</sup>, A.V. Singh<sup>1</sup>, J. Krieff<sup>2</sup>, A. Rastogi<sup>3</sup>, T. Mewes<sup>1,4</sup>, T. Kuschel<sup>2</sup> and A. Gupta<sup>1</sup> 1. MINT Center, The University of Alabama, Tuscaloosa, AL, United States;*

*2. Department of Physics, Bielefeld University, Center for Spinelectronic Materials and Devices, Bielefeld, Germany;*

*3. Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States;*

*4. Department of Physics & Astronomy, The University of Alabama, Tuscaloosa, AL, United States*

**BV-04. Amplification of spin waves in ultra-thin Yttrium Iron**

**Garnet microwaveguides by the spin-orbit torque.** *M. Evelt<sup>1</sup>, V.E. Demidov<sup>1</sup>, V. Bessonov<sup>2</sup>, S.O. Demokritov<sup>1</sup>, J.L. Prieto<sup>3</sup>,*

*M. Muñoz<sup>4</sup>, J.B. Youssef<sup>9</sup>, V. Naletov<sup>5</sup>, G. de Loubens<sup>6</sup>, O. Klein<sup>7</sup>, M. Collet<sup>8</sup>, K. Garcia-Hernandez<sup>8</sup>, P. Bortolotti<sup>8</sup>,*

*V. Cros<sup>8</sup> and A. Anane<sup>8</sup> 1. Institut für Angewandte Physik, Westfälische Wilhelms-Universität Münster, Münster, Germany;*

*2. M.N. Miheev Institute of Metal Physics of Ural Branch of Russian Academy of Sciences, Yekaterinburg, Russian Federation;*

*3. Instituto de Sistemas Optoelectronicos y Microtecnologia (UPM), Ciudad Universitaria, Madrid, Spain;*

*4. IMM-Instituto de Microelectrónica de Madrid (CNM-CSIC), Madrid, Spain;*

*5. Institute of Physics, Kazan Federal University, Kazan, Russian Federation;*

*6. Service de Physique de l'État Condensé, Université Paris-Saclay, Gif-sur-Yvette, France;*

*7. INAC-SPINTEC, CEA/CNRS and Univ. Grenoble Alpes, Grenoble, France;*

*8. Unité Mixte de Physique CNRS, Univ. Paris-Sud, Université Paris-Saclay, Palaiseau, France;*

*9. Laboratoire de Magnétisme de Bretagne CNRS, Université de Bretagne Occidentale, Brest, France*

**BV-05. A precise analytical method of harmonic Hall voltage**

**measurement for spin-orbit torque.** *S. Yun<sup>1</sup>, E. Park<sup>2</sup>, K. Lee<sup>1,2</sup> and S. Lim<sup>1</sup> 1. Materials Science and Engineering,*

*Korea University, Seoul, The Republic of Korea; 2. KU-KIST Graduate School of Converging Science and Technology, Korea University, Seoul, The Republic of Korea*

- BV-06. Magnon dragged Magnetoresistance and Spin Seebeck Effect in YIG/IRMN bilayer.** Y. Cai<sup>1</sup>, W. Li<sup>1</sup>, Y. Wu<sup>1</sup>, K. Meng<sup>1</sup>, J. Miao<sup>1</sup>, X. Xu<sup>1</sup> and Y. Jiang<sup>1</sup> *1. University of Science and Technology Beijing, Beijing, China*
- BV-07. Theory of capping layer effect on spin-orbit torque in multilayers.** C. Sun<sup>1</sup>, Z. Siu<sup>1</sup>, S. Tan<sup>2</sup>, H. Yang<sup>1</sup> and M.B. Jalil<sup>1</sup> *1. Department of Electrical and Computer Engineering, National University of Singapore, Singapore; 2. Department of Physics, National Taiwan University, Taipei, Taiwan*
- BV-08. Spin accumulation in asymmetric topological insulator thin films in out-of-plane magnetic fields.** Z. Siu<sup>1</sup>, D. Chowdhury<sup>2</sup>, B. Basu<sup>3</sup> and M.B. Jalil<sup>1</sup> *1. National University of Singapore, Singapore; 2. Ben-Gurion University, Beer Sheva, Israel; 3. Indian Statistical Institute, Kolkata, India*
- BV-09. Tuning the spin orbit torque efficiency and Dzyaloshinskii-Moriya interaction by inserting a Pt spacer in Ta/CoFeB/MgO structures.** Y. Chen<sup>1</sup>, J. Jia<sup>1</sup>, Y. Zheng<sup>1</sup>, Y. Wang<sup>1</sup> and J. Cao<sup>1</sup> *1. Lanzhou University, Lanzhou, China*
- BV-10. Spin-Orbit Torque Induced Magnetization Switching In Co/Pt Multilayer-based Synthetic Antiferromagnets.** L. Zhu<sup>1</sup>, X. Xu<sup>1</sup>, K. Meng<sup>1</sup>, Y. Wu<sup>1</sup>, J. Miao<sup>1</sup> and Y. Jiang<sup>1</sup> *1. School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China*
- BV-11. Impact of Hydrogen Gas on the Inverse Spin Hall Effect in Palladium-Cobalt Bi-Layer Films.** S.I. Watt<sup>1</sup>, R. Cong<sup>1,2</sup>, M. Sushruth<sup>1</sup>, C. Lueng<sup>1</sup>, P. Metaxas<sup>1</sup> and M. Kostylev<sup>1</sup> *1. University of Western Australia, Crawley, WA, Australia; 2. University of Science and Technology of China, Hefei, China*
- BV-12. The effect of inserting a Pt layer in Pt/Co/Ta structure on spin orbit torque.** S. Li<sup>1</sup>, G.J. Lim<sup>1</sup> and W. Lew<sup>1</sup> *1. School of Physics and Physical Science, Nanyang Technological University, Singapore, Singapore*
- BV-13. Spin current pump-probe effect in Yttrium iron garnet plate with different thickness.** Y. Chen<sup>1</sup>, J.G. Lin<sup>1</sup> and S. Huang<sup>2</sup> *1. Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan; 2. Department of Physics, National Taiwan University, Taipei, Taiwan*
- BV-14. Anomalous Nernst effect in Ir<sub>22</sub>Mn<sub>78</sub>/Co<sub>20</sub>Fe<sub>60</sub>B<sub>20</sub>/MgO layers with perpendicular magnetic anisotropy.** S. Tu<sup>1</sup>, J. Hu<sup>1</sup>, G. Yu<sup>2</sup>, H. Yu<sup>1</sup>, C. Liu<sup>1</sup>, F. Heimbach<sup>1</sup>, X. Wang<sup>3</sup>, J. Zhang<sup>1</sup>, Y. Zhang<sup>1</sup>, A. Hamzic<sup>4</sup>, K. Wang<sup>2</sup>, W. Zhao<sup>1</sup> and J. Ansermet<sup>5</sup> *1. Beihang University, Beijing, China; 2. University of California, Los Angeles, CA, United States; 3. Hong Kong University Science & Technology, Kowloon, Hong Kong; 4. University of Zagreb, Zagreb, Croatia; 5. Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland*
- BV-15. Spin pumping effect via an evanescent state in ferromagnetic insulator.** K. Hoshi<sup>1</sup> and J. Ohe<sup>1</sup> *1. Physics, Toho University, Narashino-shi, Japan*

**Session XA**

**HOW TO GET A JOB IN INDUSTRY, ACADEMIA OR  
GOVERNMENT LABORATORY  
(SPECIAL SESSION)**

Albrecht Jander, Co-Chair

Oregon State University, Corvallis, OR, United States

Usha Varshney, Co-Chair

National Science Foundation, Arlington, VA, United States

**Dr. Steve Hwang**, *Vice President of Product Development, Seagate Technology, Fremont, CA, United States*

**Dr. Liesl Folks**, *Dean, School of Engineering and Applied Sciences, University at Buffalo, Buffalo, NY, United States*

**Dr. Lucian Prejbeanu**, *Executive Director, SPINTEC, CEA, Grenoble, France*

This special evening session will focus on jobs in magnetics research. The three panelists, with distinguished leadership positions in industry, academia and government laboratory, will provide perspectives and advice on how to prepare for, and apply to, research positions. An extended question-and-answer period will follow their presentations. Although this session is primarily intended for prospective and recent graduates, all conference attendees are encouraged to participate.

**Session CA**

**SYMPOSIUM ON SKYRMIONS FOR THE FUTURE**

Wei Han, Chair

Peking University, Beijing, China

9:00

**CA-01. Skyrmions in magnetic multilayers at room temperature: electrical creation, detection and manipulation, 3D shaping. (Invited)** *A. Fert*<sup>1,2</sup>, *W. Legrand*<sup>1,2</sup>, *D. Maccariello*<sup>1,2</sup>, *J. Chauleau*<sup>3,4</sup>, *N. Reyren*<sup>1,2</sup>, *S. Collin*<sup>1,2</sup>, *K. Bouzehouane*<sup>1,2</sup>, *K. Garcia*<sup>1,2</sup>, *N. Jaouen*<sup>3</sup> and *V. Cros*<sup>1,2</sup> *1. UMP CNRS-Thales, CNRS, Palaiseau, France; 2. UMP CNRS-Thales, Université Paris-Saclay, Orsay, France; 3. Synchrotron SOLEIL, Gif-sur-Yvette, France; 4. SPEC, CEA, Gif-sur-Yvette, France*

9:30

**CA-02. Atomic-Scale Observation and Manipulation of Individual Nanoscale Skyrmions by Local Spin Currents and Electric Fields. (Invited)** *R. Wiesendanger*<sup>1</sup> *1. Dept. of Physics, University of Hamburg, Hamburg, Germany*

10:00

**CA-03. Skyrmion Dynamics – from thermal diffusion to ultra-fast motion. (Invited)** *M. Kläui*<sup>1,2</sup> *1. Universität Mainz, Mainz, Germany; 2. Materials Science in Mainz, Johannes Gutenberg University, Mainz, Germany*

10:30

- CA-04. Skyrmions in magnetic multilayers. (Invited)** *W. Jiang*<sup>1</sup>, X. Zhang<sup>2</sup>, P. P. Upadhyaya<sup>3</sup>, X. Wang<sup>4,5</sup>, S. Zhang<sup>4</sup>, C. Phatak<sup>4</sup>, G. Yu<sup>3</sup>, Q. Wang<sup>4</sup>, Z. Wei<sup>4</sup>, M. Jungfleisch<sup>4</sup>, J. Pearson<sup>4</sup>, A. Petford-Long<sup>4</sup>, X. Cheng<sup>5</sup>, O. Heinonen<sup>4</sup>, Y. Tserkovnyak<sup>6</sup>, K. Wang<sup>3</sup>, Y. Zhou<sup>2</sup>, S. te Velthuis<sup>4</sup> and A. Hoffmann<sup>4</sup>  
1. Department of Physics, Tsinghua University, Beijing, China; 2. School of Science and Engineering, The Chinese University of Hong Kong at Shenzhen, Shenzhen, China; 3. Department of Electrical Engineering, University of California, Los Angeles, CA, United States; 4. Materials Sciences Division, Argonne National Laboratory, Lemont, IL, United States; 5. Department of Physics, Bryn Mawr College, Bryn Mawr, PA, United States; 6. Department of Physics, University of California, Los Angeles, CA, United States

11:00

- CA-05. Chiral Bobbers and Skyrmions in Epitaxial B20 Thin Films and Superlattices. (Invited)** *R. Kawakami*<sup>1</sup>, A.S. Ahmed<sup>1</sup>, J. Rowland<sup>1</sup>, B.D. Esser<sup>2,4</sup>, S.R. Dunsiger<sup>3,5</sup>, D.W. McComb<sup>2,4</sup> and M. Randeria<sup>1</sup> 1. Physics, Ohio State University, Columbus, OH, United States; 2. CEMAS, Ohio State University, Columbus, OH, United States; 3. Physics, Simon Fraser University, Burnaby, BC, Canada; 4. Materials Science and Engineering, Ohio State University, Columbus, OH, United States; 5. Center for Emergent Materials, Ohio State University, Columbus, OH, United States

11:30

- CA-06. Magnetic antiskyrmions above room temperature in tetragonal Heusler materials. (Invited)** *S. Parkin*<sup>1</sup>  
1. NISE, Max Planck Institute for Microstructure Physics, Halle (Saale), Germany

WEDNESDAY  
MORNING  
9:00

ORCHID III

**Session CB**  
**SOFT MAGNETIC MATERIALS III: CRYSTALLINE MATERIALS**

Nicoleta Lupu, Chair  
National Institute of Research and Development for Technical Physics, Iasi, Romania

9:00

- CB-01. Magnetic properties and microstructure of newly developed iron-based soft magnetic powders. (Invited)** *N. Imaoka*<sup>1</sup>, S. Yamamoto<sup>1</sup> and K. Ozaki<sup>1</sup> 1. Magnetic Powder Metallurgy Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan

9:30

- CB-02. XAFS studies of the newly developed iron-based soft magnetic powders.** *S. Yamamoto*<sup>1</sup>, *N. Imaoka*<sup>1</sup> and *K. Ozaki*<sup>1</sup>  
*1. National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan*

9:45

- CB-03. Irreversible permeability of Fe and Ni based soft magnetic powder compacts.** *P. Kollar*<sup>1</sup>, *Z. Bircakova*<sup>1</sup>, *J. Fuzer*<sup>1</sup>, *D. Oleksakova*<sup>2</sup>, *R. Bures*<sup>3</sup> and *M. Faberova*<sup>3</sup>  
*1. Department of Condensed Matter Physics, Institute of Physics, Faculty of Science, P. J. Safarik University, Kosice, Slovakia;*  
*2. Department of Sciences and Humanities, Institute of Manufacturing Management, Faculty of Manufacturing Technologies, Technical University of Kosice, Presov, Slovakia;*  
*3. Institute of Material Research, Slovak Academy of Science, Kosice, Slovakia*

10:00

- CB-04. Effect of ordering on the antiferromagnetic properties of near-equimolar FeCr-based magnetic alloys.** *Z. Leong*<sup>1</sup>, *S. Baco*<sup>1</sup> and *N. Morley*<sup>1</sup>  
*1. University of Sheffield, Sheffield, United Kingdom*

10:15

- CB-05. Anisotropy and demagnetizing effects on the magnetic behavior of polycrystalline gadolinium across the spin-reorientation revealed by a magneto-thermal protocol.** *V. Provenzano*<sup>2</sup>, *R. Witte*<sup>4</sup>, *H. ElBidweihy*<sup>1</sup>, *A. Arrott*<sup>3</sup>, *C. Radu*<sup>5</sup> and *H. Hahn*<sup>4</sup>  
*1. Department of Electrical and Computer Engineering, United States Naval Academy, Annapolis, MD, United States;*  
*2. National Institute of Standards and Technology (NIST), Gaithersburg, MD, United States;*  
*3. Simon Fraser University, Burnaby, BC, Canada;*  
*4. Institute of Nanotechnology, Eggenstein-Leopoldshafen, Germany;*  
*5. Lake Shore Cryotronics Inc., Westerville, OH, United States*

10:30

- CB-06. Design, Fabrication and Performance Evaluation of Magneto-Dielectric Based Electromagnetic Wave Absorbers Optimized Using Biologically Inspired Optimization Strategies.** *R. Panwar*<sup>1</sup> and *D. Singh*<sup>2</sup>  
*1. Electronics & Communication Engineering, IIIT Jabalpur, India;*  
*2. IIT Roorkee, India*

10:45

- CB-07. The influence of cobalt content on structure and magnetic properties of Fe-Si soft magnetic composites.** *C. Zhou*<sup>1</sup>, *C. Wu*<sup>1</sup> and *M. Yan*<sup>1</sup>  
*1. Zhejiang University, Hangzhou, China*

11:00

- CB-08. The effect of mechanical stress on the static hysteresis loop shape in NO electrical steel.** *B. Schauerte*<sup>1</sup>, *S. Steentjes*<sup>1</sup>, *N. Leuning*<sup>1</sup> and *K. Hameyer*<sup>1</sup>  
*1. Institute of electrical machines (IEM), RWTH Aachen University, Aachen, Germany*

11:15

- CB-09. Improvement of Grain-Oriented Electrical Steel Sheet by Hyperfine Processing Magnetic Domain Structure on Vector Magnetic Characteristics.** *M. Enokizono*<sup>1</sup>, *D. Wakabayashi*<sup>3</sup>, *T. Sato*<sup>2</sup> and *Y. Mamiduka*<sup>1</sup> 1. *Vector Magnetic Characteristic Technical Laboratory, Usa-city, Japan*; 2. *Faculty of Science and Technology, Oita University, Oita, Japan*; 3. *Mechanical and Electrical Engineering, Nippon Bunri University, Oita, Japan*

11:30

- CB-10. Improvement of Grain-oriented Electrical Steel Sheet by Hyperfine Technique on Two-dimensional Magnetostriction.** *D. Wakabayashi*<sup>1</sup> and *M. Enokizono*<sup>1</sup> 1. *Nippon Bunri University, Oita, Japan*

11:45

- CB-11. Evolution of Residual Magnetic Field of U75V Steel Induced by Uniaxial Tensile Load with Increasing Amplitudes.** *M. Fu*<sup>1</sup>, *S. Bao*<sup>1</sup> and *Z. Zhao*<sup>1</sup> 1. *College of Civil Engineering and Architecture, Zhejiang University, Hangzhou, China*

WEDNESDAY  
MORNING  
9:00

ORCHID IV

**Session CC**  
**MICROSCOPY, IMAGING AND**  
**CHARACTERIZATION II**

Yaohua Liu, Chair  
Oak Ridge National Laboratory, Oak Ridge, TN, United States

9:00

- CC-01. Nanoscale Magnetic Imaging using Circularly Polarized High-Harmonic Radiation. (Invited)** *O. Kfir*<sup>1,2</sup>, *S. Zayko*<sup>1</sup>, *C. Nolte*<sup>3</sup>, *M. Sivils*<sup>1</sup>, *M. Möller*<sup>1</sup>, *B. Hebler*<sup>4</sup>, *S. Arekapudi*<sup>4</sup>, *D. Steil*<sup>3</sup>, *S. Schäfer*<sup>1</sup>, *M. Albrecht*<sup>4</sup>, *O. Cohen*<sup>2</sup>, *S. Mathias*<sup>3,5</sup> and *C. Ropers*<sup>1,5</sup> 1. *IV. Physical Institute, University of Göttingen, Göttingen, Germany*; 2. *Department of Physics and Solid State Institute, Technion - Israel Institute of Technology, Haifa, Germany*; 3. *I. Physical Institute, University of Göttingen, Göttingen, Germany*; 4. *Institute of Physics, University of Augsburg, Augsburg, Germany*; 5. *International Center for Advanced Studies of Energy Conversion (ICASEC), University of Göttingen, Göttingen, Germany*

9:30

- CC-02. Exploring magnetism at the nanoscale with a single spin microscope. (Invited)** *V. Jacques*<sup>1</sup> 1. *Laboratoire Charles Coulomb, UMR5221, CNRS and Université de Montpellier, Montpellier, France*

10:00

- CC-03. Atomic scale magnetic and structural imaging by achromatic electron microscopy.** X. Zhong<sup>1</sup>, Z. Wang<sup>1</sup>, L. Jin<sup>2</sup>, J. Ruzs<sup>3</sup>, H. Jiang<sup>1</sup>, Y. Moritomo<sup>4</sup>, J. Mayer<sup>2,5</sup>, R. Dunin-Borkowski<sup>5</sup>, R. Yu<sup>1</sup> and J. Zhu<sup>1</sup> 1. *National Center for Electron Microscopy in Beijing, School of Materials Science and Engineering, Tsinghua University, Beijing, China;* 2. *Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons and Peter Grünberg Institute, Forschungszentrum Jülich GmbH, Jülich, Germany;* 3. *Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden;* 4. *Graduate School of Pure & Applied Science and Faculty of Pure & Applied Science, University of Tsukuba, Ibaraki, Japan;* 5. *Central Facility for Electron Microscopy, RWTH Aachen University, Aachen, Germany*

10:15

- CC-04. Smart Magnetic Probes with Controllable States for Quantitative MFM.** O. Kazakova<sup>1</sup>, V. Panchal<sup>1</sup>, H. Corte-León<sup>1</sup>, R. Puttock<sup>1</sup>, L. Rodríguez<sup>2</sup> and V. Neu<sup>3</sup> 1. *National Physical Laboratory, Teddington, United Kingdom;* 2. *Universidad del Valle, Cali, Colombia;* 3. *IFW Dresden, Germany*

10:30

- CC-05. Single Atom Magnets at Surfaces – State-of-the-art and Future Perspectives. (Invited)** H. Brune<sup>1</sup> 1. *Physics, Swiss Federal Institute of Technology Lausanne (EPFL), Lausanne, Switzerland*

11:00

- CC-06. Investigation of anisotropic quadratic magneto-optic Kerr ellipticity of Fe(100) grown on Ir(100).** A.V. Pradeep<sup>1,2</sup>, K.G. Ajesh<sup>1</sup>, S. Ghosh<sup>1,3</sup> and P. Kumar<sup>1</sup> 1. *Department of Physics, Indian Institute of Science, Bangalore, India;* 2. *Dept. of Collegiate Education Kerala, RWPC, Kannur, India;* 3. *Department of Physics, Cornell University, Ithaca, NY, United States*

11:15

- CC-07. Spatially-resolved electric-field manipulation of magnetism in multiferroic heterostructures.** Y. Ba<sup>1</sup>, Y. Zhao<sup>1</sup>, Y. Liu<sup>1</sup>, P. Li<sup>1</sup>, L. Wu<sup>2</sup>, J. Unguris<sup>3</sup>, D. Pierce<sup>3</sup>, D. Yang<sup>4</sup>, C. Feng<sup>1</sup>, Y. Zhang<sup>1</sup>, H. Wu<sup>5</sup>, D. Li<sup>5</sup>, Y. Chang<sup>5</sup>, J. Zhang<sup>4</sup>, X. Han<sup>5</sup>, J. Cai<sup>5</sup> and C. Nan<sup>2</sup> 1. *Department of Physics and State Key Laboratory of Low-Dimensional Quantum Physics, Tsinghua University, Beijing, China;* 2. *School of Materials Science and Engineering, Tsinghua University, Beijing, China;* 3. *National Institute of Standards and Technology, Gaithersburg, MD, United States;* 4. *Beijing Normal University, Beijing, China;* 5. *Beijing National Laboratory for Condensed Matter Physics, Chinese Academy of Sciences, Beijing, China*

11:30

- CC-08. An Apparatus and Method for Full-Vector Inductive Mapping of Radio Frequency Magnetic Field Distributions in the Vicinity of RFID Tags.** P.S. Stamenov<sup>1</sup>, K. Ackland<sup>1</sup>, M. Lotya<sup>2</sup> and D.J. Finn<sup>2,1</sup> 1. *School of Physics and CRANN, Trinity College Dublin, Ireland;* 2. *Amatech Group Limited, Galway, Ireland*

- CC-09. A Sensitive AC Magnetometer using A Resonant Excitation Coil for Characterization of Magnetic Fluid in Nonlinear Magnetization Region.** *M. Saari*<sup>1</sup>, *N. Suhaimi*<sup>1</sup>, *N. Che Lah*<sup>2</sup>, *K. Sakai*<sup>3</sup>, *T. Kiwa*<sup>3</sup> and *K. Tsukada*<sup>3</sup> *1. Faculty of Electrical & Electronic Engineering, Universiti Malaysia Pahang, Pekan, Malaysia; 2. Faculty of Manufacturing Engineering, Universiti Malaysia Pahang, Pekan, Malaysia; 3. Graduate School of Natural Science and Technology, Okayama University, Okayama, Japan*

WEDNESDAY  
MORNING  
9:00

PEONY IV

**Session CD**  
**DOMAIN WALL DYNAMICS**

**Tiejun Zhou, Co-Chair**  
Hangzhou Dianzi University, Hangzhou, China  
**Dunhui Wang, Co-Chair**  
Nanjing University, Nanjing, China

9:00

- CD-01. Domain wall properties and spin transfer torque in perpendicularly magnetized Mn<sub>4</sub>N ferrimagnet thin films.** *T. Gushi*<sup>1</sup>, *L. Vila*<sup>2</sup>, *J. Attané*<sup>2</sup>, *O. Fruchart*<sup>2</sup>, *A. Marty*<sup>2</sup>, *S. Pizzini*<sup>3</sup>, *J. Vogel*<sup>3</sup>, *F. Takata*<sup>1</sup>, *A. Anzai*<sup>1</sup> and *T. Suemasu*<sup>1</sup> *1. Institute of Applied Physics, University of Tsukuba, Tsukuba, Japan; 2. INAC/SPINTEC, CEA, Grenoble, France; 3. Institut Néel, CNRS, Grenoble, France*

9:15

- CD-02. Anomalous Nernst effect related to magnetic domains in a microfabricated thermoelectric element made of noncollinear antiferromagnet Mn<sub>3</sub>Sn.** *H. Narita*<sup>1</sup>, *M. Ikhlas*<sup>1</sup>, *M. Kimata*<sup>2</sup>, *A.A. Nugroho*<sup>3</sup>, *S. Nakatsuji*<sup>1,4</sup> and *Y. Otani*<sup>1,4</sup> *1. Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan; 2. Tohoku University, Sendai, Japan; 3. Faculty of Mathematics and Natural Sciences, Institut Teknologi Bandung, Bandung, Indonesia; 4. JST CREST, Tokyo, Japan*

9:30

- CD-03. Direct observation of domain wall surface tension by deflating or inflating a magnetic bubble.** *X. Zhang*<sup>1,2\*</sup>, *N. Vernier*<sup>2</sup>, *W. Zhao*<sup>1</sup>, *L. Vila*<sup>3</sup> and *D. Ravelosona*<sup>2</sup> *1. Fert Beijing Institute, School of Electronic and Information Engineering, Beihang University, Beijing, China; 2. Center for Nanoscience and Nanotechnology, Université Paris-Sud, Orsay, France; 3. Université Grenoble Alpes, Grenoble, France*

9:45

- CD-04. Tailoring the Current Driven Domain Wall Motion by Engineering Two Heavy Metal Underlayers.** *Y. Liu*<sup>1,3</sup>, *X. Liu*<sup>2,3</sup> and *J. Zhu*<sup>2,3</sup> *1. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States*

10:00

- CD-05. Magnetic domain wall dynamics and its application.** *(Invited) T. Ono*<sup>2,1</sup> *1. CSRN, Osaka University, Toyonaka, Japan; 2. ICR, Kyoto University, Uji, Japan*

10:30

- CD-06. Field- and current-driven motion of domain walls in cylindrical nanowires.** *A. Wartelle*<sup>2</sup>, *B. Trapp*<sup>2</sup>, *S. Bochmann*<sup>3</sup>, *C. Thirion*<sup>2</sup>, *S. Martin*<sup>1,2</sup>, *M. Stano*<sup>2</sup>, *M. Schöbitz*<sup>1,2</sup>, *M. Foerster*<sup>4</sup>, *L. Aballe*<sup>4</sup>, *T.O. Mentès*<sup>5</sup>, *A. Locatelli*<sup>5</sup>, *A. Sala*<sup>5</sup>, *L. Cagnon*<sup>2</sup>, *J. Toussaint*<sup>2</sup>, *J. Bachmann*<sup>3</sup> and *O. Fruchart*<sup>1</sup> *1. SPINTEC, Univ. Grenoble Alpes, CNRS, CEA, Grenoble, France; 2. Institut Néel, Univ. Grenoble Alpes, CNRS, Grenoble, France; 3. Friedrich-Alexander Universität Erlangen-Nürnberg, Erlangen, Germany; 4. Alba Synchrotron Light Facility, Barcelona, Spain; 5. Elettra-Sincrotrone Trieste, S.C.p.A., Trieste, Italy*

10:45

- CD-07. Inertial and Supermagnonic Dynamics of Domain Walls driven by Spin-Orbit Fields in an Antiferromagnet.** *R. Otxoa*<sup>1,2</sup>, *P. Roy*<sup>1</sup> and *J. Wunderlich*<sup>1,3</sup> *1. Hitachi, Ltd., Cambridge, United Kingdom; 2. Donostia International Physics Center, Donostia, Spain; 3. Institute of Physics ASCR, Prague, Czechia*

11:00

- CD-08. Current-induced domain-wall motion in pinned magnetic wires.** *M. Samiepour*<sup>1</sup>, *J. Kim*<sup>1</sup>, *I. Polenciu*<sup>1</sup>, *T. Hayward*<sup>2</sup>, *D. Allwood*<sup>2</sup>, *G. Vallejo-Fernandez*<sup>1</sup>, *K. O'Grady*<sup>1</sup> and *A. Hirohata*<sup>1</sup> *1. University of York, York, United Kingdom; 2. University of Sheffield, Sheffield, United Kingdom*

11:15

- CD-09. Action of current on ferrimagnetic domain wall: 2 propagation regimes in creep and influence of domain wall structure.** *E. Haltz*<sup>1</sup>, *J. Sampaio*<sup>1</sup>, *R. Weil*<sup>1</sup>, *Y. Dumont*<sup>2</sup> and *A. Mougin*<sup>1</sup> *1. CNRS, Univ. Paris-Sud, Université Paris-Saclay, Laboratoire de Physique des Solides, Orsay, France; 2. Université de Versailles St-Quentin-en-Yvelines, Versailles, France*

11:30

- CD-10. Asymmetric domain wall motion in Pt/Co/Pt induced by electric current.** *M. Nsibi*<sup>1</sup>, *J. Nath*<sup>1</sup>, *I. Joumard*<sup>1</sup>, *S. Auffret*<sup>1</sup>, *I. Miron*<sup>1</sup> and *G. Gaudin*<sup>1</sup> *1. SPINTEC, CEA-INAC/CNRS/ Université Grenoble Alpes, Grenoble, France*

- CD-11. Influence of the Tb layer on current driven domain wall motion in Pt / Co / Tb magnetic wire.** *H. Awano*<sup>1</sup>, *W.C. Ying*<sup>1</sup>, *R. Yoshimura*<sup>1</sup>, *S. Sumi*<sup>1</sup> and *P.V. Thach*<sup>1</sup> *1. Graduate School, Toyota Technological Institute, Nagoya, Japan*

WEDNESDAY  
MORNING  
9:00

ROSELLE II

**Session CE**  
**HIGH FREQUENCY MAGNETIC MATERIALS AND DEVICES II**

Jianbo Wang, Co-Chair  
Lanzhou University, Lanzhou, China  
Masahiro Yamaguchi, Co-Chair  
Tohoku University, Sendai, Japan

9:00

- CE-01. Dispersion Engineering of Nonreciprocal Composite Right/Left Handed Metamaterials Using Ferrite Materials in Microwave Region. (Invited)** *T. Ueda*<sup>1</sup> and *T. Itoh*<sup>2</sup>  
*1. Electrical Engineering and Electronics, Kyoto Institute of Technology, Kyoto, Japan; 2. Electrical Engineering Department, University of California, Los Angeles, CA, United States*

9:30

- CE-02. AlN Interlayers Allow Robust Hexagonal Barium Ferrite Heteroepitaxy on 6H-SiC.** *A.S. Sokolov*<sup>1</sup>, *C. Yu*<sup>1</sup>, *E. Beam*<sup>2</sup>, *X. Gu*<sup>2</sup>, *Y. Obi*<sup>3</sup> and *V. Harris*<sup>1</sup> *1. ECE, Northeastern University, Burlington, MA, United States; 2. Qorvo, Richardson, TX, United States; 3. Metamagnetics, Inc., Westborough, MA, United States*

9:45

- CE-03. Thin-Film Magnetic Inductors for Gigahertz Integrated Applications.** *A. El-Ghazaly*<sup>2</sup>, *R.M. White*<sup>3</sup> and *S.X. Wang*<sup>1,3</sup>  
*1. Electrical Engineering, Stanford University, Stanford, CA, United States; 2. Electrical Engineering and Computer Science, University of California Berkeley, CA, United States; 3. Materials Science and Engineering, Stanford University, Stanford, CA, United States*

10:00

- CE-04. Ultra-wide Band (10 MHz- 26 GHz) Permeability Measurements of Magnetic Films.** *Y. Chen*<sup>1</sup>, *X. Wang*<sup>2</sup>, *H. Chen*<sup>2</sup>, *Y. Gao*<sup>1</sup> and *N. Sun*<sup>2</sup> *1. Winchester Technologies, Burlington, MA, United States; 2. Northeastern University, Boston, MA, United States*

10:15

- CE-05. In-site measurement of permeability and magnetostriction constant of magnetic films deposited on Si wafers.** *O. Mori*<sup>1</sup>, *Y. Endo*<sup>2,3</sup>, *Y. Shimada*<sup>1</sup>, *S. Yabukami*<sup>4</sup> and *R. Utsumi*<sup>1</sup> *1. Toei Scientific Industrial Co., LTD, Natori, Japan; 2. Graduate School of Engineering, Tohoku University, 6-6-04 Aoba, Aramaki, Aoba-ku, Sendai, Japan; 3. Center for Spintronics Research Networks, Tohoku University, Sendai, Japan; 4. Tohoku Gakuin University, 1-13-1 Chuo, Tagajo, Japan*

10:30

- CE-06. Skin Effect Suppressed NiFe/Cu Electroplated Multilayer Wiring for High Data-Rate and Low Delay-Time I/O Interface Board.** *M. Yamaguchi*<sup>1,4</sup>, *T. Yanai*<sup>2</sup>, *H. Nakayama*<sup>3</sup>, *R. Sai*<sup>4</sup>, *H. Fujiwara*<sup>5</sup>, *Y. Kitai*<sup>5</sup>, *M. Sato*<sup>5</sup> and *U. Sangawa*<sup>5</sup> *1. Department of Electrical Engineering, Tohoku University, Sendai, Japan; 2. Division of Electrical Engineering and Computer Science, Graduate school of Engineering, Nagasaki University, Nagasaki, Japan; 3. Department of Electronics and Control Engineering, National Institute of Technology, Nagano College, Nagano, Japan; 4. New Industry Creation Hatchery Center, Tohoku University, Sendai, Japan; 5. Electronic Materials Business Division, Automotive & Industrial Systems Company, Panasonic Corporation, Kadoma, Japan*

10:45

- CE-07. Angular dependence of single sideband generation in spin torque nano-oscillators.** *R. Sharma*<sup>1</sup>, *N. Sisodia*<sup>1</sup> and *P.K. Muduli*<sup>1</sup> *1. Physics, Indian Institute of Technology Delhi, Delhi, India*

11:00

- CE-08. Broadband antenna using strain-mediated spin Hall nano-oscillator. (Invited)** *Q. Wang*<sup>1</sup>, *J. Domann*<sup>2</sup>, *J. Hu*<sup>1</sup> and *G.P. Carman*<sup>1</sup> *1. Department of Mechanical and Aerospace Engineering, University of California, Los Angeles, Los Angeles, CA, United States; 2. Department of Biomedical Engineering and Mechanics, Virginia Tech, Blacksburg, VA, United States*

11:30

- CE-09. Experimental demonstration of broadband spintronic diodes for harvesting of sub- $\mu$ Watt microwave energy.** *B. Fang*<sup>1</sup>, *M. Carpentieri*<sup>2</sup>, *A.N. Slavin*<sup>5</sup>, *P. Khalili Amiri*<sup>3</sup>, *G. Finocchio*<sup>4</sup> and *Z. Zeng*<sup>1</sup> *1. Key Laboratory of Nanodevices and Applications, Suzhou Institute of Nano-tech and Nanobionics, CAS, Suzhou, China; 2. Department of Electrical and Information Engineering, Politecnico di Bari, Bari, Italy; 3. Northwestern University, Evanston, IL, United States; 4. University of Messina, Messina, Italy; 5. Oakland University, Rochester, MI, United States*

11:45

- CE-10. Intrinsic permeability of composites filled with nickel powders.** *S.N. Starostenko*<sup>1</sup>, *K.N. Rozanov*<sup>1</sup> and *A.O. Shiryaev*<sup>1</sup> *1. Theoretical, Institute for Theoretical and Applied Electromagnetics, Moscow, Russian Federation*

**Session CF**  
**MAGNETISATION DYNAMICS I**

Zongzhi Zhang, Chair  
Fudan University, Shanghai, China

9:00

- CF-01. Magnetic damping in metallic and half-metallic Co<sub>2</sub>MnGe thin films.** *J.M. Shaw*<sup>1</sup>, E.K. Delczeg-Czirjak<sup>2</sup>, E.R. Edwards<sup>1</sup>, Y. Kvashnin<sup>2</sup>, D. Thonig<sup>2</sup>, M. Schoen<sup>1</sup>, M. Pufall<sup>1</sup>, M. Schneider<sup>1</sup>, T. Silva<sup>1</sup>, O. Karis<sup>2</sup>, K. Rice<sup>3</sup>, O. Eriksson<sup>2</sup> and H. Nembach<sup>1</sup> *1. Quantum Electromagnetics Division, NIST, Boulder, CO, United States; 2. Department of Physics, Uppsala University, Uppsala, Sweden; 3. CAMECA Instruments, Madison, WI, United States*

9:15

- CF-02. Enhanced magnetostatic and dynamic properties in Fe/Co substituted Ni-Mn-In alloy films.** R. Modak<sup>1</sup> and A. Srinivasan<sup>1</sup> *1. Department of Physics, Indian Institute of Technology Guwahati, India*

9:30

- CF-03. Manipulation of Gilbert Damping Parameter by Annealing Sputtered Deposited Co/Pt Bilayer Thin Films.** A. Kumar<sup>1</sup>, N. Pandey<sup>2</sup>, D.K. Gupta<sup>2</sup>, M. Gupta<sup>2</sup>, S. Chaudhary<sup>1</sup> and P.K. Muduli<sup>1</sup> *1. Department of Physics, IIT Delhi, New Delhi, India; 2. UGC-DAE Consortium for Scientific Research, Indore, India*

9:45

- CF-04. Spin-orbit-torque and magnetic damping in ferromagnetic bilayers.** D. Lee<sup>1</sup>, J. Kim<sup>1</sup>, K. Lee<sup>1</sup>, B. Ju<sup>1</sup>, H. Koo<sup>1</sup>, B. Min<sup>1</sup> and O. Lee<sup>1</sup> *1. Korea Institute of Science and Technology, Seoul, The Republic of Korea*

10:00

- CF-05. Tetragonally Distorted Ultrathin Fe<sub>50</sub>Co<sub>50</sub> Epitaxial Film with High Magnetic Anisotropy and Gilbert Damping.** R. Mandal<sup>1</sup>, J. Jung<sup>1</sup>, Y. Takahashi<sup>1</sup>, Y. Sakuraba<sup>1</sup>, S. Kasai<sup>1</sup>, T. Ohkubo<sup>1</sup> and K. Hono<sup>1</sup> *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan*

10:15

- CF-06. Magnetic field dependence of ferromagnetic resonance of Ni wires fabricated on ferroelectric LiNbO<sub>3</sub> substrate for studying magnetic anisotropy induced by the heterojunction.** A. Yamaguchi<sup>1</sup>, A. Nakao<sup>2</sup>, Y. Utsumi<sup>1</sup>, T. Saiki<sup>3</sup>, Y. Takizawa<sup>3</sup> and K. Yamada<sup>4</sup> *1. Laboratory of Advanced Science and Technology for Industry, University of Hyogo, Ako-gun, Japan; 2. RIKEN, Wako, Japan; 3. Hyogo Prefectural Institute of Technology, Kobe, Japan; 4. Gifu University, Gifu, Japan*

10:30

- CF-07. Spin orbit torque switching process with nonuniform micromagnetic states in three terminal devices.** *J. Zhang*<sup>1,2</sup>, *C. Garg*<sup>2,3</sup>, *T. Phung*<sup>2</sup>, *C. Rettner*<sup>2</sup>, *B. Hughes*<sup>2</sup>, *S. Yang*<sup>2</sup>, *Y. Jiang*<sup>1</sup> and *S. Parkin*<sup>2,3</sup> *1. University of Science and Technology Beijing, Beijing, China; 2. IBM Almaden Research Center, San Jose, CA, United States; 3. Max Planck Institute for Microstructure Physics, Halle, Germany*

10:45

- CF-08. Tuning interfacial Dzyaloshinskii-Moriya interaction and Gilbert damping parameter with Py/Cu<sub>1-x</sub>Pt<sub>x</sub> layers.** *H. Bouloussa*<sup>1</sup>, *R. Ramaswamy*<sup>2</sup>, *Y. Roussigné*<sup>1</sup>, *M. Belmeguenai*<sup>1</sup>, *A. Stashkevich*<sup>1</sup>, *H. Yang*<sup>2</sup> and *S. Chérif*<sup>1</sup> *1. LSPM (CNRS-UPR 3407), Université Paris 13, Sorbonne Paris Cité, Villetaneuse, France; 2. Department of Electrical and Computer Engineering, National University of Singapore, Singapore*

11:00

- CF-09. Microresonator-ferromagnetic resonance investigation of thermal spin-transfer torque in Co<sub>2</sub>FeAl/MgO/CoFeB magnetic tunnel junctions.** *H. Cansever*<sup>1,2</sup>, *R. Narkowicz*<sup>1</sup>, *K. Lenz*<sup>1</sup>, *C. Fowley*<sup>1</sup>, *L. Ramasubramanian*<sup>1</sup>, *O. Yildirim*<sup>1,4</sup>, *A. Niesen*<sup>3</sup>, *T. Huebner*<sup>3</sup>, *J. Lindner*<sup>1</sup>, *J. Fassbender*<sup>1,2</sup> and *A. Deac*<sup>1</sup> *1. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden Rossendorf, Dresden, Germany; 2. Institute of Solid State Physics, Technical University of Dresden, Dresden, Germany; 3. Center for Spinelectronic Materials and Devices, Bielefeld University, Bielefeld, Germany; 4. EMPA-Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland*

11:15

- CF-10. Gilbert Damping Enhancement in Ion-Beam Sputtered Co<sub>2</sub>FeAl/Mo Bilayer thin films.** *S. Husain*<sup>1</sup>, *A. Kumar*<sup>2</sup>, *V. Barwal*<sup>1</sup>, *N. Behera*<sup>2</sup>, *S. Akansel*<sup>2</sup>, *P. Svedlindh*<sup>2</sup> and *S. Chaudhary*<sup>1</sup> *1. Physics, Indian Institute of Technology, New Delhi, India; 2. Material Science and Engineering, Uppsala University, Uppsala, Sweden*

11:30

- CF-11. Study of Static and Dynamic Properties of Dumbbell Shaped Structures.** *P.N. Sherpa*<sup>1</sup>, *S. Khanal*<sup>1</sup> and *L. Spinu*<sup>1</sup> *1. Physics/Advanced Materials Science Institute, University of New Orleans, New Orleans, LA, United States*

11:45

- CF-12. Magnetization and FMR studies of Si/Ni multilayers with varying Ni layer thickness.** *D. Singh*<sup>1</sup>, *R. Roy*<sup>1</sup> and *M. Senthil Kumar*<sup>1</sup> *1. Department of Physics, Indian Institute of Technology Bombay, Mumbai, India*

**Session CG**  
**MODELLING OF MACHINES I**

Ping Zheng, Chair  
Harbin Institute of Technology, Harbin, China

9:00

- CG-01. An Improved Core-Loss Calculation Method with Variable Coefficients Based on Equivalent Frequency.** *W. Jia<sup>1</sup> and X. Lan<sup>1</sup> 1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

9:15

- CG-02. Design of a High Power density Halbach BLDC Motor for Electric Vehicle Propulsion.** *V.R. Bommadevara<sup>1</sup> 1. Electrical Engineering, IIT Hyderabad, India*

9:30

- CG-03. High Frequency Characterization of Magnetic Rod Cores with Anisotropic Power Loss.** *B.A. Reese<sup>1</sup> and C.R. Sullivan<sup>1</sup> 1. Dartmouth College, Lebanon, NH, United States*

9:45

- CG-04. Freeze-Cast Magnetic Composites for High Frequency Power Conversion.** *B.A. Reese<sup>1</sup>, C.R. Sullivan<sup>1</sup> and U.G. Wegst<sup>1</sup> 1. Dartmouth College, Lebanon, NH, United States*

10:00

- CG-05. Electromagnetic Torque Analysis for All-Harmonic-Torque Permanent Magnet Synchronous Motor.** *J.W. Zhang<sup>1</sup> 1. Changsha University, Changsha, China*

10:15

- CG-06. Performance Optimization of a Novel DC Fault Current Limiter Combining Different Magnetic Materials and Topologies.** *H. Zhou<sup>1</sup>, J. Yuan<sup>1</sup>, L. Wei<sup>1,2</sup>, P. Gan<sup>1</sup>, F. Chen<sup>1</sup>, Y. Zhong<sup>1</sup>, C. Tian<sup>1</sup>, B. Chen<sup>1</sup>, Y. Gao<sup>3</sup> and K. Muramatsu<sup>3</sup> 1. School of Electrical and Engineering, Wuhan University, Wuhan, China; 2. Department of Electrical Engineering, Graduate School of Engineering, Kyoto University, Kyoto, Japan; 3. Department of Electrical and Electronic Engineering, Saga University, Saga, Japan*

10:30

- CG-07. Dynamic Modeling and Control of Three-Degree-of-Freedom Electromagnetic Actuator for Image Stabilization.** *A. Heya<sup>1</sup>, K. Hirata<sup>1</sup> and N. Niguchi<sup>1</sup> 1. Department of Adaptive Machine Systems, Osaka University, Suita, Japan*

10:45

- CG-08. Investigation of a High Corner-Power Modular Fault-Tolerant Permanent-Magnet In-Wheel Motor.** *Y. Tang<sup>1</sup>, F. Chai<sup>1</sup>, Z. Song<sup>1</sup> and P. Liang<sup>1</sup>* *1. Department of Electrical Engineering, Harbin Institute of Technology, Harbin, China*

11:00

- CG-09. An Effective Method with Copper Ring for Vibration Reduction in Permanent Magnet Brush DC Motors.** *J. Hong<sup>1</sup>, S. Wang<sup>1</sup>, Y. Sun<sup>1</sup> and J. Li<sup>1</sup>* *1. Tsinghua University, Beijing, China*

11:15

- CG-10. High Transmission Capacity P.U.A. Wireless Power Transfer for AUV Using an Optimized Magnetic Coupler.** *C. Cai<sup>1</sup>, Z. Yang<sup>1</sup>, M. Qin<sup>1</sup> and S. Wu<sup>1</sup>* *1. School of Information and Electrical Engineering, Harbin Institute of Technology at Weihai, Weihai, China*

11:30

- CG-11. An Economical Three-Phase Fault Current Limiter Considering Different Types of Fault.** *J. Yuan<sup>1</sup>, P. Gan<sup>1</sup>, L. Wei<sup>1,2</sup>, H. Zhou<sup>1</sup>, Y. Zhong<sup>1</sup>, Z. Zhang<sup>1</sup>, C. Tian<sup>1</sup>, Y. Gao<sup>3</sup>, K. Muramatsu<sup>3</sup> and B. Chen<sup>1</sup>* *1. Electrical and Engineering, Wuhan University, Wuhan, China; 2. Department of Electrical Engineering, Graduate School of Engineering, Kyoto University, Kyoto, Japan; 3. Department of Electrical and Electronic Engineering, Saga University, Saga, Japan*

11:45

- CG-12. Electromagnetic Vibration Analysis of Surface-Mounted Permanent Magnet Synchronous Machine.** *Z. Xing<sup>1</sup>, X. Wang<sup>1</sup> and W. Zhao<sup>1</sup>* *1. School of Electrical Engineering, Shandong University, Ji'nan, China*

WEDNESDAY  
MORNING  
9:00

PEONY II

**Session CH**  
**TRANSFORMERS AND INDUCTORS**

Yasushi Endo, Chair  
Tohoku University, Sendai, Japan

9:00

- CH-01. Reduced EMI Noise with the Consideration of Magnetic Material Design in the Grid-Connected Inverter for More Electric Aircraft.** *Y. Liu<sup>1</sup>, Y. Liu<sup>2</sup>, H. Wang<sup>1</sup>, G. Wang<sup>1</sup> and J. Peng<sup>1</sup>* *1. Shenzhen University, Shenzhen, China; 2. Nanyang Technological University, Singapore, Singapore*

9:15

- CH-02. All-Metal Domestic Induction Heating Using Single-Frequency Double-Layer Coils.** *W. Han<sup>1</sup>, K. Chau<sup>1</sup>, C. Jiang<sup>1</sup> and W. Liu<sup>1</sup>* 1. *Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong*

9:30

- CH-03. Analytic Computation of Power-Line Voltage Drop Produced by Magnetic Energy Harvesting Device.** *K. Kim<sup>1</sup>, B. Park<sup>1</sup>, J. Kim<sup>1</sup>, J. Koo<sup>2</sup> and S. Ahn<sup>1</sup>* 1. *Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea;* 2. *Ferrarispower, Seongnam, The Republic of Korea*

9:45

- CH-04. Matrix formulation of Cauer Ladder Network Method for Efficient Eddy-Current Analysis.** *T. Matsuo<sup>1</sup>, A. Kameari<sup>2</sup>, K. Sugahara<sup>3</sup> and Y. Shindo<sup>4</sup>* 1. *Kyoto University, Kyoto, Japan;* 2. *Science Solutions International Laboratory, Inc., Tokyo, Japan;* 3. *Kindai University, Higashiosaka, Japan;* 4. *Kawasaki Heavy Industries, Ltd., Akashi, Japan*

10:00

- CH-05. Design of Rotary Transformer Based on Transient Field-Circuit Coupled Model.** *H. Zhong<sup>1</sup>, Y. Wang<sup>1</sup>, B. Peng<sup>1</sup> and Y. Yang<sup>1</sup>* 1. *Electrical Engineering School, Shandong University, Jinan, China*

10:15

- CH-06. Benefits of Synthetic Polymer Bonded Soft Magnetic Composites for Inductive Wireless Power Transfer Receivers in Electric Vehicles.** *D. Barth<sup>1</sup>, B. Klaus<sup>1</sup> and T. Leibfried<sup>1</sup>* 1. *Institute of Electric Energy Systems and High-Voltage Technology (IEH), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany*

10:30

- CH-07. Winding Losses Analysis of a 4 KVA High Frequency Coaxial Transformer Used in the Bi-Directional DC-DC Converter.** *W. Water<sup>1</sup> and J. Lu<sup>1</sup>* 1. *Griffith University, South Brisbane, QLD, Australia*

10:45

- CH-08. Leakage Flux based turn-to-turn Fault Detection for Shunt Inductor.** *B. Chen<sup>1</sup>, J. Dong<sup>1</sup>, C. Tian<sup>1</sup> and Q. Chen<sup>1</sup>* 1. *Wuhan University, Wuhan, China*

11:00

- CH-09. Auto-transformer and Magnetic Control Soft Start Method of Super Large Capacity and High Voltage Motor Considering the Cost and Performance Optimization.** *J. Yuan<sup>1</sup>, C. Wang<sup>1</sup>, Y. Zhu<sup>1</sup>, H. Zhou<sup>1</sup>, L. Wei<sup>1,2</sup>, C. Tian<sup>1</sup>, Y. Gao<sup>3</sup>, K. Muramatsu<sup>3</sup> and B. Chen<sup>1</sup>* 1. *Electrical and Engineering, Wuhan University, Wuhan, China;* 2. *Department of Electrical Engineering, Graduate School of Engineering, Kyoto University, Kyoto, Japan;* 3. *Department of Electrical and Electronic Engineering, Saga University, Saga, Japan*

- CH-10. Fast Three-dimensional Optimization of Magnetic Cores for Loss and Volume Reduction.** *S. Shimokawa*<sup>1</sup>, *H. Oshima*<sup>1</sup>, *K. Shimizu*<sup>2</sup>, *Y. Uehara*<sup>2</sup>, *J. Fujisaki*<sup>2</sup>, *A. Furuya*<sup>2</sup> and *H. Igarashi*<sup>3</sup> *1. Fujitsu Laboratories Ltd., Atsugi, Japan; 2. Fujitsu Limited, Kawasaki, Japan; 3. Hokkaido University, Sapporo, Japan*

WEDNESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session CP**  
**MAGNETIC THERAPIES AND NANOMEDICINE I**  
**(Poster Session)**

Yuko Ichiyonagi, Chair  
Yokohama National University, Yokohama, Japan

- CP-01. Alteration in motor cortical excitability induced by peripheral stimulation with magnetic stimulation.** *A. Sato*<sup>1</sup>, *T. Torii*<sup>1</sup>, *M. Iwahashi*<sup>1</sup> and *K. Iramina*<sup>2</sup> *1. Medical Care and Welfare Engineering, Tokai University, Kumamoto, Japan; 2. Graduate School of Systems Life Sciences, Kyushu University, Fukuoka, Japan*
- CP-02. Transcranial magnetic stimulation: design of a high current magnetic pulse generator with custom coil for the application on small animals.** *J. Selvaraj*<sup>1</sup>, *P. Rastogi*<sup>1</sup>, *N. Prabhu Gaunkar*<sup>1</sup>, *R.L. Hadimani*<sup>2,1</sup> and *M. Mina*<sup>1,3</sup> *1. Department of Electrical and Computer Engineering, Iowa State University, Ames, IA, United States; 2. Dept. of Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 3. Department of Industrial Design, Iowa State University, Ames, IA, United States*
- CP-03. Effects of Pulsed Magnetic Field on the Flowing Red Blood Cells using Microvascular Model.** *Y. Jo*<sup>1</sup>, *H. Ahn*<sup>1</sup>, *K. Shin*<sup>1</sup> and *H. Lee*<sup>1</sup> *1. Sangji University, Wonju, The Republic of Korea*
- CP-04. Transcranial magnetic stimulation: comparison of 15 coils with 50 MRI derived head models.** *P. Rastogi*<sup>1</sup>, *Y. Tang*<sup>1</sup>, *B. Zhang*<sup>1</sup>, *E.G. Lee*<sup>2</sup>, *R.L. Hadimani*<sup>3,1</sup> and *D.C. Jiles*<sup>1</sup> *1. Department of Electrical and Computer Engineering, Iowa State University, Ames, IA, United States; 2. Department of Psychiatry, Massachusetts General Hospital, Harvard Medical School, Charleston, MA, United States; 3. Department of Mechanical and Nuclear engineering, Virginia Commonwealth University, Richmond, VA, United States*
- CP-05. Magnetohydrodynamic Approach to Effective Blood-Flow Control Utilizing ELF fields.** *H. Nakagawa*<sup>1</sup> and *M. Ohuchi*<sup>1</sup> *1. Department of Electrical and Electronic Engineering, Tokyo Denki University, Adachi-ku, Japan*

- CP-06. High Focality Stimulation on Primary Auditory Cortex.** *J.R. Germick<sup>1</sup>, Y. Alkheder<sup>2</sup>, P. Rastogi<sup>1</sup>, A. Pandurangi<sup>3</sup>, D.C. Jiles<sup>1</sup> and R.L. Hadimani<sup>2</sup>* 1. *Dept. of Electrical and Nuclear Engineering, Iowa State University, Ames, IA, United States*; 2. *Dept. of Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States*; 3. *Dept. of Psychiatry, School of Medicine, Virginia Commonwealth University, Richmond, VA, United States*
- CP-07. Efficacy of Investigating Mirror Neuron Activity in Schizophrenics Using Transcranial Magnetic Stimulation.** *J.R. Germick<sup>1</sup>, E. Cheng<sup>2</sup>, P. Rastogi<sup>1</sup>, R.L. Hadimani<sup>3,1</sup>, U. Mehta<sup>4</sup>, A. Pandurangi<sup>5</sup> and D.C. Jiles<sup>1</sup>* 1. *Dept. of Electrical and Nuclear Engineering, Iowa State University, Ames, IA, United States*; 2. *Dept. of Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States*; 3. *Dept. of Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States*; 4. *Department of Psychiatry, National Institute of Mental Health and Neurosciences, Bangalore, India*; 5. *Dept. of Psychiatry, School of Medicine, Virginia Commonwealth University, Richmond, VA, United States*
- CP-08. Simulation study of Magnetic Response of Magnetic Nanoparticles for different temperature under different selection gradient field.** *J. Zhu<sup>1</sup>, X. Lu<sup>1</sup>, S. Wei<sup>1</sup>, Z. Wang<sup>1</sup> and W. Yang<sup>1</sup>* 1. *School Electronic, Electrical and Communication Engineering, University of Chinese Academy of Sciences, Beijing, China*
- CP-09. Gradient/ELF magnetic Field Affects Metamorphic Behaviors in T<sub>4</sub>-Administrated Axolotls: Regulation of Amphibian Metamorphosis Depending on Field Strength and Exposure Timing.** *H. Nakagawa<sup>1</sup> and M. Ohuchi<sup>1</sup>* 1. *Department of Electrical and Electronic Engineering, Tokyo Denki University, Adachi-ku, Japan*
- CP-10. Reaserch on Influence of the Electric Vehicle on Body During the Wireless Charging Process.** *S. Jiang<sup>1</sup>* 1. *Tianjin Polytechnic University, Tianjin, China*
- CP-11. Biogenic micro-mirrors of aquatic species display enhanced light reflection upon exposure to a magnetic field.** *H. Kashiwagi<sup>1</sup>, H. Asada<sup>2</sup> and M. Iwasaka<sup>3</sup>* 1. *Graduate School of AdSM, Hiroshima University, Higashihiroshima, Japan*; 2. *Graduate School of Science and Technology for Innovation, Yamaguchi University, Ube, Japan*; 3. *RNBS, Hiroshima University, Higashihiroshima, Japan*
- CP-12. Numerical investigation of biconical transcranial magnetic stimulation coil.** *Y. Wu<sup>1</sup> and Z. Liu<sup>1</sup>* 1. *School of Materials Science and Engineering, South China University of Technology, Guangzhou, China*
- CP-13. Effects of Magnetic Stimulation on Insomnia Based on Brain Functional Networks.** *H. Yu<sup>1</sup>, W. Zheng<sup>1</sup>, W. Xia<sup>1</sup>, W. Ding<sup>2</sup>, G. Xu<sup>1</sup> and L. Guo<sup>1</sup>* 1. *Hebei University of Technology, Tianjin, China, Tianjin, China*; 2. *Tianjin Beichen District Chinese Medicine Hospital, Tianjin, China*

**CP-14. Effects of Magnetic Stimulation on the Proliferation of Dopaminergic Neuronal Cells Grown in Extracellular Matrix.** X. Zhong<sup>1</sup>, J.C. Boldrey<sup>1</sup>, I.C. Schneider<sup>2</sup>, L. Que<sup>1</sup> and D.C. Jiles<sup>1</sup> 1. *Electrical and Computer Engineering, Iowa State University, Ames, IA, United States*; 2. *Chemical and Biological Engineering, Iowa State University, Ames, IA, United States*

**CP-15. Computational Safety Study of Combination Treatment: Deep Brain Stimulation and Transcranial Magnetic Stimulation.** F. Syeda<sup>1</sup>, C.H. Serrate<sup>1</sup>, H. Magsood<sup>1</sup>, K. Holloway<sup>2,3</sup> and R.L. Hadimani<sup>1</sup> 1. *Mechanical and Nuclear Engineering, Virginia Commonwealth University, Glen Allen, VA, United States*; 2. *McGuire Research Institute, Hunter Holmes McGuire Veterans Affairs Medical Center, Richmond, VA, United States*; 3. *Department of Neurosurgery, Virginia Commonwealth University Health System, Richmond, VA, United States*

**CP-16. Study on the Effects of Magnetic Stimulation on K-Ras-Driven Lung Cancer in Mice.** N. Zhang<sup>1,2</sup>, S. Ning<sup>3</sup>, S. Wang<sup>1</sup>, C. Zhang<sup>2</sup>, S. Wang<sup>1</sup> and P. Hao<sup>1</sup> 1. *State Key Laboratory of Electrical Insulation and Power Equipment, Faculty of Electrical Engineering, Xi'an Jiaotong University, Xi'an, China*; 2. *Department of Oncology, Johns Hopkins University School of Medicine, Baltimore, MD, United States*; 3. *College of Electrical and Information Engineering, Shaanxi University of Science and Technology, Xi'an, China*

WEDNESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session CQ**  
**DOMAIN WALLS AND SKYRMIONS**  
**(Poster Session)**

Yan Zhou, Chair  
The Chinese University of Hong Kong, Shatin, Hong Kong

**CQ-01. Measurement of tilted magnetic anisotropy of quasi-perpendicularly magnetized Ta/Pt/CoFeB/Pt multilayers.** S. Guddeti<sup>1</sup> and P. Kumar<sup>1</sup> 1. *Department of Physics, Indian Institute of Science, Bangalore, India*

**CQ-02. Pinning sites with tilted magnetization for domain wall motion control in racetrack memory.** T. Jin<sup>1</sup>, F. Tan<sup>1</sup>, C.C. Ang<sup>1</sup>, W. Gan<sup>1</sup>, J. Cao<sup>2</sup>, W. Lew<sup>1</sup> and S. Piramanayagam<sup>1</sup> 1. *Nanyang University, Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Singapore, Singapore*; 2. *Lanzhou University, Lanzhou, China*

**CQ-03. Role of Effective Anisotropy in Temperature Gradient-induced Skyrmion Motion.** X. Wang<sup>1</sup>, W. Gan<sup>1</sup>, T. Jin<sup>2</sup> and W. Lew<sup>2</sup> 1. *School of Science, Lanzhou University of Technology, Lanzhou, China*; 2. *School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*

- CQ-04. Multilevel Storage Based on Magnetic Skyrmion.** *S. Luo*<sup>1</sup> and *L. You*<sup>1</sup> *1. School of Optical and Electronic Information, Huazhong University of Science & Technology, Wuhan, China*
- CQ-05. Spin-hall effect-driven motion of chiral skyrmions in an anisotropy gradient.** *R. Tomasello*<sup>1</sup>, *S. Komineas*<sup>2</sup>, *G. Siracusano*<sup>3</sup>, *M. Carpentieri*<sup>4</sup> and *G. Finocchio*<sup>5</sup>  
*1. Department of Engineering, University of Perugia, Terni, Italy; 2. Department of Mathematics and Applied Mathematics, University of Crete, Heraklion, Greece; 3. Department of Electric, Electronic and Computer Engineering, University of Catania, Catania, Italy; 4. Department of Electrical and Information Engineering, Politecnico di Bari, Bari, Italy; 5. Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina, Messina, Italy*
- CQ-06. Spectroscopic Evaluation of Non-Adiabatic Spin Transfer Torque Using Coupled Oscillation of Magnetic Vortices.** *T. Horaguchi*<sup>1</sup>, *T. Tanazawa*<sup>1</sup> and *Y. Nozaki*<sup>1,2</sup> *1. Department of Physics, Keio University, Yokohama, Japan; 2. Center for Spintronics Research Network, Keio University, Yokohama, Japan*
- CQ-07. Over 100,000-times variation of domain-wall speed with respect to ferromagnetic layer thickness.** *D. Kim*<sup>1</sup>, *M. Park*<sup>1</sup>, *Y. Park*<sup>1,2</sup>, *J. Yu*<sup>1</sup>, *J. Kim*<sup>1</sup>, *D. Kim*<sup>1,3</sup>, *B. Min*<sup>2</sup> and *S. Choe*<sup>1</sup>  
*1. Physics, Seoul National University, Seoul, The Republic of Korea; 2. Korea Institute of Science and Technology, Seoul, The Republic of Korea; 3. Kyoto University, Kyoto, Japan*
- CQ-08. Coherent terahertz spin-wave emission associated with ferrimagnetic domain wall dynamics.** *S. Oh*<sup>1</sup>, *S. Kim*<sup>2</sup>, *D. Lee*<sup>3</sup>, *G. Go*<sup>3</sup>, *K. Kim*<sup>4,5</sup>, *T. Ono*<sup>5</sup>, *Y. Tserkovnyak*<sup>2</sup> and *K. Lee*<sup>1,3</sup> *1. Department of Nano-Semiconductor and Engineering, Korea University, Seoul, The Republic of Korea; 2. Department of Physics and Astronomy, University of California, Los Angeles, CA, United States; 3. Department of Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 4. Department of Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 5. Institute for Chemical Research, Kyoto University, Kyoto, Japan*
- CQ-09. Domain wall configurations in amorphous ferromagnetic nanowires with cylindrical symmetry.** *C. Rotarescu*<sup>1</sup>, *H. Chiriac*<sup>1</sup>, *N. Lupu*<sup>1</sup> and *T.A. Ovari*<sup>1</sup> *1. National Institute of Research and Development for Technical Physics, Iasi, Romania*
- CQ-10. Thermally assisted domain wall motion in the presence of spin torque.** *J. Chureemart*<sup>2</sup> and *P. Chureemart*<sup>1</sup> *1. Physics department, Mahasarakham University, Kantarawichai, Thailand; 2. Physics department, Mahasarakham University, Kantarawichai, Thailand*
- CQ-11. Magnetic skyrmion motion in the presence of defect.** *I. Hong*<sup>1</sup> and *K. Lee*<sup>1,2</sup> *1. KU-KIST graduate school of converging science and technology, Korea University, Seoul, The Republic of Korea; 2. Department of materials science and engineering, Korea University, Seoul, The Republic of Korea*

- CQ-12. Mechanism of skyrmionium nucleation by local spin-orbit torque.** *A. Kolesnikov<sup>1</sup>, M. Stebliy<sup>1</sup>, A. Ognev<sup>1</sup>, A.S. Samardak<sup>1</sup> and L. Chebotkevich<sup>1</sup>* *1. School of Natural Science, Far Eastern Federal University, Vladivostok, Russian Federation*
- CQ-13. Controllable transport of a skyrmion in a ferromagnetic narrow channel with voltage-controlled magnetic anisotropy.** *J. Wang<sup>1</sup>, J. Xia<sup>2</sup>, X. Zhang<sup>2</sup>, G. Zhao<sup>3</sup>, J. Wu<sup>4</sup>, Y. Xu<sup>2</sup>, L. Ye<sup>5</sup>, Z. Zou<sup>6</sup> and Y. Zhou<sup>1</sup>* *1. Department of Electronic Engineering, University of York, York, United Kingdom; 2. School of Science and Engineering, The Chinese University of Hong Kong, Shenzhen, Shenzhen, China; 3. College of Physics and Electronic Engineering, Sichuan Normal University, Chengdu, China; 4. Department of Physics, University of York, York, United Kingdom; 5. College of Communication Engineering, Chongqing University, Chongqing, China; 6. Department of Physics, Nanjing University, Nanjing, China*
- CQ-14. Current-induced skyrmion dynamics in a frustrated magnetic film.** *X. Zhang<sup>1,2</sup>, J. Xia<sup>1</sup>, Y. Zhou<sup>1</sup>, X. Liu<sup>2</sup>, H. Zhang<sup>3</sup> and M. Ezawa<sup>4</sup>* *1. School of Science and Engineering, The Chinese University of Hong Kong, Shenzhen, Shenzhen, China; 2. Department of Electrical and Computer Engineering, Shinshu University, Nagano, Japan; 3. College of Optoelectronic Engineering, Shenzhen University, Shenzhen, China; 4. Department of Applied Physics, The University of Tokyo, Tokyo, Japan*
- CQ-15. Bidirectional propagation of tilting domain wall due to the interfacial Dzyaloshinskii-Moriya interaction in perpendicularly magnetized T-junction.** *J. Kwon<sup>1</sup>, H. Hwang<sup>1</sup>, J. Hong<sup>1</sup> and C. You<sup>1</sup>* *1. Department of Emerging Materials Science, Daegu Gyeongbuk Institute of Science and Technology, Daegu, The Republic of Korea*

WEDNESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session CR**  
**FUNDAMENTAL PROPERTIES AND COOPERATIVE PHENOMENA I**  
**(Poster Session)**

Baomin Wang, Chair  
Ningbo Institute of Materials Technology and Engineering,  
Ningbo, China

- CR-01. Mechanism of spin re-orientation phase transition in SmCrO<sub>3</sub>.** *M. Tripathi<sup>1</sup>, T. Chatterji<sup>2</sup>, R.J. Choudhary<sup>1</sup>, D.M. Phase<sup>1</sup> and H.E. Fischer<sup>2</sup>* *1. Thin film magnetization, UGC DAE Consortium for Scientific research, Indore, India; 2. Institut Laue-Langevin, Grenoble, France*

- CR-02. Unusual Critical Behaviors in  $\text{La}_{1.2}\text{Sr}_{1.8}\text{Mn}_2\text{O}_7$  Single Crystal.** *D. Tran*<sup>1,2</sup>, X. Kieu<sup>1</sup>, D. Pham<sup>1</sup>, V. Tien<sup>1</sup>, S. Yu<sup>1</sup>, T. Phan<sup>3</sup>, A. Telegin<sup>4</sup> and S. Naumov<sup>4</sup> *1. Chungbuk National University, Cheongju, The Republic of Korea; 2. Institute of Materials Science, Vietnam Academy of Science and Technology, Hanoi, Vietnam; 3. Hankuk University of Foreign Studies, Yongin, The Republic of Korea; 4. Institute of Metal Physics, RAS, Russian Federation*
- CR-03. Critical behavior in  $\text{La}_{0.75}\text{Ca}_{0.2}\text{Ag}_{0.05}\text{MnO}_3$  Exhibiting the Griffiths Phase.** *D. Tran*<sup>1,2</sup>, D. Pham<sup>1</sup>, X. Kieu<sup>1</sup> and S. Yu<sup>1</sup> *1. Chungbuk National University, Cheongju, The Republic of Korea; 2. Vietnam Academy of Science and Technology, Hanoi, Vietnam*
- CR-04. Observation of Griffiths like phase above room temperature in antiferromagnetic double perovskite  $\text{Pr}_2\text{CoFeO}_6$ .** *A. Pal*<sup>1</sup>, V. Gangwar<sup>1</sup> and S. Chatterjee<sup>1</sup> *1. Physics, Indian Institute of Technology BHU, Varanasi, India*
- CR-05. Low Temperature Magnetic Properties of Pyrochlore  $\text{Nd}_2\text{Ru}_2\text{O}_7$ .** *D. Kumar*<sup>1</sup>, S.T. Ku<sup>1</sup>, M.R. Lees<sup>2</sup>, W.T. Lee<sup>3</sup>, R.J. Aldus<sup>3</sup>, A. Studer<sup>3</sup>, I. Paolo<sup>3</sup>, S. Asai<sup>4</sup>, T. Masuda<sup>4</sup>, S.W. Chen<sup>5</sup>, J.M. Chen<sup>5</sup> and L.J. Chang<sup>1,6</sup> *1. Department of Physics, National Cheng Kung University, Tainan, Taiwan; 2. Department of Physics, University of Warwick, Coventry, United Kingdom; 3. Australian Nuclear Science and Technology Organization, Kirrawee, NSW, Australia; 4. Institute of Solid State Physics, The University of Tokyo, Chiba, Japan; 5. National Synchrotron Radiation Research Center, Hsinchu, Taiwan; 6. Advanced Science Research Center, Japan Atomic Energy Agency, Ibaraki, Japan*
- CR-06. Magnetic excitation, partial gap opening and chemical pressure effect in  $\text{CeNiGe}_2$ .** *K. Singh*<sup>1</sup> and *K. Mukherjee*<sup>1</sup> *1. School of Basic Sciences, Indian Institute of Technology Mandi, India*
- CR-07. Orthorhombic  $\text{Ti}_2\text{O}_3$ : A Polymorph-Dependent Narrow-Bandgap Ferromagnetic Oxide.** *Y. Li*<sup>2,1</sup>, Y. Weng<sup>3</sup>, X. Yin<sup>4</sup>, X. Yu<sup>4</sup>, S. Kumar<sup>2</sup>, N. Wehbe<sup>5</sup>, H. Wu<sup>1</sup>, H. Alshareef<sup>2</sup>, S.J. Pennycook<sup>1</sup>, M.B. Breese<sup>4</sup>, J. Chen<sup>1</sup>, S. Dong<sup>3</sup> and T. Wu<sup>2</sup> *1. Material Science and Engineering, National University of Singapore, Singapore; 2. Material Science and Engineering, King Abdullah University of Science and Technology (KAUST), Jeddah, Saudi Arabia; 3. Department of Physics, Southeast University, Nanjing, China; 4. Singapore Synchrotron Light Source (SSLS), National University of Singapore, Singapore; 5. Imaging&Characterization Core Lab, King Abdullah University of Science and Technology (KAUST), Jeddah, Saudi Arabia*
- CR-08. Inverted magnetic hysteresis loop and strong magnetoelectric coupling in mixed ferrimagnetic-multiferroic phases of a double perovskite.** *D. Oh*<sup>1</sup>, M. Kim<sup>1</sup>, J. Moon<sup>1</sup>, S. Oh<sup>1</sup>, Y. Choi<sup>1</sup> and N. Lee<sup>1</sup> *1. Yonsei University, Seoul, The Republic of Korea*

- CR-09. Study of Spin Polarized Tunneling in Magnetoresistance and Low Temperature Anomaly in Nanoparticles of  $\text{La}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$ .** A.K. Saw<sup>1</sup>, G. Channagoudra<sup>1</sup>, H. Fu<sup>2</sup>, R.L. Hadimani<sup>3</sup> and V. Dayal<sup>1</sup> *1. Department of Physics, Maharaja Institute of Technology-Mysore, Mandya, India; 2. University of Electronic Science and Technology of China, Chengdu, China; 3. Department of Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States*
- CR-10. Non-collinear spin structure at ultrathin magnetic interfaces and its evolution by the oxygen adsorption.** T. Chuang<sup>1</sup>, C. Huang<sup>2</sup>, C. Lu<sup>1</sup> and D. Wei<sup>1,2</sup> *1. National Synchrotron Radiation Research Center, Hsinchu, Taiwan; 2. National Sun Yat-sen University, Program for Synchrotron Radiation and Neutron Beam Applications, Kaohsiung, Taiwan*
- CR-11. Role of Fe-doped effect in two-dimensional  $\text{MoS}_2$  magnetic semiconductor.** C. Kao<sup>2</sup>, C. Yang<sup>2</sup>, H. Kao<sup>2</sup>, Y. Tung<sup>2</sup>, T. Hsu<sup>2</sup>, W. Wu<sup>2</sup> and K. Lin<sup>1</sup> *1. Chemical Engineering and Material Science, Yuan Ze University, Taoyuan City, Taiwan; 2. Physics, Chung Yuan Christian University, Taoyuan City, Taiwan*
- CR-12. Reversible 90-Degree Rotation of Fe Magnetic Moment Using Hydrogen.** W. Lin<sup>1</sup>, C. Hsu<sup>1</sup>, P. Chang<sup>1</sup>, Y. Chen<sup>1</sup> and C. Liu<sup>1</sup> *1. Department of Physics, National Taiwan Normal University, Taipei, Taiwan*
- CR-13. The Role of Graphene Oxide Precursor on Magnetic and Microwave Properties of Nitrogen-doped Graphene.** L. Quan<sup>1</sup>, F. Qin<sup>1</sup>, H. Wang<sup>1</sup> and H. Peng<sup>1</sup> *1. Zhejiang University, Hangzhou, China*

WEDNESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session CS  
HARD MAGNETS I  
(Poster Session)**

Aru Yan, Chair  
Ningbo Institute of Materials Technology & Engineering,  
Ningbo, China

- CS-01. Magnetic properties of Fe-Pt thick-film magnets electroplated on Cu substrates.** Y. Omagari<sup>1</sup>, J. Honda<sup>1</sup>, R. Hamamura<sup>1</sup>, H. Yamada<sup>2</sup>, N. Fujita<sup>2</sup>, K. Takashima<sup>1</sup>, T. Yanai<sup>1</sup>, M. Nakano<sup>1</sup> and H. Fukunaga<sup>1</sup> *1. Nagasaki University, Nagasaki, Japan; 2. National Institute of Technology, Nara College, Nara, Japan*

- CS-02. Mossbauer studies and magnetic properties of Fe-doped MnAl(C) alloys.** *V. Nguyen*<sup>1,2</sup>, *F. Calvayrac*<sup>1</sup> and *N. Randrianantoandro*<sup>1</sup> *1. Institut des Molécules et Matériaux du Mans – UMR CNRS n°6283, Le Mans Université, Le Mans, France; 2. Advanced Materials Science and Nanotechnology, University of Science and Technology of Hanoi, Vietnam Academy of Science and Technology, Hanoi, Vietnam*
- CS-03. Magnetic properties and morphologies of synthesized strontium ferrite powders by the molten salt method.** *M. Kim*<sup>1</sup>, *K. Lee*<sup>1</sup>, *M. Choi*<sup>1</sup> and *J. Kim*<sup>1</sup> *1. Materials Science and Chemical Engineering, Hanyang University, Ansan, The Republic of Korea*
- CS-04. Synthesis of high-purity spherical core-shell  $\alpha$ -Fe<sub>16</sub>N<sub>2</sub>/SiO<sub>2</sub> magnetic nanoparticles.** *J. Li*<sup>1</sup>, *L. Guo*<sup>1</sup>, *X. Peng*<sup>1</sup>, *Y. Yang*<sup>1</sup>, *X. Wang*<sup>1</sup> and *H. Ge*<sup>1</sup> *1. Department of Materials Science & Engineering, China Jiliang University, Hangzhou, China*
- CS-05. Coercivity and phase evolution in mechanically milled (FeCo)<sub>2</sub>B-type hard magnetic alloy.** *K. Kim*<sup>1</sup>, *H. Kwon*<sup>1</sup>, *M. Kang*<sup>3</sup>, *C. Yang*<sup>3</sup>, *J. Lee*<sup>2</sup> and *J. Yu*<sup>2</sup> *1. Pukyong National University, Pusan, The Republic of Korea; 2. Korea Institute of Materials Science, Changwon, The Republic of Korea; 3. Sungkyunkwan University, Suwon, The Republic of Korea*
- CS-06. Hard magnetic property improvement of melt spun PrCo<sub>5</sub> ribbons by Fe and C doping.** *H.W. Chang*<sup>1</sup>, *H. Wang*<sup>1</sup>, *Y. Lee*<sup>1</sup>, *C. Shih*<sup>1</sup>, *W.C. Chang*<sup>1</sup>, *C. Shaw*<sup>2</sup> and *C. Yang*<sup>3</sup> *1. Department of Physics, National Chung Cheng University, Chia-Yi, Taiwan; 2. Superrite Electronics Co. Ltd., Taipei, Taiwan; 3. Chung-Yuan Christian University, Chungli, Taiwan*
- CS-07. First-principles study of spin-wave dispersion in Sm(FeCo)<sub>12</sub>.** *T. Fukazawa*<sup>1,2</sup>, *H. Akai*<sup>3,2</sup>, *Y. Harashima*<sup>1,2</sup> and *T. Miyake*<sup>1,2</sup> *1. National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 2. ESICMM, National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. ISSP, The University of Tokyo, Kashiwa, Japan*
- CS-08. Site probability of substituted Titanium in 1:12 phase structures SmFe<sub>12</sub>, NdFe<sub>12</sub>, and SmCo<sub>12</sub>.** *C. Skelland*<sup>1</sup>, *G. Hrkac*<sup>1,6</sup>, *T. Schrefl*<sup>3</sup>, *T. Ostler*<sup>4</sup>, *S. Westmoreland*<sup>5</sup>, *R.W. Chantrell*<sup>5</sup>, *R.F. Evans*<sup>5</sup>, *M. Yano*<sup>2</sup>, *T. Shoji*<sup>2</sup>, *A. Kato*<sup>2</sup> and *A. Manabe*<sup>2</sup> *1. University of Exeter, Exeter, United Kingdom; 2. Toyota Motor Corporation, Toyota City, Japan; 3. Danube University Krems, Austria; 4. Sheffield Hallam University, Sheffield, United Kingdom; 5. University of York, York, United Kingdom; 6. TU Vienna, Vienna, Austria*
- CS-09. Magnetic properties of (Sm,Zr)<sub>5</sub>(Fe,Co)<sub>17-x</sub>Ti<sub>x</sub> melt-spun ribbons.** *T. Saito*<sup>1</sup>, *T. Horita*<sup>1</sup> and *D. Nishio-Hamane*<sup>2</sup> *1. Chiba Institute of Technology, Chiba, Japan; 2. Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan*
- CS-10. Coercivity Mechanism of SrO•6Fe<sub>2</sub>O<sub>3</sub> Ferrite Magnets.** *Y. Matsuura*<sup>1</sup> *1. Research Institute for Applied Sciences, Kyoto, Japan*

- CS-11. **Electronic structure and magnetic property of  $Ba_{1-x}Sr_xCoFe_{11}O_{19}$  hexaferrites.** *N. Tran<sup>1</sup>, D. Kim<sup>1</sup>, H. Kim<sup>1</sup>, S. Lee<sup>1</sup>, T. Phan<sup>1</sup> and B. Lee<sup>1</sup>* 1. *Department of Physics and Oxide Research Center, Hankuk University of Foreign Studies, Yongsi-si, The Republic of Korea*

WEDNESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session CT**  
**LINEAR MOTORS II**  
**(Poster Session)**

Fei Zhao, Chair

Harbin Institute of Technology (Shenzhen), Shenzhen, China

- CT-01. **Characteristic Analysis and Design of a Novel Ironless Halbach-magnetized Permanent Magnet Linear Synchronous Motor.** *L. Zhang<sup>1</sup> and B. Kou<sup>1</sup>* 1. *Department of Electrical Engineering, Harbin Institute of Technology, Harbin, China*
- CT-02. **Power Factor Improvement of Linear Permanent-Magnet Vernier Motor by Using Dual-Inverter.** *D. Xu<sup>1</sup>, W. Zhao<sup>1</sup> and P. Zhao<sup>1</sup>* 1. *School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*
- CT-03. **Detent Force Investigation in Long-stator PM Linear Machines with Non-ideal Mechanical Airgap Condition.** *M. Ma<sup>1</sup>* 1. *School of Electrical Engineering and Automation, Hefei University of Technology, Hefei, China*
- CT-04. **Algorithm of Linear Induction Motor Control Considering End-effect of Magnetic Levitation Train Propulsion System.** *H. Seo<sup>2</sup>, J. Jeong<sup>1</sup>, G. Choe<sup>3</sup> and J. Lim<sup>4</sup>* 1. *Dept. of Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea;* 2. *EV Team, R&D Center, VCTech, Gunpo, The Republic of Korea;* 3. *Dept. of Electrical Engineering, Konkuk University, Seoul, The Republic of Korea;* 4. *Dept. of Magnetic Levitation and Linear Drive, Korea Institute of Machinery & Materials, Daejeon, The Republic of Korea*
- CT-05. **Experimental Verification of Characteristic Analysis and Performance Verification of Double-Sided Permanent Magnet Linear Synchronous Generator Designed with Three-Dimensional Effects for Ocean Wave Energy Converter.** *S. Seo<sup>1</sup>, G. Jang<sup>1</sup>, M. Koo<sup>1</sup>, K. Kim<sup>2</sup>, K. Hong<sup>2</sup> and J. Choi<sup>1</sup>* 1. *Electrical Engineering, Chung-nam National University, Daejeon, The Republic of Korea;* 2. *Offshore Plant Research Division, Korea Research Institute of Ships & Ocean Engineering, DaeJeon, The Republic of Korea*

- CT-06. Novel Propulsion Control Algorithm considering Magnetic Field Analysis Results of Linear Induction Motor for High Performance Operating.** *J. Jeong*<sup>1</sup>, *H. Seo*<sup>2</sup>, *J. Lim*<sup>3</sup> and *J. Choi*<sup>1</sup> *1. Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea; 2. EV Team, R&D Center, VCTech, Gunpo, The Republic of Korea; 3. Magnetic Levitation and Linear Drive, Korea Institute of Machinery & Materials, Daejeon, The Republic of Korea*
- CT-07. Design and Reduction of Thrust Ripple in Transverse Flux Permanent Magnet Linear Machine.** *M. Zhao*<sup>1,2</sup>, *K. Liu*<sup>3</sup>, *H. Yang*<sup>1</sup>, *N. Feng*<sup>1</sup>, *D. Hou*<sup>1</sup>, *P. Zhang*<sup>1</sup> and *M. Xu*<sup>1</sup> *1. Ludong University, Yantai, China; 2. Harbin Institute of Technology, Harbin, China; 3. Southeast University, Nanjing, China*
- CT-08. Design and Implementation of Amorphous Magnetic Material-Based Common Magnetic-Bus for the Replacement of Common DC-Bus.** *M. Islam*<sup>1</sup>, *K. Muttaqi*<sup>1</sup>, *D. Sutanto*<sup>1</sup> and *J. Zhu*<sup>2</sup> *1. Faculty of Engineering and Information Sciences, University of Wollongong, Wollongong, NSW, Australia; 2. Faculty of Engineering and Information Technologies, University of Technology Sydney, NSW, Australia*
- CT-09. Research on Detent Force for Tubular Permanent Magnet Linear Motor with Skewed Core End.** *G. Zhao*<sup>1</sup>, *Y. Wang*<sup>1</sup>, *B. Bai*<sup>1</sup> and *X. Gao*<sup>1</sup> *1. Shenyang University of Technology, Shenyang, China*
- CT-10. Thermal Design of a Toroidally Wound Mover Linear Switched Reluctance Machine using 3D Equivalent Thermal Network.** *D. Zhang*<sup>1</sup>, *X. Du*<sup>1</sup>, *D. Wang*<sup>1</sup> and *C. Peng*<sup>1</sup> *1. Shandong University, Jinan, China*
- CT-11. A New Decoupled RotLin Motor with Fuzzy Sliding Mode Control.** *Y. Zou*<sup>1</sup> and *E. Cheng*<sup>1</sup> *1. Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*
- CT-12. Design of VCM actuator with optical zoom for smartphone cameras.** *Y. Chang*<sup>1</sup>, *C. Hu*<sup>1</sup>, *C. Hsieh*<sup>1</sup> and *C. Liu*<sup>1</sup> *1. National Chung Cheng University, Chiayi County, Taiwan*
- CT-13. Design and Analysis of a Tubular Hybrid-Excited Flux-Modulated PM Motor with Improved Power Factor.** *H. Zhou*<sup>1</sup>, *J. Zhang*<sup>1</sup>, *W. Tao*<sup>1</sup> and *G. Liu*<sup>1</sup> *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*
- CT-14. Design a Spherical Motor and Its Drive.** *Y. Zou*<sup>1</sup> and *N. Cheung*<sup>1</sup> *1. Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, China*
- CT-15. Proposal and Design of Primary-PM Transverse-Flux Linear Motor with Enhanced Secondary-PM Structure for High Power Density.** *J. Luo*<sup>1</sup>, *B. Kou*<sup>1</sup>, *X. Yang*<sup>1</sup>, *L. Zhang*<sup>1</sup> and *H. Zhang*<sup>1</sup> *1. Electrical Engineering, Harbin Institute of Technology, Harbin, China*

**CT-16. Improvement of the self-propelled rotary actuator in consideration of shape and rolling direction of steel sheets.**

*N. Soda*<sup>1</sup>, *T. Kawano*<sup>1</sup> and *M. Enokizono*<sup>2</sup> *1. College of Engineering, Ibaraki University, Hitachi, Japan; 2. Vector Magnetic Characteristic Technical Laboratory, Usa, Japan*

WEDNESDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session CU**  
**LINEAR MOTORS III**  
**(Poster Session)**

Wei Xu, Co-Chair

Huazhong University of Science and Technology, Wuhan, China

Feng Chai, Co-Chair

Harbin Institute of Technology, Harbin, China

**CU-01. Design and Analysis of a Novel Modular Linear Double Stator Biased Flux Machine.** *Y. Mao*<sup>1</sup> and *S. Niu*<sup>1</sup> *1. Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

**CU-02. Experimental investigation of a new type of oscillation based linear capsule actuator.** *L. Wu*<sup>1</sup>, *K. Lu*<sup>1</sup> and *Y. Xia*<sup>1</sup>  
*1. Department of Energy Technology, Aalborg University, Aalborg, Denmark*

**CU-03. Dry Run Test of the In-vessel CEDM.** *J. Park*<sup>1</sup>, *M. Baek*<sup>2</sup>, *W. Lee*<sup>1</sup>, *M. Lee*<sup>1</sup>, *Y. Cho*<sup>1</sup>, *H. Kim*<sup>1</sup>, *C. Maeng*<sup>1</sup> and *C. Chung*<sup>1</sup>  
*1. KEPCO E&C, Daejeon, The Republic of Korea; 2. Woojin Inc., Hwaseong, The Republic of Korea*

**CU-04. Design and Analysis of Linear Hybrid-Excited Slot Permanent Magnet Machines.** *Y. Shen*<sup>1</sup> and *Q. Lu*<sup>1</sup>  
*1. College of Electrical Engineering, Zhejiang University, Hangzhou, China*

**CU-05. Investigation of Novel Linear Multi-tooth Variable Flux Reluctance Machines.** *Y. Shen*<sup>1</sup> and *Q. Lu*<sup>1</sup> *1. College of Electrical Engineering, Zhejiang University, Hangzhou, China*

**CU-06. A Study of Non-symmetric Double-sided Linear Induction Motor for Hyperloop All-in-one system(Propulsion, Levitation, Guidance).** *W. Ji*<sup>1</sup>, *G. Jeong*<sup>2</sup>, *H. Kim*<sup>2</sup> and *H. Lee*<sup>1</sup>  
*1. Railway Vehicle System Engineering, Korea National University of Transportation, Incheon, The Republic of Korea; 2. Hanyang University, Seoul, The Republic of Korea*

**CU-07. Design and analysis of a novel rotary-linear motor with voice coil structure.** *F. Xing*<sup>1</sup> and *B. Kwon*<sup>1</sup> *1. Hanyang University, Ansan, The Republic of Korea*

- CU-08. Design and Experimental Analysis of a 3kW Single-Phase Linear Permanent Magnet Generator for Stirling Engines.** K. Lee<sup>1,2</sup>, S. Lee<sup>1</sup>, J. Park<sup>1</sup>, J. Choi<sup>2</sup> and K. Sim<sup>3</sup> 1. Korea Institute of Industrial Technology, Gwangju, The Republic of Korea; 2. Electrical engineering, Chungnam National University, Daejeon, The Republic of Korea; 3. Seoul National University of Science and Technology, Seoul, The Republic of Korea
- CU-09. Cost and detent force reduction in a permanent magnet linear motor by using different PM materials.** X. Liu<sup>1,2</sup>, D. Gerada<sup>2,3</sup>, Z. Xu<sup>2,3</sup>, C. Gerada<sup>2,3</sup> and H. Yu<sup>1</sup> 1. Department of Electrical Engineering, Southeast University, Nanjing, JiangSu, China; 2. Power Electronics, Machines and Control Group, The University of Nottingham, Nottingham, United Kingdom; 3. Department of Electrical and Electronic Engineering, University of Nottingham, Ningbo, China
- CU-10. Torque Analysis and Optimal Design of a Three-Degrees-of-Freedom Maglev Permanent Magnet Linear Motor.** F. Xing<sup>1</sup>, B. Kou<sup>1</sup>, T. Wang<sup>1</sup>, C. Zhang<sup>1</sup> and Y. Zhou<sup>1</sup> 1. Harbin Institute of Technology, Harbin, China
- CU-11. A Robust Multimodal Optimization Strategy for a Tubular Voice Coil Motor Design in Linear Slit Stage.** J. Lim<sup>1</sup> and D. Lim<sup>2</sup> 1. Magnetic Levitation and Linear Drive, Korea Institute of Machinery & Materials (KIMM), Daejeon, The Republic of Korea; 2. Electrical Engineering, University of Ulsan, Ulsan, The Republic of Korea
- CU-12. A Study on Performance Improvement of Spherical Multi-DOF Motor.** S. Cho<sup>1</sup>, J. Lim<sup>1</sup>, K. Joo<sup>1</sup>, S. Oh<sup>1</sup>, D. Kang<sup>2</sup> and J. Lee<sup>1</sup> 1. Electrical Engineering, Hanyang University, Seoul, The Republic of Korea; 2. Keimyung University, Daegu, The Republic of Korea
- CU-13. A novel Switched Halbach Electro-magnetic linear actuating valve for Aerospace vehicle.** V.R. Bommadevara<sup>1</sup> 1. Electrical Engineering, IIT Hyderabad, India
- CU-14. Electromagnetic optimization and minimization of detent force for linear permanent magnet vernier motor.** Y. Shao<sup>1</sup>, H. Zhang<sup>1</sup> and B. Kou<sup>1</sup> 1. Harbin Institute of Technology, Harbin, China
- CU-15. Design Optimization of High Force Density Linear Switched Reluctance Motor with Segmental Stator for Long Distance Propulsion Applications.** H. Zheng<sup>1</sup>, X. Du<sup>1</sup>, D. Zhang<sup>1</sup>, D. Wang<sup>1</sup>, L. Wang<sup>1</sup> and X. Wang<sup>1</sup> 1. Shandong University, Tsinan, China
- CU-16. Design of 2-Phase Slotless Actuator with New Winding Structure for Position Control of Multi-DOF Motor.** H. Hong<sup>1</sup>, H. Kim<sup>1</sup>, S. Oh<sup>1</sup> and J. Lee<sup>1</sup> 1. Hanyang University, Seoul, The Republic of Korea

**Session CV**  
**SENSORS: FRONTIER APPLICATIONS II**  
**(Poster Session)**

Yuan-Chieh Tseng, Chair  
National Chiao Tung University, Hsin-chu, Taiwan

- CV-01. Nondestructive Testing for Shallow Defect of Ferromagnetic Objects Based on Magnetic Probe Structure.** *S. Pan<sup>1</sup>, D. Zhang<sup>1</sup> and E. Zhang<sup>1</sup>*. *1. Power Electronic and Motion Control Research Center, Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, China*
- CV-02. DC-arcing detection by noise measurement with magnetic sensing by TMR sensors.** *W. Miao<sup>1</sup>, X. Liu<sup>1</sup>, S.K. Lam<sup>1</sup> and P. Pong<sup>1</sup>*. *1. The University of Hong Kong, Hong Kong*
- CV-03. Structural Health Monitoring using magnetostrictive sensors.** *Z. Leong<sup>1</sup>, L. Chan<sup>1</sup>, W. Holmes<sup>1</sup>, J. Clarke<sup>1</sup>, N. Walters<sup>1</sup>, S. Hayes<sup>1</sup> and N. Morley<sup>1</sup>*. *1. Materials Science and Engineering, University of Sheffield, Sheffield, United Kingdom*
- CV-04. Serial MTJ sensors for detection back-side defects by eddy current testing.** *Z. Jin<sup>1</sup>, M. Oogane<sup>1</sup>, M.B. Mohd Noor Sam<sup>1</sup>, K. Fujiwara<sup>1</sup> and Y. Ando<sup>1</sup>*. *1. Applied Physics, Tohoku University, Sendai, Japan*
- CV-05. Detection of Slit Defects on Backside of Steel Plate Using Low-Frequency Eddy-Current-Testing.** *W. Yoshimura<sup>1</sup>, R. Tanaka<sup>1</sup>, T. Sasayama<sup>1</sup> and K. Enpuku<sup>1</sup>*. *1. Kyushu University, Fukuoka, Japan*
- CV-06. Detection and identification of object based on a magnetostrictive tactile sensing system.** *B. Zhang<sup>1</sup>, B. Wang<sup>1</sup>, Y. Li<sup>1</sup>, W. Huang<sup>1</sup> and L. Weng<sup>1</sup>*. *1. Hebei University of Technology, Tianjin, China*
- CV-07. Strategy for determining a magnet position in a 2D space using 1D sensors.** *P.M. Ribeiro<sup>1</sup>, M. Neto<sup>1</sup> and S. Cardoso de Freitas<sup>1</sup>*. *1. INESC - Microsistemas e Nanotecnologias and IN, Lisbon, Portugal*
- CV-08. Analysis of a Defect Signal Deformations Induced by Eddy Current in RFECT System for Pipeline Inspection.** *H. Kim<sup>1</sup>, H. Yoo<sup>2</sup> and G. Park<sup>3</sup>*. *1. Electrical and Computer Engineering, Pusan National University, Busan, The Republic of Korea; 2. Korea Gas Corporation, Incheon, The Republic of Korea; 3. Electrical Engineering, Pusan National University, Busan, The Republic of Korea*
- CV-09. Fault Line Identification of HVDC Transmission Line by Frequency Spectrum Correlation Based on Capacitive-Coupling and Magnetic-Field-Sensing.** *K. Zhu<sup>1</sup>, W. Lee<sup>1</sup> and P. Pong<sup>1</sup>*. *1. Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong*

- CV-10. Searching an avalanche victim using a transmitter with a rotating magnetic dipole.** *A. Chiba*<sup>1</sup> and *T. Nara*<sup>1</sup>  
1. *The University of Tokyo, Tokyo, Japan*
- CV-11. Determination Scheme for Accurate Defect Depth in Underground Pipeline Inspection by Using Magnetic Flux Leakage Sensors.** *H. Kim*<sup>1</sup>, *C. Heo*<sup>1</sup>, *S. Cho*<sup>3</sup> and *G. Park*<sup>2</sup>  
1. *Electrical and Computer Engineering, Pusan National University, Busan, The Republic of Korea*; 2. *Electrical Engineering, Pusan National University, Busan, The Republic of Korea*; 3. *Korea Gas Corporation, Incheon, The Republic of Korea*
- CV-12. Detecting method of hardened depth in surface hardened steel by magnetic field on steel.** *Y. Gotoh*<sup>1</sup>, *S. Onita*<sup>2</sup>, *T. Horino*<sup>2</sup> and *Y. Misaka*<sup>2</sup> 1. *Innovative Engineering, Faculty of Science and Technology, Oita University, Oita, Japan*; 2. *Research and Development Center, Neturen Co., Ltd., Hiratsuka, Japan*
- CV-13. Electromagnetic inspection for detecting defect of underground part in road sign pillar.** *Y. Gotoh*<sup>1</sup>, *M. Tohara*<sup>2</sup> and *R. Nakamura*<sup>3</sup> 1. *Innovative Engineering, Faculty of Science and Technology, Oita University, Oita, Japan*; 2. *Mechanical and Energy Systems Engineering, Oita University, Oita, Japan*; 3. *Division of Technical administration, Japan Non-Destructive Inspection Inc., Kurashiki, Japan*
- CV-14. Investigation of Magnetic Tunnel Junction Sensor for Magnetic Flux Leakage Testing of Reinforced Concrete.** *M.B. Mohd Noor Sam*<sup>1</sup>, *Z. Jin*<sup>1</sup>, *M. Oogane*<sup>1</sup>, *K. Fujiwara*<sup>1</sup> and *Y. Ando*<sup>1</sup> 1. *Applied Physics, Tohoku University, Sendai, Japan*
- CV-15. A New Design of MFL Sensors for Self-Driving NDT Robot to Avoid Getting Stuck in Curved Underground Pipelines.** *H. Kim*<sup>1</sup>, *H. Yoo*<sup>2</sup> and *G. Park*<sup>3</sup> 1. *Electrical and Computer Engineering, Pusan National University, Busan, The Republic of Korea*; 2. *Korea Gas Corporation, Incheon, The Republic of Korea*; 3. *Electrical Engineering, Pusan National University, Busan, The Republic of Korea*
- CV-16. A High-Field Tunneling Magnetoresistive Angle Sensor.** *J. Deak*<sup>1</sup> and *I. Jin*<sup>2</sup> 1. *R&D, MultiDimension Technology Co., Ltd, Zhangjiagang, China*; 2. *Wafer Front End, MultiDimension Technology Co., Ltd, San Jose, CA, United States*

Session CW

**SENSORS: FUNDAMENTAL DEVELOPMENTS AND  
MATERIALS II  
(Poster Session)**

Alexander Samardak, Chair

Far Eastern Federal University, Vladivostok, Russian Federation

- CW-01. Frequency Characteristics of an Optical Current Sensor Based on Rare Earth Materials.** W. Sima<sup>1</sup>, Y. Wang<sup>1</sup>, M. Yang<sup>1</sup> and R. Zheng<sup>1</sup> *1. State Key Laboratory of Power Transmission Equipment & System Security and New Technology, Chongqing University, Chongqing, China*
- CW-02. Current annealing of glass-coated amorphous wire for noise reduction of low-offset fundamental mode orthogonal fluxgate.** N. Murata<sup>1,2</sup> and R. Nomura<sup>1</sup> *1. Environmental Test Technology Unit, Japan Aerospace Exploration Agency (JAXA), Tsukuba, Japan; 2. Department of Space and Astronautical Science, The Graduate University for Advanced Studies, Sagami-hara, Japan*
- CW-03. High frequency and sensitivity magnetic core with amorphous HB1-M operate at electromagnetic interface characteristic.** C. Hsu<sup>1</sup>, C. Chang<sup>3</sup> and C. Tseng<sup>2</sup> *1. Department of Mechanical Engineering, Oriental Institute of Technology, New Taipei city, Taiwan; 2. Division of Physics, Institute of Nuclear Energy Research, Taoyuan, Taiwan; 3. Department of Information and Telecommunications Engineering, Ming Chuan University, Taoyuan, Taiwan*
- CW-04. Noise suppression and sensitivity manipulation of magnetic tunnel junction sensors with soft magnetic Co<sub>70.5</sub>Fe<sub>4.5</sub>Si<sub>15</sub>B<sub>10</sub> layer.** L. Huang<sup>1</sup>, Z. Yuan<sup>1</sup>, B. Tao<sup>1</sup>, C. Wan<sup>1</sup>, P. Guo<sup>1</sup>, Q. Zhang<sup>1</sup>, L. Yin<sup>1</sup>, J. Feng<sup>1</sup>, T. Nakano<sup>2</sup>, H. Naganuma<sup>2</sup>, H. Liu<sup>1</sup>, Y. Yan<sup>3</sup> and X. Han<sup>1</sup> *1. State Key Lab of Magnetism, Institute of Physics, Beijing, China; 2. Tohoku University, Sendai, Japan; 3. Jilin University, Changchun, China*
- CW-05. Tuning antiparallel pinned spin valves with modified artificial antiferromagnetic layer for full-bridge magnetic sensors.** V. Luong<sup>1</sup>, A. Nguyen<sup>1</sup> and H. Tran Thi<sup>1</sup> *1. International Training Institute for Materials Science, Hanoi University of Science and Technology, Ha Noi, Vietnam*
- CW-06. Hybrid planar hall effect and giant magnetoresistance sensors based on ferromagnetic/nonmagnetic/ferromagnetic multi-domain structures.** A. Elzawy<sup>1,2</sup>, A. Talantsev<sup>1,3</sup> and C. Kim<sup>1</sup> *1. Emerging materials science, Daegu Gyeongbuk Institute of Science & Technology (DGIST), Daegu, The Republic of Korea; 2. Ceramics Department, National Research Centre, Cairo, Egypt; 3. Institute of Problems of Chemical Physics, Moscow, Russian Federation*

- CW-07. Anisotropy control of magnetostrictive film using thermal stress and its application for sensor device.** *S. Hashi<sup>1</sup>, D. Sora<sup>1</sup>, Y. Kubo<sup>1</sup>, K. Arai<sup>1</sup> and K. Ishiyama<sup>1</sup>* *I. Resarch Institute of Electrical Communication, Tohoku University, Sendai, Japan*
- CW-08. A Self-biased Anisotropic Magneto-resistive (AMR) Magnetic Field Sensor on Flexible Kapton.** *C. Wang<sup>1</sup>, W. Su<sup>1</sup>, J. Pu<sup>1</sup>, Z. Hu<sup>1</sup> and M. Liu<sup>1</sup>* *I. Electronic Materials Research Laboratory, Key Laboratory of the Ministry of Education & International Center for Dielectric Research, Xi'an Jiaotong University, Xi'an, China*
- CW-09. A flexible magnetoelectric transducer based on FeCuNbSiB/poly (vinylidene fluoride) (PVDF) laminate composites for wearable magnetic sensors.** *X. He<sup>1</sup>, J. Qiu<sup>1</sup>, Y. Long<sup>1</sup>, Q. Chang<sup>1</sup>, Z. Hu<sup>1</sup> and H. Liu<sup>1</sup>* *I. College of Optoelectronic Engineering, Chongqing University, Chongqing, China*
- CW-10. Flat bandwidth expansion for spin-valve GMR magnetic field sensors.** *Y. Chiang<sup>1</sup>, X. Trinh<sup>1</sup> and J. Jeng<sup>1</sup>* *I. Mechanical Engineering, National Kaohsiung University of Applied Sciences, Kaohsiung, Taiwan*
- CW-11. High isotropic magnetic sensor based on ring Terfenol-D / PZT composites.** *W. Wang<sup>1</sup>, J. Ouyang<sup>1</sup>, X. Wu<sup>1</sup>, Y. Ren<sup>1</sup>, J. Liang<sup>1</sup>, S. Chen<sup>1</sup> and X. Yang<sup>1</sup>* *I. School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, China*
- CW-12. Incident power dependence on magnetoimpedance element with domain wall resonance.** *C. Sumida<sup>1</sup> and H. Kikuchi<sup>1</sup>* *I. Iwate University, Morioka, Japan*
- CW-13. Influence of substrate material and geometry on giant magnetoimpedance of NiFe composite wires.** *K. Roy<sup>1</sup> and V. Srinivas<sup>1</sup>* *I. Department of Physics, Indian Institute of Technology Madras, Chennai, India*
- CW-14. Fabrication of ferromagnetic Co-MgF<sub>2</sub> granular film with high transmittance and large Faraday-effect for optical magnetic field sensor.** *M. Miyamoto<sup>1,2</sup>, T. Kubo<sup>2</sup>, Y. Fujishiro<sup>1</sup>, K. Shiota<sup>1</sup>, M. Sonehara<sup>1</sup> and T. Sato<sup>1</sup>* *I. Shinshu University, Nagano, Japan; 2. Citizen Finedevice Co., Ltd., Kitasaku-gun, Japan*
- CW-15. Effect of Annealing Temperature on GMI in NiFe Thin Films.** *L. Zhu<sup>1</sup>, F. Jin<sup>1</sup>, K. Dong<sup>1</sup>, W. Mo<sup>1</sup> and J. Song<sup>1</sup>* *I. China University of Geosciences, Wuhan, China*
- CW-16. Effect of amorphous wire core diameter on the noise of an orthogonal fluxgate.** *M. Butta<sup>1</sup>, M. Janosek<sup>1</sup>, B. Schutte<sup>1</sup>, M. Vázquez<sup>2</sup>, R. Perez del Real<sup>2</sup>, E. Calle<sup>2</sup> and A. Jimenez<sup>2</sup>* *I. Faculty of Electrical Engineering, Czech Technical University in Prague, Praha, Czechia; 2. Institute of Materials Science of Madrid (ICMM-CSIC), Madrid, Spain*

**Session DA**  
**SYMPOSIUM ON MAGNETISM IN BIOMEDICINE:**  
**WHERE NEXT?**

Montserrat Rivas, Chair  
Universidad de Oviedo, Gijón, Spain

**2:00**

- DA-01. In-situ Studies of the Dynamical Magnetic Response of Iron Oxide Nanoparticles in Cellular Environments. (Invited)** D. Cabrera<sup>1,2</sup>, N. Telling<sup>1</sup>, A. Coene<sup>3</sup>, J. Leliaert<sup>4</sup>, E. Artés-Ibáñez<sup>2</sup>, L. Dupré<sup>3</sup> and F. Teran<sup>2</sup> *1. Institute for Science and Technology in Medicine, Keele University, Stoke-on-Trent, United Kingdom; 2. Campus Universitario de Cantoblanco, iMdea Nanociencia, Madrid, Spain; 3. Department of Electrical Energy, Metals, Mechanical Constructions and Systems, Ghent University, Zwijnaarde, Belgium; 4. Department of Solid State Sciences, Ghent University, Ghent, Belgium*

**2:30**

- DA-02. Design and Medical Applications of a Platform for Image-Guided Non-Invasive Brain Delivery of Magnetic Particles. (Invited)** J. Benlloch<sup>1</sup>, I. Weinberg<sup>1</sup> *1. I3M, Valencia, Spain*

**3:00**

- DA-03. Magnetoelectric biomaterials for advanced tissue engineering applications. (Invited)** S. Lanceros-Mendez<sup>1</sup>, C. Ribeiro<sup>2</sup>, S. Ribeiro<sup>2</sup>, M. Fernandes<sup>2</sup>, N. Castro<sup>1</sup> and V. Correia<sup>2</sup> *1. BCMaterials, Leioa, Spain; 2. Universidade do Minho, Braga, Portugal*

**3:30**

- DA-04. In Vivo Magnetic Recording of Neuronal Activity. (Invited)** M. Pannetier-Lecoer<sup>1</sup>, V. Trauchessec<sup>1</sup>, T. Wunderle<sup>2</sup>, L. Caruso<sup>1</sup>, J. Trejo-Rosillo<sup>1</sup>, C.M. Lewis<sup>2</sup>, J. Valadeiro<sup>3</sup>, J. Ni<sup>2</sup>, P. Jendritza<sup>2</sup>, C. Fermon<sup>1</sup>, S. Cardoso de Freitas<sup>3</sup>, P. Freitas<sup>3</sup> and P. Fries<sup>2</sup> *1. SPEC, CEA Saclay, Gif sur Yvette, France; 2. Ernst Strüngmann Institute (ESI) for Neuroscience in Cooperation with Max Planck Society, Frankfurt, Germany; 3. Instituto de Engenharia de Sistemas e Computadores – Microsistemas e Nanotecnologias, Lisbon, Portugal*

**Session DB**  
**MAGNETIC FLUIDS AND ORGANIC MAGNETIC**  
**MATERIALS I**

Guoqiang Yu, Chair  
Institute of physics, Chinese Academy of Sciences, Beijing, China

2:00

- DB-01. Organic Ligand Induced Ferromagnetism in Ni doped ZnO films.** *S. Nallusamy*<sup>1</sup> and *G. Nammalvar*<sup>1</sup> *1. Physics, National Institute of Technology, Tiruchirappalli, India*

2:15

- DB-02. Uniaxial 2D Superlattice of Fe<sub>4</sub> Molecular Magnets on Graphene.** *M. Fonin*<sup>1</sup>, *F. Paschke*<sup>1</sup>, *L. Gragnaniello*<sup>1</sup>, *P. Erler*<sup>1</sup>, *H. Brune*<sup>2</sup> and *S. Rusponi*<sup>2</sup> *1. University of Konstanz, Konstanz, Germany; 2. EPFL, Lausanne, Switzerland*

2:30

- DB-03. Spin dependent charge trapping in a MnO<sub>2</sub>/C<sub>60</sub> heterojunction.** *T. Moorsom*<sup>1</sup>, *M. Rogers*<sup>1</sup>, *G. Teobaldi*<sup>2</sup>, *M. Valvidares*<sup>3</sup>, *S. Lee*<sup>4</sup>, *R. Stewart*<sup>4</sup>, *T. Prokscha*<sup>5</sup>, *H. Leutkens*<sup>5</sup>, *P. Gargiani*<sup>3</sup>, *D. Bromley*<sup>1</sup>, *M. Ali*<sup>1</sup>, *F. Al Ma'Mari*<sup>6</sup>, *G. Burnell*<sup>1</sup>, *B. Hickey*<sup>1</sup> and *O. Cespedes*<sup>1</sup>  
*1. University of Leeds, Leeds, United Kingdom; 2. Stephenson Institute of Renewable Energy, University of Liverpool, Liverpool, United Kingdom; 3. ALBA Synchrotron, Barcelona, Spain; 4. University of St Andrews, St Andrews, United Kingdom; 5. Paul Scherrer Institut, Villigen, Switzerland; 6. Sultan Qaboos University, Muscat, Oman*

2:45

- DB-04. Carbon-coated nanoparticles of zinc-doped iron oxides for magnetic separation of organic pollutants: structure, magnetism and separation performance.** *L. Kubickova*<sup>1,2</sup>, *J. Koktan*<sup>1</sup>, *T. Korinkova*<sup>1</sup>, *M. Klementova*<sup>1</sup>, *T. Kmjec*<sup>2</sup>, *J. Kohout*<sup>2</sup>, *P. Rezanka*<sup>3</sup> and *O. Kaman*<sup>1</sup> *1. Department of Magnetism and Superconductors, Academy of Sciences of the Czech Republic, Prague, Czechia; 2. Department of Low-Temperature Physics, Charles University, Prague, Czechia; 3. Department of Analytical Chemistry, University of Chemistry and Technology, Prague, Czechia*

3:00

- DB-05. Singlet ground state in the spin-1/2 weakly coupled dimer compound NH<sub>4</sub>[(V<sub>2</sub>O<sub>3</sub>)<sub>2</sub>(4,4'-bpy)<sub>2</sub>(H<sub>2</sub>PO<sub>4</sub>)(PO<sub>4</sub>)<sub>2</sub>].0.5H<sub>2</sub>O.** *A. Unnikrishnan*<sup>1</sup>, *V. Kumar*<sup>4</sup>, *P. Anjana*<sup>2</sup>, *A. Thirumurugan*<sup>2</sup>, *J. Sichelschmidt*<sup>3</sup>, *A. Mahajan*<sup>4</sup> and *R. Nath*<sup>1</sup> *1. School of Physics, Indian Institute of Science Education and Research, Thiruvananthapuram, India; 2. School of Chemistry, Indian Institute of Science Education and Research, Thiruvananthapuram, India; 3. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 4. Department of Physics, Indian Institute of Technology Bombay, Mumbai, India*

- DB-06. Spinterface induced magnetic properties in Fe or Co thin films.** S. Mallik<sup>1</sup>, S. Mattauch<sup>2</sup>, M.K. Dalai<sup>3</sup>, T. Brückel<sup>2</sup> and S. Bedanta<sup>1</sup> *1. Physics, National Institute of Science Education and Research (NISER), Bhubaneswar, India; 2. Jülich Centre for Neutron Science (JCNS), Munich, Germany; 3. CSIR–National Physical Laboratory, New Delhi, India*

- DB-07. Evaluation of Local Anisotropy of Magnetic Response from Non-oriented Electrical Steel by Magnetic Barkhausen Noise.** Y. He<sup>2</sup>, M. Mehdi<sup>1,2</sup>, E. J. Hilinski<sup>3</sup>, A. Edrissy<sup>1</sup>, S. Mukundan<sup>4</sup>, A. Mollaeian<sup>4</sup> and N. C. Kar<sup>4</sup> *1. Mechanical, Automotive, and Materials Engineering, University of Windsor, Windsor, ON, Canada; 2. CanmetMATERIALS, Hamilton, ON, Canada; 3. Tempel Steel Co, Chicago, IL, United States; 4. Electrical and computer engineering, University of Windsor, Windsor, ON, Canada*

- DB-08. 5% Superelasticity in Ferromagnetic FeNiCoAl Cold-Drawn Rapidly Quenched Microwires for Medical Applications.** F. Borza<sup>1</sup>, V. Dobra<sup>1</sup>, L. Bujoreanu<sup>2</sup>, M. Grigoras<sup>1</sup>, G. Ababei<sup>1</sup> and N. Lupu<sup>1</sup> *1. National Institute of Research and Development for Technical Physics, Iasi, Romania; 2. Faculty of Materials Science and Engineering, “Gheorghe Asachi” Technical University of Iasi, Iasi, Romania*

WEDNESDAY  
AFTERNOON  
2:00

ORCHID IV

**Session DC**  
**SPIN-TRANSPORT WITH TOPOLOGICAL**  
**MATERIALS**

Kyung-Jin Lee, Chair  
Korea University, Seoul, The Republic of Korea

- DC-01. Bilinear magnetoelectric resistance for spin texture detection in topological insulators.** P. He<sup>1</sup>, S. Zhang<sup>2,3</sup>, D. Zhu<sup>1</sup>, Y. Liu<sup>1</sup>, Y. Wang<sup>1</sup>, G. Vignale<sup>2</sup> and H. Yang<sup>1</sup> *1. National University of Singapore, Singapore; 2. Department of Physics and Astronomy, University of Missouri, Columbia, MO, United States; 3. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States*

- DC-02. Ultra-low-power spin-orbit-torque switching using the colossal spin Hall effect in BiSb topological insulator.** K.H. Nguyen<sup>1</sup>, Y. Ueda<sup>1</sup> and N. Pham<sup>1,2</sup> *1. Electronic and Electrical Engineering, Tokyo Institute of Technology, Tokyo, Japan; 2. Center for Spintronics Research Network (CSRN), The University of Tokyo, Tokyo, Japan*

2:30

- DC-03. Role of surface states in the generation of the colossal spin Hall effect in BiSb topological insulator.** *K. Yao*<sup>1</sup>, T. Shirokura<sup>1</sup> and N. Pham<sup>1,2</sup> *1. Electrical&Electronic Engineering course, Tokyo Institute of Technology, Tokyo, Japan; 2. Center for Spintronics Research Network, The University of Tokyo, Tokyo, Japan*

2:45

- DC-04. High spin-orbit torque efficiency of *in-situ* fabricated Bi<sub>2</sub>Se<sub>3</sub>/Fe heterostructures.** *D. Zhu*<sup>1</sup>, Y. Wang<sup>1</sup>, S. Shi<sup>1</sup>, K. Teo<sup>1</sup>, Y. Wu<sup>1</sup> and H. Yang<sup>1</sup> *1. Department of Electrical and Computer Engineering, National University of Singapore, Singapore*

3:00

- DC-05. Spin and charge conversion in topological surface states and oxide interface states. (Invited)** *W. Han*<sup>1</sup> *1. International Center for Quantum Materials, Peking University, Beijing, China*

3:30

- DC-06. Highly efficient spin-to-charge current conversion at room temperature in strained HgTe surface states. (Invited)** P. Noel<sup>1</sup>, C. Thomas<sup>2,3</sup>, L. Vila<sup>1</sup>, T. Meunier<sup>3</sup>, P. Ballet<sup>2</sup> and J. Attané<sup>1</sup> *1. INAC, Spintec, Université Grenoble Alpes, Grenoble, France; 2. Leti/Dopt, CEA, Grenoble, France; 3. Institut Néel, C.N.R.S. and Université Grenoble Alpes, Grenoble, France*

WEDNESDAY  
AFTERNOON  
2:00

PEONY IV

### Session DD

## NEUROMORPHIC COMPUTING

Susana Cardoso de Freitas, Co-Chair  
INESC-MN, Lisbon, Portugal

Myriam Pannetier-Lecoœur, Co-Chair  
CEA Saclay, Gif sur Yvette, France

2:00

- DD-01. Neuromorphic computing with spintronic devices. (Invited)** *J. Grollier*<sup>1</sup> *1. Unité Mixte CNRS/Thales, Palaiseau, France*

2:30

- DD-02. Low energy implementation of feedforward neural network with backpropagation algorithm using a spin orbit torque driven skyrmionic device.** U. Saxena<sup>1</sup>, D. Kaushik<sup>1</sup>, M. Bansal<sup>1</sup>, H. Chandel<sup>1</sup>, U. Sahu<sup>1</sup> and D. Bhowmik<sup>1</sup> *1. Electrical Engineering, Indian Institute of Technology Delhi, New Delhi, India*

2:45

- DD-03. Circuit-level Design and Evaluation of STT-MRAM based Binary Winner-Takes-All Network for Image Recognition.** C. Wang<sup>1,2</sup>, D. Zhang<sup>1,2</sup>, Y. Hou<sup>1,2</sup>, L. Zeng<sup>1,2</sup>, J. Klein<sup>3</sup> and W. Zhao<sup>1,2</sup> *1. Fert Beijing Institute, BDBC, Beihang University, Beijing, China; 2. School of Electrical and Information Engineering, Beihang University, Beijing, China; 3. Centre de Nanoscience et de Nanotechnologies (C2N-Orsay), University of Paris-Sud, Orsay, France*

3:00

- DD-04. AFM-based artificial neurons for ultrafast neuromorphic computing. (Invited)** O. Sulymenko<sup>3</sup>, R. Khymyn<sup>2</sup>, V.S. Tiberkevich<sup>1</sup>, J. Åkerman<sup>2</sup> and A.N. Slavin<sup>1</sup> *1. Physics, Oakland University, Rochester Hills, MI, United States; 2. Physics, University of Gothenburg, Gothenburg, Sweden; 3. Radiophysics, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine*

3:30

- DD-05. Domain wall based Mackey-Glass oscillator for neuromorphic applications.** J. Williams<sup>1</sup> and J. Kim<sup>1</sup> *1. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Sud, Université Paris-Saclay, Orsay, France*

3:45

- DD-06. Neuromorphic computing using spin-transfer torque magnetic random access memory (STT-MRAM).** J. Moon<sup>1</sup> and K. Lee<sup>1,2</sup> *1. Department of Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 2. KU-KIST Graduate School of Converging Science and Technology, Korea University, Seoul, The Republic of Korea*

WEDNESDAY  
AFTERNOON  
2:00

ROSELLE II

**Session DE**  
**ANTIFERROMAGNETIC SPINTRONICS**

Young Sun, Chair  
Institute of Physics, Chinese Academy of Sciences, Beijing, China

2:00

- DE-01. Role of thermal activation in the electrical switching of antiferromagnetic Mn<sub>2</sub>Au and CuMnAs.** T. Matalla-Wagner<sup>1</sup>, D. Graulich<sup>1</sup>, M. Rath<sup>1</sup> and M. Meinert<sup>1</sup> *1. Faculty of Physics, Bielefeld University, Bielefeld, Germany*

2:15

- DE-02. Spin transport thru antiferromagnetic NiO in Bi<sub>2</sub>Se<sub>3</sub>/NiO/Py heterostructures.** Y. Wang<sup>1</sup>, D. Zhu<sup>1</sup>, J. Lee<sup>1</sup>, Y. Yang<sup>1</sup>, R. Ramaswamy<sup>1</sup>, K. Teo<sup>1</sup>, Y. Wu<sup>1</sup> and H. Yang<sup>1</sup> *1. Department of Electrical and Computer Engineering, National University of Singapore, Singapore*

2:30

- DE-03. Giant Spin-Hall Angle in Epitaxial L1<sub>0</sub>-IrMn.** J. Zhou<sup>1</sup>, X. Wang<sup>3</sup>, J. Yu<sup>1</sup>, Q. Qin<sup>1</sup>, L. Liu<sup>1</sup>, S. Chen<sup>1</sup>, J. Deng<sup>1</sup>, H. Yoong<sup>1</sup>, P. Yang<sup>2</sup>, X. Han<sup>3</sup> and J. Chen<sup>1</sup> 1. *Material Science & Engineering, National University of Singapore, Singapore*; 2. *Singapore Synchrotron Light Source, National University of Singapore, Singapore*; 3. *Institute of Physics and Beijing National Laboratory for Condensed Matter Physics, Chinese Academy of Sciences, Beijing, China*

2:45

- DE-04. Spin-Hall and Anisotropic Magnetoresistance effects in Layered Structures with Ferrimagnetic Co-Gd alloys.** T. Seki<sup>1</sup>, W. Zhou<sup>1</sup>, T. Kubota<sup>1</sup> and K. Takanashi<sup>1</sup> 1. *Tohoku University, Sendai, Japan*

3:00

- DE-05. Spin-orbit torque in antiferromagnets.** C. Song<sup>1</sup>, X. Zhou<sup>1</sup>, X. Chen<sup>1</sup>, P. Zhang<sup>1</sup>, G. Shi<sup>1</sup> and F. Pan<sup>1</sup> 1. *Department of Materials Science and Engineering, Tsinghua University, Beijing, China*

3:15

- DE-06. Micromagnetic simulations of spin-Hall driven dynamics in an antiferromagnet.** V. Puliafito<sup>1</sup>, M. Carpentieri<sup>2</sup>, B. Azzaroni<sup>1</sup>, V.S. Tiberkevich<sup>3</sup>, A.N. Slavin<sup>3</sup> and G. Finocchio<sup>4</sup> 1. *Department of Engineering, University of Messina, Messina, Italy*; 2. *Department of Electrical and Information Engineering, Politecnico di Bari, Bari, Italy*; 3. *Department of Physics, Oakland University, Rochester, MI, United States*; 4. *Department of Mathematical and Computer Science, Physical Sciences and Earth Sciences, University of Messina, Messina, Italy*

3:30

- DE-07. Terahertz-frequency AC signal source based on antiferromagnetic tunnel junction.** O. Sulymenko<sup>1</sup>, O. Prokopenko<sup>1</sup>, A.N. Slavin<sup>2</sup> and V.S. Tiberkevich<sup>2</sup> 1. *Faculty of Radio Physics, Electronics and Computer Systems, Taras Shevchenko National University of Kyiv, Kiev, Ukraine*; 2. *Department of Physics, Oakland University, Rochester, MI, United States*

3:45

- DE-08. Injection-locking of a nonlinear sub-THz antiferromagnetic spin-Hall oscillator.** R. Khymyn<sup>1</sup>, V.S. Tiberkevich<sup>2</sup>, A.N. Slavin<sup>2</sup> and J. Åkerman<sup>1,3</sup> 1. *Department of Physics, University of Gothenburg, Gothenburg, Sweden*; 2. *Department of Physics, Oakland University, Rochester, MI, United States*; 3. *Department of Applied Physics, KTH Royal Institute Technology, Stockholm, Sweden*

**Session DF**  
**HEAT ASSISTED RECORDING PHYSICS**

Kaizhong Gao, Chair  
Argonne National Laboratory, North Oaks, MN, United States

**2:00**

**DF-01. Thermally induced magnetisation switching: basic physics and potential for a new storage technology. (Invited)**

R.F. Evans<sup>1</sup>, T. Ostler<sup>3</sup>, O. Chubykalo-Fesenko<sup>2</sup> and R.W. Chantrell<sup>1</sup> 1. Physics, The University of York, York, United Kingdom; 2. Institute of Materials Science of Madrid (ICMM-CSIC), Madrid, Spain; 3. Faculty of Arts, Computing, Engineering and Sciences, Sheffield Hallam University, Sheffield, United Kingdom

**2:30**

**DF-02. Micromagnetics at Finite Temperature. (Invited) D. Wei<sup>1</sup>**

1. School of Materials Science and Engineering, Tsinghua University, Beijing, China

**3:00**

**DF-03. Impact of intergrain spin transfer torques due to huge thermal gradients on the performance of heat assisted magnetic recording. (Invited) B. Dieny<sup>1</sup>, M. Chshiev<sup>1</sup>, B. Charles<sup>1</sup>, N. Strelkov<sup>1,2</sup>, A. Truong<sup>1</sup>, O. Fruchart<sup>1</sup>, A. Hallal<sup>1</sup>, J. Wang<sup>3</sup>, Y. Takahashi<sup>3</sup>, T. Mizuno<sup>4</sup> and K. Hono<sup>3</sup>**

1. SPINTEC, Grenoble Alpes Univ/CEA/CNRS, Grenoble, France; 2. Physics Department, Lomonosov Moscow State University, Moscow, Russian Federation; 3. National Institute for Materials Science, Tsukuba, Japan; 4. Headway Technologies, Milpitas, CA, United States

**3:30**

**DF-04. Effect of Recording Conditions on the Downtrack Thermal Gradient in Heat Assisted Magnetic Recording.**

S. Hernandez<sup>1</sup>, Z. Liu<sup>1</sup>, S.D. Granz<sup>1</sup>, P. Huang<sup>2</sup>, I. Gilbert<sup>1</sup>, D. Mader<sup>1</sup>, M. Blaber<sup>3</sup>, C.J. Rea<sup>3</sup>, G. Ju<sup>2</sup>, T. Rausch<sup>1</sup> and E. Gage<sup>1</sup> 1. Seagate Research Group, Seagate Technology, Shakopee, MN, United States; 2. Recording Media Operations, Seagate Technology, Fremont, CA, United States; 3. Recording Head Operations, Seagate Technology, Bloomington, MN, United States

**3:45**

**DF-05. Understanding of Different Noises in HAMR. Y. Jiao<sup>1</sup> and R.H. Victora<sup>1</sup>**

1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States

**Session DG**

**ENERGY HARVESTERS AND GENERATORS I**

Christopher H. T. Lee, Chair

Massachusetts Institute of Technology, Cambridge, MA, United States

**2:00**

- DG-01. Design and analysis of an integrated electromagnetic energy harvester from water flow.** *T. Wang<sup>1</sup>, Y. Zhang<sup>1</sup> and S. Zhu<sup>1</sup>*  
*1. Zhejiang University, Zhoushan, China*

**2:15**

- DG-02. Investigation of a Novel Dual-PM Partitioned-primary Hybrid-excited Flux-switching Linear Machine.** *Z. Zeng<sup>1</sup> and Q. Lu<sup>1</sup>*  
*1. College of Electrical Engineering, Zhejiang University, Hangzhou, China*

**2:30**

- DG-03. A novel two-degree-of-freedom electromagnetic vibration energy harvester: design, modeling and experiments.** *Z. Wang<sup>1</sup>, S. Wu<sup>1</sup>, T. Yao<sup>2</sup>, D. Lv<sup>1</sup> and H. Zhang<sup>1</sup>*  
*1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin Municipality, China; 2. School of Mechanical Engineering, Hebei University of Technology, Tianjin Municipality, China*

**2:45**

- DG-04. A planar translational permanent magnet generator for an inertial wave energy converter.** *M. Trapanese<sup>1</sup>*  
*1. DEIM, Palermo University, Palermo, Italy*

**3:00**

- DG-05. Ultra small and thin energy-harvesting device based on electromagnetic induction.** *K. Morii<sup>1</sup> and S. Koganezawa<sup>2</sup>*  
*1. Kansai University Graduate School, Suita-shi, Japan; 2. Kansai University, Suita-shi, Japan*

**3:15**

- DG-06. Performance Analysis of a Novel Fall-Back Transverse-Flux Permanent-Magnet Generator with Outer Rotor Design Suitable for Direct-Coupling Wind Turbine.** *M.A. Patel<sup>1</sup> and S.C. Vora<sup>1</sup>*  
*1. Department of Electrical Engineering, Institute of Technology, Nirma University, Ahmedabad, India*

**3:30**

- DG-07. Magnetic field modelling of an Ironless Wind Power Microgenerator.** *V. Verdum<sup>1</sup>, R.P. Homrich<sup>1</sup>, A.F. Flores Filho<sup>1</sup>, M.A. Silveira<sup>2</sup> and D.G. Dorrell<sup>3</sup>*  
*1. Engenharia Elétrica, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil; 2. Engenharia Elétrica, Universidade Luterana do Brasil, Canoas, Brazil; 3. University of KwaZulu-Natal, Durban, South Africa*

- DG-08. Multiple-Objective-Based Optimal Energy Distribution for Wireless Power Transfer.** Z. Zhang<sup>1</sup>, H. Pang<sup>1</sup>, R. Tong<sup>1</sup>, W. Ai<sup>1</sup>, S. Chang<sup>1</sup> and J. Wang<sup>1</sup> *1. School of Electrical and Information Engineering, Tianjin University, Tianjin, China*

WEDNESDAY  
AFTERNOON  
2:00

PEONY II

**Session DH**  
**PERMANENT MAGNET AND RELUCTANCE MACHINES V**

E.A. Lomonova, Chair  
Technische Universiteit Eindhoven, Eindhoven, Netherlands

2:00

- DH-01. Design and Analysis for Torque Ripple Reduction in Synchronous Reluctance Machine.** D. Yan<sup>1</sup>, C. Xia<sup>1,2</sup>, L. Guo<sup>1</sup>, H. Wang<sup>2</sup> and T. Shi<sup>1</sup> *1. School of Electrical and Information Engineering, Tianjin University, Tianjin, China; 2. Tianjin Engineering Center of Electric Machine System Design and Control, Tianjin, China*

2:15

- DH-02. Printed Circuit Axial-Flux Permanent Magnet Machines: A Comparative Analysis of Their PCB Topologies and Performance Characteristics.** S. Paul<sup>2,1</sup>, M. Farshadnia<sup>1</sup>, A. Pouramin<sup>1</sup>, J. Fletcher<sup>1</sup> and J. Chang<sup>2</sup> *1. Electrical Engineering and Telecommunications, University of New South Wales, Kensington, NSW, Australia; 2. Electrical Engineering, Dong-A University, Busan, The Republic of Korea*

2:30

- DH-03. Electromagnetic Performance Analysis of a New Hybrid Excitation Synchronous Machine for Electric Vehicle Applications.** Y. Liu<sup>1</sup>, Z. Zhang<sup>1</sup>, C. Wang<sup>1</sup> and W. Geng<sup>1</sup> *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

2:45

- DH-04. A New Variable Step Skew Approach for Minimizing Torque Pulsations in Permanent Magnet Synchronous Motors.** O. Ocak<sup>1,2</sup> and M. Aydin<sup>2</sup> *1. R&D, Akim Metal A.S., Kocaeli, Turkey; 2. Department of Mechatronics Engineering, Kocaeli University, Kocaeli, Turkey*

3:00

- DH-05. Suppression of Even-Order Harmonics and Torque Ripple in Outer Rotor Consequent-Pole PM Machine with Multilayer Windings.** F. Li<sup>1</sup> and H. Zhang<sup>1</sup> *1. Institute of automation, Nanjing University of Aeronautics and Astronautics, Nan Jing, China*

3:15

**DH-06. A Unified Design Approach of a Direct Drive External-Rotor Switched Reluctance Motor (Ex-R SRM) and its Implementation for a Low-Speed Domestic Appliance with R-dump Converter.** *R. Azhagar<sup>1</sup> and A. Kavitha<sup>1</sup> 1. Electrical and Electronics Engineering, College of Engineering, Anna University, Chennai, India*

3:30

**DH-07. Characteristic Analysis of Turn-to-turn Short Circuit Current Mitigation Method for Concentrated Winding Permanent Magnet Machines.** *Y. Jiang<sup>1</sup>, Z. Zhang<sup>1</sup>, W. Jiang<sup>1</sup>, J. Huang<sup>1</sup> and Y. Xu<sup>1</sup> 1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

3:45

**DH-08. Design and Performance Assessments of a Surface-mounted Permanent-magnet Vernier Motor for Exoskeleton System Application.** *C. Liu<sup>1</sup>, K. Yang<sup>1</sup>, Z. Cai<sup>1</sup>, P. Shih<sup>1</sup> and C. Hwang<sup>2</sup> 1. Department of Electrical Engineering, National Sun Yat-Sen University, Kaohsiung, Taiwan; 2. Department of Electrical Engineering, Feng Chia University, Taichung, Taiwan*

WEDNESDAY  
AFTERNOON  
4:00

ORCHID I-II

**Session PL  
PLENARY**

Sara Majetich, Chair  
Carnegie Mellon University, Pittsburgh, PA, United States

4:00

**Awards Ceremony**

5:00

**PL-01. Spintronics Nanodevices. (Invited) H. Ohno<sup>1,2</sup> 1. Laboratory for Nanoelectronics and Spintronics, Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Center for Spintronics Integrated Systems, Tohoku University, Sendai, Japan**

**Session EA**  
**SYMPOSIUM ON NOVEL HARD MAGNETIC  
MATERIALS AND THEIR APPLICATIONS**

Jinbo Yang, Chair  
Peking University, Beijing, China

**9:00**

- EA-01. Heavy rare earth free, free rare earth and rare earth free magnets - vision and reality. (Invited) O. Gutfleisch<sup>1</sup> and K. Skokov<sup>1</sup>** *1. Material Science, TU Darmstadt, Darmstadt, Germany*

**9:30**

- EA-02. Fe<sub>16</sub>N<sub>2</sub>: from a 40-year mystery of magnetic materials to one of promises for rare-earth-free magnets. (Invited) J. Wang<sup>1,2</sup>, Y. Jiang<sup>1</sup>, M.A. Mehedi<sup>2</sup>, J. Liu<sup>1</sup>, Y. Wu<sup>3</sup> and B. Ma<sup>1</sup>** *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States; 3. Niron Magnetics, Minneapolis, MN, United States*

**10:00**

- EA-03. Rare earth permanent magnets with ultimate hard magnetic properties. (Invited) K. Hono<sup>1,2</sup>** *1. Elements Strategy Initiative Center for Magnetic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan*

**10:30**

- EA-04. Recent developments in melt-spun Nd-Fe-B bonded magnets for automotive applications. (Invited) Z. Chen<sup>1</sup>, W. Zhao<sup>1</sup>, N.K. Sheth<sup>1</sup>, A. Meerani<sup>1</sup> and J. Herchenroeder<sup>1</sup>** *1. Magnequench Technology Center, Neo Performance Materials (S) Pte Ltd, Singapore, Singapore*

**11:00**

- EA-05. Effects of Cerium on Magnetic Properties of Sintered R-Fe-B Permanent Magnets. (Invited) X. Rao<sup>1</sup>, E. Niu<sup>1</sup>, F. Du<sup>1</sup> and B. Hu<sup>1</sup>** *1. Zhong Ke San Huan Research, Beijing, China*

**11:30**

- EA-06. The advances of high-performance permanent magnets by microstructure designing. (Invited) W. Cui<sup>1</sup>** *1. Northeastern University, Shenyang, China*

**Session EB**  
**MAGNETO-ELASTIC AND MAGNETO-OPTIC**  
**MATERIALS**

Victorino Franco, Chair  
University of Sevilla, Sevilla, Spain

9:00

- EB-01. Polymer-based magnetoelectric materials: from fundamentals to applications.** *P. Martins*<sup>1</sup> and *S. Lanceros-Mendez*<sup>2,3</sup> *1. Physics, University of Minho, Braga, Portugal; 2. BCMaterials, Leioa, Spain; 3. Ikerbasque, Basque Foundation for Science, Bilbao, Spain*

9:15

- EB-02. MR Elastomers for Energy Harvesting System.** *G. Diguët*<sup>1</sup>, *G. Sebald*<sup>1</sup>, *M. Nakano*<sup>2,1</sup> and *M. Lallart*<sup>3</sup> *1. ELYTMAX UMI 3757, International Joint Unit, Tohoku University, CNRS, Université de Lyon, Tohoku University, Sendai, Japan; 2. Intelligent Fluid Control Systems Laboratory, Institute of Fluid Science, Tohoku University, Sendai, Japan; 3. LGEF EA682, Université de Lyon, INSA-Lyon, Lyon Villeurbanne, France*

9:30

- EB-03. Dynamic Characterization of a Magnetostrictive-based Sensor for Fast Force Profile Detection.** *V. Apicella*<sup>1</sup>, *C.S. Clemente*<sup>1</sup>, *D. Davino*<sup>1</sup>, *D. Leone*<sup>1</sup> and *C. Visone*<sup>1</sup> *1. Department of Engineering, University of Sannio, Benevento, Italy*

9:45

- EB-04. Effect of substrate temperature driven magnetic anisotropies on the magnetostrictive behaviour of Tb-Fe-Co thin films.** *U. K*<sup>1,2</sup>, *A. Talapatra*<sup>3</sup>, *A. Chelvane*<sup>1</sup>, *J. Mohanty*<sup>3</sup> and *J. V*<sup>2</sup> *1. Defence Metallurgical Research Laboratory, Hyderabad, India; 2. Physics, National Institute of Technology Warangal, Warangal, India; 3. Physics, Indian Institute of Technology Hyderabad, Kandi, Sangareddy, India*

10:00

- EB-05. Investigating the magnetization process of Ni-Mn-Ga films with different types of microstructure.** *F. Casoli*<sup>1</sup>, *S. Fabbri*<sup>1</sup>, *M. Takhsha Ghahfarokhi*<sup>1</sup>, *L. Nasi*<sup>1</sup>, *R. Cabassi*<sup>1</sup>, *G. Varvaro*<sup>2</sup>, *F. Celegato*<sup>3</sup>, *P. Tiberto*<sup>3</sup> and *F. Albertini*<sup>1</sup> *1. IMEM-CNR, Parma, Italy; 2. ISM-CNR, Roma, Italy; 3. INRIM, Torino, Italy*

10:15

- EB-06. Magnetostrictive Behaviors of fcc-Co Single-Crystal Films under Rotating Magnetic Fields.** *T. Kawai*<sup>1</sup>, *K. Serizawa*<sup>1</sup>, *M. Ohtake*<sup>2</sup> and *M. Futamoto*<sup>1</sup> *1. Chuo Univ., Tokyo, Japan; 2. Kogakuin University, Tokyo, Japan*

10:30

- EB-07. Microstructure and elastocaloric effect in as-undercooled Pd<sub>59.3</sub>In<sub>23.2</sub>Fe<sub>17.5</sub> magnetic shape memory alloys.** *Q. Shen*<sup>1</sup> and *J. Liu*<sup>1</sup> *1. Key laboratory of Magnetic Materials and Devices, Ningbo Institute of Material Technology and Engineering, Ningbo, China*

10:45

- EB-08. FDTD simulation of enhanced Faraday effect in plasmonic composite structures with rectangularly arranged Au particles.** *J. Schlipf*<sup>1,2</sup>, *Y. Itabashi*<sup>1</sup>, *T. Goto*<sup>1</sup>, *H. Takagi*<sup>1</sup>, *P.B. Lim*<sup>1</sup>, *Y. Nakamura*<sup>1</sup>, *I.A. Fischer*<sup>2</sup>, *J. Schulze*<sup>2</sup>, *H. Uchida*<sup>1</sup> and *M. Inoue*<sup>1</sup> *1. Toyohashi University of Technology, Toyohashi, Japan; 2. Institut für Halbleitertechnik, University of Stuttgart, Stuttgart, Germany*

11:00

- EB-09. Helicity dependent photovoltaic conversion at nonmagnetic interface with inversion asymmetry.** *F.V. Auvray*<sup>1</sup>, *J. Puebla*<sup>2</sup>, *M. Xu*<sup>1</sup> and *Y. Otani*<sup>1,2</sup> *1. Advanced Materials Science, The University of Tokyo, Kashiwa, Japan; 2. CEMS, RIKEN, Wako, Japan*

11:15

- EB-10. Broadband Magneto-Optical Response of Magnetoplasmonic Quasicrystals.** *A. Kalish*<sup>2,1</sup>, *R. Komarov*<sup>2</sup>, *M. Kozhaev*<sup>1,3</sup>, *V. Achanta*<sup>4</sup>, *S. Dagesyan*<sup>2</sup>, *A. Shaposhnikov*<sup>5</sup>, *V. Berzhansky*<sup>5</sup>, *A. Zvezdin*<sup>1,3</sup> and *V. Belotelov*<sup>1,2</sup> *1. Russian Quantum Center, Skolkovo, Russian Federation; 2. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russian Federation; 3. Prokhorov General Physics Institute of Russian Academy of Sciences, Moscow, Russian Federation; 4. Tata Institute of Fundamental Research, Mumbai, India; 5. V.I. Vernadsky Crimean Federal University, Simferopol, Russian Federation*

11:30

- EB-11. Investigation of amorphous SmFe<sub>2</sub> thin films with giant negative magnetostriction and perpendicular magnetic anisotropy.** *M. Tomita*<sup>1</sup>, *Y. Ishitani*<sup>1</sup>, *S. Ishiyama*<sup>1</sup>, *Y. Takamura*<sup>1</sup> and *S. Nakagawa*<sup>1</sup> *1. Electrical and Electronic Engineering, Tokyo Institute of Technology, Tokyo, Japan*

11:45

- EB-12. Smart Shape Memory Actuator based on Monocrystalline Ni<sub>2</sub>FeGa glass-coded microwire.** *L. Frolova*<sup>1</sup>, *T. Ryba*<sup>2</sup>, *P. Diko*<sup>3</sup>, *V. Kavecansky*<sup>3</sup>, *J. Kravcak*<sup>4</sup>, *Z. Vargova*<sup>5</sup> and *R. Varga*<sup>1,2</sup> *1. Cond. Matt. Phys., Inst. Phys., Fac. Sci., UPJS, Kosice, Slovakia; 2. RVmagnetics a.s., Hodkovce, Slovakia; 3. Inst. Exp. Phys., SAS, Kosice, Slovakia; 4. Dept. Phys., FEEI TUKE, Kosice, Slovakia; 5. Dept. Inorg. Chem., Inst. Chem., Fac. Sci., UPJS, Kosice, Slovakia*

**Session EC**

**GMR, TMR, AND MULTIFERROIC MATERIALS**

Liang Liu, Co-Chair

National University of Singapore, Singapore

Hao Wu, Co-Chair

University of California, Los Angeles, CA, United States

**9:00**

- EC-01. Very large voltage-controlled magnetic anisotropy and extremely reliable voltage-induced switching. (Invited)** *T. Nozaki*<sup>1</sup>, *A. Koziol-Rachwal*<sup>1,2</sup>, *M. Tsujikawa*<sup>3</sup>, *Y. Shiota*<sup>1</sup>, *T. Yamamoto*<sup>1</sup>, *T. Ikeura*<sup>1</sup>, *X. Xu*<sup>5</sup>, *T. Ohkubo*<sup>5</sup>, *T. Tsukahara*<sup>4</sup>, *S. Miwa*<sup>4</sup>, *M. Suzuki*<sup>6</sup>, *H. Imamura*<sup>1</sup>, *S. Tamaru*<sup>1</sup>, *H. Kubota*<sup>1</sup>, *A. Fukushima*<sup>1</sup>, *K. Hono*<sup>5</sup>, *M. Shirai*<sup>3</sup>, *Y. Suzuki*<sup>1,4</sup> and *S. Yuasa*<sup>1</sup> *1. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 2. Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, Al. Mickiewicza 30, 30-059, Poland; 3. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 4. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 5. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 6. Japan Synchrotron Radiation Research Institute (JASRI), Sayo, Japan*

**9:30**

- EC-02. Flexible MgO-based Magnetic Tunnel Junctions on Silicon Substrate.** *S. Amara*<sup>1</sup>, *G. A. Torres Sevilla*<sup>1</sup>, *I. Ivanov*<sup>1</sup>, *J. Gerhard*<sup>2</sup>, *S. Jaiswal*<sup>2,3</sup>, *H. Muhammad Mustafa*<sup>1</sup>, *M. Kläui*<sup>2</sup> and *J. Kosel*<sup>1</sup> *1. CEMSE, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia; 2. Institut für Physik, Johannes Gutenberg Universität Mainz, Mainz, Germany; 3. Singulus Technologies AG, Kahl am Main, Germany*

**9:45**

- EC-03. Tunneling anisotropic magnetoresistance driven by magnetic phase transition.** *X. Chen*<sup>1</sup>, *C. Song*<sup>1</sup>, *J. Feng*<sup>2</sup>, *X. Zhong*<sup>1</sup> and *F. Pan*<sup>1</sup> *1. Tsinghua University, Beijing, China; 2. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

**10:00**

- EC-04. Ionic liquid gating control of magnetism in ultrathin magnetic multilayers. (Invited)** *M. Liu*<sup>1</sup> and *Z. Zhou*<sup>1</sup> *1. Electronic Materials Research Laboratory, Key Laboratory of the Ministry of Education & International Center for Dielectric Research, Xi'an Jiaotong University, Xi'an, China*

10:30

- EC-05. Tailoring magnetic properties of giant magnetoresistance spin-valves by inserting ultrathin noble metals between pinned and pinning layers.** *S. Kim*<sup>1</sup>, *J. Choi*<sup>2</sup> and *S. Lim*<sup>1</sup>  
*1. Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 2. Center for Spintronics Research, Korea Institute of Science and Technology, Seoul, The Republic of Korea*

10:45

- EC-06. Giant magnetoresistance effects in interface-tailored current-perpendicular-to-plane type junctions using Heusler alloy electrodes.** *T. Kubota*<sup>1,2</sup>, *Y. Ina*<sup>1</sup>, *Z. Wen*<sup>1,2</sup> and *K. Takanashi*<sup>1,2</sup>  
*1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Center for Spintronics Research Network, Tohoku University, Sendai, Japan*

11:00

- EC-07. Perpendicular Anisotropy in  $\text{Co}_2\text{FeAl}_{0.5}\text{Si}_{0.5}$  for CPP-GMR devices.** *W.J. Frost*<sup>1</sup>, *M. Samiepour*<sup>1</sup> and *A. Hirohata*<sup>1</sup>  
*1. Department of Electronic Engineering, University of York, York, United Kingdom*

11:15

- EC-08. Mn-composition dependence of strength of bi-quadratic interlayer exchange coupling in  $\text{Co}_2\text{MnSi}$ -based pseudo spin-valves.** *M. Inoue*<sup>1</sup>, *D. Mouri*<sup>1</sup>, *K. Inubushi*<sup>2</sup>, *K. Nakada*<sup>2</sup>, *M. Yamamoto*<sup>1</sup> and *T. Uemura*<sup>1</sup>  
*1. Division of Electronics for Informatics, Hokkaido University, Sapporo, Japan; 2. Technical Center, TDK Corporation, Ichikawa, Japan*

11:30

- EC-09. Control ferromagnets all electrically at room temperature without external magnetic field. (Invited)** *K. Wang*<sup>1</sup>  
*1. Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China*

**Session ED**

**SPIN-ORBITRONICS III**

Shunsuke Fukami, Co-Chair  
Tohoku University, Sendai, Japan

Xuepeng Qiu, Co-Chair  
Tongji University, Shanghai, China

**9:00**

- ED-01. Hybrid strain-mediated spin-orbit torque switching for magnetic memory.** *Q. Wang*<sup>4</sup>, *J. Domann*<sup>1</sup>, *G. Yu*<sup>2,3</sup>, *H. Wu*<sup>3</sup>, *A. Barra*<sup>4</sup>, *K. Wang*<sup>3</sup> and *G.P. Carman*<sup>4</sup> *1. Department of Biomedical Engineering and Mechanics, Virginia Tech, Blacksburg, VA, United States; 2. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 3. Department of Electrical and Computer Engineering, University of California, Los Angeles, CA, United States; 4. Department of Mechanical and Aerospace Engineering, University of California, Los Angeles, CA, United States*

**9:15**

- ED-02. Switching of exchange-coupled perpendicular magnetized layers driven by spin orbital torque with low power consumption.** *S. Wang*<sup>1</sup> and *J. Luo*<sup>1</sup> *1. Institute of Microelectronics, UCAS, Beijing, China*

**9:30**

- ED-03. Spin orbit torque via interfacial oxidation in magnetic heterostructures. (Invited)** *X. Qiu*<sup>1</sup> and *H. Yang*<sup>2</sup> *1. Department of Physics Science and Engineering, Tongji University, Shanghai, China; 2. Department of Electrical and Computer Engineering, National University of Singapore, Singapore*

**10:00**

- ED-04. Spin Hall magnetoresistance in Co / transparent-conductive-oxide bilayers.** *S. Isogami*<sup>2</sup> and *M. Hayashi*<sup>1,2</sup> *1. The University of Tokyo, Tokyo, Japan; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan*

**10:15**

- ED-05. Direct optical observation of spin accumulation at nonmagnetic metal / oxide interface.** *J. Puebla*<sup>1</sup>, *F.V. Auvray*<sup>2</sup>, *M. Xu*<sup>2</sup>, *B. Rana*<sup>1</sup>, *K. Kondou*<sup>1</sup> and *Y. Otani*<sup>1,2</sup> *1. CEMS, RIKEN, Wako, Japan; 2. The University of Tokyo, Kashiwa, Japan*

**10:30**

- ED-06. Enhancement of Spin Orbit Torques by Oxygen Implantation.** *J. Nath*<sup>1,2</sup>, *A.V. Trifu*<sup>1,2</sup>, *S. Auffret*<sup>1,2</sup>, *G. Gaudin*<sup>1,2</sup> and *I. Miron*<sup>1,2</sup> *1. SPINTEC/CEA/CNRS, Grenoble, France; 2. Université Grenoble Alpes, Grenoble, France*

10:45

**ED-07. Reliable Estimation of TaB Spin Hall Angle by Incorporating the Interfacial Transparency and Isolating Inverse Spin Hall Effect in ST-FMR Analysis.** *A. Tiwari<sup>1</sup>, H. Yoda<sup>1</sup>, Y. Kato<sup>1</sup>, K. Koi<sup>1</sup>, M. Ishikawa<sup>1</sup>, S. Oikawa<sup>1</sup>, Y. Saito<sup>2</sup>, T. Inokuchi<sup>1</sup>, N. Shimomura<sup>1</sup>, M. Shimizu<sup>1</sup>, S. Shirotori<sup>1</sup>, A. Buyandalai<sup>1</sup>, H. Sugiyama<sup>1</sup>, Y. Ohsawa<sup>1</sup> and A. Kurobe<sup>1</sup>* *1. Corporate Research and Development, Toshiba Corporation, Kawasaki, Japan; 2. Center for Innovative Integrated Electronic System, Tohoku University, Sendai, Japan*

11:00

**ED-08. Spin-orbit-torque switching in an exchange-biased ferromagnetic system.** *P. Lin<sup>1</sup>, M. Tsai<sup>1</sup>, K. Huang<sup>1</sup>, H. Lin<sup>2</sup> and C. Lai<sup>1</sup>* *1. Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan; 2. Department of Physics, National Tsing Hua University, Hsinchu, Taiwan*

11:15

**ED-09. Enhanced spin orbit torques in Pt/Co/Pt films with inserting Ru layers.** *Y. Wu<sup>1</sup>, K. Meng<sup>1</sup>, Y. Wu<sup>1</sup>, J. Chen<sup>1</sup>, J. Miao<sup>1</sup>, X. Xu<sup>1</sup> and Y. Jiang<sup>1</sup>* *1. Materials Science and Engineering institute, University of Science and Technology Beijing, Beijing, China*

11:30

**ED-10. Harmonic measurement of current induced spin-orbit torques in high-resistivity-W/CoFeB/MgO.** *Y. Takeuchi<sup>1</sup>, C. Zhang<sup>1</sup>, A. Okada<sup>1</sup>, H. Sato<sup>1</sup>, S. Fukami<sup>1</sup> and H. Ohno<sup>1</sup>* *1. Tohoku University, Sendai, Japan*

11:45

**ED-11. Enhancement of Spin-Orbit Torques through Material Engineering: The Role of Boron.** *Y. Du<sup>1</sup>, P. Chen<sup>1</sup>, B. Yang<sup>1</sup>, P. Lin<sup>1</sup>, G. Guo<sup>2</sup> and C. Lai<sup>1</sup>* *1. Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan; 2. Department of Physics, National Taiwan University, Taipei, Taiwan*

THURSDAY  
MORNING  
9:00

ROSELLE II

### Session EE

## SYMPOSIUM ON RECENT ADVANCES AND FUTURE CHALLENGES OF COMPUTATIONAL MAGNETICS

Jan Sykulski, Chair

University of Southampton, Southampton, United Kingdom

9:00

**EE-01. Steady state solution of periodically excited nonlinear eddy current problems. (Invited)** *O. Biro<sup>1</sup> and G. Koczka<sup>2</sup>* *1. TU Graz, Graz, Austria; 2. Siemens AG Österreich – Transformers Weiz, Weiz, Austria*

9:30

- EE-02. **Advanced soft- and hard-magnetic material models for the numerical simulation of electrical machines. (Invited)** *K. Hameyer<sup>1</sup>, S. Steentjes<sup>1</sup>, N. Leuning<sup>1</sup>, G. Bravendiek<sup>1</sup> and S. Elfgén<sup>1</sup> 1. IEM, RWTH Aachen University, Aachen, Germany*

10:00

- EE-03. **Modern Finite-Element Discretization Techniques for Electromagnetic Field Simulation. (Invited)** *H. De Gersem<sup>1</sup> and S. Schöps<sup>1</sup> 1. Technische Universitaet Darmstadt, Darmstadt, Germany*

10:30

- EE-04. **Advanced constitutive laws for computational magnetics: The case of magneto-mechanical behaviour. (Invited)** *L. Daniel<sup>1</sup> 1. GeePs-CentraleSupélec, Gif sur Yvette, France*

11:00

- EE-05. **High Resolution Modeling of Magnetic Field Exposure Scenarios in the Vicinity of Inductive Wireless Power Transfer Systems. (Invited)** *M. Clemens<sup>1</sup>, M. Zang<sup>1</sup>, M. Alsayegh<sup>2</sup> and B. Schmuelling<sup>2</sup> 1. Chair of Electromagnetic Theory, University of Wuppertal, Wuppertal, Germany; 2. E-Mobility Research Group, University of Wuppertal, Wuppertal, Germany*

11:30

- EE-06. **Design and Optimisation of Magnetic Devices. (Invited)** *D. Lowther<sup>1</sup> 1. Elec and Comp Eng, McGill University, Montreal, QC, Canada*

THURSDAY  
MORNING  
9:00

PEONY I

### Session EF

## ENERGY ASSISTED RECORDING

Yuepeng Zhang, Chair

Argonne National Laboratory, Argonne, WI, United States

9:00

- EF-01. **Micromagnetics of FePt-L1<sub>0</sub> Media with Thermally Insulating Magnetic Grain Boundaries.** *J. Zhu<sup>1</sup> and Y. Qin<sup>1</sup> 1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States*

9:15

- EF-02. **Sources and Impact of Media Thermal Fluctuations in Heat Assisted Magnetic Recording.** *P. Jubert<sup>1</sup> and C. Papusoi<sup>1</sup> 1. Western Digital, San Jose, CA, United States*

9:30

- EF-03. A Split Pole and Gap-NFT Write Head Design for Transition Curvature Reduction in Heat Assisted Magnetic Recording.** C. Chow<sup>1</sup> and J.A. Bain<sup>1</sup> *1. Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

9:45

- EF-04. Design of field generating layer in all-in-plane spin-torque-oscillator.** H. Sepehri-Amin<sup>1</sup>, C. Abert<sup>2</sup>, D. Suess<sup>2</sup> and K. Hono<sup>1</sup> *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan; 2. Christian Doppler Laboratory, Advanced Magnetic Sensing and Materials, University of Vienna, 1090, Vienna, Austria*

10:00

- EF-05. Magnetization Switching of a Co/Pt-Multilayer Perpendicular Nanomagnet Assisted by a Microwave Field with Time-Varying Frequency. (Invited)** H. Suto<sup>1</sup>, T. Kanao<sup>1</sup>, T. Nagasawa<sup>1</sup>, K. Mizushima<sup>1</sup> and R. Sato<sup>1</sup> *1. Corporate Research & Development Center, Toshiba Corporation, Kawasaki, Japan*

10:30

- EF-06. Heat Assisted Magnetic Recording – Next Generation Mass Storage Technology. (Invited)** G. Ju<sup>1</sup>, J. Thiele<sup>1</sup>, Y. Peng<sup>1</sup>, T. Klemmer<sup>1</sup>, Y. Ding<sup>1</sup>, Y. Kubota<sup>1</sup>, A.Q. Wu<sup>1</sup>, X. Zhu<sup>1</sup>, E.K. Chang<sup>1</sup>, L. Gao<sup>1</sup>, F. Zavaliche<sup>1</sup>, P. Huang<sup>1</sup>, H. Amini<sup>1</sup>, S.D. Granz<sup>2</sup>, C.J. Rea<sup>3</sup>, J. Qiu<sup>3</sup>, H. Yin<sup>3</sup>, M.A. Seigler<sup>3</sup>, T. Rausch<sup>2</sup>, Y. Chen<sup>3</sup>, E. Gage<sup>3</sup>, S. Hwang<sup>1</sup> and M.E. Re<sup>1</sup> *1. Seagate Technology, Fremont, CA, United States; 2. Seagate Technology, Shakopee, MN, United States; 3. Seagate Technology, Bloomington, MN, United States*

11:00

- EF-07. Spin torque oscillator with in-plane magnetized spin-injection layer for microwave assisted magnetic recording.** W. Zhou<sup>1</sup>, H. Sepehri-Amin<sup>1</sup>, Y. Sakuraba<sup>1</sup>, S. Kasai<sup>1</sup>, S. Bosu<sup>1</sup> and K. Hono<sup>1</sup> *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan*

11:15

- EF-08. Systemic Evaluation of Microwave Assisted Magnetic Recording.** Z. Liu<sup>1</sup>, P. Huang<sup>2</sup>, S. Hernandez<sup>1</sup>, G. Ju<sup>2</sup>, T. Rausch<sup>1</sup> and E. Gage<sup>1</sup> *1. Seagate Technology, Shakopee, MN, United States; 2. Seagate Technology, Fremont, CA, United States*

**Session EG**  
**SHIELDING, ELECTROMAGNETIC COMPATIBILITY,  
MOTORS AND GENERATORS I**

Shunsuke Ohashi, Chair  
Kansai University, Osaka, Japan

9:00

EG-01. **Withdrawn**

9:15

EG-02. **Fast Surrogate-Assisted Design of Multilayered Magnetic Shields.** *H. Chen<sup>1,2</sup>, Y. Du<sup>2</sup> and Q. Cheng<sup>1</sup> 1. Department of Electrical and Electronic Engineering, Southern University of Science and Technology, Shenzhen, China; 2. Department of Building Service Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

9:30

EG-03. **Research on Common Mode Current and Electromagnetic Radiation in PWM Motor System.** *F. Niu<sup>1,2</sup>, S. Cao<sup>1</sup>, X. Huang<sup>2</sup>, J. Zhang<sup>2</sup>, J. Ma<sup>2</sup>, K. Li<sup>1</sup> and Y. Fang<sup>2</sup> 1. School of Electrical Engineering, Hebei University of Technology, Tianjin, China; 2. College of Electrical Engineering, Zhejiang University, Hangzhou, China*

9:45

EG-04. **Dual Mode Dual Stator Wound Rotor Synchronous Machine for Variable Speed Applications.** *A. Hussain<sup>1</sup>, M. Ayub<sup>1</sup>, T. Yazdan<sup>1</sup> and B. Kwon<sup>1</sup> 1. Electronic Systems Engineering, Hanyang University, South Korea, Ansan, The Republic of Korea*

10:00

EG-05. **Radial Force and Vibration Calculation for Modular Permanent Magnet Synchronous Machine with Symmetrical and Asymmetrical Open-circuit Faults.** *Y. Pei<sup>1</sup>, Z. Song<sup>1</sup>, F. Chai<sup>1</sup> and Y. Li<sup>1</sup> 1. Harbin Institute of Technology, Harbin, China*

10:15

EG-06. **Weighted Average Efficiency Optimization for Permanent Magnet Synchronous Generators Used in Hybrid Electric Special Vehicles.** *J. Gao<sup>1</sup>, L. Dai<sup>1</sup> and W. Zhang<sup>2</sup> 1. College of Electrical and Information Engineering, Hunan University, Changsha, China; 2. Department of Electronic and Electrical Engineering, Changsha University, Changsha, China*

10:30

EG-07. **Modeling Induction Motors under Mixed Radial-Axial Asymmetry of Air Gap Produced by Oil Whirl in a Sleeve Bearing.** *M. Ojaghi<sup>1</sup> and R. Akhondi<sup>1</sup> 1. Electrical Engineering, University of Zanjan, Zanjan, The Islamic Republic of Iran*

10:45

**EG-08. PM Vernier Machine with Multiple Working Harmonics and Enhanced Flux Modulation Effect.** T. Zou<sup>1</sup>, D. Li<sup>1</sup> and R. Qu<sup>1</sup> *1. School of Electrical and Electronic Engineering, Huazhong University of Science & Technology, Wuhan, China*

11:00

**EG-09. Design and Analysis of A Novel PMSM with Single Stator and Contra-rotating Rotors.** D. Luo<sup>1</sup>, X. Su<sup>1</sup>, J. Gao<sup>1</sup>, R. He<sup>1</sup> and S. Huang<sup>1</sup> *1. College of Electrical and Information Engineering, Hunan University, Changsha, China*

11:15

**EG-10. Characteristics Verification of a Novel Motor with Two Controllable Rotors.** H. Suzuki<sup>1</sup>, K. Hirata<sup>1</sup>, N. Niguchi<sup>1</sup> and A. Kohara<sup>1</sup> *1. Graduate School of Engineering, Osaka University, Suita, Japan*

11:30

**EG-11. A New Structure of Stator Pole to Reduce Torque Ripple and Acoustic Noise in Switched Reluctance Motor.** M. Babaei<sup>1</sup> and A. Ahmarinejad<sup>1</sup> *1. Electrical Engineering Department, Yadegare Imam Khomeini (RAH) Shahr-e-Rey Branch, Islamic Azad University, Tehran, The Islamic Republic of Iran*

THURSDAY  
MORNING  
9:00

PEONY II

### Session EH

## MAGNETIC SEMICONDUCTORS AND OXIDES

Chen Ge, Chair

Institute of Physics, Chinese Academy of Sciences, Beijing, China

9:00

**EH-01. Giant Magnetoelectric Effects in Multiferroic Hexaferrites.** (*Invited*) Y. Sun<sup>1</sup>, K. Zhai<sup>1</sup>, J. Shen<sup>1</sup>, D. Shang<sup>1</sup> and Y. Chai<sup>1</sup> *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

9:30

**EH-02. The atomic-scale magnetism of Cr-doped Bi<sub>2</sub>Se<sub>3</sub> topological insulators.** W. Liu<sup>1</sup>, D. West<sup>2</sup>, L. He<sup>3</sup>, S. Zhang<sup>2</sup>, Y. Xu<sup>4</sup>, R. Zhang<sup>5</sup> and K. Wang<sup>3</sup> *1. Department of Electronics Engineering, Royal Holloway University of London, Egham, United Kingdom; 2. Department of Physics, Rensselaer Polytechnic Institute, Troy, NY, United States; 3. Department of Electrical Engineering, University of California Los Angeles, LA, CA, United States; 4. Electronics Department, University of York, York, United Kingdom; 5. Nanjing University, Nanjing, China*

- EH-03. Role of  $R^{3+}$  ion on structural and magnetic properties of  $R_2NiMnO_6$  double perovskites.** *M. Nasir<sup>1</sup>, S. Ayaz<sup>2</sup> and S. Sen<sup>1,2</sup>* 1. Physics, IIT Indore, INDORE, India; 2. MEMS, IIT Indore, Indore, India

10:00

- EH-04. Enhancing the low-field magnetoresistance by ac current excitation in  $La_{0.7}Sr_{0.3}MnO_3$ .** *P. Kumar<sup>1</sup>, U. Chadhuri<sup>1</sup> and R. Mahendiran<sup>1</sup>* 1. Physics Department, 2 Science Drive 3, National University of Singapore, Singapore

10:15

- EH-05. Suppression of charge and antiferromagnetic ordering in Ru substituted  $Bi_{0.5}Ca_{0.5}MnO_3$  probed by electrical, magnetic and thermoelectric transport.** *M. Kumari<sup>1</sup>, A. Chanda<sup>1</sup> and R. Mahendiran<sup>1</sup>* 1. Physics, National University of Singapore, Singapore

10:30

- EH-06. Anisotropic Electronic Transport Properties in Low-Temperature Phase  $Fe_3O_4$  Epitaxial Films.** *X. Liu<sup>1</sup>, W. Mi<sup>1</sup>, Q. Zhang<sup>2</sup> and X. Zhang<sup>2</sup>* 1. Department of Applied Physics, Tianjin University, Tianjin, China; 2. PSE Division, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia

10:45

- EH-07. Effect of  $CaCO_3$  and  $V_2O_5$  on the microstructure and magnetic property of MnZn ferrites.** *G. Wu<sup>1</sup>, Z. Yu<sup>1</sup>, Z. Tang<sup>2</sup>, K. Sun<sup>1</sup>, R. Guo<sup>1</sup>, X. Zou<sup>1</sup>, X. Jiang<sup>1</sup> and Z. Lan<sup>1</sup>* 1. University of Electronic Science and Technology of China, Chengdu, China; 2. China Aerospace Components Engineering Center, Beijing, China

11:00

- EH-08. Magnetically driven insulating behavior in monoclinic antiferromagnetic Ni-Mn-In Heusler alloys.** *H. Yang<sup>1,2</sup>, B. Wang<sup>1,2</sup> and R. Li<sup>1,2</sup>* 1. Key Laboratory of Magnetic Materials and Devices, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, China; 2. Laboratory of Magnetic Materials and Application Technology, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, China

11:15

- EH-09. Valley polarized tunneling through magnetic and electrical barriers in Weyl semimetals.** *C. Yesilyurt<sup>1</sup>, Z. Siu<sup>1</sup>, S. Tan<sup>1</sup>, G. Liang<sup>1</sup> and M.B. Jalil<sup>1</sup>* 1. Electrical and Computer Engineering, National University of Singapore, Singapore

11:30

- EH-10. Nucleation and annihilation of skyrmions in spin gapless semiconductor  $Mn_2CoAl$ .** *S. Granville*<sup>1,2</sup>, *B. Ludbrook*<sup>1,2</sup>, *G. Dubuis*<sup>1,2</sup>, *A. Puichaud*<sup>1,2</sup> and *B.J. Ruck*<sup>1,2</sup> *1. Victoria University of Wellington, Lower Hutt, New Zealand; 2. MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand*

11:45

- EH-11. Anomalous Hall effect in a wide range of conductivity in  $Co_2FeSi$  Heusler-alloy thin films.** *B.K. Hazra*<sup>1</sup>, *S.N. Kaul*<sup>1</sup>, *S. Srinath*<sup>1</sup>, *M. Raja*<sup>2</sup>, *R. Rawat*<sup>3</sup> and *A. Lakhani*<sup>3</sup> *1. School of Physics, University of Hyderabad, Hyderabad, India; 2. Defence Metallurgical Research Laboratory, Hyderabad, India; 3. UGC-DAE Consortium for Scientific Research, Indore, India*

THURSDAY  
MORNING  
9:00

ORCHID II

### Session EI

## MAGNETIC THERAPIES AND NANOMEDICINE II

Irving Weinberg, Chair

Weinberg Medical Physics, Bethesda, MD, United States

9:00

- EI-01. Magnetic Nanoparticles for Theranostics. (Invited)** *Y. Ichiyonagi*<sup>1</sup>, *H. Takeuchi*<sup>1</sup>, *K. Fujiwara*<sup>1</sup>, *T. Ide*<sup>1</sup> and *A. Oshima*<sup>1</sup> *1. Yokohama National University, Yokohama, Japan*

9:30

- EI-02. Magneto-photothermal effects of pegylated superparamagnetic iron-oxide nanoparticles for multimodal cancer therapy.** *S.A. Shah*<sup>1,2</sup>, *M. Hashmi*<sup>3</sup>, *K. Javed*<sup>2</sup>, *N. Ahmad*<sup>4</sup> and *M. Arshad*<sup>5</sup> *1. Materials Science & Engineering, University of Washington, Seattle WA, USA, Seattle, WA, United States; 2. Physics, Forman Christian College (University), Lahore, Pakistan; 3. Superior University, Lahore, Pakistan; 4. Physics, International Islamic University, Lahore, Pakistan; 5. National Center for Physics, Islamabad, Pakistan*

- EI-03. Properties of Permalloy nanodiscs in magnetic vortex state and magneto-mechanical treatment of cancer cells.**  
 M. Goirienea-Goikoetxea<sup>1,2</sup>, I. Orue<sup>3</sup>, K. Guslienko<sup>4</sup>,  
 E. Berganza<sup>5</sup>, M. Jaafar<sup>5</sup>, A. Asenjo<sup>5</sup>, D. Muñoz<sup>6</sup>, A. Muela<sup>6,7</sup>  
 and A. García-Arribas<sup>2,7</sup> 1. *Electrical Engineering and Computer Science, University of California, Berkeley, CA, United States*; 2. *Departamento de Electricidad y Electrónica, Universidad del País Vasco, UPV/EHU, Leioa, Spain*; 3. *SGIKER Medidas Magnéticas, Universidad del País Vasco, UPV/EHU, Leioa, Spain*; 4. *IKERBASQUE and Depto. de Física de Materiales, Universidad del País Vasco, UPV/EHU, San Sebastián, Spain*; 5. *Instituto de Ciencia de Materiales de Madrid, CSIC, Cantoblanco, Spain*; 6. *Depto. de Inmunología, Microbiología y Parasitología, Universidad del País Vasco, UPV/EHU, Leioa, Spain*; 7. *Basque Center for Materials, Applications and Nanostructures, BCMaterials, Leioa, Spain*

10:00

- EI-04. In silico testing of clinical magnetic hyperthermia: progresses and future directions. (Invited)** I. Rubia-Rodríguez<sup>1</sup>,  
 H. Verdaguer<sup>2</sup>, T. Macarulla<sup>2</sup> and D. Ortega Ponce<sup>1</sup> 1. *IMDEA Nanoscience, Madrid, Spain*; 2. *Medical Oncology, Vall d'Hebron University Hospital, Barcelona, Spain*

10:30

- EI-05. Magnetic hysteresis, cellular uptake and cytotoxicity of sub-micron magnetic nanodisks for biomedical applications.**  
 P. Tiberto<sup>1</sup>, G. Barrera<sup>1</sup>, F. Celegato<sup>1</sup>, M. Coisson<sup>1</sup>, C. Divieto<sup>1</sup>  
 and M. Sassi<sup>1</sup> 1. *INRIM, Torino, Italy*

10:45

- EI-06. Fe-Cr-Nb-B magnetic nanoparticles - a good solution for cancer cell destruction by magneto-mechanical effect.**  
 H. Chiriac<sup>1</sup>, E. Radu<sup>1,2</sup>, M. Tibu<sup>1</sup>, D. Herea<sup>1</sup>, L. Labusca<sup>1</sup> and  
 N. Lupu<sup>1</sup> 1. *National Institute of Research and Development for Technical Physics, 47 Mangeron Boulevard, 700050 Iasi, Romania, Iasi, Romania*; 2. *Physics, Alexandru Ioan Cuza University of Iasi, Iasi, Romania*

11:00

- EI-07. Twin Coil Design Considerations for Depth and Focality in Transcranial Magnetic Stimulation.** S. Chang<sup>1</sup>, X. Wei<sup>1</sup>,  
 Z. Zhang<sup>1</sup>, S. Li<sup>1</sup>, J. Wang<sup>1</sup> and G. Yi<sup>1</sup> 1. *School of Electrical and Information Engineering, Tianjin University, Tianjin, China*

11:15

- EI-08. Development of Angular Coil for Transcranial Magnetic Stimulation.** M.A. Yedeas<sup>1</sup>, Y. Kawasaki<sup>2</sup>, S. Liu<sup>1</sup>, J. Gu<sup>1</sup>,  
 Y. Saitoh<sup>3</sup> and M. Sekino<sup>1</sup> 1. *Department of Electrical Engineering and Information Systems, Graduate School of Engineering, The University of Tokyo, Tokyo, Japan*; 2. *Department of Bioengineering, Graduate School of Engineering, The University of Tokyo, Tokyo, Japan*; 3. *Department of Neuromodulation and Neurosurgery, Graduate School of Medicine, Osaka University, Osaka, Japan*

11:30

- EI-09. Flexibility of Micro-magnetic Flagella in the Presence of an Oscillating Field.** *Y. Li<sup>1</sup> and C. Yen<sup>1</sup> 1. Department of Mechanical and Aerospace Engineering, National Defense University, Taoyuan, Taiwan*

11:45

- EI-10. Novel Electromagnetic Targeting System for Navigating Surgery in Endobronchoscopy.** *C. Chen<sup>1</sup>, C. Lin<sup>1,2</sup>, Y. Cheng<sup>1</sup>, T. Chung<sup>1</sup>, C. Chang<sup>1</sup>, S. Tsai<sup>1</sup>, J. Chen<sup>1</sup> and X. Lin<sup>1</sup> 1. National Chiao Tung University, Hsinchu, Taiwan; 2. National Taiwan University Hospital, Taipei, Taiwan*

THURSDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

### Session EP

## EXCHANGE COUPLING, SUPERCONDUCTIVITY AND ELECTRONIC STRUCTURE I

### (Poster Session)

Xiaolin Wang, Chair

University of Wollongong, Wollongong, NSW, Australia

- EP-01. Thickness dependence of spin polarization in Co<sub>2</sub>FeAl thin films.** *X. Zhang<sup>1</sup>, L. He<sup>1</sup>, Y. Xu<sup>1,2</sup> and W. Liu<sup>2</sup> 1. Nanjing University, Nanjing, China; 2. University of York, York, United Kingdom*
- EP-02. Levitation Force Computation of HTS/PM system by H-formulation.** *W. Chen<sup>1</sup>, J. Shi<sup>1</sup> and Y. Xu<sup>1</sup> 1. Huazhong University of Science & Technology, Wuhan, China*
- EP-03. Key features of the magnetic and magnetoelectric properties of rare-earth langasite Ho<sub>0.09</sub>La<sub>2.91</sub>Ga<sub>5</sub>SiO<sub>14</sub>.** *N. Kostyuchenko<sup>1,2</sup>, A. Mukhin<sup>3</sup>, A. Pimenov<sup>2</sup>, L. Weymann<sup>2</sup> and A. Zvezdin<sup>1,3</sup> 1. Moscow Institute of Physics and Technology (State University), Moscow, Russian Federation; 2. Institut für Festkörperphysik, Technische Universität Wien, Vienna, Austria; 3. A. M. Prokhorov General Physics Institute of Russian Academy of Sciences, Moscow, Russia, Moscow, Russian Federation*
- EP-04. Anomalous magnetic and Electrical properties of Fe<sub>2</sub>V<sub>2-x</sub>Al<sub>x</sub> (x=0-1) alloys.** *S. Hari<sup>1</sup> and V. Srinivas<sup>1</sup> 1. Department of Physics, IIT Madras, Chennai, India*
- EP-05. Spinterface Properties and Magnetic Coupling of Tris(8-hydroxyquinoline)iron(III) on Cobalt Surface.** *L. Yu<sup>1</sup>, J. Lin<sup>1,2</sup>, Y. Lai<sup>1</sup>, H. Shiu<sup>1</sup> and Y. Hsu<sup>1</sup> 1. National Synchrotron Radiation Research Center, Hsinchu, Taiwan; 2. Program for Science and Technology of Accelerator Light Source, National Chiao Tung University, Hsinchu, Taiwan*

- EP-06. Observation of superconductivity in  $\text{LaNiO}_3/\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$  superlattice.** G. Zhou<sup>1</sup>, Z. Quan<sup>1</sup> and X. Xu<sup>1</sup> *1. Shanxi Normal University, Linfen, China*
- EP-07. Enhanced Spin Ordering Temperature in Ultrathin FeTe Films Grown on a Topological Insulator.** J. Warmuth<sup>1</sup>, U. Singh<sup>1</sup>, L. Cornils<sup>1</sup>, A. Kamlapure<sup>1</sup>, P. Hofmann<sup>2</sup>, J. Wiebe<sup>1</sup> and R. Wiesendanger<sup>1</sup> *1. Institute of Applied Physics, University of Hamburg, Hamburg, Germany; 2. Department of Physics and Astronomy, Aarhus University, Aarhus, Denmark*
- EP-08. The long-range exchange bias in ultrathin paramagnetic  $\text{LaNiO}_3$ -based heterostructure.** X. Xu<sup>1</sup>, G. Zhou<sup>1</sup> and Z. Quan<sup>1</sup> *1. Shanxi Normal University, Linfen, China*
- EP-09. Comparative magnetic properties of Ag/Fe bilayer and nano-dot arrays.** B. Alkadour<sup>2</sup>, W. Chuang<sup>1</sup>, S. Ciou<sup>3</sup>, J. Wu<sup>3</sup>, P. Manna<sup>2</sup>, K. Lin<sup>1</sup> and J. van Lierop<sup>2</sup> *1. National Chung Hsing University, Taichung, Taiwan; 2. University of Manitoba, Winnipeg, MB, Canada; 3. National Changhua University of Education, Changhua, Taiwan*
- EP-10. Exchange bias induced asymmetry in the magnetization reversal process of Fe/GaAs/GaMnAs hybrid structure.** S. Lee<sup>1,2</sup>, S. Choi<sup>2</sup>, S. Bac<sup>2</sup>, K. Lee<sup>2</sup>, J. Chang<sup>2</sup>, S. Choi<sup>2</sup>, P. Chongthanaphisut<sup>2</sup>, S. Lee<sup>2</sup>, M. Dobrowolska<sup>3</sup>, X. Liu<sup>3</sup> and J. Furdyna<sup>3</sup> *1. Korea Institute of Science and Technology, Seoul, The Republic of Korea; 2. Physics, Korea University, SEOUL, The Republic of Korea; 3. Physics, University of Notre Dame, Notre Dame, IN, United States*
- EP-11. Giant perpendicular exchange bias in a sub-nanometer inverted  $(\text{Co/Pt})_n/\text{Co/IrMn}$  structure.** J. Feng<sup>1</sup>, H. Wei<sup>1</sup>, H. Liu<sup>1</sup>, X. Zhang<sup>2</sup>, Y. Ren<sup>3</sup>, X. Li<sup>3</sup>, J. Wang<sup>4</sup> and X. Han<sup>1</sup> *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. Department of Physics and Quantum Theory Project, University of Florida, Gainesville, FL 32611, American Samoa; 3. Institute of Nuclear Physics and Chemistry, China Academy of Engineering Physics, Mianyang, 621999, China; 4. The Center for Micromagnetics and Information Technologies (MINT) and Department of Electrical and Computer Engineering, University of Minnesota, 200 Union St SE, Minneapolis, Minnesota 55455, MN, United States*
- EP-12. Tunable exchange bias field, damping, and misalignment anisotropies of FeCo/IrMn multilayers tailored by MgO-dilution in antiferromagnets.** Z. Zhang<sup>1</sup>, Z. Xu<sup>1</sup>, F. Hu<sup>1</sup>, E. Liu<sup>1</sup> and F. Xu<sup>1</sup> *1. Nanjing University of Science and Technology, School of Materials Science and Engineering, Nanjing, China*
- EP-13. Exchange Bias in  $\text{LaMnO}_3$  film Induced by Electron Beam Irradiation.** M. Xue<sup>1</sup>, X. Chen<sup>2</sup>, H. Chen<sup>3</sup>, S. Ding<sup>1</sup>, Y. Lai<sup>1</sup>, L. Zha<sup>1</sup>, Y. Men<sup>4</sup>, Z. Xu<sup>4</sup>, X. Kong<sup>4</sup>, L. Han<sup>4</sup>, K. Li<sup>1</sup>, Z. Shao<sup>1</sup>, G. Qiao<sup>1</sup>, X. Li<sup>1</sup>, Y. Zhang<sup>1</sup>, H. Zhao<sup>1</sup>, X. Wen<sup>1</sup>, W. Yang<sup>1</sup>, H. Du<sup>1</sup>, J. Han<sup>1</sup>, Y. Yang<sup>1</sup>, S. Liu<sup>1</sup>, C. Wang<sup>1</sup> and J. Yang<sup>1</sup> *1. Peking University, Beijing, China; 2. University of Nebraska-Lincoln, Lincoln, GA, United States; 3. University of International Business and Economics, Beijing, China; 4. Chinese Academy of Sciences, Beijing, China*

**EP-14. Perpendicular exchange bias effect in CoFeB/Pt/MnIr multilayers.** W. Li<sup>1</sup>, J. Yan<sup>1</sup>, Y. Lu<sup>1</sup>, S. Lou<sup>1</sup>, Z. Zhang<sup>2</sup>, X. Zhang<sup>1</sup> and Q. Jin<sup>1,2</sup> *1. State Key Laboratory of Precision Spectroscopy, East China Normal University, Shanghai, China; 2. Department of Optical Science and Engineering, Fudan University, Shanghai, China*

**EP-15. Vectorial mapping of exchange anisotropy in [NiFe/FeMn] bilayers through angular resonant absorption curves.** D. Adams<sup>1,2</sup>, P. Kern<sup>3</sup> and L. Spinu<sup>1,2</sup> *1. Advanced Materials Research Institute, University of New Orleans, New Orleans, LA, United States; 2. Physics, University of New Orleans, New Orleans, LA, United States; 3. Física, Universidade Federal de Santa Maria, Santa Maria, Brazil*

**EP-16. Extraordinary Optical Transmission of sub-wavelength metallic grating with mirror symmetric cavities.** Y. Qi<sup>1</sup>, H. Gong<sup>1</sup> and X. Zhang<sup>1</sup> *1. College of Physics and Electronic Engineering, Northwest Normal University, Lanzhou, China*

THURSDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session EQ**  
**FERRITE MATERIALS AND APPLICATIONS**  
**(Poster Session)**

Haizhong Guo, Chair  
Zhengzhou University, Zhengzhou City, China

**EQ-01. Ferromagnetic resonance linewidth and magnetic property of cobalt-substituted NiCuZn ferrites.** K. Li<sup>1</sup>, K. Sun<sup>1</sup>, C. Chen<sup>2</sup>, X. Liu<sup>2</sup>, R. Guo<sup>1</sup>, H. Liu<sup>1</sup>, Z. Yu<sup>1</sup>, X. Jiang<sup>1</sup> and Z. Lan<sup>1</sup> *1. University of Electronic Science and Technology of China, Chengdu, China; 2. Global Energy Interconnection Research Institute, Beijing, China*

**EQ-02. Fabrication of Magnetic Ultrafine Particles-Insulator Composite Film Using the LbL Assisted Composite Plating Method.** N. Fujita<sup>1</sup>, M. Takeuchi<sup>1</sup>, Y. Watanabe<sup>1</sup>, N. Matsumoto<sup>2</sup> and H. Muto<sup>2</sup> *1. Electrical Engineering, National Institute of Technology, Nara College, Yamatokoriyama, Japan; 2. Electrical and Electronic Information Engineering, Toyohashi University of Technology, Toyohashi, Japan*

**EQ-03. A Rotational Hysteresis Model of the Soft Magnetic Composite Material.** N. Duan<sup>1</sup>, W. Xu<sup>2</sup>, Y. Li<sup>3</sup>, S. Wang<sup>1</sup> and J. Zhu<sup>4</sup> *1. Xi'an Jiaotong University, Xi'an, China; 2. State Grid Shaanxi Electric Power Company Economic Research Institute, Xi'an, China; 3. Hebei University of Technology, Tianjin, China; 4. University of Technology Sydney, Sydney, NSW, Australia*

**EQ-04. Influence of Al doping on the magnetic and magnetodielectric properties of GaFeO<sub>3</sub> nanoparticles.** T. Han<sup>1</sup>, Z. Tu<sup>1</sup>, Y. Huang<sup>1</sup> and Y. Su<sup>1</sup> *1. Department of Applied Physics, National University of Kaohsiung, Kaohsiung, Taiwan*

- EQ-05. Analysis of magnetic properties of electrical steel sheets under the coupling of temperature and pressure.** *L. Xiao<sup>1</sup>, G. Yu<sup>1</sup>, J. Zou<sup>1</sup>, Y. Xu<sup>1</sup>, H. Lan<sup>1</sup>, M. Wang<sup>1</sup> and F. Gao<sup>1</sup>*  
*1. Harbin Institute of Technology, Harbin, China*
- EQ-06. Influence of In-plane Stress on 1D Magnetic Property of Silicon Steel.** *J. Chen<sup>1</sup>, D. Wang<sup>1</sup>, Y. Jiang<sup>1</sup>, X. Teng<sup>1</sup> and X. Zhang<sup>1</sup>*  
*1. Naval University of Engineering, Wuhan, China*
- EQ-07. Voltage Control of Two-Magnon Scattering in MnZn Ferrite thin film.** *W. Hou<sup>1</sup>, Z. Zhou<sup>1</sup> and M. Liu<sup>1</sup>*  
*1. Xi'an Jiaotong University, Xi'an, China*
- EQ-08. Numerical Modeling on B-H Characteristics of Fe-Based Soft Magnetic Composites Considering Saturation.**  
*D. Zhang<sup>1</sup>, W. Guan<sup>1</sup>, M. Yang<sup>1</sup>, Y. Gao<sup>2</sup> and K. Muramatsu<sup>2</sup>*  
*1. School of Electrical Engineering, Wuhan University, Wuhan, China; 2. Department of Electrical and Electronic Engineering, Saga University, Saga, Japan*
- EQ-09. Systematic Experimental and Simulation Studies of Dimensional Resonance in Mn-Zn Ferrite Toroidal Cores.**  
*H. Kawano<sup>1</sup>, H. Oshima<sup>1</sup>, K. Shimizu<sup>2</sup>, A. Furuya<sup>2</sup>, Y. Uehara<sup>2</sup>, J. Kato<sup>3</sup>, M. Kitaoka<sup>3</sup> and K. Hakamata<sup>3</sup>*  
*1. Fujitsu Laboratories Ltd., Atsugi, Japan; 2. Fujitsu Limited, Kawasaki, Japan; 3. FDK Corporation, Kosai, Japan*
- EQ-10. Gel-casting Hexagonal Ferrites for High Density and Low Loss Microwave Devices.** *J. Adams<sup>1</sup>, A.S. Sokolov<sup>1</sup> and V. Harris<sup>1</sup>*  
*1. Electrical & Computer Engineering, Northeastern University, Medway, MA, United States*
- EQ-11. Correlation of calcination temperature and flux doping on the microstructure and magnetic properties of low-temperature-fired NiCuZn ferrites.** *H. Su<sup>1</sup>, Q. Luo<sup>1</sup>, Y. Jing<sup>1</sup>, Y. Li<sup>1</sup>, H. Zhang<sup>1</sup> and X. Tang<sup>1</sup>*  
*1. University of Electronic Science and Technology of China, Chengdu, China*
- EQ-12. Mn-Zn ferrite thin films with anomalously large magnetic moments.** *P. Rajagiri<sup>1</sup>, B. Sahu<sup>1</sup>, N. Venkataramani<sup>2</sup>, S. Prasad<sup>1</sup> and R. Krishnan<sup>3</sup>*  
*1. Physics, Indian Institute of Technology Bombay, Mumbai, India; 2. Department of Metallurgical Engineering and Materials Science, Indian Institute of Technology Bombay, Mumbai, India; 3. Retired scientists, CNRS/Universite de Versailles-St-Quentin, Versailles, France*
- EQ-13. Ion diffusion and microwave electromagnetic characteristics of LiZn/NiCuZn ferrites.** *R. Guo<sup>1</sup>, K. Sun<sup>1</sup>, X. Liu<sup>2</sup>, C. Chen<sup>2</sup>, Z. Yu<sup>1</sup>, X. Jiang<sup>1</sup>, C. Wu<sup>1</sup>, W. Wang<sup>1</sup>, G. Wu<sup>1</sup>, Y. Liu<sup>1</sup>, H. Liu<sup>1</sup> and Z. Lan<sup>1</sup>*  
*1. State Key Laboratory of Electronic Thin Films and Integrated Devices, University of Electronic Science and Technology of China, Chengdu, China; 2. Global Energy Interconnection Research Institute, Beijing, China*
- EQ-14. Fingerprinting the intra-wire interactions within the arrays of NiFe/Cu multisegmented nanowires using FORC analysis.** *S. Shojaie Mehr<sup>1</sup>, A. Ramezani<sup>1,2</sup> and M. Almasi Kashi<sup>1,2</sup>*  
*1. Nanoscience and Nanotechnology Research Center, University of Kashan, Kashan, The Islamic Republic of Iran; 2. Department of Physics, University of Kashan, Kashan, The Islamic Republic of Iran*

- EQ-15. Fabrication of Fe-Ga Alloy Particle based Magnetorheological Fluid and Its Viscoelastic Characteristics.** *H. Choi*<sup>1</sup>, *S. Kwon*<sup>1</sup>, *S. Na*<sup>2</sup> and *A.B. Flatau*<sup>2</sup>  
*1. Dept. of Polymer Science and Engineering, Inha University, Incheon, The Republic of Korea; 2. Department of Aerospace Engineering, University of Maryland, College Park, MD, United States*

THURSDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session ER**  
**MAGNETIC BEARINGS, AND LEVITATION**  
**(Poster Session)**

**Jang-Young Choi, Co-Chair**  
Chungnam National University, Daejeon, The Republic of Korea  
**Myounggyu Noh, Co-Chair**  
Chungnam National University, Daejeon, The Republic of Korea

- ER-01. Study of characteristics on stability of the yoke equipped magnetic rotor in the HTS Magnetic Bearing.** *T. Arai*<sup>1</sup>, *T. Minami*<sup>1</sup>, *S. Hiraoka*<sup>1</sup> and *S. Ohashi*<sup>1</sup> *1. Electrical and Electronic Engineering, Kansai University, Suita, Japan*
- ER-02. A Proposal of Noncontact Baton-pass System for a Thin Steel Plate Based on Magnetic Levitation Technique.** *Y. Sudo*<sup>1</sup>, *Y. Arita*<sup>1</sup>, *M. Yamada*<sup>1</sup> and *T. Nakagawa*<sup>1</sup> *1. Electrical and Electronic Engineering, Tokyo City University, Setagaya, Japan*
- ER-03. A study on Optimal Operating Point of Linear Induction Motor considering Normal Force and Efficiency in MAGLEV Vehicle.** *J. Lim*<sup>2</sup>, *J. Jeong*<sup>1</sup> and *D. Park*<sup>2</sup> *1. Electrical Engineering, Chung Nam National University, Daejeon, The Republic of Korea; 2. Magnetic Levitation and Linear Drive, Korea Institute of Machinery & Materials (KIMM), Daejeon, The Republic of Korea*
- ER-04. Improvement of damping factor on the lateral guideway displacement by using weight-reduced damper coil on superconducting magnetically levitation bogie.** *R. Nakakita*<sup>1</sup>, *E. Shin*<sup>1</sup>, *T. Takeuchi*<sup>1</sup> and *S. Ohashi*<sup>1</sup> *1. Electrical and Electronic Engineering, Kansai University, Suita, Japan*
- ER-05. A Novel Bearingless Switched Reluctance Machine with Axial Split Phase Inner Stator Permanent Magnet Structure.** *Z. Zhu*<sup>1,2</sup>, *Y. Jiang*<sup>2</sup> and *Y. Sun*<sup>1</sup> *1. School of Electric Power Engineering, Nanjing Institute of Technology, NANJING, China; 2. School of Electrical and Engineering, Southeast University, NANJING, China*
- ER-06. Analysis of a Multi-Phase Bearingless PMSM With Double-Winding Based on MMF.** *Y. Qin*<sup>1</sup> and *H. Zhu*<sup>1</sup> *1. Jiangsu University, Zhenjiang, China*

- ER-07. Design and Control of Radial Homopolar Hybrid Magnetic Bearing.** *A. Roshanzamir*<sup>1</sup> and *B. Kwon*<sup>1</sup> *1. Electronic Systems Engineering, Hanyang University, Ansan-si, The Republic of Korea*
- ER-08. Study on propulsion force characteristics by improving distance between the coils and excitation method in permanent magnet-HTS hybrid magnetically levitated conveyance system.** *T. Inui*<sup>1</sup>, *Y. Takaki*<sup>1</sup>, *H. Sasaki*<sup>1</sup> and *S. Ohashi*<sup>1</sup> *1. Electrical and Electronic Engineering, Kansai University, Suita, Japan*
- ER-09. Novel Heteropolar Hybrid Radial Magnetic Bearing with Double-Layer Stator for Flywheel Energy Storage System.** *W. Xu*<sup>1</sup>, *R. Zhu*<sup>1</sup>, *C. Ye*<sup>1</sup> and *J. Zhu*<sup>2</sup> *1. School of electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan, China; 2. Faculty of Engineering and Information Technology, University of Technology Sydney, Sydney, NSW, Australia*
- ER-10. Exploration of a floating magnet rotor in diamagnetic levitation system.** *K. Zhang*<sup>1</sup>, *Y. Su*<sup>1</sup>, *J. Gao*<sup>1</sup>, *Z. Duan*<sup>2</sup> and *J. Ding*<sup>1</sup> *1. School of Mechanical Engineering, Zhengzhou University, Zhengzhou, China; 2. School of Physical Engineering, Zhengzhou university, Zhengzhou, China*
- ER-11. Design and analysis of a centripetal force type-magnetic bearing for a flywheel battery system.** *W. Zhang*<sup>1</sup>, *L. Cheng*<sup>1</sup> and *H. Yang*<sup>1</sup> *1. Jiangsu University, Zhenjiang, China*
- ER-12. Proposal of New Superconducting Magnetic Bearing Using High Tc Superconducting Bulk and Coil.** *M. Komori*<sup>1</sup>, *K. Yamanaka*<sup>1</sup>, *K. Asami*<sup>1</sup> and *N. Sakai*<sup>1</sup> *1. Kyushu Institute of Technology, Kitakyushu, Japan*
- ER-13. Design and Analysis of a Magnetic Levitation Voice Coil Actuator for Multi-Degree-of-Freedom High-Precision Positioning System.** *Y. Zhou*<sup>1</sup>, *B. Kou*<sup>1</sup>, *H. Zhang*<sup>1</sup>, *F. Xing*<sup>1</sup> and *X. Yang*<sup>1</sup> *1. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China*
- ER-14. Radial Suspension Forces Modeling for Bearingless Flux-Switching Permanent Magnet Motor.** *C. Zhao*<sup>1</sup> and *H. Zhu*<sup>1</sup> *1. Jiangsu University, Zhenjiang, China*
- ER-15. Multi-Optimal Design of Novel Bearingless Switched Reluctance Motor Based on Artificial Bee Colony Particle Swarm Optimizer.** *Y. Sun*<sup>1</sup> and *Z. Binbin*<sup>2</sup> *1. School of Automation, Nanjing University of Science and Technology, Nanjing, China; 2. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

**Session ES**  
**MAGNETIC GEARS**  
**(Poster Session)**

Byungtaek Kim, Chair

Kunsan National University, Gunsan, The Republic of Korea

- ES-01. Comparison of the Magnetic Field and Torque Characteristics for Axial Magnetic Gears with Various Permanent Magnet arrays.** *X. Liu<sup>1</sup>, Y. Zhou<sup>1</sup>, D. Wan<sup>1</sup> and Z. Chen<sup>2</sup>* 1. *College of Electrical and Information Engineering, Hunan University, Changsha, China;* 2. *Department of Energy Technology, Aalborg University, Aalborg, Denmark*
- ES-02. Investigation of the Torsion and Vibration Characteristics of a Dual-Flux-Modulator Coaxial Magnetic Gear.** *X. Liu<sup>1</sup>, Y. Zhao<sup>1</sup>, Z. Chen<sup>2</sup>, D. Luo<sup>1</sup> and S. Huang<sup>1</sup>* 1. *College of Electrical and Information Engineering, Hunan University, Changsha, China;* 2. *Department of Energy Technology, Aalborg University, Aalborg, Denmark*
- ES-03. Torque Parameter Characteristics of Non-contact Magnetic Coupling considering Rotor Volumetric Modeling.** *J. Park<sup>1,2</sup>, K. Lee<sup>1</sup>, S. Lee<sup>1</sup> and S. Jung<sup>2</sup>* 1. *Korea Institute of Industrial Technology, Gwangju, The Republic of Korea;* 2. *School of Electronics and Electrical Engineering, Sungkyunkwan University, Gwangju, The Republic of Korea*
- ES-04. New Magnetic Gear with Transmission Ratio in Steps.** *D. Fodorean<sup>1</sup>* 1. *Electrical Machines and Drives, Technical University of Cluj-Napoca, Cluj-Napoca, Romania*
- ES-05. Modeling and Transmission Characteristics Analysis of Dual-Mechanical-Port Magnet-Geared Machine Using Control Block Diagrams.** *C. Chen<sup>1</sup> and M. Tsai<sup>1</sup>* 1. *Mechanical Engineering Department, National Cheng Kung University, Tainan, Taiwan*
- ES-06. Analytical and Experimental Study for Electromagnetic Performance Analysis of Magnetic Geared Permanent Magnet Machines.** *K. Shin<sup>1</sup>, H. Cho<sup>3</sup>, D. You<sup>2</sup> and J. Choi<sup>1</sup>* 1. *Dept. of Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea;* 2. *Dept. of Fire Safety Engineering, Chungnam Provincial Cheongyang College, Chungnam, The Republic of Korea;* 3. *Dept. of Electric, Electronic and Comm. Eng. Edu., Chungnam National University, Daejeon, The Republic of Korea*
- ES-07. Design of Doubly Fed Magnetic Geared Motor Considering Inherent Characteristics.** *H. Shin<sup>1</sup> and J. Chang<sup>1</sup>* 1. *Electrical engineering, University of Dong-A, Busan, The Republic of Korea*

- ES-08. Analysis on Torque Characteristics of Magnetic-Geared Machine with Sandwiched Armature Stator according to Pole Pair Combination.** D. Kang<sup>1</sup>, J. Song<sup>1</sup>, D. Kim<sup>1</sup>, Y. Kim<sup>2</sup> and S. Jung<sup>1</sup> 1. *Electronic, Electrical & Computer Engineering, Sungkyunkwan University, Suwon, The Republic of Korea;* 2. *Department of Electronical Engineering, Chosun University, Gwangju, The Republic of Korea*
- ES-09. Efficiency Improvement of Magnetic-Geared Motor by Open-Slot and Interior Permanent Magnet Structure.** K. Nakamura<sup>1</sup>, T. Kadomatsu<sup>1</sup> and Y. Hane<sup>1</sup> 1. *Graduate School of Engineering, Tohoku University, Sendai, Japan*
- ES-10. Comparative Study on the Characteristics of Magnetic-geared Permanent Magnet Synchronous Motor for Electric Vehicles according to Gear Ratio Variation.** C. Park<sup>1</sup> and G. Jeong<sup>2</sup> 1. *Korea National University of Transportation, Uiwang-si, The Republic of Korea;* 2. *Hanyang University, Seoul, The Republic of Korea*
- ES-11. Comparative Study and Analysis of Two Different Types of Coaxial Magnetic Gears Considering Magnetic Losses and Magnet Volume.** J. Lee<sup>1</sup>, T. Bang<sup>1</sup>, K. Shin<sup>1</sup>, S. Cho<sup>1</sup> and J. Choi<sup>1</sup> 1. *Dept. of Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea*
- ES-12. Comparative Study of Axial Flux Magnetically Geared Machine with Conventional Axial Flux YASA Machine.** M.F. Khatab<sup>1</sup>, Z. Zhu<sup>1</sup>, H. Li<sup>1</sup> and Y. Liu<sup>1</sup> 1. *The University of Sheffield, Sheffield, United Kingdom*
- ES-13. Design of Marine Current Power Generation System Based on a Magnetic Gear.** N. Feng<sup>2,1</sup>, H. Yu<sup>1</sup>, X. Liu<sup>1</sup> and R. Guo<sup>1</sup> 1. *School of Electrical Engineering, Southeast University, Nanjing, China;* 2. *School of information and electrical engineering, Ludong University, Yantai, China*
- ES-14. Analysis of Doubly Fed Magnetic Geared Motor with Maximum Efficiency Operation by Individual Frequency Control.** H. Shin<sup>1</sup> and J. Chang<sup>1</sup> 1. *Electrical engineering, University of Dong-A, Busan, The Republic of Korea*
- ES-15. Performance Evaluation of Magnetic Lead Screws Equipped with Segmented Arc Magnets Instead of Helical Ones.** F. Gao<sup>1</sup>, Q. Wang<sup>1</sup> and J. Zou<sup>1</sup> 1. *Department of Electrical Engineering, Harbin Institute of Technology, Harbin, China*

Session ET  
**MAGNETISATION DYNAMICS II**  
**(Poster Session)**

Jiangwei Cao, Chair  
Lanzhou University, Lanzhou, China

- ET-01. Unravelling the effects associated with ferromagnetic dynamics in non-magnet/ferromagnet metallic multilayers.** O. Gladii<sup>1</sup>, L. Frangou<sup>1</sup>, G. Forestier<sup>1</sup>, S. Auffret<sup>1</sup>, U. Ebels<sup>1</sup>, S. Gambarelli<sup>2</sup> and V. Baltz<sup>1</sup> *1. SPINTEC (Univ. Grenoble Alpes / CNRS / INAC-CEA / GINP), Grenoble, France; 2. SYMMES (Univ. Grenoble Alpes / CNRS / INAC-CEA), Grenoble, France*
- ET-02. Temperature dependence of spin-torque driven ferromagnetic resonance in MgO-based magnetic tunnel junction with a perpendicularly free layer.** X. Wang<sup>1</sup>, J. Feng<sup>1</sup>, P. Guo<sup>1</sup>, H. Wei<sup>1</sup>, B. Fang<sup>2</sup>, Z. Zeng<sup>2</sup> and X. Han<sup>1</sup> *1. State Key Lab of Magnetism, Institute of Physics, Beijing, China; 2. Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, Suzhou, China*
- ET-03. Role of intersublattice coupling in current-induced spin torque in Rashba antiferromagnet.** C. Ho<sup>1</sup> and M.B. Jalil<sup>1</sup> *1. Department of Electrical and Computer Engineering, National University of Singapore, Singapore*
- ET-04. Quasi-oscillating transition between magnetic states in Pt/Co/Ir/Co/Pt/GaAs spin valves.** G. L'vova<sup>1,2</sup>, R. Morgunov<sup>1,2</sup>, T. Fache<sup>3</sup> and S. Mangin<sup>3</sup> *1. Institute of Problems of Chemical Physics, Chernogolovka, Russian Federation; 2. Tambov State Technical University, Tambov, Russian Federation; 3. Institut Jean Lamour, Nancy, France*
- ET-05. Exchange coupling induced giant damping enhancement in  $Y_3Fe_5O_{12}/Co_2FeAl_{0.5}Si_{0.5}$  bilayers.** M. Li<sup>1</sup>, L. Jin<sup>1</sup>, Y. Rao<sup>1</sup>, H. Zhang<sup>1</sup>, C. Hong<sup>1</sup>, Z. Zhong<sup>1</sup> and Q. Yang<sup>1</sup> *1. University of Electronic Science and Technology of China, Chengdu, China*
- ET-06. Threshold field of Resonance Frequency in Permalloy Films with stripe domains.** L. Pan<sup>1</sup>, C. Zhao<sup>1</sup>, X. Cheng<sup>1</sup>, D. Cao<sup>2</sup>, J. Wang<sup>1,3</sup> and Q. Liu<sup>1</sup> *1. Key Laboratory for Magnetic and Magnetic Materials of the Ministry of Education, Lanzhou University, Lanzhou, China; 2. College of Physics, Qingdao University, Qingdao, China; 3. Key Laboratory of Special Function Materials and Structure Design of the Ministry of Education, Lanzhou University, Lanzhou, China*
- ET-07. Effect of absorption of hydrogen on the linewidth of the ferromagnetic resonance response of Co/Pd bilayer films.** T. Schefer<sup>1,2</sup> and M. Kostylev<sup>1</sup> *1. University of Western Australia, Perth, WA, Australia; 2. University of Basel, Basel, Switzerland*

- ET-08. Angle-dependent static and dynamic magnetic properties of B2 ordered Co<sub>2</sub>FeSi film.** Z. Xu<sup>1</sup>, Z. Zhang<sup>1</sup>, X. Li<sup>1</sup>, J. Tang<sup>1</sup>, F. Hu<sup>1</sup>, E. Liu<sup>1</sup> and F. Xu<sup>1</sup> *1. School of Materials Science and Engineering, Nanjing University of Science and Technology, Nanjing, China*
- ET-09. Voltage control of two magnon scattering and an enhanced ME coupling in multiferroic heterostructures.** X. Xue<sup>1</sup>, Z. Zhou<sup>1</sup> and M. Liu<sup>1</sup> *1. Xi'an Jiaotong University, Xi'an, China*
- ET-10. Magnetic anisotropy and damping constant in CoFeB/Ir and CoFeB/Ru systems.** M. Belmeguenai<sup>1</sup>, D. Apalkov<sup>2</sup>, M. Gabor<sup>3</sup>, F. Zighem<sup>1</sup>, G. Feng<sup>2</sup> and X. Tang<sup>2</sup> *1. LSPM, Université Paris 13, Villetaneuse, France; 2. New Memory Technology Lab, Samsung Semiconductor Inc, San Jose, CA, United States; 3. Center for Superconductivity, Spintronics and Surface Science, Technical University of Cluj-Napoca, Cluj-Napoca, Romania*
- ET-11. Detection sensitivity exceeding 10<sup>5</sup> mV/mW in spin-torque diode.** B. Fang<sup>1</sup>, J.L. Cai<sup>1</sup>, P. Khalili Amiri<sup>2</sup>, G. Finocchio<sup>3</sup> and Z. Zeng<sup>1</sup> *1. Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, Suzhou, China; 2. Department of Physics and Astronomy, University of California, Los Angeles, CA, United States; 3. Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina, Messina, Italy*
- ET-12. Proximity effect induced enhanced spin pumping in Py/Gd at room temperature.** R. Bansal<sup>1</sup>, N. Chowdhury<sup>1</sup> and P.K. Muduli<sup>1</sup> *1. Physics, Indian Institute of Technology, New Delhi, Delhi, India*
- ET-13. Bias Field Tunable Spin Configuration and Spin Dynamics in Arrays of Ni<sub>80</sub>Fe<sub>20</sub> Nano-Cross Structures.** K. Adhikari<sup>1</sup>, S. Choudhury<sup>1</sup>, S. Barman<sup>2</sup>, Y. Otani<sup>3</sup> and A. Barman<sup>1</sup> *1. S. N. Bose National Centre for Basic Sciences, Kolkata, India; 2. Institute of Engineering & Management, Management House, Kolkata, India; 3. Institute for Solid State Physics, University of Tokyo, Riken, Japan*
- ET-14. Losses Modeling Based on Domain Wall Processes and Validation Considering Rotational Excitation of Electrical Steel Sheets.** J. Li<sup>1</sup>, Q. Yang<sup>2,3</sup>, S. Wang<sup>1</sup> and Y. Li<sup>2</sup> *1. State Key Laboratory of Control and Simulation of Power System and Generation Equipments, Tsinghua University, Beijing, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China; 3. Municipal Key Laboratory of Advanced Technology of Electrical Engineering and Energy, Tianjin Polytechnic University, Tianjin, China*
- ET-15. Withdrawn**
- ET-16. Switching of Skyrmion chirality by local heating.** Y. Nakatani<sup>1</sup>, K. Yamada<sup>2</sup> and A. Hirohata<sup>3</sup> *1. University of Electro-Communications, Chofu, Japan; 2. Gifu University, Gifu, Japan; 3. University of York, York, United Kingdom*

Session EU  
**MICROMAGNETICS I**  
**(Poster Session)**

Zhuo Bin Siu, Chair  
National University of Singapore, Singapore

- EU-01. Magnetic properties of  $L 1_0$  FePt thin film influenced by strains stemmed from the polarization of PMN-PT substrate.** *L. Liu<sup>1</sup>, C. Hu<sup>2</sup>, Y. Xu<sup>1</sup> and W. Rao<sup>1</sup> 1. Department of Materials Physics, and IEMM, Nanjing University of Information Science and Technology, Nanjing, China; 2. College of Materials Science and Engineering, Liaocheng University, Liaocheng, China*
- EU-02. Voltage controlled spin torque nano-oscillator based on magnetic skyrmion.** *C. Song<sup>1</sup>, C. Jin<sup>1</sup>, H. Xia<sup>1</sup>, J. Wang<sup>1</sup>, J. Wang<sup>1,2</sup> and Q. Liu<sup>1</sup> 1. Key Laboratory for Magnetism and Magnetic Materials of the Ministry of Education, Lanzhou University, Lanzhou, China; 2. Key Laboratory for Special Function Materials and Structural Design of the Ministry of Education, Lanzhou University, Lanzhou, China*
- EU-03. Effects of Anisotropy Field and easy axis dispersions on squareness ratio for HDDR-processed NdFeB powders.** *F. Akagi<sup>1</sup>, T. Shirai<sup>1</sup> and R. Kariya<sup>1</sup> 1. Kogakuin Univ., Shinjuku-ku, Japan*
- EU-04. Numerical analysis of write current reduction in magnetic tri-layer structure with low-T<sub>c</sub> interlayer for MRAM.** *Y. Kayama<sup>1</sup>, K. Machida<sup>1</sup>, S. Greaves<sup>2</sup>, Y. Sonobe<sup>3</sup> and Y. Nakatani<sup>1</sup> 1. University of Electro-Communications, Chofu, Japan; 2. RIEC, Tohoku University, Sendai, Japan; 3. Samsung Research Institute of Japan, Yokohama, Japan*
- EU-05. Multiscale Modeling of Magnetic Distribution in a Magnetic Core of high-frequency transformer.** *H. Li<sup>1</sup>, S. Wang<sup>1</sup> and J. Zhu<sup>2</sup> 1. Xi'an Jiaotong University, Xi'an, China; 2. The University of Technology, Sydney, Sydney, NSW, Australia*
- EU-06. The effect of easy axis deviations on the magnetic property of Co nanowire.** *Y. Peng<sup>1</sup>, M. Yue<sup>1</sup>, H. Li<sup>1</sup>, Y. Li<sup>1</sup>, C. Li<sup>1</sup>, H. Xu<sup>1</sup> and Q. Wu<sup>1</sup> 1. College of Materials Science and Engineering, Beijing University of Technology, Beijing, China*
- EU-08. An optimal design of an electromagnetic actuator for targeting magnetic micro/nano-carriers in a desired region.** *T. Le<sup>1</sup> and J. Yoon<sup>1</sup> 1. School of Integrated technology, Gwangju Institutue of Science and Technology, Gwangju, The Republic of Korea*
- EU-09. AC Loss Database Built with Numerical Multi-scale Model and Status Prediction of a 150 kJ SMES.** *Z. Zhang<sup>1</sup> 1. State Key Laboratory of Advanced Electromagnetic Engineering and Technology, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan, China*

**EU-10. Analytical functions of magnetization curves for high magnetic permeability materials.** *M. Mirzaei*<sup>1</sup> and *P. Ripka*<sup>1</sup>  
*1. Czech Technical University, Prague, Czechia*

**EU-11. Size effect on the magnetic behavior of rapidly solidified cylindrical amorphous nanowires.** *C. Rotarescu*<sup>1</sup>, *H. Chiriac*<sup>1</sup>, *N. Lupu*<sup>1</sup> and *T.A. Ovari*<sup>1</sup> *1. National Institute of Research and Development for Technical Physics, Iasi, Romania*

THURSDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session EV**  
**MICROSCOPY, IMAGING AND**  
**CHARACTERIZATION III**  
**(Poster Session)**

Haifeng Du, Co-Chair

High Magnetic Field Laboratory of Chinese Academy of Sciences,  
Hefei, China

Yonggang Zhao, Co-Chair  
Tsinghua University, Beijing, China

**EV-01. High resolution magnetic field energy imaging of the magnetic recording head by A-MFM with superparamagnetic tip.** *P. Kumar*<sup>1</sup>, *Y. Suzuki*<sup>1</sup>, *Y. Cao*<sup>2</sup>, *S. Yoshimura*<sup>1</sup> and *H. Saito*<sup>1</sup> *1. Graduate School of Engineering Science, Akita University, Akita City, Japan; 2. Regional Innovation Center, Akita University, Akita City, Japan*

**EV-02. Rotatable magnetic anisotropy in Fe-based thin films with stripe domains by Field-Dependent Magnetic Force Microscopy.** *P. Tiberto*<sup>1</sup>, *G. Barrera*<sup>1</sup>, *F. Celegato*<sup>1</sup>, *M. Cialone*<sup>2</sup>, *M. Coisson*<sup>1</sup> and *P. Rizzi*<sup>2</sup> *1. INRIM, Torino, Italy; 2. Chemistry, Università di Torino, Torino, Italy*

**EV-03. Observation of superconducting vortices and vortex clusters in S/F hybrids.** *C. Di Giorgio*<sup>1,2</sup>, *F. Bobba*<sup>1</sup>, *D. D'Agostino*<sup>1</sup>, *S.A. Moore*<sup>2</sup>, *I. Maria*<sup>2</sup>, *G. Karapetrov*<sup>3</sup>, *N. Valentyn*<sup>4</sup>, *V. Yefremenko*<sup>4</sup> and *A. Cucolo*<sup>1</sup> *1. Physics, Università degli studi di Salerno, Fisciano, Italy; 2. Physics, Temple University, Philadelphia, PA, United States; 3. Physics, Drexel University, Philadelphia, PA, United States; 4. Material Science Division, Argonne National Laboratory, Chicago, IL, United States*

**EV-04. Resolution enhancement of magneto-optical Kerr images using modern image processing algorithms.** *N. Gorn*<sup>2</sup>, *I. Soldatov*<sup>1</sup>, *R. Schäfer*<sup>1,3</sup> and *D. Berkov*<sup>2</sup> *1. Institute for Metallic Materials, Leibniz Institute for Solid State and Materials Research (IFW) Dresden, Dresden, Germany; 2. General Numerics Research Lab, Jena, Germany; 3. Institute for Materials Science, Technical University Dresden, Dresden, Germany*

- EV-05. Machine-Learning Assisted X-Ray Spectroscopy for High-Throughput Characterization of Magnetic Materials.** T. Ueno<sup>1</sup>, H. Hino<sup>2</sup> and K. Ono<sup>3</sup> 1. *Quantum Beam Science Research Directorate, National Institutes for Quantum and Radiological Science and Technology, Sayo, Japan;* 2. *Department of Computer Science, University of Tsukuba, Tsukuba, Japan;* 3. *Institute of Materials Structure Science, High Energy Accelerator Research Organization, Tsukuba, Japan*
- EV-06. Revealing complex magnetic order in nanostructure patterns via nuclear X-ray scattering.** K. Schlage<sup>1</sup>, D. Erb<sup>1,2</sup>, L. Bocklage<sup>1,3</sup>, H. Wille<sup>1</sup>, L. Dzemiantsova<sup>1,3</sup>, G. Meier<sup>3,4</sup>, R. Ruffer<sup>5</sup> and R. Roehlsberger<sup>1,3</sup> 1. *Deutsches Elektronen-Synchrotron (DESY), Hamburg, Germany;* 2. *Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany;* 3. *The Hamburg Centre for Ultrafast Imaging, Hamburg, Germany;* 4. *Max Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany;* 5. *European Synchrotron Radiation Facility, Grenoble, France*
- EV-07. Spin-orbit torque magnetometry by wide-field magneto-optical Kerr effect.** T. Tsai<sup>1</sup> and C. Pai<sup>1</sup> 1. *Materials Science and Engineering, National Taiwan University, Taoyuan City, Taiwan*
- EV-08. Combined FORC and Kerr Microscopy Domain Analysis.** I. Soldatov<sup>2</sup>, J. Garcia<sup>2</sup>, A. Volegov<sup>3</sup>, P. Dhagat<sup>4</sup>, A. Jander<sup>4</sup> and R. Schäfer<sup>2,1</sup> 1. *Institute for Materials Science, TU Dresden, Dresden, Germany;* 2. *Institute for Metallic Materials, Leibniz Institute for Solid State and Materials Research (IFW) Dresden, Dresden, Germany;* 3. *Institute of Natural Science, Ural Federal University, Ekaterinburg, Russian Federation;* 4. *School of EECS, Oregon State University, Corvallis, OR, United States*
- EV-09. Improvement of the measurement method of rock magnetic properties based on the scanning SQUID microscope with an in-situ magnetization/demagnetization field.** J. Du<sup>1,2</sup>, Q. Wang<sup>1</sup> and T. Song<sup>1,2</sup> 1. *Institute of Electrical Engineering, Chinese Academy of Science, Beijing, China;* 2. *University of the Chinese Academy of Sciences, Beijing, China*
- EV-10. Implementation of 16-channel AMR sensor array for quantitative mapping of two-dimension current distribution.** G. Huang<sup>1</sup> and J. Jeng<sup>1</sup> 1. *Mechanical Engineering, National Kaohsiung University of Applied Sciences, KAOHSIUNG, Taiwan*
- EV-11. Magnetic control of guanine-vesicle hybrid and its possible application in live cell imaging.** A. Mootha<sup>1</sup>, K. Suzuki<sup>3</sup> and M. Iwasaka<sup>1</sup> 1. *Research institute of Nanodevice ad Biosystems, Hiroshima University, Higashihiroshimashi, Japan;* 3. *Kanagawa University, Hiratsuka, Japan*
- EV-12. Modifying coercivity via growth rate on domain wall pinning (001) FePd thin film.** C. Hsiao<sup>1</sup>, H. Chang<sup>2</sup> and C. Ouyang<sup>1</sup> 1. *Materials science and engineering, National Tsing Hua University, Hsinchu, Taiwan;* 2. *National Chung Cheng University, Chia-Yi, Taiwan*

**EV-13. Design and Simulation of a Double Tuned RF Coil for  $^1\text{H}$  and  $^{31}\text{P}$  MR imaging at 7T.** *F. Du*<sup>1,2</sup>, *S. Liu*<sup>1</sup>, *N. Li*<sup>1,2</sup>, *Y. Dou*<sup>2</sup>, *X. Zhang*<sup>3,4</sup> and *Y. Li*<sup>2</sup> *1. Department of Biomedical Engineering, Chongqing University of Technology, Chongqing, China; 2. Lauterbur Research Center for Biomedical Imaging, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China; 3. Department of Radiology and Biomedical Imaging, University of California, San Francisco, San Francisco, CA, United States; 4. UCSF/UC Berkeley Joint Graduate Group in Bioengineering, San Francisco, CA, United States*

**EV-14. Effect of synthesis method on particle size and magnetic and structural properties of Co-Ni ferrites.** *S. Sharmin*<sup>1</sup>, *M. Kishimoto*<sup>1</sup>, *E. Kita*<sup>1</sup>, *H. Latiff*<sup>1</sup> and *H. Yanagihara*<sup>1</sup>  
*1. Applied Physics, University of Tsukuba, Nagareyama, Japan*

**EV-15. Effect of Sputtered Flux Direction on Damping Properties in Magnetic Bilayers.** *S. Nayak*<sup>1</sup>, *S. Mallick*<sup>1</sup>, *B.B. Singh*<sup>1</sup> and *S. Bedanta*<sup>1</sup> *1. LNMM, School of Physical Sciences, NISER, Bhubaneswar, India*

THURSDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session EW**  
**SENSORS: NEW SENSING PRINCIPLES**  
**(Poster Session)**

*Jai Lin Tsai*, Chair  
National Chung Hsing University, Taichung, Taiwan

**EW-01. Hall effect spintronics for gas detection.** *A. Gerber*<sup>1</sup> and *G. Kopnov*<sup>1</sup> *1. School of Physics, Tel Aviv University, Tel Aviv, Israel*

**EW-02. Design of a Hall-Effect Current Sensor using Integrated Magnetic Concentrator and Magnetic Shield.** *H. Hwang*<sup>1</sup>, *J. Cho*<sup>1</sup>, *Y. Choo*<sup>1</sup>, *C. Kim*<sup>1</sup> and *C. Lee*<sup>1</sup> *1. Electrical and Computer Engineering, Pusan National University, Pusan, The Republic of Korea*

**EW-03. Magnetoimpedance strain gage sensors on FeNi alloys.** *E. Fernandez Martin*<sup>1</sup>, *I. Orue*<sup>3</sup>, *J. Feuchtwanger*<sup>2</sup> and *A. García-Arribas*<sup>2,1</sup> *1. BCMaterials, Leioa, Spain; 2. Electricity and electronics, University of the Basque Country (UPV/EHU), Leioa, Spain; 3. SGIKER Magnetic Measurements, University of the Basque Country (UPV/EHU), Leioa, Spain*

**EW-04. Magnetic non-destructive materials characterization of non-ferromagnetic materials using magnetic susceptibility.** *B. Gupta*<sup>1,2</sup>, *B. Ducharme*<sup>1</sup>, *G. Sebald*<sup>2</sup> and *T. Uchimoto*<sup>2</sup> *1. INSA LYON, Laboratoire de Génie Electrique et Ferroélectricité, Villeurbanne, France; 2. ELyTMaX, Sendai, Japan*

- EW-05. Low noise fundamental mode orthogonal fluxgate (FM-OFG) magnetometer built with an amorphous ribbon core.** *I. Sasada*<sup>1</sup> *I. Sasada Magnetics & Sensors Laboratory, Fukuoka, Japan*
- EW-06. Accuracy Analysis of Sensing Coils in 2D Magnetic Properties Measurement.** *X. Ding*<sup>1</sup> and *S. Ren*<sup>1</sup> *I. Beihang University, Beijing, China*
- EW-07. Magnetic Properties and Detection Methods of the Metal Wear Particles under Harmonic Magnetic Field.** *R. Jia*<sup>1</sup>, *B. Ma*<sup>1</sup>, *C. Zheng*<sup>1</sup>, *L. Wang*<sup>2</sup> and *Q. Du*<sup>1</sup> *I. Beijing Institute of Technology, Beijing, China; 2. Beijing Information Science and Technology University, Beijing, China*
- EW-08. Graphene-Co Nanoparticle Composites: Sensor Applications.** *C.G. ünülü*<sup>1</sup>, *A. Tekgül*<sup>3,4</sup>, *M. Acet*<sup>2</sup>, *M. Ak*<sup>1</sup> and *M. Farle*<sup>2</sup> *I. Department of Chemistry, Pamukkale University, Denizli, Turkey; 2. Department of Physics, Duisburg-Essen University, Duisburg, Germany; 3. Department of Physics, Akdeniz University, Antalya, Turkey; 4. Department of Physics, Uludag University, Bursa, Turkey*
- EW-09. Force sensors based on magnetic amorphous wires.** *C. Hlenschi*<sup>1,2</sup>, *S. Corodeanu*<sup>1</sup>, *H. Chiriac*<sup>1</sup> and *N. Lupu*<sup>1</sup> *I. National Institute of Research and Development for Technical Physics, Iasi, Romania; 2. Alexandru Ioan Cuza University, Iasi, Romania*
- EW-10. Rotating magnetoelectric sensor for DC magnetic field measurement.** *Y. Ren*<sup>1</sup>, *J. Ouyang*<sup>1</sup>, *X. Wu*<sup>1</sup>, *W. Wang*<sup>1</sup>, *J. Liang*<sup>1</sup>, *S. Chen*<sup>1</sup> and *X. Yang*<sup>1</sup> *I. School of Optics and electronic information, Huazhong University of Science and Technology, Wuhan, China*
- EW-11. Development of the Technique for Measuring the Magnetic Flux in the Motor Core under Operating Conditions.** *Y. Maeda*<sup>1</sup>, *S. Urata*<sup>1</sup> and *H. Nakai*<sup>1</sup> *I. Toyota Central R&D Labs., Inc., Nagakute, Japan*
- EW-12. The perceptually-inspired model of tactile texture sensor based on the inverse magnetostrictive effect.** *L. Wan*<sup>1</sup> and *B. Wang*<sup>1</sup> *I. Hebei University of Technology, Tianjin, China*
- EW-13. A magnetoresistive sensor based on the elasticity of domain walls.** *X. Zhang*<sup>2,3</sup>, *N. Vernier*<sup>3</sup>, *Z. Cao*<sup>2,1</sup>, *Q. Leng*<sup>2</sup>, *A. Cao*<sup>1,2</sup>, *D. Ravelosona*<sup>3</sup> and *W. Zhao*<sup>1,2</sup> *I. Fert Beijing Institute, School of Electronic and Information Engineering, Beihang University, Beijing, China; 2. Beihang-Goertek Joint Microelectronics Institute, Qingdao Research Institute, Beihang University, Qingdao, China; 3. Center for nanoscience and nanotechnology, Université Paris-Sud, Orsay, France*
- EW-14. Determination of the strain-impedance gauge factor of Si-cantilever-based giant magnetoimpedance sensors.** *G. Büttel*<sup>1</sup>, *J. Joppich*<sup>1</sup> and *U. Hartmann*<sup>1</sup> *I. Institute of Experimental Physics, Saarland University, Saarbrücken, Germany*

**EW-15. MgO-based Magnetoresistive Biosensor for Magnetically labeled Cells Detection.** *S. Amara*<sup>1</sup>, *R. Bu*<sup>2</sup>, *M. Alawein*<sup>1</sup> and *H. Fariborzi*<sup>1</sup> *1. CEMSE, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia; 2. Computer School of Physics. Shandong University, Jinan, China*

**EW-16. Detection of magnetic nanoparticles by variation of magnetization dynamics of Co/Ni multilayer.** *Y. Otaki*<sup>1</sup>, *T. Kato*<sup>1</sup>, *S. Okamoto*<sup>2</sup>, *N. Kikuchi*<sup>2</sup>, *D. Oshima*<sup>3</sup>, *S. Iwata*<sup>3</sup> and *O. Kitakami*<sup>2</sup> *1. Department of Electronics, Nagoya University, Nagoya, Japan; 2. Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; 3. Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan*

THURSDAY  
AFTERNOON  
2:00

ORCHID I

**Session FA**  
**SYMPOSIUM ON TOPOLOGICAL AND COLLECTIVE  
MAGNETIC PHENOMENA**

**Fusheng Ma, Co-Chair**  
Nanyang Technological University, Singapore  
**Anjan Soumyanarayanan, Co-Chair**  
Data Storage Institute, Singapore, Singapore

2:00

**FA-01. Topology of magnonic bands: From chiral edge modes to spin superfluidity. (Invited)** *Y. Tserkovnyak*<sup>1</sup> *1. Physics and Astronomy, UCLA, Los Angeles, CA, United States*

2:30

**FA-02. Topological Magnon Materials. (Invited)** *I. Mertig*<sup>1,2</sup>, *A. Mook*<sup>1</sup> and *J. Henk*<sup>1</sup> *1. Physics, Martin-Luther-Universität Halle-Wittenberg, Halle, Germany; 2. Max Planck Institute for Microstructure Physics, Halle, Germany*

3:00

**FA-03. Quantum anomalous Hall effect and topological Hall effect in magnetic topological insulators. (Invited)** *Y. Wang*<sup>1</sup> *1. Tsinghua University, Beijing, China*

3:30

**FA-04. Mixed semimetals for magnetization and momentum space topology control. (Invited)** *J. Hanke*<sup>1</sup>, *C. Niu*<sup>1</sup>, *F. Freimuth*<sup>1</sup>, *G. Bihlmayer*<sup>1</sup>, *S. Bluegel*<sup>1</sup> and *Y. Mokrousov*<sup>1</sup> *1. IAS-1, Forschungszentrum Julich, Juelich, Germany*

4:00

**FA-05. Topological bands and topological phase transitions in electronic and magnonic systems. (Invited)** *S. Murakami*<sup>1,2</sup> *1. Department of Physics, Tokyo Institute of Technology, Tokyo, Japan; 2. TIES, Tokyo Institute of Technology, Tokyo, Japan*

**FA-06. Magnonic Topological Materials and Devices. (Invited)**

*X. Wang*<sup>1,2</sup> and *X. Wang*<sup>3,1</sup> 1. *Physics, The Hong Kong University of Science and Technology, Kowloon, China;*  
 2. *HKUST Shenzhen Research Institute, Shenzhen, China;*  
 3. *University of Electronic Science and Technology of China, Chengdu, China*

THURSDAY  
 AFTERNOON  
 2:00

ORCHID III

**Session FB****HARD MAGNETIC MATERIALS AND PROCESSING I**

*Alberto Bollero*, Chair  
 IMDEA Nanoscience, Madrid, Spain

2:00

**FB-01. Remanence enhancement melt-spun Nitroquench  $\text{Sm}_2\text{Fe}_{17}\text{N}_3$ .**

*M. Coey*<sup>1</sup>, *P.S. Stamenov*<sup>1</sup>, *M. Venkatesan*<sup>1</sup>, *S.B. Porter*<sup>1</sup> and *T. Iriyama*<sup>2</sup> 1. *School of Physics, Trinity College Dublin, Dublin, Ireland;* 2. *Daido Electronics Company, Nagoya, Japan*

2:15

**FB-02. Preparation and characterization of phenol formaldehyde bonded Nd-Fe-B magnets with high strength and heat resistance.**

*W. Xi*<sup>1</sup>, *W. Liu*<sup>1</sup>, *M. Yue*<sup>1</sup>, *D. Zhang*<sup>1</sup>, *Q. Lu*<sup>1</sup>, *H. Zhang*<sup>1</sup>, *Q. Wu*<sup>1</sup> and *Y. Li*<sup>1</sup> 1. *College of Materials Science and Engineering, Beijing University of Technology, Beijing, China*

2:30

**FB-03. Effects of initial alloy on microstructure and magnetic properties during hot-deformation of Nd-Fe-B HDDR powder.**

*J. Lee*<sup>1</sup>, *J. Yoo*<sup>1,2</sup>, *Y. Baek*<sup>1</sup>, *D. Lee*<sup>2</sup> and *H. Kwon*<sup>3</sup> 1. *Korea Institute of Materials Science, Changwon, The Republic of Korea;* 2. *Pusan National University, Pusan, The Republic of Korea;* 3. *Pukyong National University, Pusan, The Republic of Korea*

2:45

**FB-04. Comparison of two Magnetizing Fixture Designs to Achieve Radial Magnetization Profile for Isotropic Bonded Neo Magnets.**

*R.C. Angara*<sup>1</sup>, *K.W. Hsu*<sup>1</sup>, *P.J. Villar*<sup>1</sup> and *N.K. Sheth*<sup>1</sup> 1. *R&D Magnequench, Magnequench Neo Powders Pte Ltd, Singapore, Singapore*

3:00

**FB-05. Desirable Measurement on Accurate Hysteresis Curve for Large Nd-Fe-B Sintered Magnets at Elevated Temperatures.**

*H. Nishio*<sup>1,2</sup> and *K. Machida*<sup>1</sup> 1. *Division of Applied Chemistry, Osaka University, Suita, Japan;* 2. *Research Institute for Measurement of Magnetic Materials, Yokohama, Japan*

3:15

- FB-06. High performance magnetic properties of CoFe<sub>2</sub>O<sub>4</sub> nanoparticles for rare earth free permanent magnet applications.** *Y. Kumar*<sup>1</sup> and *P.M. Shirage*<sup>1,2</sup> *1. Metallurgy Engineering and Materials Science, Indian institute of Technology Indore, Indore, India; 2. Discipline of Physics, Indian Institute of Technology Indore, Indore, India*

3:30

- FB-07. 3-D Magnetic Field Analysis of a Permanent Magnet Spherical Actuator Using Spherical Harmonics.** *X. Li*<sup>1,2</sup>, *J. Liu*<sup>1</sup> and *W. Chen*<sup>1</sup> *1. School of Automation Science and Electrical Engineering, Beihang University, Beijing, China; 2. Department of Materials and Production, Aalborg University, Aalborg, Denmark*

3:45

- FB-08. Influence of Soft Magnetic Material type in Fixture Components on the Magnetization of Bonded Neo Magnet and Motor Performance.** *R.C. Angara*<sup>1</sup>, *K.W. Hsu*<sup>1</sup>, *P.J. Villar*<sup>1</sup> and *N.K. Sheth*<sup>1</sup> *1. R&D Magnequench, Magnequench Neo Powders Pte Ltd, Singapore, Singapore*

4:00

- FB-09. A hybrid coercivity mechanism for exchange-coupled nanocomposite permanent magnets.** *G. Zhao*<sup>1</sup> *1. Physics, Sichuan Normal University, Chengdu, China*

4:15

- FB-10. The corrosion behavior with sintered (Ce,Nd)-Fe-B in the presence of pressurised vapour.** *X. Shi*<sup>1</sup>, *M. Zhu*<sup>1</sup>, *D. Zhou*<sup>1</sup>, *L. Song*<sup>1</sup>, *Y. Fang*<sup>1</sup> and *W. Li*<sup>1</sup> *1. Division of Functional Materials, Central Iron & Steel Research Institute, Beijing, China*

4:30

- FB-11. Element-specific characterization of Co:FePt nanocomposite magnet films.** *F. Wilhelm*<sup>1</sup>, *V. Dupuis*<sup>2</sup>, *D. Le Roy*<sup>2</sup>, *N. Dempsey*<sup>3</sup> and *A. Rogalev*<sup>1</sup> *1. ESRF, Grenoble, France; 2. Institut Lumière Matière, Villeurbanne, France; 3. Institut Néel, Grenoble, France*

4:45

- FB-12. Effect of residue hydrogen content on microstructure and magnetic properties of Sm(Co<sub>bal</sub>Fe<sub>0.28</sub>Cu<sub>0.053</sub>Zr<sub>0.02</sub>)<sub>7.84</sub>.** *C. Zhang*<sup>1</sup>, *Z. Liu*<sup>1</sup>, *L. Liu*<sup>1</sup>, *T. Li*<sup>1</sup>, *R. Chen*<sup>1</sup>, *D. Lee*<sup>2</sup> and *A. Yan*<sup>1</sup> *1. Key Laboratory of Magnetic Materials and Devices, Ningbo Institute of Industrial Technology, Chinese Academy of Sciences, Ningbo, China; 2. University of Dayton, Dayton, OH, United States*

**Session FC**  
**TMR, VCMA AND SWITCHING**

Caihua Wan, Chair

Institute of Physics, Chinese Academy of Sciences, Beijing, China

2:00

- FC-01. Voltage-driven precessional switching at zero bias magnetic field in a conically magnetized free layer.** *R. Matsumoto<sup>1</sup>, T. Nozaki<sup>1</sup>, S. Yuasa<sup>1</sup> and H. Imamura<sup>1</sup>* *1. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

2:15

- FC-02. Field-Free Switching of Perpendicular Magnetization through Voltage-Gated Spin Hall Effect.** *S. Peng<sup>1,2</sup>, W. Kang<sup>1</sup>, X. Li<sup>2</sup>, H. Zhang<sup>1</sup>, Z. Wang<sup>1</sup>, Y. Zhang<sup>1</sup>, K. Wang<sup>2</sup> and W. Zhao<sup>1</sup>* *1. Fert Beijing Institute, BDBC, School of Electronic and Information Engineering, Beihang University, Beijing, China; 2. Department of Electrical Engineering, University of California, Los Angeles, CA, United States*

2:30

- FC-03. Atomic layer number dependence of voltage-controlled magnetic anisotropy in Cr/Fe/MgAl<sub>2</sub>O<sub>4</sub> heterostructure.** *Q. Xiang<sup>1,2</sup>, H. Sukegawa<sup>1</sup>, M. Al-Mahdawi<sup>1</sup>, M. Belmoubarik<sup>1</sup>, S. Kasai<sup>1</sup>, Y. Sakuraba<sup>1</sup>, S. Mitani<sup>1,2</sup> and K. Hono<sup>1,2</sup>* *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba City, Japan; 2. Graduate School of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Japan*

2:45

- FC-04. The lower bound of the write error rate of a voltage-torque MRAM.** *H. Imamura<sup>1</sup> and R. Matsumoto<sup>1</sup>* *1. Spintronics RC, AIST, Tsukuba, Japan*

3:00

- FC-05. Study of voltage-controlled perpendicular magnetic anisotropy in Ta/FeB/MgO and W/FeB/MgO nanowires by the Hall effect measurements.** *V. Zayets<sup>1</sup>, T. Nozaki<sup>1</sup>, A. Fukushima<sup>1</sup> and S. Yuasa<sup>1</sup>* *1. Spintronics Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

3:15

- FC-06. Electric-field effect on the exchange stiffness in CoFeB/MgO stacks.** *N. Ichikawa<sup>1</sup>, T. Dohi<sup>1</sup>, A. Okada<sup>1</sup>, H. Sato<sup>1,2</sup>, S. Fukami<sup>1,2</sup> and H. Ohno<sup>1,2</sup>* *1. RIEC, Tohoku University, Sendai, Japan; 2. CSIS, Tohoku University, Sendai, Japan*

- FC-07. Voltage-Controlled Magnetic Tunnel Junctions for Processing-In-Memory Implementation.** *L. Wang*<sup>1,2</sup>, K. Wang<sup>1</sup>, F. Ebrahimi<sup>2</sup>, X. Li<sup>2</sup>, Y. Huang<sup>1</sup>, C. Zhao<sup>3</sup>, K. Wang<sup>2</sup> and W. Zhao<sup>1</sup> *1. Beihang University, Beijing, China; 2. UCLA, LA, CA, United States; 3. Institute of Microelectronics, Chinese Academy of Sciences, Beijing, China*

3:45

- FC-08. Ultrafast random number generator based on voltage-controlled switching.** *A. Fukushima*<sup>1</sup>, T. Yamamoto<sup>1</sup>, T. Nozaki<sup>1</sup>, K. Yakushiji<sup>1</sup>, H. Kubota<sup>1</sup> and S. Yuasa<sup>1</sup>  
*1. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

4:00

- FC-09. High Voltage-Controlled Magnetic Anisotropy by Tuning Seed Layers of Magnetic Tunnel Junctions for Embedded Applications.** *X. Li*<sup>1,2</sup>, T. Sasaki<sup>3</sup>, L. Wang<sup>4</sup>, C. Grezes<sup>1</sup>, D. Wu<sup>1,5</sup>, S. Kwon<sup>6</sup>, H. Wu<sup>1,7</sup>, K. Wong<sup>1</sup>, T. Ohkubo<sup>3</sup>, Z. Zhang<sup>5</sup>, X. Han<sup>7</sup>, W. Zhao<sup>4</sup>, N.G. Kioussis<sup>6</sup>, K. Hono<sup>3</sup>, P. Khalili<sup>1,8</sup> and K. Wang<sup>1</sup> *1. Electrical Engineering, University of California, Los Angeles, Los Angeles, CA, United States; 2. Inston Inc., Los Angeles, CA, United States; 3. National Institute for Materials Science (NIMS), Tsukuba, Japan; 4. Electronic and Information Engineering, Beihang University, Beijing, China; 5. Optical Science and Engineering, Fudan University, Shanghai, China; 6. Physics and Astronomy, California State University, Northridge, Northridge, CA, United States; 7. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 8. Electrical Engineering and Computer Science, Northwestern University, Evanston, IL, United States*

4:15

- FC-10. Effect of insertion layer on the properties of Mn<sub>2</sub>Ru<sub>x</sub>Ga in magnetic tunnel junctions.** *A. Titova*<sup>1,2</sup>, C. Fowley<sup>1</sup>, Y. Lau<sup>3</sup>, D. Betto<sup>3</sup>, N. Thiyagarajah<sup>3</sup>, G. Atcheson<sup>3</sup>, C. Xu<sup>1</sup>, M. Coey<sup>3</sup>, P.S. Stamenov<sup>3</sup>, K. Rode<sup>3</sup>, J. Lindner<sup>1</sup>, J. Fassbender<sup>1,2</sup> and A. Deac<sup>1</sup> *1. Institute of Ion Beam Physics and Materials Research, Helmholtz - Zentrum Dresden - Rossendorf, Dresden, Germany; 2. Institute for Physics of Solids, Technische Universität Dresden, Dresden, Germany; 3. AMBER and School of Physics, Trinity College Dublin, Dublin, Ireland*

4:30

- FC-11. Current-induced magnetization switching in atom-thick tungsten engineered perpendicular magnetic tunnel junctions with large tunneling magnetoresistance.** *M. Wang*<sup>1</sup>, W. Cai<sup>1</sup>, K. Cao<sup>1</sup>, J. Zhou<sup>1</sup>, J. Wrona<sup>2</sup>, S. Peng<sup>1</sup>, H. Yang<sup>1</sup>, J. Wei<sup>1</sup>, W. Kang<sup>1</sup>, Y. Zhang<sup>1</sup>, J. Langer<sup>2</sup>, B. Ocker<sup>2</sup>, A. Fert<sup>1,3</sup> and W. Zhao<sup>1</sup> *1. Fert Beijing Institute, BDBC, and School of Electronic and Information Engineering, Beihang University, HaiDian District, China; 2. Singulus Technologies, Kahl am Main, Germany; 3. Unité Mixte de Physique, CNRS, Thales, Univ. Paris-Sud, Université Paris-Saclay, Palaiseau, France*

- FC-12. Highly (001)-textured MgAl<sub>2</sub>O<sub>4</sub>-based magnetic tunnel junctions with large magnetoresistance over 240%.** I. Tiar<sup>1</sup>, H. Sukegawa<sup>1</sup>, X. Xu<sup>1</sup>, M. Belmoubarik<sup>1</sup>, H. Lee<sup>1</sup>, S. Kasai<sup>1</sup> and K. Hono<sup>1</sup> *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan*

THURSDAY  
AFTERNOON  
2:00

PEONY IV

**Session FD**

**MAGNETO-CALORIC MATERIALS I**

Ramanathan Mahendiran, Co-Chair  
National University of Singapore, Singapore

R. Nirmala, Co-Chair  
IIT Madras, IIT Madras, India

2:00

- FD-01. Finding the separation between first- and second-order phase transitions in La(Fe,Ni,Si)<sub>13</sub> magnetocaloric materials.** L.M. Moreno-Ramírez<sup>1</sup>, J. Law<sup>1</sup>, C. Romero-Muñoz<sup>2</sup>, V. Franco<sup>1</sup>, A. Conde<sup>1</sup>, F. Maccari<sup>3</sup>, I.A. Radulov<sup>3</sup>, K. Skokov<sup>3</sup> and O. Gutfleisch<sup>3</sup> *1. University of Sevilla, Sevilla, Spain; 2. Universidad Autónoma de Madrid, Madrid, Spain; 3. TU Darmstadt, Darmstadt, Germany*

2:15

- FD-02. Magnetocaloric effect in melt-spun rare earth high entropy alloy YGdTbDyHo.** N. R<sup>1</sup>, A. Sankar<sup>1</sup>, A. Chelvane<sup>2</sup>, A. Morozkin<sup>3</sup>, A.K. Nigam<sup>4</sup>, S. Quezado<sup>5</sup> and S.K. Malik<sup>5</sup> *1. Physics, Indian Institute of Technology Madras, Chennai, India; 2. DMRL, Hyderabad, India; 3. Lomonosov Moscow State University, Moscow, Russian Federation; 4. TIFR, Mumbai, India; 5. UFRN, Natal, Brazil*

2:30

- FD-03. Pressure-Dependent Magnetic Transition Temperatures in Magnetocaloric High Entropy Alloys.** A.E. Perrin<sup>1</sup>, S. McCall<sup>3</sup>, M. Sorescu<sup>2</sup>, D. Laughlin<sup>1</sup> and M. McHenry<sup>1</sup> *1. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Physics, Duquesne University, Pittsburgh, PA, United States; 3. Lawrence Livermore National Lab, Livermore, CA, United States*

2:45

- FD-04. Magnetocaloric Behavior of Fe<sub>75-x</sub>Mn<sub>x</sub>Al<sub>25</sub> Alloys for Near Room Temperature Cooling.** V.K. Sharma<sup>1</sup>, V. Chaudhary<sup>1</sup> and R.V. Ramanujan<sup>1</sup> *1. School of Materials Science and Engineering, Nanyang Technological University, Singapore, Singapore*

3:00

- FD-05. Magnetocaloric effect in diluted magnetic ferroelectric:  $\text{Ba}_{0.6}\text{Eu}_{0.4}\text{TiO}_3$ .** K. Rubi<sup>1</sup> and R. Mahendiran<sup>1</sup> 1. *Physics, National University of Singapore, Singapore*

3:15

- FD-06.  $\text{Gd}_5(\text{Si},\text{Ge})_4$  nanoparticles produced by pulsed laser deposition.** V.M. Andrade<sup>1</sup>, N. Checca<sup>2</sup>, J. Belo<sup>3</sup>, B. Almeida<sup>4</sup>, M.S. Reis<sup>2,5</sup>, A. Pereira<sup>1</sup> and J. Araujo<sup>1</sup> 1. *Department of Physics and Astronomy, IFIMUP-IN, Porto, Portugal;* 2. *Departamento de Física, Instituto de Física da Universidade Federal Fluminense, Rio de Janeiro, Brazil;* 3. *Department of Physics and CICECO, Aveiro University - CICECO, Aveiro, Portugal;* 4. *Physics Department, Minho University, Braga, Portugal;* 5. *Physics Department, Aveiro University - I3N, Aveiro, Portugal*

3:30

- FD-07. Influence of overlapping transitions on the MCE response of a series of  $\text{Ni}_{0.49-x}\text{Mn}_{0.36+x}\text{In}_{0.15}$  Heusler alloys.** J. Law<sup>1</sup>, V. Franco<sup>1</sup>, A. Conde<sup>1</sup> and A. Giri<sup>2</sup> 1. *Condensed Matter Physics, Sevilla University, Sevilla, Spain;* 2. *Weapons and Materials Research Directorate, US Army Research Laboratory, Aberdeen, MD, United States*

3:45

- FD-08. Magnetocaloric effect in  $\text{MnNiSi-Fe}_2\text{Ge}$  and  $\text{MnNiSi-Fe-Sn}$  alloys.** D. Kamble<sup>1,2</sup> and R.V. Ramanujan<sup>1,2</sup> 1. *Materials Science and Engineering, Nanyang Technological University, Singapore, Singapore;* 2. *Singapore-HUJ Alliance for Research and Enterprise (SHARE), Nanomaterials for Energy and Energy-Water Nexus (NEW), Campus for Research Excellence and Technological Enterprise (CREATE), Singapore, Singapore*

4:00

- FD-09. Entropy Change and Hysteresis Losses in  $\text{Ni}_{45}\text{Co}_5\text{Mn}_{(37-x)}\text{In}_{(13+x)}$  Alloy Family.** M. Ghahremani<sup>1</sup>, A. Aslani<sup>2</sup>, M. Hosseinnia<sup>3</sup>, L.H. Bennett<sup>2</sup> and E. Della Torre<sup>2</sup> 1. *Computer Science, Mathematics, and Engineering, Shepherd University, Shepherdstown, WV, United States;* 2. *Electrical and Computer Engineering, The George Washington University, Washington, DC, United States;* 3. *Beatson Institute, University of Glasgow, Glasgow, United Kingdom*

4:15

- FD-10. Low field and large magnetocaloric effect in Ni-Mn-Sn (Fe-B) alloys.** K. Srikanti<sup>1</sup>, R. V.V<sup>1</sup>, G. Anusha<sup>1</sup> and G. Raghavan<sup>1</sup> 1. *CAEM, International Advanced Research Centre for Powder Metallurgy, Chennai, India*

- FD-11. Thermal stability, magnetic and magnetocaloric properties of  $Gd_{55}Co_{35}M_{10}$  (M=Si, Zr and Nb) amorphous alloys.** X. Zhong<sup>1</sup>, X. Huang<sup>1</sup>, D. Jiao<sup>1</sup>, H. Zhang<sup>1</sup>, W. Qiu<sup>1</sup>, Z. Liu<sup>1</sup> and R.V. Ramanujan<sup>2,3</sup> 1. School of Materials Science and Engineering, South China University of Technology, Guangzhou, China; 2. School of Materials Science and Engineering, Nanyang Technological University, Singapore, Singapore; 3. Singapore-HIJ Alliance for Research and Enterprise (SHARE), Nanomaterials for Energy and Energy-Water Nexus (NEW), Campus for Research Excellence and Technological Enterprise (CREATE), Singapore, Singapore

- FD-12. Table-like Magnetocaloric Effect in  $Ho_{36}Co_{48}Al_{16}$  Multiphase Alloy.** E.A. Balfour<sup>1</sup>, Y. Shang<sup>1</sup>, Y. Cao<sup>1</sup>, H. Fu<sup>1</sup>, A.A. El-Gendy<sup>2</sup> and R.L. Hadimani<sup>3</sup> 1. Applied Physics, School of Physical Electronics, University of Electronic Science and Technology of China, Chengdu, China; 2. Department of Physics, University of Texas at El Paso, El Paso, TX, United States; 3. Department of Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States

THURSDAY  
AFTERNOON  
2:00

ROSELLE II

### Session FE

## PATTERNED FILMS AND ELEMENTS

Olivier Fruchart, Chair

Univ. Grenoble Alpes, CNRS, CEA, Grenoble, France

- FE-01. Peculiarities of disorder-induced ferromagnetism phenomena in  $Fe_{60}Al_{40}$  films on a local scale.** A. Smekhova<sup>1</sup>, E. La Torre<sup>2</sup>, T. Szyjka<sup>2</sup>, B. Eggert<sup>2</sup>, B. Cöster<sup>2</sup>, K. Ollefs<sup>2,3</sup>, D. Walecki<sup>2</sup>, S. Salamon<sup>2</sup>, R. Bali<sup>4</sup>, J. Lindner<sup>4</sup>, F. Wilhelm<sup>3</sup>, A. Rogalev<sup>3</sup>, E. Weschke<sup>5</sup>, D. Többsen<sup>5</sup>, R. Banerjee<sup>6</sup>, B. Sanyal<sup>6</sup>, C. Schmitz-Antoniak<sup>1</sup> and H. Wende<sup>2</sup> 1. PGI-6, FZ Juelich, Berlin, Germany; 2. University of Duisburg-Essen and CENIDE, Duisburg, Germany; 3. ESRF, Grenoble, France; 4. HZDR, Dresden, Germany; 5. HZB (BESSY II), Berlin, Germany; 6. Uppsala University, Uppsala, Sweden

- FE-02. Anomalous Nernst and Hall Effects in  $Co_x(MgO)_{1-x}$  Granular Thin Films.** P. Sheng<sup>1</sup> and M. Mizuguchi<sup>1,2</sup> 1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. CREST, Japan Science and Technology Agency, Kawaguchi, Japan

- FE-03. Zero Field Cooled Exchange Bias Effect in Nano-Crystalline Mg-Ferrite Thin Film.** H. Roy Dakua<sup>1,2</sup>, N. Venkataramani<sup>3</sup> and S. Prasad<sup>4</sup> 1. *Physics, Indian Institute of Technology, Mumbai, India*; 2. *Physics, National University of Singapore, Singapore*; 3. *Metallurgical Engineering and Materials Science, Indian Institute of Technology, Mumbai, India*; 4. *Physics, Indian Institute of Technology, Mumbai, India*

2:45

- FE-04. Growth and Characterisation of Antiferromagnetic Polycrystalline Mn<sub>3</sub>Ga and Mn<sub>3</sub>Ge Films.** H. Wu<sup>1</sup>, L. Sudoh<sup>2</sup>, R. Xu<sup>3</sup>, W. Si<sup>3</sup>, T. Takahashi<sup>2</sup>, C.A. Vaz<sup>4</sup>, J. Kim<sup>1</sup>, G. Vallejo-Fernandez<sup>1</sup> and A. Hirohata<sup>1</sup> 1. *University of York, YORK, United Kingdom*; 2. *Nagaoka University of Technology, Nagaoka, Japan*; 3. *City University of Hong Kong, Hong Kong*; 4. *Paul Scherrer Institute, Villigen, Switzerland*

3:00

- FE-05. Emergent dynamic chirality in a thermally driven artificial spin ratchet. (Invited)** S. Gliga<sup>1</sup> 1. *Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom*

3:30

- FE-06. Long-range multi-modal ordering in artificial spin ice.** R. Puttock<sup>1,2</sup>, V. Neu<sup>3</sup>, A. Manzin<sup>4</sup>, F. Garcia-Sanchez<sup>4</sup>, A. Fernandez-Scarioni<sup>5</sup>, V. Antonov<sup>2</sup> and O. Kazakova<sup>1</sup> 1. *Quantum Science, National Physical Laboratory, Teddington, United Kingdom*; 2. *Department of Physics, Royal Holloway University of London, Egham, United Kingdom*; 3. *Leibniz Institute for Solid State and Materials Research (IFW) Dresden, Dresden, Germany*; 4. *Istituto Nazionale di Ricerca Metrologica, Turin, Italy*; 5. *Physikalisch-Technische Bundesanstalt, Braunschweig, Germany*

3:45

- FE-07. Phase domain development in nanopatterned FeRh islands.** R.C. Temple<sup>1</sup>, T.P. Almeida<sup>2</sup>, J. Massey<sup>1</sup>, K. Fallon<sup>2</sup>, S. Morley<sup>1,3</sup>, F. Maccherozzi<sup>4</sup>, S. Dhessi<sup>4</sup>, T.A. Moore<sup>1</sup> and C.H. Marrows<sup>1</sup> 1. *School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom*; 2. *School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom*; 3. *Physics Department, University of California, Santa Cruz, Santa Cruz, CA, United States*; 4. *Surfaces and Interfaces, Diamond Light Source Ltd, Didcot, United Kingdom*

4:00

- FE-08. Nonlinear Response of Patterned Ferromagnets with Spin Vortex Ground State. (Invited)** M.P. Nikitin<sup>1,2</sup>, A.V. Orlov<sup>3</sup>, I. Sokolov<sup>2</sup>, A. Minakov<sup>3</sup>, P.I. Nikitin<sup>3</sup>, J. Ding<sup>1</sup>, S.D. Bader<sup>1</sup>, E.A. Rozhkova<sup>4</sup> and V. Novosad<sup>1</sup> 1. *Materials Science Division, Argonne National Laboratory, Argonne, IL, United States*; 2. *Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russian Federation*; 3. *Prokhorov General Physics Institute, Moscow, Russian Federation*; 4. *Center for Nanoscale Materials, Argonne National Laboratory, Argonne, IL, United States*

4:30

**FE-09. Interpreting FORC diagrams beyond the Preisach model: an experimental permalloy micro array investigation.**

F. Gross<sup>1</sup>, S. Ilse<sup>1</sup>, G. Schütz<sup>1</sup>, J. Gräfe<sup>1</sup> and E. Goering<sup>1</sup>  
*1. Modern Magnetic Systems, Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

4:45

**FE-10. Ion Irradiation Induced Cobalt/Cobalt Oxide**

**Heterostructures: From Materials to Devices.** D. Hilliard<sup>1,2</sup>, O. Yildirim<sup>1,3</sup>, C. Fowley<sup>1</sup>, S. Arekapudi<sup>2</sup>, H. Cansever<sup>1,4</sup>, R. Böttger<sup>1</sup>, G. Hlawacek<sup>1</sup>, O. Hellwig<sup>2</sup>, J. Lindner<sup>1</sup>, J. Fassbender<sup>1,4</sup> and A. Deac<sup>1</sup> *1. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Institute of Physics, Chemnitz University of Technology, Chemnitz, Germany; 3. Empa-Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland; 4. Institute of Physics of Solids, Dresden University of Technology, Dresden, Germany*

THURSDAY  
AFTERNOON  
2:00

PEONY I

**Session FF  
SPIN WAVES I**

Mathias Kläui, Co-Chair  
Universität Mainz, Mainz, Germany  
Olivier Klein, Co-Chair  
CEA-SPINTEC, Grenoble, France

2:00

**FF-01. All-electrical detection of spin-wave interference in CoFeB waveguides.** G. Talmelli<sup>1,2</sup>, T. Devolder<sup>3</sup>, M. Heyns<sup>1</sup>, I.P. Radu<sup>1</sup>, C. Adelman<sup>1</sup> and F. Ciubotaru<sup>1</sup> *1. IMEC, Leuven, Belgium; 2. Department of Materials Engineering, KU Leuven, Leuven, Belgium; 3. Centre de Nanosciences et de Nanotechnologies, Université Paris-Sud, Orsay, France*

2:15

**FF-02. Voltage-controlled reconfigurable spin wave nanochannels and logic devices.** B. Rana<sup>1</sup> and Y. Otani<sup>1,2</sup> *1. Center for Emergent Matter Science, RIKEN, Wako, Japan; 2. Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan*

2:30

**FF-03. Spin wave interference in vortex stacks.** C. Behncke<sup>1,2</sup>, C.F. Adolff<sup>1,2</sup>, N. Lenzing<sup>1</sup>, M. Hänze<sup>3,4</sup>, B. Schulte<sup>4</sup>, M. Weigand<sup>5</sup> and G. Meier<sup>2,4</sup> *1. Institute of Applied Physics, University of Hamburg, Hamburg, Germany; 2. The Hamburg Centre for Ultrafast Imaging, Hamburg, Germany; 3. Max Planck Institute for Solid State Research, Stuttgart, Germany; 4. Max Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany; 5. Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

- FF-04. Protected Chiral Spin-Wave Modes for Backscattering-Immune Magnonic Transport.** M. Mohseni<sup>1</sup>, T. Brächer<sup>1</sup>, Q. Wang<sup>1</sup>, D.A. Bozhko<sup>1</sup>, B. Hillebrands<sup>1</sup> and P. Pirro<sup>1</sup>  
1. Physics, TU Kaiserslautern, Kaiserslautern, Germany

3:00

- FF-05. Excitation of Coherent Heterosymmetric Spin Waves with Ultrashort Wavelengths.** G. Dieterle<sup>3</sup>, J. Förster<sup>3</sup>, H. Stoll<sup>3</sup>, A.S. Semisalova<sup>2</sup>, S. Finizio<sup>1</sup>, A. Gangwar<sup>4</sup>, M. Weigand<sup>3</sup>, M. Noske<sup>3</sup>, M. Fähnle<sup>3</sup>, I. Bykova<sup>3</sup>, D.A. Bozhko<sup>5</sup>, H.Y. Musiienko-Shmarova<sup>5</sup>, V.S. Tiberkevich<sup>6</sup>, A.N. Slavin<sup>6</sup>, C. Back<sup>4</sup>, J. Raabe<sup>1</sup>, G. Schütz<sup>3</sup> and S. Wintz<sup>1,2</sup> 1. Paul Scherrer Institut, Villigen PSI, Switzerland; 2. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 3. Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 4. Universität Regensburg, Regensburg, Germany; 5. Technische Universität Kaiserslautern, Kaiserslautern, Germany; 6. Oakland University, Rochester, MI, United States

3:15

- FF-06. Direct observation of sub-100 nm spin wave propagation in magnonic wave-guides.** N.A. Träger<sup>1</sup>, P. Gruszecki<sup>2</sup>, F. Lisiecki<sup>3</sup>, J. Förster<sup>1</sup>, M. Weigand<sup>1</sup>, P. Kuswik<sup>3,4</sup>, J. Dubowik<sup>3</sup>, G. Schütz<sup>1</sup>, M. Krawczyk<sup>2</sup> and J. Gräfe<sup>1</sup>  
1. Modern Magnetic Systems, Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 2. Faculty of Physics, Adam Mickiewicz University, Poznan, Poland; 3. Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland; 4. Centre for Advanced Technology, Adam Mickiewicz University, Poznan, Poland

3:30

- FF-07. Long Distance Lateral Spin Transport in Antiferromagnetic Insulators.** R. Lebrun<sup>1</sup>, A. Ross<sup>1,2</sup>, A. Qaiumzadeh<sup>3</sup>, S. Bender<sup>4</sup>, L. Baldrati<sup>1</sup>, J. Cramer<sup>1,2</sup>, O. Gomonay<sup>1</sup>, J. Sinova<sup>1</sup>, R. Duine<sup>5</sup>, A. Brataas<sup>3</sup> and M. Kläui<sup>1,2</sup> 1. Johannes Gutenberg University, Mainz, Germany; 2. Graduate School of Excellence Materials Science in Mainz, Mainz, Germany; 3. Norges teknisk-naturvitenskaplige universitet (NTNO), Trondheim, Norway; 4. University of California, Los Angeles, CA, United States; 5. Utrecht University, Utrecht, Netherlands

3:45

- FF-08. Variable effective magnetization and spin wave velocity in low magnetic damping metallic multilayers.** J.M. Shaw<sup>1</sup>, E.R. Edwards<sup>1</sup>, T. Silva<sup>1</sup> and H. Nembach<sup>1,2</sup> 1. Quantum Electromagnetics Division, NIST, Boulder, CO, United States; 2. JILA, University of Colorado, Boulder, CO, United States

4:00

- FF-09. Finite Speed of Propagation of Spin Waves in the Inertial Regime.** C. Serpico<sup>2</sup>, M. d'Aquino<sup>1</sup>, V. Scalera<sup>2</sup> and M. Lo Bue<sup>3</sup> 1. Dipartimento di Ingegneria, Università degli Studi di Napoli "Parthenope", Napoli, Italy; 2. DIETI, University of Naples Federico II, Naples, Italy; 3. SATIE, CNRS, ENS Paris-Saclay, Université Paris-Saclay, Cachan, France

4:15

- FF-10. The general Boltzmann method for magnon transport with full scattering process.** Y. Li<sup>1</sup>, T. Liu<sup>1</sup>, W. Wang<sup>1</sup> and J. Zhang<sup>1</sup> *1. School of Physics, Tongji University, Shanghai, China*

4:30

- FF-11. Bose-Einstein Condensation of Quasi-Particles in a Dynamically Cooled System.** T. Brächer<sup>1</sup>, M. Schneider<sup>1</sup>, V. Lauer<sup>1</sup>, P. Pirro<sup>1</sup>, O. Serga<sup>1</sup>, B. Heinz<sup>1</sup>, Q. Wang<sup>1</sup>, H. Musienko-Shmarova<sup>1</sup>, T. Meyer<sup>1</sup>, F. Heussner<sup>1</sup>, S. Keller<sup>1</sup>, B. Lägell<sup>1</sup>, T. Löber<sup>1</sup>, V.S. Tiberkevich<sup>2</sup>, A.N. Slavin<sup>2</sup>, C. Dubs<sup>3</sup>, B. Hillebrands<sup>1</sup> and A. Chumak<sup>1</sup> *1. Physics, TU Kaiserslautern, Kaiserslautern, Germany; 2. Oakland University, Rochester, MI, United States; 3. INNOVENT e.V. Technologieentwicklung, Jena, Germany*

4:45

- FF-12. A Magneto-elastic Correlator Using Acoustic Wave Pumping of Spin Waves.** I. Lisenkov<sup>1</sup>, M. Hansen<sup>1</sup>, J. Davies<sup>2</sup>, P. Dhagat<sup>1</sup> and A. Jander<sup>1</sup> *1. Electrical Engineering and Computer Science, Oregon State University, Corvallis, OR, United States; 2. NVE Corporation, Minneapolis, MN, United States*

THURSDAY  
AFTERNOON  
2:00

PEONY III

### Session FG

## MAGNETIC BEARINGS, GEARS AND LEVITATION

Mochimitsu Komori, Co-Chair

Kyushu Institute of Technology, Kitakyushu, Japan

Will Robertson, Co-Chair

Adelaide University, The University of Adelaide, SA, Australia

2:00

- FG-01. Design and Analysis of a Hybrid Stator Permanent Magnet Biased Bearingless Switched Reluctance Motor.** Y. Yuan<sup>1</sup>, Y. Sun<sup>1</sup>, Y. Huang<sup>1</sup>, J. Yan<sup>2</sup> and F. Yang<sup>1</sup> *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China; 2. School of Automation, Nanjing University of Science and Technology, Nanjing, China*

2:15

- FG-02. Weight reduction of the damper coils in the superconducting magnetically levitated bogie.** S. Ohashi<sup>1</sup> *1. Electrical and Electric Engineering, Kansai University, Osaka, Japan*

2:30

- FG-03. Analysis of a Coaxial Magnetic Gear without Rotor Iron Yoke.** E. Göbl<sup>1</sup>, G. Jungmayr<sup>2</sup>, E. Marth<sup>1</sup> and W. Amrhein<sup>1</sup> *1. Johannes Kepler University, Linz, Austria; 2. Linz Center of Mechatronics GmbH, Linz, Austria*

2:45

**FG-04. Investigating the Performance of a Halbach Rotor Magnetic Gearbox with 3-D Printed Structural Components.**

D.H. Wong<sup>1</sup> and J.Z. Bird<sup>1</sup> 1. *Portland State University, Portland, OR, United States*

3:00

**FG-05. A Disc-type Contra-rotating Permanent Magnet Synchronous Motor for Marine Electrical Propulsion System.**

Z. Rao<sup>1</sup>, S. Huang<sup>1</sup> and C. Luo<sup>1</sup> 1. *College of Electrical and Information Engineering, Hunan University, Changsha, China*

3:15

**FG-06. Comparative Analysis of a Coaxial Magnetic Gearbox with a Flux Concentration Halbach Rotor and Consequent Pole Rotor Typology.**

D.H. Wong<sup>1</sup>, S. Modaresahmadi<sup>2</sup>, J.Z. Bird<sup>1</sup> and W. Williams<sup>2</sup> 1. *Portland State University, Portland, OR, United States*; 2. *University of North Carolina at Charlotte, Charlotte, NC, United States*

3:30

**FG-07. A Novel Design Philosophy for Low-Stiffness Magnetic Levitation Gravity Compensation.**

H. Zhang<sup>1</sup>, Y. Zhou<sup>1</sup>, B. Kou<sup>1</sup> and Z. Zhu<sup>2</sup> 1. *Harbin Institute of Technology, Harbin, China*; 2. *University of Sheffield, Sheffield, United Kingdom*

3:45

**FG-08. Design of a Novel Halbach-Array Permanent Magnet Motor for Electric Submersible Pumps.**

S.F. Rabbi<sup>1</sup> and M. Rahman<sup>2</sup> 1. *Electrical and Computer Engineering, Memorial University of Newfoundland, St. John's, NL, Canada*; 2. *Electrical and Computer Engineering, Memorial University of Newfoundland, St. John's, NL, Canada*

4:00

**FG-09. Modeling and Analysis of Suspension Force of a New Bearingless Reluctance Machine with Independent DC Bias Winding.**

L. Yu<sup>1</sup>, Z. Zhang<sup>1</sup>, Y. Shi<sup>1</sup> and W. Lu<sup>1</sup> 1. *Department of Electrical Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China*

4:15

**FG-10. The influences of lever arm on the stability of a quasi-zero stiffness magnetic levitation vibration isolation system.**

N. Kamaruzaman<sup>1</sup>, M. Ghayesh<sup>1</sup>, B. Cazzolato<sup>1</sup>, A. Zander<sup>1</sup> and W. Robertson<sup>1</sup> 1. *School of Mechanical Engineering, The University of Adelaide, Adelaide, SA, Australia*

4:30

**FG-11. Design and Analysis of a Double Stator Halbach Permanent Magnet Bearingless Brushless DC Motor.**

Y. Yuan<sup>1</sup>, Y. Sun<sup>2</sup>, F. Yang<sup>1</sup> and Y. Huang<sup>1</sup> 1. *School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*; 2. *School of Power Engineering, Nanjing Institute of Technology, Nsnjing, China*

**Session FH**  
**ANALYSIS AND OPTIMISATION OF ELECTRICAL  
MACHINES I**

Chunhua Liu, Co-Chair  
City University of Hong Kong, Hong Kong  
Li Zhu, Co-Chair  
Shanghai Jiao Tong University, Shanghai, China

**2:00**

- FH-01. Development of a Radial Flux Permanent Magnet Machine with an Amorphous Metal Stator Core.** *W. Tong<sup>1</sup>, R. Sun<sup>1</sup>, S. Wu<sup>1</sup> and R. Tang<sup>1</sup>* *1. School of Electrical Engineering, Shenyang University of Technology, Shenyang, China*

**2:15**

- FH-02. Optimal Design of a Novel Five-phase SPM Machine with Electronic Pole-Changing Effects.** *J. Gong<sup>1</sup>, T. Tong<sup>1</sup> and N. Bracikowski<sup>2</sup>* *1. School of Electrical Engineering, Shandong University, Jinan, China; 2. IREENA Laboratory, Nantes University, Saint Nazaire, France*

**2:30**

- FH-03. Analysis and Control of the Permanent Magnet Synchronous Motor with Auxiliary Modular Design.** *H. Lin<sup>2</sup>, F. Zhao<sup>1</sup> and B. Kwon<sup>3</sup>* *1. Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, China; 2. Chang'an University, Xi'an, China; 3. Hanyang University, Ansan, The Republic of Korea*

**2:45**

- FH-04. Experimental Results and Parameter Identification of a Permanent Magnet Assisted Synchronous Reluctance Machine with a Ribless Rotor.** *M. Zimmermann<sup>1</sup>, A. Lange<sup>1</sup> and B. Piepenbreier<sup>1</sup>* *1. Institute of Electrical Drives and Machines, University of Erlangen-Nuremberg, Erlangen, Germany*

**3:00**

- FH-05. Magnetic materials and technologies enabling an even brighter future for electrical machines. (Invited)** *P. Upadhyay<sup>1</sup>* *1. US Corporate Research, ABB Inc., Raleigh, NC, United States*

**3:30**

- FH-06. Analysis of a Novel Double-sided Dual-PM Hybrid-excitation Switched-flux Linear machine.** *Z. Zeng<sup>1</sup> and Q. Lu<sup>1</sup>* *1. College of Electrical Engineering, Zhejiang University, Hangzhou, China*

3:45

- FH-07. Study of efficiency characteristics of Interior Permanent Magnet Synchronous Motors.** *S. Feng*<sup>1</sup>, *W. Jiang*<sup>1</sup>, *Z. Zhang*<sup>1</sup>, *J. Zhang*<sup>1</sup>, *Y. Li*<sup>2</sup> and *Y. Wang*<sup>1</sup> *1. Department of Electrical Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China; 2. Nanjing YueBoo Power System Co.,Ltd, Nanjing, China*

4:00

- FH-08. Consequent Pole Hybrid Brushless Wound Rotor Synchronous Machine.** *A. Hussain*<sup>1</sup> and *B. Kwon*<sup>1</sup> *1. Electronic Systems Engineering, Hanyang University, South Korea, Ansan, The Republic of Korea*

4:15

- FH-09. An Innovative Dual-Rotor Axial-Gap Flux Switching Permanent Magnet Machine Topology with Hybrid Excitation.** *E. Yildiriz*<sup>1</sup>, *M. Gulec*<sup>2</sup> and *M. Aydin*<sup>2</sup> *1. Electrical and Electronics Engineering, Duzce University, Düzce, Turkey; 2. Mechatronic Engineering, Kocaeli University, Kocaeli, Turkey*

4:30

- FH-10. Design of a ,+U shape Interior PM Machines for Electric Vehicle Applications.** *M. Sheng*<sup>1</sup> *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

4:45

- FH-11. Optimal Design and Experimental Test of Surface-Mounted Permanent Magnet Motors with Cost-Effective Magnet Utilization to Suppress Torque Pulsations.** *W. Zhao*<sup>1</sup>, *H. Shen*<sup>1</sup>, *W. Chai*<sup>2</sup>, *X. Wang*<sup>1</sup> and *B. Kwon*<sup>2</sup> *1. School of Electrical Engineering, Shandong University, Jinan, China; 2. Department of Electronic Systems Engineering, Hanyang University, Ansan, The Republic of Korea*

THURSDAY  
AFTERNOON  
2:00

ORCHID II

**Session FI**  
**FUNDAMENTAL PROPERTIES AND COOPERATIVE PHENOMENA II**

Solveig Felton, Chair  
Queen's University Belfast, Belfast, United Kingdom

2:00

- FI-01. Recovery of long-range magnetic order by Rh substitution in spin glass compound  $Mn_{0.7}Fe_{0.3}NiGe$ .** *S. Samatham*<sup>1</sup>, *A.K. Patel*<sup>1</sup> and *S. K. G.*<sup>1</sup> *1. Department of Physics, Indian Institute of Technology Bombay, Mumbai, India*

- FI-02. Magnetization dynamics of weakly interacting sub-100 nm square artificial spin ices.** *J. Porro Azpiazu*<sup>1,2</sup>, *S. Morley*<sup>3,4</sup>, *D. Alba Venero*<sup>1</sup>, *R. Macêdo*<sup>5</sup>, *M. Rosamond*<sup>3</sup>, *R.L. Stamps*<sup>5</sup>, *C.H. Marrows*<sup>3</sup> and *S. Langridge*<sup>1</sup> *1. ISIS, the Neutron and Muon Source, Rutherford Appleton Laboratory, Didcot, United Kingdom; 2. BCMaterials, the Basque Center for Materials, Applications and Nanostructures, Leioa, Spain; 3. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 4. Department of Physics, University of California, Santa Cruz, Santa Cruz, CA, United States; 5. School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom*

- FI-03. Electron Accumulation and Emergent Magnetism in LaMnO<sub>3</sub>/SrTiO<sub>3</sub> Heterostructures.** *Z. Liu*<sup>1</sup> *1. School of Materials Science & Engineering, Beihang University, Beijing, China*

- FI-04. Complex Magnetic Structure of Tb<sub>3</sub>Ni.** *S. Goswami*<sup>1</sup>, *P. Babu*<sup>1</sup> and *R. Rawat*<sup>2</sup> *1. Magnetism, UGC-DAE Consortium for Scientific Research, Mumbai Centre, Mumbai, India; 2. UGC-DAE Consortium for Scientific research, Indore, India*

- FI-05. Universal magnetic behavior of Ni<sub>2</sub>Mn<sub>1-x</sub>Fe<sub>x</sub>In (x = 0.0 and 0.1) through magnetization, magnetocaloric and magnetoresistance scaling methods.** *A.K. Patel*<sup>1</sup>, *S. Samatham*<sup>1</sup> and *K.G. Suresh*<sup>1</sup> *1. Department of Physics, Indian Institute of Technology Bombay, Mumbai, India*

- FI-06. Signature of a Griffiths phase in layered canted antiferromagnet Sr<sub>2</sub>IrO<sub>4</sub>.** *A. Rathi*<sup>2</sup>, *P. Rout*<sup>1</sup>, *S. Perween*<sup>2</sup>, *R. Singh*<sup>3</sup>, *A. Gupta*<sup>2</sup>, *R. Pant*<sup>2</sup> and *G. Basheed*<sup>2</sup> *1. CSIR-National Physical Laboratory (NPL), New Delhi, India, New Delhi, India; 2. AcSIR, CSIR-National Physical Laboratory (NPL) Campus, New Delhi, India; 3. Indian Institute of Science Education and Research (IISER), Bhopal, India*

- FI-07. Modulation of spin dynamics across metal to insulator transitions in hybrid heterostructures.** *M. Zhu*<sup>1</sup>, *Z. Zhou*<sup>1</sup>, *W. Ren*<sup>1</sup> and *M. Liu*<sup>1</sup> *1. Xi'an Jiaotong University, Xi'an, China*

- FI-08. Alternating spin chain compound AgVOAsO<sub>4</sub> probed by <sup>75</sup>As NMR.** *N.A. Koodacadavan*<sup>1</sup> *1. Physics, Indian Institute of Science Education and Research, Thiruvananthapuram, India*

- FI-09. Suppression of the double exchange in 4d-5d transition metal compounds. (Invited)** *S. Streltsov*<sup>1</sup> and *D. Khomskii*<sup>2</sup> *1. Institute of Metal physics, Ekaterinburg, Russian Federation; 2. University of Cologne, Cologne, Germany*

- FI-10. Topological magnons and excitons.** *R. Shindou*<sup>1</sup> *1. Physics, Peking University, Beijing, China*

- FI-11. Interface Effects on Coercivity and Training in Exchange Bias Systems.** *J. Gompertz*<sup>1</sup>, *R. Carpenter*<sup>2</sup>, *S.A. Cavill*<sup>1,3</sup>, *G. Vallejo-Fernandez*<sup>1</sup> and *K. O'Grady*<sup>1</sup> *1. Department of Physics, University of York, Heslington, York, UK, YO10 5DD, York, United Kingdom; 2. Seagate Technology, Springtown Industrial Estate, Londonderry, United Kingdom; 3. Diamond Light Source Ltd, Harwell Science and Innovation Campus, Fermi Ave, Didcot, United Kingdom*

THURSDAY  
AFTERNOON  
1:30

SIMPOR/ROSELLE BALLROOM

**Session FP**  
**CIRCUIT ANALYSIS OF TRANSFORMERS**  
**(Poster Session)**

Tetsuya Ueda, Chair  
Kyoto Institute of Technology, Kyoto, Japan

- FP-01. Effect of annealing on magnetic and mechanical behavior of NANOPERM-type alloys.** *M. Hasiak*<sup>1</sup> and *A. Laszcz*<sup>1</sup>  
*1. Wroclaw University of Science and Technology, Wroclaw, Poland*
- FP-02. Magnetic Force Analysis in a Gapped-Core Reactor Model under Harmonic Magnetizations by Efficient Frequency-Domain Decomposition.** *X. Zhao*<sup>1</sup>, *Z. Jin*<sup>1</sup>, *Z. Cheng*<sup>2</sup>, *B. Forghani*<sup>3</sup>, *L. Li*<sup>1</sup> and *H. Zhang*<sup>1</sup> *1. North China Electric Power University, Baoding, China; 2. Institute of Power Transmission and Transformation Technology, Baoding, China; 3. Infolytica Corporation, Montreal, QC, Canada*
- FP-03. Investigation into the Effect of Yoke Pressed Structure on Electromagnetic Performance of Transformer.** *X. Yan*<sup>1</sup>, *Z. Peng*<sup>2</sup>, *Y. Kang*<sup>3</sup>, *X. Yu*<sup>4</sup>, *Z. Ren*<sup>1</sup> and *Y. Zhang*<sup>1</sup> *1. Shenyang University of Technology, Shenyang, China; 2. Shaoyang University, Shaoyang, China; 3. TEBA Shenyang Transformer Group Co. Ltd., Shenyang, China; 4. Shandong Power Equipment Co. Ltd., Jinan, China*
- FP-04. A Switched-capacitorless Energy-encrypted Transmitter for Roadway-charging Electric Vehicles.** *W. Liu*<sup>1</sup>, *K. Chau*<sup>1</sup>, *C. Lee*<sup>2</sup>, *C. Jiang*<sup>1</sup> and *W. Han*<sup>1</sup> *1. The University of Hong Kong, Hong Kong; 2. Massachusetts Institute of Technology, Boston, MA, United States*
- FP-05. Reduction of an Eddy Current Losses in Metallic Support of an Underground Power Cable.** *H. Song*<sup>1</sup>, *S. IM*<sup>1</sup> and *G. Park*<sup>1</sup>  
*1. Department of Electrical and Computer Engineering, Pusan National University, Busan, The Republic of Korea*

- FP-06. Calculation of AC Resistance in a Multi-strand Coil Considering Proximity Effect with Eddy Current Induced Magnetic Fields.** *D. Um<sup>1</sup> and G. Park<sup>1</sup> 1. School of Electrical and Computer Engineering, Pusan National University, Busan, The Republic of Korea*
- FP-07. Copper Loss Reduction of Planar Transformer Using Magnetic Cap and Plate.** *T. Yamamoto<sup>1</sup>, Y. Bu<sup>1</sup> and T. Mizuno<sup>1</sup> 1. Shinshu university, Nagano, Japan*
- FP-08. Determination Approach for the Parameters of Equivalent Circuit Model of Deep Saturated Three-phase Integrative Transformers.** *Y. Wang<sup>1</sup>, Y. Shangguan<sup>1</sup> and J. Yuan<sup>1</sup> 1. Dept. of Electrical Engineering, Tsinghua University, Beijing, China*
- FP-09. Research on Split-Core Reactor Vibration Reduction Method Based on Magnetostrictive Effect.** *L. Zhu<sup>1</sup>, R. Sha<sup>1</sup>, X. Zhang<sup>1</sup>, B. Wang<sup>1</sup> and T. Han<sup>1</sup> 1. Key Laboratory of Advanced Electrical En, Tianjin Polytechnic University, Tianjin, China*
- FP-10. Research on Transformer Inductance Parameter Calculation Model for High Frequency Characteristic Analysis.** *X.M. Zi<sup>1</sup>, G. Jian<sup>1</sup> and Z. Ying<sup>1</sup> 1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*
- FP-11. Inverse Updating Method of High-frequency Equivalent Circuit Model in Transformer for Winding Deformation Diagnosis.** *H. Zhang<sup>1</sup>, S. Wang<sup>2</sup>, S. Wang<sup>2</sup> and S. Wang<sup>2</sup> 1. Hubei Universitie of Arts and Science, Xiangyang, China; 2. Xi'an Jiaotong University, Xi'an, China*
- FP-12. The Integration of Energy-saving Transformer Possessing Variable Impedance.** *S. Wang<sup>1</sup>, S. Wang<sup>1</sup>, Y.H. He<sup>1,2</sup>, M.N. Zhang<sup>1</sup> and S. Wang<sup>1</sup> 1. Xi'an Jiaotong University, Xi'an, China; 2. State Grid Yulin Electric Power Company, Yulin, China*
- FP-13. Analysis of a Novel Three-Coil Wireless Power Transfer System Applied in Biomedical Devices.** *X. Zhang<sup>1</sup>, L. Wang<sup>2</sup> and X. Zhang<sup>1</sup> 1. Tianjin Normal University, Tianjin, China; 2. Chinese Academy of Medical Science & Peking Union Medical College Institute of Biomedical Engineering, Tianjin, China*

**Session FQ**  
**HARD MAGNETIC MATERIALS AND MOTOR**  
**APPLICATIONS**  
**(Poster Session)**

Mi-Ching Tsai, Chair  
National Cheng Kung University, Tainan, Taiwan

- FQ-01. Reduced magnetic response of Dy doped  $\text{CoFe}_2\text{O}_4$  nanoparticles.** *H. Kumar*<sup>1</sup> 1. *H.A.S.(Physics), Rajkiya Engineering College Bijnor India, Bijnor, India*
- FQ-02. A Study on Optimal Design for Direct Drive Submerged Pump Actuator.** *Y. Kim*<sup>1</sup>, *Q. Yan*<sup>1</sup>, *D. Ryu*<sup>1</sup> and *J. Lee*<sup>1</sup>  
1. *Hanbat National University, Daejeon, The Republic of Korea*
- FQ-03. Analytical Method for 3-D Overhang Effect of Surface-Mounted Permanent-Magnet Motor Using Conformal Mapping.** *Y. Ko*<sup>1</sup>, *J. Song*<sup>1</sup>, *M. Seo*<sup>1</sup>, *Y. Kim*<sup>2</sup> and *S. Jung*<sup>1</sup>  
1. *Sungkyunkwan University, Suwon, The Republic of Korea;*  
2. *Chosun University, Gwangju, The Republic of Korea*
- FQ-04. Investigation of flux adjustment capability in hybrid excited switching flux permanent magnet machines.** *X. Liu*<sup>1,2</sup>, *S. Wang*<sup>1,2</sup> and *D. Dong*<sup>1,2</sup> 1. *State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China;* 2. *School of Electrical Engineering, Hebei University of Technology, Tianjin, China*
- FQ-05. Multi-Objective Design Optimization of A New Cost Effective Axial Flux Permanent Magnet Assisted Eddy Current Brake.** *M. Gulec*<sup>1</sup> and *M. Aydin*<sup>1</sup> 1. *Mechatronics Engineering, Kocaeli University, Kocaeli, Turkey*
- FQ-06. The Influence of Magnetization on Modular Spoke-type Permanent-Magnet Machine for In-Wheel Traction Applications.** *H. Zhang*<sup>1</sup> and *W. Hua*<sup>1</sup> 1. *School of Electrical Engineering, Southeast University, Nanjing, China*
- FQ-07. Proposal of Maxwell Stress Tensor for Local Force Calculation in Magnetic Body.** *M.K. Ghosh*<sup>1</sup>, *Y. Gao*<sup>1</sup>, *H. Dozono*<sup>1</sup>, *K. Muramatsu*<sup>1</sup>, *W. Guan*<sup>2</sup>, *J. Yuan*<sup>2</sup>, *C. Tian*<sup>2</sup> and *B. Chen*<sup>2</sup> 1. *Department of Electrical & Electronic Engineering, Saga University, Sagacity, Japan;* 2. *Department of Electrical & Electronic Engineering, Wuhan University, Wuhan, China*
- FQ-08. Coercivity enhancement of Nd-Ce-Fe-B sintered magnets by the grain boundary diffusion process using Nd-Al-Cu alloys.** *Q. Zhou*<sup>1</sup>, *R. Tang*<sup>1</sup>, *F. Xiao*<sup>1</sup> and *Z. Liu*<sup>2</sup> 1. *GuangDong Research Institute of Rare Metals, Guangzhou, China;* 2. *School of Materials Science and Engineering, South China University of Technology, Guangzhou, China*

**FQ-09. An Improved Analysis Method of Irreversible Demagnetization for Single-Phase Line Start Permanent Magnet Motor.** *J. Jung*<sup>1</sup>, *B. Lee*<sup>2</sup>, *M. Lim*<sup>1</sup> and *J. Hong*<sup>3</sup>  
*1. Hyundai Mobis, Yongin, The Republic of Korea; 2. Korea Automotive Technology Institute, Daegu, The Republic of Korea; 3. Hanyang University, Seoul, The Republic of Korea*

**FQ-10. Demagnetization and Permanent-Magnet Minimization Analyses of Less-Rare-Earth Interior Permanent-Magnet Synchronous Machines Used for Electric Vehicles.**  
*W. Wang*<sup>1</sup>, *P. Zheng*<sup>1,2</sup>, *M. Wang*<sup>1</sup>, *Y. Liu*<sup>1</sup> and *Z. Fu*<sup>1</sup>  
*1. Department of Electrical Engineering, Harbin Institute of Technology, Harbin, China; 2. State Key Laboratory of Robotics and System, Harbin Institute of Technology, Harbin, China*

**FQ-11. Structural and magnetic ordering in MnBi nanoclusters produced in a low energy cluster beam deposition system.**  
*D. Le Roy*<sup>1</sup>, *F. Orlandini-Keller*<sup>2</sup>, *J. Jacquot*<sup>3</sup>, *N. Blanchard*<sup>1</sup>, *N. Dempsey*<sup>2</sup> and *V. Dupuis*<sup>1</sup> *1. Institut Lumière Matière, Villeurbanne, France; 2. Institut Néel CNRS, Grenoble, France; 3. CEA, Grenoble, France*

**FQ-12. Novel Permanent Magnet Design and Materials Structures.**  
*Y. Zhang*<sup>1</sup> and *K. Gao*<sup>1</sup> *1. Argonne National Laboratory, North Oaks, MN, United States*

THURSDAY  
AFTERNOON  
1:30

SIMPOR/ROSELLE BALLROOM

**Session FR**  
**MAGNETIC FLUIDS AND ORGANIC MAGNETIC MATERIALS II**  
**(Poster Session)**

*Mei Fang, Chair*  
*Central South University, Changsha, China*

**FR-02. Reversible Control of Intrinsic Spins by Guest Molecules in a Layered Ferrimagnetic Metal-Organic Framework.**  
*J. Zhang*<sup>1</sup>, *W. Kosaka*<sup>1</sup> and *H. Miyasaka*<sup>1</sup> *1. Institute for Materials Research, Tohoku University, Sendai, Japan*

**FR-03. Magnetorheology of Core-Shell Structured Mesoporous Fe<sub>3</sub>O<sub>4</sub>@mSiO<sub>2</sub> Nanoparticle Added Carbonyl Iron Dispersion.** *W. Han*<sup>1</sup> and *H. Choi*<sup>1</sup> *1. Polymer Science and Engineering, Inha University, Incheon, The Republic of Korea*

**FR-01. Effect of Fe<sub>3</sub>O<sub>4</sub>/sepiolite Nanocomposite Additive on Carbonyl Iron Based Magnetorheological Fluid.** *Y. Dong*<sup>1</sup>, *S. Piao*<sup>1</sup> and *H. Choi*<sup>1</sup> *1. Polymer Science and Engineering, Inha University, Incheon, The Republic of Korea*

- FR-04. Synthesis of Organic-inorganic Poly(diphenylamine)/magnetite Composite Particles and Their Magnetorheological Response.** *Y. Dong*<sup>1</sup> and *H. Choi*<sup>1</sup>  
*I. Polymer Science and Engineering, Inha University, Incheon, The Republic of Korea*
- FR-05. Synthesis and Viscoelastic Behavior of Non-stoichiometric Inverse Spinel Ferrite Nanoparticle Suspension with Controlled Morphology and Enhanced Magnetization.** *J. Han*<sup>1</sup>, *W. Han*<sup>1</sup>, *C. Gao*<sup>1</sup>, *Y. Dong*<sup>1</sup> and *H. Choi*<sup>1</sup> *I. Dept. of Polymer Science and Engineering, Inha UNiversity, Incheon, The Republic of Korea*
- FR-06. Effect of Magnetic Nanoparticle Additive on Viscoelastic Behaviors of Carbonyl Iron-based Magnetorheological Suspension.** *C. Gao*<sup>1</sup>, *Q. Lu*<sup>1</sup> and *H. Choi*<sup>1</sup> *I. Polymer Science and Engineering, Inha University, Incheon, The Republic of Korea*
- FR-07. Experimental Verification of Effectiveness of Magnetorheological Fluid Damper fixed to an Elevator in Case of Earthquake.** *K. Kawase*<sup>1</sup>, *N. Kobayashi*<sup>1</sup>, *M. Yamada*<sup>1</sup> and *T. Nakagawa*<sup>1</sup> *I. Faculty of Engineering, Tokyo City University, Tmazutsumi, Japan*
- FR-08. Characterization of Output Torque of a Permanent Magnet-based MRF Clutch with a Field Blocking Mechanism.** *M.A. Fernández*<sup>1</sup>, *J. Chang*<sup>1</sup> and *C. Huang*<sup>1</sup> *I. Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan*
- FR-09. Phenomenological magnetic hysteresis model of a polymer matrix filled with magnetic particles.** *Z. Xiang*<sup>1</sup>, *B. Gupta*<sup>1</sup>, *M. Le*<sup>1</sup>, *G. Coativy*<sup>1</sup> and *B. Ducharne*<sup>1</sup> *I. INSA LYON, Laboratoire de Génie Electrique et Ferroélectricité, Villeurbanne, France*
- FR-10. Magnetically controlled light manipulating properties of biogenic and synthetic guanine crystals.** *H. Kashiwagi*<sup>1</sup>, *M. Iwasaka*<sup>2</sup>, *H. Asada*<sup>3</sup>, *T. Koyanagi*<sup>3</sup> and *K. Kishimoto*<sup>3</sup>  
*I. Graduate School of AdSM, Hiroshima University, Higashihiroshima, Japan; 2. RNBS, Hiroshima University, Higashihiroshima, Japan; 3. Graduate School of Science and Technology for Innovation, Yamaguchi University, Ube, Japan*
- FR-11. Cr and Fe substitution effects on magnetic properties and phase stabilities in tetragonal Mn<sub>3</sub>(Ga,Ge).** *H. Okada*<sup>1</sup>, *K. Moriya*<sup>1</sup> and *M. Doi*<sup>1</sup> *I. Tohoku Gakuin University, Tagajo, Japan*
- FR-12. Fabrication of biogenic guanine crystal/ferromagnetic film hybrid plate for micro-optical MEMS.** *T. Sogame*<sup>1</sup>, *K. Deguchi*<sup>1</sup>, *M. Inoue*<sup>1</sup>, *T. Kimura*<sup>1</sup>, *E. Muneyama*<sup>1</sup>, *K. Kishimoto*<sup>1</sup>, *T. Koyanagi*<sup>1</sup>, *H. Asada*<sup>1</sup> and *M. Iwasaka*<sup>2</sup>  
*I. Graduate School of Sci. & Tech. for Innov., Yamaguchi University, Ube, Japan; 2. RNBS, Hiroshima University, Higashihiroshima, Japan*
- FR-13. Magnetic Field Analysis and Optimization Design of Magnetorheological Fluid Brake.** *N. Yan*<sup>1</sup>, *W. Li*<sup>1</sup> and *B. Zhang*<sup>1</sup> *I. Shenyang University of Technology, Shenyang, China*

**FR-14. A Permanent Magnet-Excited Magneto-rheological Fluid Brake Manipulated by Mechanical Magnetic Shield.** *P. Lee<sup>1</sup> and J. Chang<sup>1</sup> 1. Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan*

**FR-15. Fe<sub>3</sub>O<sub>4</sub>@Angelica Sinensis Polysaccharides Nanoparticles for Magnetic Resonance Imaging.** *X. Xu<sup>1</sup>, K. Wang<sup>1</sup>, Y. Li<sup>1</sup>, Y. Wang<sup>2</sup>, J. Wang<sup>2</sup> and Y. Jiang<sup>1</sup> 1. School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China; 2. Department of molecular imaging, Peking Union Medical College Hospital, Chinese Academy of Medical Sciences, Beijing, China*

**FR-16. Micro optical-interference-plate featuring highly efficient diamagnetic rotation of biogenic crystals.** *T. Sogame<sup>1</sup>, E. Muneyama<sup>1</sup>, M. Inoue<sup>1</sup>, T. Kimura<sup>1</sup>, K. Kishimoto<sup>1</sup>, T. Koyanagi<sup>1</sup>, H. Asada<sup>1</sup> and M. Iwasaka<sup>2</sup> 1. Graduate School of Sci. & Tech. for Innov., Yamaguchi University, Ube, Japan; 2. RNBS, Hiroshima University, Higashihiroshima, Japan*

THURSDAY  
AFTERNOON  
1:30

SIMPOR/ROSELLE BALLROOM

**Session FS**  
**MAGNETO-ELASTIC MATERIALS**  
**(Poster Session)**

Rastislav Varga, Chair  
Faculty of Sciences, UPJS, Kosice, Slovakia

**FS-01. Structural Dynamic Modeling and Optimization for Vibration Control of a Composite Cantilever with Magnetostrictive Shunt Damper.** *J. Zheng<sup>1</sup>, S. Cao<sup>1</sup> and R. Pan<sup>1</sup> 1. Hebei University of Technology, Tianjin, China*

**FS-02. Determination of stress-coefficient of magnetoelastic anisotropy in flexible amorphous CoFeB film by anisotropic magnetoresistance.** *X. Wen<sup>1,2</sup>, B. Wang<sup>1,2</sup> and R. Li<sup>1,2</sup> 1. CAS Key Laboratory of Magnetic Materials and Devices, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, China; 2. Zhejiang Province Key Laboratory of Magnetic Materials and Application Technology, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, China*

**FS-03. Modeling and analysis of bistable Galfenol cantilever energy harvester with dynamic elastic magnifier.** *S. Cao<sup>1</sup>, L. Liu<sup>1</sup> and J. Zheng<sup>1</sup> 1. Hebei University of Technology, Tianjin, China*

**FS-04. Balancing negative and positive expansion effect in dual-phase La(Fe,Si)<sub>13</sub>/α-Fe composite with improved mechanical property.** *J. Wang<sup>1</sup> 1. School of Materials Science and Engineering, Nanjing University of Science and Technology, Nanjing, China*

- FS-05. Magneto-mechanical Optimization and Analysis of a Magnetostrictive Cantilever Beam for Energy Harvesting.** V. Apicella<sup>1</sup>, C.S. Clemente<sup>1</sup>, D. Davino<sup>1</sup>, D. Leone<sup>1</sup> and C. Visone<sup>1</sup> *1. engineering, University of Sannio, Benevento, Italy*
- FS-06. Magnetoelastic Coupling Effect on Magnetization in FeGa Film Induced by Surface Acoustic Waves.** C. Zhao<sup>1</sup>, L. Pan<sup>1</sup>, X. Li<sup>1</sup>, Q. Liu<sup>1</sup> and J. Wang<sup>1</sup> *1. Key Laboratory for Magnetic and Magnetic Materials of the Ministry of Education, Lanzhou University, Lanzhou 730000, People's Republic of China, Lanzhou University, Lanzhou, China*
- FS-07. Mössbauer investigation of magnetostrictive Fe<sub>83</sub>Ga<sub>17</sub> with trace rare-earth doping.** P.S. Stamenov<sup>1</sup>, Y. He<sup>2</sup>, C. Jiang<sup>2</sup> and M. Coey<sup>1</sup> *1. School of Physics, Trinity College Dublin, Dublin, Ireland; 2. School of Materials Science and Engineering, Beihang University, Beijing, China*
- FS-08. High Frequency Vibration Model with Electromagnetic-Mechanical-Thermal Multi-Field Coupled Effects for Giant Magnetostrictive Transducer.** Y. Li<sup>1</sup>, W. Huang<sup>1</sup>, B. Wang<sup>1</sup>, C. Gao<sup>1</sup>, X. Wu<sup>1</sup> and Y. Xu<sup>1</sup> *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*
- FS-09. Concurrent inverse effects of magnetostriction and electrostriction in magnetoelectric layered structures.** B. Zadov<sup>2</sup>, M. Auslender<sup>1</sup> and E. Liverts<sup>3</sup> *1. Electrical and Computer Engineering, Ben Gurion University of the Negev, Beer Sheva, Israel; 2. Electrical and Computer Engineering, Ben Gurion University of the Negev, Beer Sheva, Israel; 3. Department of Mechanical Engineering, Ben Gurion University of the Negev, Beer Sheva, Israel*
- FS-10. Experimental and Calculating Analysis of High Frequency Magnetic Energy Losses for Terfenol-D Magnetostrictive Material.** W. Huang<sup>1</sup>, C. Gao<sup>1</sup>, B. Wang<sup>1</sup> and Y. Li<sup>1</sup> *1. Hebei University of Technology, Tianjin, China*
- FS-11. Magnetoelectric surface acoustic wave characteristics of the ScAlN/FeGa heterostructure with negative Poisson's ratio.** J. Jiang<sup>1</sup> and F. Bai<sup>1</sup> *1. State Key Laboratory of Electronic Thin Films and Integrated Devices, University of Electronic Science and Technology of China, Chengdu, China*
- FS-12. Tuning ferromagnetic properties of LaMnO<sub>3</sub> thin films by oxygen vacancies and strain.** Y. Liu<sup>1</sup>, H. Wong<sup>1</sup>, K. Lam<sup>1</sup>, C. Mak<sup>1</sup> and C. Leung<sup>1</sup> *1. Department of Applied Physics, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

**Session FT**  
**MODELLING OF MACHINES II**  
**(Poster Session)**

Ronghai Qu, Chair  
Huazhong University of Science and Technology, Wuhan, China

- FT-01. Analysis and Measurements of Interior Permanent Magnet Motor Based on Equivalent Magnetic Circuit Method.** *T. Bang<sup>1</sup>, K. Shin<sup>1</sup>, J. Lee<sup>1</sup>, C. Han<sup>1</sup>, H. Cho<sup>1</sup> and J. Choi<sup>1</sup>*  
*1. Chungnam National University, Daejeon, The Republic of Korea*
- FT-02. Coupled Finite Element Analysis of Magnetic and Thermal Fields Using Adaptive Single-Mesh Method.** *W. Chen<sup>1</sup> and Z. Li<sup>2</sup>*  
*1. Key Laboratory of Low-Voltage Apparatus Intellectual Technology of Zhejiang, Wenzhou University, Wenzhou, China;*  
*2. College of Electrical Engineering, Zhejiang University, Hangzhou, China*
- FT-03. Theoretical and Experimental Analysis of Transverse Flux Linear Machines Using Mutually Coupled Windings for High Force Density.** *J. Du<sup>1,2</sup>, Q. Liu<sup>1</sup>, Y. Long<sup>1</sup> and D. Yai<sup>1</sup>*  
*1. State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Xi'an, China; 2. Aviation Industry Corporation of Qing'an Group, Xi'an, China*
- FT-04. Electromagnetic Analysis of a Balanced Armature Receiver Considering Fringing Flux Effect by Lumped Parameter Method.** *D. Xu<sup>1,2</sup>, Y. Jiang<sup>2</sup> and S. Hwang<sup>2</sup>*  
*1. School of Mechanical Engineering and Automation, Shanghai University, Shanghai, China; 2. Mechanical Engineering, Pusan National University, Busan, The Republic of Korea*
- FT-05. Iron loss characteristics of a nanocrystalline ring excited by Si-IGBT and GaN-FET inverters.** *A. Yao<sup>1</sup>, T. Sugimoto<sup>1</sup> and K. Fujisaki<sup>1</sup>*  
*1. Department of Engineering, Toyota Technological Institute, Nagoya, Japan*
- FT-06. Analysis of Vibration of a Dual-stator Hybrid Excitation Permanent Magnet Motor for Electric Vehicles.** *Y. Fan<sup>1</sup>, Z. Wu<sup>1</sup> and C. Tan<sup>1</sup>*  
*1. School of Electrical Engineering, Southeast University, Nanjing, China*
- FT-07. Thermal Effects on Magnetic Noise and Vibrations of Synchronous Motors.** *I. Ibrahim<sup>1</sup>, H. Mohammadi<sup>1</sup>, V. Ghorbanian<sup>1</sup> and D. Lowther<sup>1</sup>*  
*1. Elec and Comp Eng, McGill University, Montreal, QC, Canada*
- FT-08. Improvement of efficiency and vibration noise characteristics depending on excitation waveform of a brushless DC motor.** *S. Noguchi<sup>1</sup>*  
*1. Motor Drive Laboratory, Tokyo City University, Setagaya-ku, Japan*

- FT-09. Analysis and Comparison on Motor Core Losses with Si-IGBT and SiC-MOSFET Inverter Excitations.** *G. Nguyen<sup>1</sup>, S. Odawara<sup>2</sup>, K. Fujisaki<sup>3</sup>, F. Iwamoto<sup>4</sup>, T. Yamada<sup>4</sup> and T. Sasaya<sup>4</sup>* 1. *Research Center for Smart Vehicles, Toyota Technological Institute, Nagoya, Japan;* 2. *Kitami Institute of Technology, Kitami, Japan;* 3. *Electromagnetic Energy System Laboratory, Toyota Technological Institute, Nagoya, Japan;* 4. *Advanced Research and Innovation Div. 3, Denso Corporation, Aichi, Japan*
- FT-10. Modeling Magnetic Holding Forces of Permanent Magnet Wheels.** *M.D. Noh<sup>1</sup>, J. Kim<sup>1</sup> and Y. Park<sup>1</sup>* 1. *Mechatronics Engineering, Chungnam Natl Univ, Daejeon, The Republic of Korea*
- FT-11. Analytical Modeling and Experimental Verification for Electromagnetic Analysis of Tubular Linear Synchronous Machines with Axially Magnetized Permanent Magnets accounting for Flux-Passing Iron Pole.** *K. Shin<sup>1</sup>, H. Cho<sup>2</sup>, D. You<sup>3</sup> and J. Choi<sup>1</sup>* 1. *Dept. of Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea;* 2. *Dept. of Electric, Electronic and Comm. Eng. Edu., Chungnam National University, Daejeon, The Republic of Korea;* 3. *Dept. of Fire Safety Engineering, Chungnam Provincial Cheongyang College, Chungnam, The Republic of Korea*
- FT-12. A Nonlinear Permanent Magnet Working Point Migration Model and its Application to Simulation of a Polarized Magnetic System.** *J. You<sup>1,2</sup>, X. Liao<sup>1</sup>, R. Wang<sup>1</sup>, H. Liang<sup>1</sup> and J. Sykulski<sup>2</sup>* 1. *School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China;* 2. *Electronics and Computer Science, University of Southampton, Southampton, United Kingdom*
- FT-13. Analysis of Multi-phase and Multi-layer Fractional-Slot Concentrated-Winding on PM Eddy Current Loss Considering Axial Segmentation and Load Operation.** *Q. Chen<sup>1</sup>, D. Liang<sup>1</sup>, S. Jia<sup>1</sup> and X. Wan<sup>1</sup>* 1. *Xi'an Jiaotong University, Xi'an, China*
- FT-14. A study on the analytical methods for demagnetization characteristics of FEM-based permanent magnet synchronous motor.** *G. Jeong<sup>1</sup>, D. Jung<sup>1</sup>, H. Kim<sup>1</sup> and W. Kim<sup>2</sup>* 1. *Electrical Engineering, Hanyang university, Seoul, The Republic of Korea;* 2. *Gachon University, Seognam-si, The Republic of Korea*
- FT-15. Determination of Solenoid Coil Size for Resonance-Based Magnetically Coupled Wireless Power Transfer with Rated Distance.** *H. Song<sup>1</sup> and Q. Xu<sup>1</sup>* 1. *Key Laboratory of Image Processing and Intelligent Control of Education Ministry, Department of Control Science and Engineering, Huazhong University of Science and Technology, Wuhan, China*
- FT-16. Adagrad Algorithm based Optimal Slot-pole Selection for Reduced Inductance Harmonics in Concentrated Wound Multiphase PMSM.** *H. Dhulipati<sup>1</sup>, E. Ghosh<sup>1</sup>, S. Mukundan<sup>1</sup>, J. Tjong<sup>1</sup> and N. C. Kar<sup>1</sup>* 1. *University of Windsor, Windsor, ON, Canada*

**Session FU**  
**MODELLING OF MACHINES III**  
**(Poster Session)**

Jin Hur, Chair

Incheon National University, Seoul, The Republic of Korea

- FU-01. Performance Analysis of Squirrel Cage Induction Motors under Broken Rotor Bar and Stator Interturn Fault Conditions Using Analytical Modeling.** *M. Ojaghi<sup>1</sup>, M. Sabouri<sup>1</sup> and J. Faiz<sup>2</sup>* *1. Electrical Engineering, University of Zanjan, Zanjan, The Islamic Republic of Iran; 2. University of Tehran, Tehran, The Islamic Republic of Iran*
- FU-02. Hybrid analytical modeling of saturated electromagnetic devices: Integration of Fourier modeling and magnetic equivalent circuits.** *J. Bao<sup>1</sup>, B. Gysen<sup>1</sup> and E. Lomonova<sup>1</sup>* *1. Eindhoven University of Technology, Eindhoven, Netherlands*
- FU-03. Convergence Analysis of SEM and FEM to an analytical field distribution in the airgap.** *M. Curti<sup>1</sup>, J. Jansen<sup>1</sup> and E. Lomonova<sup>1</sup>* *1. Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands*
- FU-04. Reduction of Stator Core Loss in Interior PM Machines for Electric Vehicle Applications.** *Y. Hu<sup>1</sup> and S. Zhu<sup>1</sup>* *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*
- FU-05. Vector Magnetic Characteristic Analysis of Induction Motor Considering Harmonic Wave by Slip Motion.** *M. Enokizono<sup>1</sup> and N. Kunihiro<sup>2</sup>* *1. Vector Magnetic Characteristic Technical Laboratory, Usa-city, Japan; 2. Oita University, Oita, Japan*
- FU-06. Elimination of Unipolar Leakage Flux in Consequent-Pole PM Machines by Employing Novel Pole Sequence.** *J. Li<sup>1</sup>, K. Wang<sup>1</sup> and C. Liu<sup>1</sup>* *1. Electrical Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China*
- FU-07. Indirect Analytical Method for Electromagnetic Performances Analysis of V-shaped Interior Permanent Magnet Synchronous Machine.** *L. Xu<sup>2</sup> and M. Lin<sup>1</sup>* *1. Southeast University, Nanjing, China; 2. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*
- FU-08. Improved E&S Model for Core Loss Calculation of Brushless Doubly Fed Machine with Hybrid Rotor.** *F. Zhang<sup>1</sup>, Y. Wang<sup>1</sup> and S. Yu<sup>1</sup>* *1. School of Electrical Engineering, Shenyang University of Technology, Shenyang, China*

- FU-09. About Accuracy and Influence of the Pole Coverage for Eddy Current Losses within Permanent Magnets of Electrical Machines.** *E. Schmidt*<sup>1</sup> and *M. Kaltenbacher*<sup>2</sup>  
 1. Institute of Energy Systems and Electrical Drives, Vienna University of Technology, Vienna, Austria; 2. Institute of Mechanics and Mechatronics, Vienna University of Technology, Vienna, Austria
- FU-10. Non-conforming finite element method to simulate eddy currents due to motion using the  $T, \Phi-\Phi$  formulation.** *G. Wallinger*<sup>1</sup> and *O. Biro*<sup>1</sup> 1. Institute of Fundamentals and Theory in Electrical Engineering, Graz University of Technology, Graz, Austria
- FU-11. Analytical Method of the Cogging Torque in External Rotor Single-phase BLDC Motors applied Tapered Air-gap with notches.** *D. Kim*<sup>1,2</sup>, *Y. Park*<sup>1,2</sup> and *K. Woo*<sup>3</sup> 1. Electrical Control Engineering, Sunchon National University, Suncheon, The Republic of Korea; 2. Green Energy Laboratory, Sunchon National University, Suncheon, The Republic of Korea; 3. Pukyong National University, Busan, The Republic of Korea
- FU-12. Two-Level Surrogate-Assisted Differential Evolution Multi-objective Optimization of Electric Machines Using 3D Finite Element Analysis (FEA).** *N. Taran*<sup>1</sup>, *D. Ionel*<sup>1</sup> and *D.G. Dorrel*<sup>2</sup> 1. Electrical and Computer Engineering, University of Kentucky, Lexington, KY, United States; 2. Discipline of Electrical, Electronics and Computer Engineering, University of KwaZulu-Natal, Durban, South Africa
- FU-13. Comparison of Various Constraints in 3-D Adaptive Degrees-of-Freedom Finite Element Method.** *Y. Zhang*<sup>1</sup>, *S. Ho*<sup>1</sup> and *W. Fu*<sup>1</sup> 1. Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong
- FU-14. Finite-element Method with Topological Data Structure Mesh for Optimization of Electrical Device.** *X. Liu*<sup>1</sup> and *W. Fu*<sup>1</sup> 1. Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong
- FU-15. An equivalent circuit model for predicting core losses of a claw pole permanent magnet motor with molded soft magnetic composite core.** *X. Ba*<sup>1,2</sup>, *C. Zhang*<sup>1</sup>, *Y. Guo*<sup>2</sup> and *J. Zhu*<sup>2</sup> 1. Beijing Institute of Technology, BeiJing, China; 2. University of Technology, Sydney, Sydney, NSW, Australia
- FU-16. Finite-element models for foil windings with an improved resolution of the electric field distribution.** *H. De Gersem*<sup>1</sup>  
 1. Technische Universitaet Darmstadt, Darmstadt, Germany

**Session FV**  
**SPIN WAVES AND OPTICAL MAGNETISATION**  
**SWITCHING**

**(Poster Session)**

Kaiyou Wang, Chair

Institute of Semiconductors, Chinese Academy of Sciences, Beijing,  
China

- FV-01. Excitation of spin waves by pure spin current.** *B. Divinskiy<sup>1</sup>, V.E. Demidov<sup>1</sup>, S.O. Demokritov<sup>1</sup> and S. Urazhdin<sup>2</sup>*  
*1. University of Muenster, Muenster, Germany; 2. Emory University, Atlanta, GA, United States*
- FV-02. Spin wave coupling in strain-tuned magnonic waveguide and reconfigurable magnonic crystals.** *A.V. Sadovnikov<sup>1,2</sup>, A. Grachev<sup>1</sup>, S. Sheshukova<sup>1</sup>, Y. Sharaevsky<sup>1</sup>, A. Serdobintsev<sup>1</sup> and S. Nikitov<sup>1,2</sup>* *1. Nonlinear Physics, Saratov State University, Saratov, Russian Federation; 2. Kotel'nikov Institute of Radioengineering and Electronics, Russian Academy of Sciences, Moscow, Russian Federation*
- FV-03. Spin wave propagation in sputter-deposited YIG nanometer films.** *Y. Shiota<sup>1</sup>, S. Kasukawa<sup>1</sup>, T. Moriyama<sup>1</sup> and T. Ono<sup>1,2</sup>*  
*1. Institute for Chemical Research, Kyoto University, Uji, Japan; 2. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan*
- FV-04. Suppression of spin-wave transport in antiferromagnets.** *J. Ohe<sup>1</sup> and N. Arakawa<sup>1</sup>* *1. Department of Physics, Toho University, Funabashi, Japan*
- FV-05. Antiferromagnetic magnonic crystals with alternating Dzyaloshinskii-Moriya interaction.** *S. Lee<sup>1</sup> and K. Lee<sup>1</sup>*  
*1. Korea Univ., Seoul, The Republic of Korea*
- FV-06. Motion of a skyrmionium driven by spin wave.** *M. Shen<sup>1</sup>, Y. zhang<sup>1</sup>, J. Ouyang<sup>1</sup>, X. Yang<sup>1</sup> and L. You<sup>1</sup>* *1. School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, China*
- FV-07. Bose-Einstein condensation of magnons in confined systems studied by micromagnetic simulations.** *M. Mohseni<sup>1</sup>, T. Brächer<sup>1</sup>, Q. Wang<sup>1</sup>, O. Serga<sup>1</sup>, B. Hillebrands<sup>1</sup> and P. Pirro<sup>1</sup>*  
*1. Physics, TU Kaiserslautern, Kaiserslautern, Germany*
- FV-08. Phase locking, intermittency and chaos, of an array of magnonic crystal cavities driven by spin torque nano oscillators.** *N. Kumar<sup>1</sup> and A. Prabhakar<sup>1</sup>* *1. Electrical Engineering, IIT Madras, Chennai, India*

- FV-09. Excitation of spin waves with controllable wavelength and spectrum by femtosecond laser pulses.** *I.V. Savochkin*<sup>1</sup>, M. Jäckl<sup>2</sup>, V. Belotelov<sup>1,3</sup>, I. Akimov<sup>2,4</sup>, M. Kozhaev<sup>1,5</sup>, D. Sylgacheva<sup>3,1</sup>, A. Chernov<sup>1,5</sup>, A. Shaposhnikov<sup>6</sup>, A. Prokopov<sup>6</sup>, V. Berzhansky<sup>6</sup>, D. Yakovlev<sup>2,4</sup>, A. Zvezdin<sup>1,5</sup> and M. Bayer<sup>2,4</sup> *1. Russian Quantum Center, Moscow, Russian Federation; 2. TU Dortmund, Dortmund, Germany; 3. Lomonosov Moscow State University, Moscow, Russian Federation; 4. Ioffe Institute, St. Petersburg, Russian Federation; 5. Prokhorov General Physics Institute, Moscow, Russian Federation; 6. Vernadsky Crimean Federal University, Simferopol, Russian Federation*
- FV-10. Mechanism of Magnetic Orientation Reversal Induced by Ultrafast Laser.** *Y. Zou*<sup>1</sup>, H. Wang<sup>1</sup>, Z. Zeng<sup>1</sup>, T. Huang<sup>1</sup>, Y. Xiao<sup>1</sup>, W. Cheng<sup>3</sup>, K. Wang<sup>2</sup> and C. Xie<sup>1</sup> *1. Wuhan National Laboratory for Optoelectronics, Huazhong University of Science & Technology, Wuhan, China; 2. School of Physics, Huazhong University of Science & Technology, Wuhan, China; 3. School of Optical and Electronic Information, Huazhong University of Science & Technology, Wuhan, China*
- FV-11. Hybrid characteristic of multi-shot circularly polarized laser pulses for magnetization switching process in L1<sub>0</sub>-FePt nanoparticles.** *Y. Xiao*<sup>1</sup>, H. Wang<sup>2</sup>, T. Huang<sup>1</sup>, Y. Zou<sup>1</sup>, Z. Zeng<sup>1</sup>, K. Wang<sup>1</sup> and C. Xie<sup>1</sup> *1. Wuhan National Laboratory for Optoelectronics, Huazhong University of Science & Technology, Wuhan, China; 2. Wuhan National Laboratory for Optoelectronics, Huazhong University of Science & Technology, Wuhan, China*
- FV-12. Roles of heating and helicity in ultrafast all-optical magnetization switching in TbFeCo.** *X. Lu*<sup>1,2</sup>, X. Zou<sup>1</sup>, D. Hinzke<sup>3</sup>, T. Liu<sup>4</sup>, T. Cheng<sup>8</sup>, J. Wu<sup>1,2</sup>, T. Ostler<sup>5,6</sup>, J. Cai<sup>4</sup>, U. Nowak<sup>3</sup>, R.W. Chantrell<sup>1</sup>, Y. Zhai<sup>7</sup> and Y. Xu<sup>2,8</sup> *1. Department of Physics, University of York, York, United Kingdom; 2. York-Nanjing International Joint Center in Spintronics, Nanjing University, Nanjing, China; 3. Department of Physics, University of Konstanz, Konstanz, Germany; 4. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 5. Computing, Engineering and Sciences, Sheffield Hallam University, Sheffield, United Kingdom; 6. Département de Physique, L'Université de Liège, Liège, Belgium; 7. Department of Physics, Southeast University, Nanjing, China; 8. Department of Electronics, University of York, York, United Kingdom*
- FV-13. Femtosecond laser heating induced ultrafast magnetization reversal in TbCo films with different electron-phonon coupling interaction.** *W. Cheng*<sup>1,2</sup>, Y. Wang<sup>1</sup>, Z. Liu<sup>1</sup>, Y. Hui<sup>2</sup>, H. Wang<sup>2</sup>, J. Chen<sup>2</sup>, Y. Hao<sup>1</sup> and X. Miao<sup>1,2</sup> *1. School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, China; 2. Wuhan National Research Center for Optoelectronics, Huazhong University of Science and Technology, Wuhan, China*
- FV-14. Photonic orbital angular momentum transfer and magnetic skyrmion rotation.** *W. Yang*<sup>1</sup>, H. Yang<sup>1</sup>, Y. Cao<sup>1</sup> and P. Yan<sup>1</sup> *1. Microelectronics and Solid-State Electronics, University of Electronic Science and Technology of China, Chengdu, China*

- FV-15. Dependency of Spin Pumping on Seed and Capping Layers in Co Ultrathin Films.** B.B. Singh<sup>1</sup>, S. Jena<sup>1</sup> and S. Bedanta<sup>1</sup>  
*1. Physical sciences, National Institute of science education and research, Bhubaneswar, India*

THURSDAY  
AFTERNOON  
1:30

SIMPOR/ROSELLE BALLROOM

**Session FW**

**TRANSFORMERS AND INDUCTORS: MODELLING II  
(Poster Session)**

Makoto Sonehara, Co-Chair  
Shinshu University, Nagano, Japan

Zhen Zhang, Co-Chair  
Tianjin University, Tianjin, China

- FW-01. A Magnetic Integration Structure of Hybrid Distribution Transformer.** Y. Liu<sup>1</sup>, D. Liang<sup>1</sup>, M. Zhang<sup>1</sup>, Y. Liang<sup>1</sup>, X. Wan<sup>1</sup>, Q. Chen<sup>1</sup>, S. Wang<sup>1</sup> and S. Wang<sup>1</sup> *1. Xi'an Jiaotong University, Xi'an, China*
- FW-02. Analytical and FEM Calculation of Electrical Parameters of Carbon Steel Pipelines for DEH systems.** A. Chen<sup>1</sup>, A. Nysveen<sup>1</sup>, M. Hoyer-Hansen<sup>2</sup> and J. Lervik<sup>2</sup> *1. Electrical power engineering, Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF Energy Research, Trondheim, Norway*
- FW-03. Calculation method of armature commutation coil inductance in universal motor.** H. Jun<sup>1</sup>, H. Kim<sup>1</sup>, S. Oh<sup>1</sup> and W. Kim<sup>2</sup> *1. Electric Engineering Department, Hanyang University, Seoul, The Republic of Korea; 2. Energy IT department, Gachon University, Seongnam, The Republic of Korea*
- FW-04. Study the Effect of Inductor Nonlinear Behavior on the LCL Three Phase Grid- Connected Inverter.** S. Jiang<sup>1</sup>, Y. Liu<sup>1</sup>, H. Wang<sup>1</sup>, G. Wang<sup>1</sup>, J. Peng<sup>1</sup> and Y. Liu<sup>2</sup> *1. College of Mechatronics and Control Engineering, Shenzhen University, Shenzhen, China; 2. School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, Singapore*
- FW-05. Prediction of Stray Loss in Transformer Wall Shunt due to Leakage Magnetic Flux.** K. Park<sup>1</sup>, S. Hahn<sup>1</sup> and H. Ahn<sup>2</sup> *1. Electrical Engineering, Dong-A University, BUSAN, The Republic of Korea; 2. R&D Center, Power & Industrial Systems Performance Group, Hyosung Corporation, Changwon, The Republic of Korea*
- FW-06. A Novel Multi-unit Out-rotor Homopolar Inductor Machine for Flywheel Energy Storage System.** J. Yang<sup>1</sup>, C. Ye<sup>1</sup>, X. Liang<sup>1</sup>, F. Xiong<sup>1</sup> and W. Xu<sup>1</sup> *1. State Key Laboratory of Advanced Electromagnetic Engineering and Technology (AEE), School of Electrical and Electronic Engineering (SEEE), Huazhong University of Science and Technology, Wuhan, China*

- FW-07. Fabrication and development of miniaturized efficient power converters using ultra-soft magnetic ribbons.** *H. Ahmadian Baghbaderani*<sup>1</sup>, D.J. Cronin<sup>1</sup>, P. McCloskey<sup>1</sup>, S. Kulkarni<sup>1</sup>, Z. Pavlovic<sup>1</sup>, A. Masood<sup>1</sup>, K. Ackland<sup>2</sup>, P. Stamenov<sup>2</sup> and C. O'Mathuna<sup>1</sup> *1. Strategic Programs, Tyndall National Institute, Cork, Ireland; 2. School of Physics, Trinity College, Dublin, Ireland*
- FW-08. Prediction of Heating Power in Magnetic Pipe Conducting Large AC Current with High Frequencies Up to 200Hz.** *A. Chen*<sup>1</sup>, A. Nysveen<sup>1</sup>, J. Lervik<sup>2</sup> and M. Høyer-Hansen<sup>2</sup> *1. Electrical power engineering, Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF energy, Trondheim, Norway*
- FW-09. A Novel Three Limb Topology of a Saturated Core Fault Current Limiter in HVDC System.** *H. Zhou*<sup>1</sup>, J. Yuan<sup>1</sup>, L. Wei<sup>1,2</sup>, P. Gan<sup>1</sup>, F. Chen<sup>1</sup>, Y. Zhong<sup>1</sup>, C. Tian<sup>1</sup>, B. Chen<sup>1</sup>, Y. Gao<sup>3</sup> and K. Muramatsu<sup>3</sup> *1. School of Electrical and Engineering, Wuhan University, Wuhan, China; 2. Department of Electrical Engineering, Graduate School of Engineering, Kyoto University, Kyoto, Japan; 3. Department of Electrical and Electronic Engineering, Saga University, Saga, Japan*
- FW-10. New Equivalent Circuit Model of UHVDC Converter Transformer Winding for the Calculation of Transient Potential Distribution.** *S. He*<sup>1</sup>, C. Li<sup>1</sup>, Y. Liu<sup>1</sup>, Z. Zhao<sup>1</sup>, J. Deng<sup>2</sup>, J. Li<sup>1</sup> and H. Qian<sup>2</sup> *1. electrical engineering, xi'an jiaotong university, Xi'an, China; 2. Maintenance and Test Center of EHV Power Transmission Company, China Southern Power Grid, Guangzhou, China*
- FW-11. Dynamic Transformer Core Model Based on the Inverse Three-component Preisach Model.** *W. Sima*<sup>1</sup>, D. Peng<sup>1</sup>, M. Yang<sup>1</sup>, M. Zou<sup>1</sup> and Y. Liu<sup>1</sup> *1. Chongqing University, Chongqing, China*
- FW-12. An Analytical and Numerical Hybrid Model for Static Characteristics of a Interior Permanent Magnet Machine.** *P. Jin*<sup>1</sup>, Y. Guo<sup>1</sup> and Y. Zhu<sup>1</sup> *1. School of Energy and Electrical Engineering, Hohai University, Nanjing, China*
- FW-13. AC Loss Analysis of a Flux-coupling type Superconducting Fault Current Limiter.** *S. Yan*<sup>1</sup>, Y. Tang<sup>1</sup>, L. Ren<sup>1</sup> and Z. Wang<sup>1</sup> *1. Hua Zhong University of Science and Technology, Wuhan, China*

**Session YA**  
**PANEL DISCUSSION: THE FUTURE OF INFORMATION  
STORAGE AND MEMORY TECHNOLOGIES**  
**(SPECIAL SESSION)**

Jingsheng Chen, Chair  
National University of Singapore, Singapore

**Dr. Ed Gage**, *Vice President, Seagate Research Group, Minneapolis, MN, United States*

**Dr. Thao A. Nguyen**, *Senior Vice President of Head Operation, Western Digital Corporation, San Jose, CA, United States*

**Dr. Danny Shum**, *Fellow, Embedded Nonvolatile Memory Technology Development & Research, GLOBALFOUNDRIES, Singapore*

This special evening session features three executives from leading hard disk drive and memory companies discussing the state of the art and future directions of data storage and magnetic memory technology. Each will present their vision and roadmap of technology development. What revolutionary approaches will extend the dominance of the hard disk in mass data storage? How and when will magnetic random access memory (MRAM) become competitive? What breakthroughs are still anticipated to keep these technologies growing at historic trends? In particular, there will be description of recent demonstrations of hard disk drives with Heat Assisted Magnetic Recording (HAMR) and Microwave Assisted Magnetic Recording (MAMR). The current status of Spin Transfer Torque (STT) MRAM will also be presented along with discussions on the embedding of MRAM into contemporary CMOS circuits. Following the presentations of the panelists, there will be an extended period for questions from the audience and further discussion.

**Session GA**  
**SYMPOSIUM ON THE PRESENT AND FUTURE OF  
STT-MRAM**

Hyunsoo Yang, Chair  
National University of Singapore, Singapore

9:00

**GA-01. Highly Manufacturable Embedded STT-MRAM Technology. (Invited)** *K. Nam<sup>1</sup>. Samsung Electronics, Hawsung-City, The Republic of Korea*

9:30

**GA-02. Embedded MRAM for Next-Generation Microcontroller Platform. (Invited)** *K. Lee<sup>1</sup>, S. Noh<sup>1</sup>, V.B. Naik<sup>1</sup>, J. Kwon<sup>1</sup>, J. Lim<sup>1</sup>, S. K<sup>1</sup>, B. Behin-aein<sup>1</sup>, K. Yamane<sup>1</sup>, D. Zeng<sup>1</sup>, K. Gan<sup>1</sup>, H. Yang<sup>1</sup>, N. Thiyagarajah<sup>1</sup>, S. Jang<sup>1</sup>, L. Goh<sup>1</sup>, R. Chao<sup>1</sup>, N. Chung<sup>1</sup>, T. Wee<sup>1</sup>, T. Ling<sup>1</sup>, J. Wong<sup>1</sup> and S. Woo<sup>1</sup>. TD, GLOBALFOUNDRIES Singapore, Singapore*

10:00

- GA-03. STT-MRAM for embedded memory applications from eNVM to Last Level Cache. (Invited)** L. Thomas<sup>1</sup>, G. Jan<sup>1</sup>, Y. Lee<sup>1</sup>, H. Liu<sup>1</sup>, J. Zhu<sup>1</sup>, S. Le<sup>1</sup>, S. Serrano-Guisan<sup>1</sup>, J. Iwata-Harms<sup>1</sup>, R. Tong<sup>1</sup>, S. Patel<sup>1</sup>, V. Sundar<sup>1</sup>, D. Shen<sup>1</sup>, J. Haq<sup>1</sup>, Y. Yang<sup>1</sup>, R. He<sup>1</sup>, Z. Teng<sup>1</sup>, V. Lam<sup>1</sup>, P. Liu<sup>1</sup>, H. Fukuzawa<sup>1</sup>, Y. Wang<sup>1</sup>, T. Zhong<sup>1</sup> and P. Wang<sup>1</sup> *I. TDK-Headway Technologies, Inc., Milpitas, CA, United States*

10:30

- GA-04. High Performance pMTJ with Ir as RKKY and PMA enhancing Layer. (Invited)** Y. Huai<sup>1</sup> *I. Avalanche Technology, Fremont, CA, United States*

11:00

- GA-05. Advances in three-terminal spin-orbit torque MRAM devices. (Invited)** R. Buhrman<sup>1</sup> *I. Cornell University, Ithaca, NY, United States*

11:30

- GA-06. The Pursuit of Saving Energy Consumption of Memory Systems by MRAMs, from STT-MRAM to Voltage-Control Spintronics Memory (VoCSM). (Invited)** H. Yoda<sup>1</sup>, N. Shimomura<sup>1</sup>, Y. Ohsawa<sup>1</sup>, Y. Kato<sup>1</sup>, S. Shirotori<sup>1</sup>, M. Shimizu<sup>1</sup>, K. Koi<sup>1</sup>, T. Inokuchi<sup>1</sup>, H. Sugiyama<sup>1</sup>, S. Oikawa<sup>1</sup>, B. Altansargai<sup>1</sup>, M. Ishikawa<sup>1</sup>, A. Tiwari<sup>1</sup> and A. Kurobe<sup>1</sup> *I. R&D Center, Toshiba Corporation, Kawasaki, Japan*

FRIDAY  
MORNING  
9:00

ORCHID III

### Session GB

## NANOSTRUCTURED HARD MAGNETIC MATERIALS

Chih-huang Lai, Chair  
National Tsing Hua University, HsinChu, Taiwan

9:00

- GB-01. Multicomponent nanostructured Nd-Fe-B permanent magnets prepared by Spark Plasma Sintering technique.** T. Tomše<sup>1,2</sup>, L.M. Scherf<sup>3</sup>, J. Jačimović<sup>3</sup>, J. Dubois<sup>1,2</sup> and S. Kobe<sup>1,2</sup> *I. Department for Nanostructured Materials, Jožef Stefan Institute, Ljubljana, Slovenia; 2. Jožef Stefan International Postgraduate School, Ljubljana, Slovenia; 3. ABB Corporate Research Center, Baden-Daettwil, Switzerland*

9:15

- GB-02. Ultra thin films of L1<sub>0</sub>-MnAl on GaAs (001): tuning the properties of the Mn-Ga-As-Al interphase.** C. Navío<sup>1</sup>, M. Villanueva<sup>1</sup>, E. Céspedes<sup>1</sup>, F. Mompean<sup>2</sup>, M. García-Hernández<sup>2</sup>, J. Camarero<sup>3,1</sup> and A. Bollero<sup>1</sup> *I. Division of Permanent Magnets and Applications, IMDEA Nanoscience, Madrid, Spain; 2. Instituto de Ciencia de Materiales de Madrid, ICMM-CSIC, Madrid, Spain; 3. Condensed Matter Physics, Universidad Autónoma de Madrid, Madrid, Spain*

9:30

- GB-03. Mechanochemical synthesis of Dy substituted Nd<sub>2</sub>(Fe,Co)<sub>14</sub>B magnetic nanoparticles.** *Y. Zhong*<sup>1</sup>, *V. Chaudhary*<sup>2</sup>, *H. Parmar*<sup>2</sup>, *X. Tan*<sup>1</sup> and *R.V. Ramanujan*<sup>1</sup> *1. School of Materials Science and Engineering, Nanyang Technological University, Singapore, Singapore; 2. Rolls-Royce@NTU Corporate Lab, Nanyang Technological University, Singapore, Singapore*

9:45

- GB-04. Large improvement in magnetic properties of hot deformed HREE-free Nd-Fe-B magnets using the rapid heating technique of the powder.** *Y. Nakazawa*<sup>1</sup>, *R. Kato*<sup>1</sup>, *Y. Shintani*<sup>1</sup> and *H. Shimizu*<sup>1</sup> *1. Honda R&D Co., Ltd. Automobile R&D Center, Haga-machi, Haga-gun, Japan*

10:00

- GB-05. Sustainability In The Production Of Sr-ferrite Magnets: Understanding Microstructure-Magnetic Correlation Translates To A Successful Recycling Case In Industry.** *A. Bollero*<sup>1</sup>, *J. Rial*<sup>1</sup>, *M. Villanueva*<sup>1</sup>, *A. Seoane*<sup>2</sup>, *J. Almunia*<sup>2</sup> and *R. Altamira*<sup>2</sup> *1. Permanent Magnets and Applications, IMDEA Nanoscience, Madrid, Spain; 2. Ingeniería Magnética Aplicada, IMA S.L., Barcelona, Spain*

10:15

- GB-06. Effects of Hot Pressing Temperature on Magnetic Properties of Hot Pressed Nanocrystalline Nd-Fe-B Magnets.** *Z. Jing*<sup>1</sup>, *Z. Guo*<sup>1</sup>, *M. Li*<sup>1</sup>, *M. Zhu*<sup>1</sup> and *W. Li*<sup>1</sup> *1. Central Iron & Steel Research Institute, Division of Functional Materials, Beijing, China*

10:30

- GB-07. The effect of the presence of Ni/Cu coating residues on the recyclability of Sm<sub>2</sub>Co<sub>17</sub> magnets.** *A. Eldosouky*<sup>1,2</sup> and *I. Skulj*<sup>1</sup> *1. Magneti Ljubljana, d.d., Ljubljana, Slovenia; 2. Jozef Stefan International Postgraduate, Ljubljana, Slovenia*

10:45

- GB-08. Structural Evolution and Magnetic Properties of Bulk MnAl-C Prepared by High Pressure Compaction of Gas-atomized Powders.** *P. Si*<sup>1,2</sup>, *H. Qian*<sup>1</sup>, *J. Park*<sup>1</sup>, *C. Choi*<sup>1</sup>, *S. Han*<sup>1</sup> and *H. Ge*<sup>2</sup> *1. Korea Institute of Materials Science, Changwon, The Republic of Korea; 2. China Jiliang University, Hangzhou, China*

11:00

- GB-09. Additive Manufactured Magnetic Structures with Locally Varying Magnetization Direction in 3D.** *C. Huber*<sup>1,2</sup>, *F. Bruckner*<sup>1,2</sup>, *C. Abert*<sup>1,2</sup>, *M. Groenefeld*<sup>3</sup> and *D. Suess*<sup>1,2</sup> *1. Physics of Functional Materials, University of Vienna, Vienna, Austria; 2. Christian Doppler Laboratory for Advanced Magnetic Sensing and Materials, Vienna, Austria; 3. Magnetfabrik Bonn GmbH, Bonn, Germany*

11:15

- GB-10. Magnetic Force Equations based on Computer Simulation and the Effect of Load Line.** *C. Chen*<sup>1,3</sup>, *H. Meng*<sup>2</sup> and *M. Fan*<sup>1</sup>  
1. *Quadrant at San Jose, San Jose, CA, United States;*  
2. *Quadrant at Hangzhou, Hangzhou, China;* 3. *Magnet Energy LLC, San Jose, CA, United States*

11:30

- GB-11. High (BH)<sub>max</sub> (Nd,Dy)-(Fe,Co)-B Hard Magnetic Powders Synthesized by Microwave Processing.** *X. Tan*<sup>1</sup>, *H. Parmar*<sup>1,2</sup>, *V. Chaudhary*<sup>1,2</sup>, *Y. Zhong*<sup>1</sup> and *R.V. Ramanujan*<sup>1</sup> 1. *Materials Science and Engineering, Nanyang Technological University, Singapore, Singapore;* 2. *Rolls-Royce@NTU Corporate Lab, Nanyang Technological University, Singapore, Singapore*

11:45

- GB-12. Sintered Multicomponent Magnets for Electrical Machines.** *L.M. Scherf*<sup>1</sup>, *D. Tremelling*<sup>2</sup>, *J. Jaćimović*<sup>1</sup>, *R. Kessler*<sup>1</sup>, *T. Tomše*<sup>3</sup> and *L. Herrmann*<sup>1</sup> 1. *Corporate Research Center, ABB, Baden-Dättwil, Switzerland;* 2. *Corporate Research Center, ABB, Raleigh, NC, United States;* 3. *Department for Nanostructured Materials, Jozef Stefan Institut, Ljubljana, Slovenia*

FRIDAY  
MORNING  
9:00

ORCHID IV

**Session GC**  
**MAGNETISATION SWITCHING AND**  
**MAGNON-PHOTON COUPLING**

*Philipp Pirro*, Co-Chair  
TU Kaiserslautern, Kaiserslautern, Germany  
*Sebastiaan van Dijken*, Co-Chair  
Aalto University, Espoo, Finland

9:00

- GC-01. Domain Wall Motion Driven by Laplace Pressure in CoFeB-MgO Nanodots with Perpendicular Anisotropy.** *Y. Zhang*<sup>1,2</sup>, *X. Zhang*<sup>1</sup>, *N. Vernier*<sup>2</sup>, *Z. Zhang*<sup>1</sup>, *G. Agnus*<sup>2</sup>, *J. Coudevylle*<sup>2</sup>, *X. Lin*<sup>1</sup>, *Y. Zhang*<sup>1</sup>, *Y. Zhang*<sup>1</sup>, *W. Zhao*<sup>1</sup> and *D. Ravelosona*<sup>2</sup>  
1. *Beihang University, Beijing, China;* 2. *Centre de Nanosciences et de Nanotechnologies, CNRS, University of Paris-Sud, Orsay, France*

9:15

- GC-02. Oscillatory spin-orbit torque switching due to field-like torques.** *J. Lee*<sup>1</sup>, *J. Kwon*<sup>1</sup>, *R. Ramaswamy*<sup>1</sup>, *R. Mishra*<sup>1</sup>, *S. Srivastava*<sup>1</sup>, *K. Cai*<sup>1</sup> and *H. Yang*<sup>1</sup> 1. *Department of Electrical Engineering and Computer Engineering, National University of Singapore, Singapore*

9:30

- GC-03. Magnetization damping in spin-orbit coupled magnetic textures.** *C.A. Akosa*<sup>1</sup>, *Z. Yuan*<sup>3</sup>, *A. Takeuchi*<sup>2</sup> and *G. Tatara*<sup>1</sup>  
1. *RIKEN Center for Emergent Matter Science (CEMS), Wako, Japan*; 2. *Department of Physics and Mathematics, Aoyama Gakuin University, Sagami-hara, Japan*; 3. *The Center for Advanced Quantum Studies and Department of Physics, Beijing Normal University, Beijing, China*

9:45

- GC-04. Structural and magnetic study by nonmagnetic (Ti<sup>4+</sup> and Ga<sup>3+</sup>) doping at Ru site in SrRuO<sub>3</sub>.** *R. Gupta*<sup>1</sup> and *A. Pramanik*<sup>1</sup>  
1. *School of Physical Science, Jawaharlal Nehru University, New Delhi, India*

10:00

- GC-05. Plasmon-Induced Demagnetization and Magnetic Switching in Nickel Nanoparticle Arrays.** *M. Kataja*<sup>1</sup>, *F. Freire-Fernandez*<sup>1</sup>, *J. Witteveen*<sup>1</sup>, *T. Hakala*<sup>1</sup>, *P. Törmä*<sup>1</sup> and *S. van Dijken*<sup>1</sup>  
1. *Department of Applied Physics, Aalto University, Espoo, Finland*

10:15

- GC-06. Scaling of All-Optical Switching to Nanometer Dimensions.** *A. El-Ghazaly*<sup>1</sup>, *C. Lambert*<sup>1</sup>, *B. Tran*<sup>2</sup>, *A. Pattabi*<sup>1</sup>, *J. Gorchon*<sup>1,3</sup>, *S. Salahuddin*<sup>1</sup>, *H. Wong*<sup>4</sup> and *J. Bokor*<sup>1</sup>  
1. *Electrical Engineering and Computer Science, University of California Berkeley, Berkeley, CA, United States*; 2. *Physics, University of California Berkeley, Berkeley, CA, United States*; 3. *Lawrence Berkeley National Laboratory, Berkeley, CA, United States*; 4. *Electrical Engineering, Stanford University, Stanford, CA, United States*

10:30

- GC-07. Magnons in Photonic Cavities and Resonators. (Invited)** *B. Rameshti*<sup>1</sup>, *S. Sharma*<sup>2</sup>, *Y. Blanter*<sup>2</sup> and *G. Bauer*<sup>3,4</sup>  
1. *Institute for Research in Fundamental Sciences, Tehran, The Islamic Republic of Iran*; 2. *Delft University of Technology, Delft, Netherlands*; 3. *Tohoku University, Sendai, Japan*; 4. *University of Groningen, Groningen, Netherlands*

11:00

- GC-08. Cavity Spintronics. (Invited)** *C. Hu*<sup>1</sup>  
1. *Department of Physics and Astronomy, University of Manitoba, Winnipeg, MB, Canada*

11:30

- GC-09. Tunable magnon photon coupling using a BLIG ((LuBi)<sub>3</sub>Fe<sub>5</sub>O<sub>12</sub>) film and a split ring resonator.** *M. M*<sup>1</sup>, *S. S*<sup>2</sup>, *G. Venkat*<sup>1</sup>, *K. Arunachalam*<sup>2</sup> and *A. Prabhakar*<sup>1</sup>  
1. *Electrical Engineering, Indian Institute of Technology Madras, Chennai, India*; 2. *Engineering Design, Indian Institute of Technology Madras, Chennai, India*

- GC-10. Microwave to optical photon conversion by means of travelling-wave magnons in YIG films.** *M. Kostylev*<sup>1</sup> and *A. Stashkevich*<sup>2</sup> *1. University of Western Australia, Crawley, WA, Australia; 2. LSPM (CNRS-UPR 3407), Université Paris 13, Villetaneuse, France*

FRIDAY  
MORNING  
9:00

PEONY IV

**Session GD**  
**SPIN-ORBITRONICS IV**

Yi Wang, Chair  
National University of Singapore, Singapore

9:00

- GD-01. Modulation of spin-orbit torque efficiency in ultrathin ferromagnetic layer with different capping layers.** *Z.A. Bekele*<sup>1</sup>, *K. Meng*<sup>1</sup>, *J. Chen*<sup>1</sup>, *Y. Wu*<sup>1</sup>, *J. Miao*<sup>1</sup>, *X. Xu*<sup>1</sup> and *Y. Jiang*<sup>1</sup> *1. School of Materials Science and Engineering, University of Science and Technology Beijing, China*

9:15

- GD-02. Charge-spin current interconversion in epitaxial systems: symmetric spin-torque ferromagnetic resonance scan but not infinity spin Hall angle.** *S. Petit-Watelot*<sup>1</sup>, *C. Guillemard*<sup>1</sup>, *S. Andrieu*<sup>1</sup> and *J. Rojas-Sánchez*<sup>1</sup> *1. Institut Jean Lamour - CNRS - Univ. Lorraine, Nancy, France*

9:30

- GD-03. Nonvolatile memory devices with magnetic nanowires controlled by spin-transfer and spin-orbit torques. (Invited)** *S. Fukami*<sup>1</sup> and *H. Ohno*<sup>1</sup> *1. Tohoku University, Sendai, Japan*

10:00

- GD-04. Magnon transport in multilayer magnetic system.** *Z. Fu*<sup>2</sup>, *S. Ruta*<sup>1</sup>, *T. Ostler*<sup>3</sup>, *A. Kimel*<sup>4</sup>, *R.F. Evans*<sup>1</sup> and *R.W. Chantrell*<sup>1</sup> *1. Physics, University of York, York, United Kingdom; 2. Tongji University, Shanghai, China; 3. Sheffield Hallam University, Sheffield, United Kingdom; 4. Institute for Molecules and Materials, Radboud University Nijmegen, Nijmegen, Netherlands*

10:15

- GD-05. Enhancement of Gilbert damping in NiFe/Pt bilayers with MgO capping layers.** *T. Zhu*<sup>1</sup> and *F. Chang*<sup>1,2</sup> *1. State Key Lab for Magnetism, Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. Institute of high energy physics, Beijing, China*

10:30

- GD-06. Influence of W insertion layer in Ta and CoFeB on antidamping-like effective torque efficiency.** *I. Cha*<sup>1</sup>, *Y. Kim*<sup>1</sup>, *G. Kim*<sup>1</sup>, *T. Kim*<sup>1</sup>, *K. Garello*<sup>2</sup> and *Y.K. Kim*<sup>1</sup>  
*1. Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 2. Imec, Leuven, Belgium*

10:45

- GD-07. Optimize Fe/Pt bilayers as efficient spintronic terahertz emitters by tailoring the thickness of the layers and the interface structural properties.** *L. Scheuer*<sup>1</sup>, *S. Keller*<sup>1</sup>, *G. Torosyan*<sup>2</sup>, *M. Battiato*<sup>3</sup>, *R. Beigang*<sup>1</sup> and *E. Papaioannou*<sup>1</sup>  
*1. Physics, TU Kaiserslautern, Kaiserslautern, Germany; 2. Photonic Center Kaiserslautern, Kaiserslautern, Germany; 3. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*

11:00

- GD-08. Spin Seebeck effect in a polycrystalline bulk-YIG fabricated by the sol-gel synthesis.** *M. Jang*<sup>1</sup> and *K. Lee*<sup>1</sup> *1. Materials Science and Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, The Republic of Korea*

11:15

- GD-09. Anomalous Nernst and Hall effects in ferromagnetic multilayers.** *M. Mizuguchi*<sup>1,2</sup>, *H. Suzuki*<sup>1</sup>, *H. Sharma*<sup>1,2</sup> and *K. Takanashi*<sup>1</sup> *1. Tohoku University, Sendai, Japan; 2. JST-CREST, Kawaguchi, Japan*

11:30

- GD-10. Thermal contribution to the spin-orbit torque in metallic/ferrimagnetic systems: the switching temperature.** *J. Rojas-Sánchez*<sup>1</sup>, *T. Pham*<sup>1</sup>, *S. Je*<sup>2,1</sup>, *P. Vallobrá*<sup>1</sup>, *T. Fache*<sup>1</sup>, *D. Lacour*<sup>1</sup>, *G. Malinowski*<sup>1</sup>, *M. Cyrille*<sup>3</sup>, *G. Gaudin*<sup>2</sup>, *O. Boulle*<sup>2</sup>, *M. Hehn*<sup>1</sup> and *S. Mangin*<sup>1</sup> *1. Institut Jean Lamour - CNRS - Univ. Lorraine, Nancy, France; 2. CNRS, SPINTEC, Grenoble, France; 3. Leti, technology research institute, CEA, Grenoble, France*

11:45

- GD-11. Anomalous hall effect in Ultrathin FePt ferromagnetic layer.** *J. Yu*<sup>1,2</sup>, *L. Liu*<sup>1</sup>, *J. Deng*<sup>1</sup>, *H. Yoong*<sup>1</sup>, *W. Lin*<sup>1</sup>, *H. Wang*<sup>1</sup>, *H. Liu*<sup>2</sup>, *F. Poh*<sup>2</sup>, *D. Shum*<sup>2</sup> and *J. Chen*<sup>1</sup> *1. Material Science and Engineering, National University of Singapore, Singapore; 2. GLOBALFOUNDRIES Singapore Pte Ltd., Singapore 738406, Singapore*

**Session GE**  
**EXCHANGE COUPLING, SUPERCONDUCTIVITY AND**  
**ELECTRONIC STRUCTURES II**

Xiaoxi Liu, Chair  
Shinshu University, Nagano, Japan

9:00

- GE-01. Chiral Majorana Fermion Modes in a Quantum Anomalous Hall insulator-Superconductor Structure for Topological Quantum Computing. (Invited) K. Wang<sup>1</sup>** *1. Departments of ECE, Physics and Astronomy, and MSE, University of California, Los Angeles, Los Angeles, CA, United States*

9:30

- GE-02. Superconducting exchange coupling and spin currents between ferromagnets. (Invited) M.G. Blamire<sup>1</sup>** *1. Materials Science, University of Cambridge, Cambridge, United Kingdom*

10:00

- GE-03. Domain Imaging Across the Magneto-Structural Phase Transition in  $\text{Fe}_{1+y}\text{Te}$ . J. Warmuth<sup>3</sup>, M. Bremholm<sup>1</sup>, P. Hofmann<sup>2</sup>, J. Wiebe<sup>3</sup> and R. Wiesendanger<sup>3</sup>** *1. Department of Chemistry, Aarhus University, Aarhus, Denmark; 2. Department of Physics and Astronomy, Interdisciplinary Nanoscience Center (iNANO), Aarhus University, Aarhus, Denmark; 3. Department of Physics, Hamburg University, Hamburg, Germany*

10:15

- GE-04. Coexistence of Ferromagnetism and Superconductivity in Zn-ion implanted and buffer-free InN films. W. Xie<sup>1</sup>, Q. Xie<sup>2</sup>, F. Duan<sup>1</sup>, K. Wang<sup>1</sup>, H. Tian<sup>1</sup> and X. Wu<sup>1</sup>** *1. Physics, Nanjing University, Nanjing, China; 2. Nanjing University of Posts and Telecommunications, Nanjing, China*

10:30

- GE-05. Diamagnetically diluted iron borate-based single crystals: EMR and SQUID studies. J. Kliava<sup>1</sup>, P. Rosa<sup>2</sup>, K. Seleznyova<sup>3</sup>, M. Strugatsky<sup>3</sup> and S. Yagupov<sup>3</sup>** *1. LOMA, UMR 5798, Université de Bordeaux-CNRS, Talence, France; 2. ICMCB, UPR 9048, Université de Bordeaux-CNRS, Pessac, France; 3. V.I. Vernadsky Crimean Federal University, Simferopol, Russian Federation*

10:45

- GE-06. Theory of Mn-containing high-magnetization permanent magnets. (Invited) A. Kashyap<sup>1</sup>, D. Sellmyer<sup>2</sup> and R. Skomski<sup>2</sup>** *1. School of Basic Sciences, IIT Mandi, Mandi, India; 2. Department of Physics and Astronomy, NCMN, University of Nebraska-Lincoln, Lincoln, NE, United States*

11:15

- GE-07. Origin of perpendicular magnetic anisotropy in Co/Pd multilayers studied by x-ray magnetic circular dichroism and first-principles calculations.** *J. Okabayashi*<sup>1</sup>, *Y. Miura*<sup>2</sup> and *H. Munekata*<sup>3</sup> *1. The University of Tokyo, Bunkyo-ku, Japan; 2. Kyoto Institute of Technology, Kyoto, Japan; 3. Tokyo Institute of Technology, Yokohama, Japan*

11:30

- GE-08. Perpendicular exchange bias in CoPt/FeMn bilayers.** *C. Pan*<sup>1,2</sup>, *T. Gao*<sup>3</sup>, *T. Harumoto*<sup>2</sup>, *Z. Zhang*<sup>1</sup>, *Y. Nakamura*<sup>2</sup> and *J. Shi*<sup>2</sup> *1. School of Materials Science and Engineering, Tsinghua University, Beijing, China; 2. School of Materials and Chemical Technology, Tokyo Institute of Technology, Tokyo, Japan; 3. Department of Applied Physics and Physicoinformat, Keio University, Yokohama, Japan*

11:45

- GE-09. Additively Manufactured Functionally Graded FeNi based High Entropy Magnetic Alloys.** *V. Chaudhary*<sup>1</sup>, *T. Borkar*<sup>2,3</sup>, *C.V. Mikler*<sup>2</sup>, *B. Gwalani*<sup>2</sup>, *D. Choudhuri*<sup>2</sup>, *V. Soni*<sup>2</sup>, *T. Alam*<sup>2</sup>, *R.V. Ramanujan*<sup>1</sup> and *R. Banerjee*<sup>2</sup> *1. Nanyang Technological University, Singapore, Singapore; 2. University of North Texas, Denton, TX, United States; 3. Cleveland State University, Cleveland, OH, United States*

FRIDAY  
MORNING  
9:00

PEONY I

**Session GF**  
**SPIN WAVES II**  
Florin Ciubotaru, Chair  
IMEC, Leuven, Belgium

9:00

- GF-01. Crossover to subthermal magnons spin conductance in open YIG films driven by large spin-orbit torque. (Invited)** *O. Klein*<sup>1</sup>, *N. Thiery*<sup>1</sup>, *L. Vila*<sup>1</sup>, *G. de Loubens*<sup>2</sup>, *V. Naletov*<sup>2</sup>, *V.E. Demidov*<sup>3</sup> and *S.O. Demokritov*<sup>3</sup> *1. CEA-SPINTEC, GRENOBLE, France; 2. CEA-SPEC, Gif-Sur-Yvette, France; 3. Physics department, University of Muenster, Muenster, Germany*

9:30

- GF-02. Mapping surface anisotropies in ferromagnetic (Ga,Mn)As films.** *X. Liu*<sup>1</sup>, *M. Dobrowolska*<sup>1</sup>, *J. Furdyna*<sup>1</sup>, *H. Puzkarski*<sup>2</sup> and *P. Tomczak*<sup>2</sup> *1. Physics, University of Notre Dame, Notre Dame, IN, United States; 2. Faculty of Physics, Adam Mickiewicz University, ul. Umultowska, Poland*

- GF-03. Reconfigurable Spin Wave Propagation in Pseudo One-Dimensional Magnonic Crystal for High Frequency Nanoscale Devices.** C. Banerjee<sup>1</sup>, S. Choudhury<sup>1</sup>, J. Sinha<sup>1</sup> and A. Barman<sup>1</sup> *1. S. N. Bose National Centre for Basic Sciences, Kolkata, India*

10:00

- GF-04. Field Controlled Modulation of Magnetization Dynamics and Spin-Wave Mode Conversion in Two-Dimensional Nanoscale Antidot Lattices.** A. De<sup>1</sup>, S. Mondal<sup>1</sup>, S. Sahoo<sup>1</sup>, S. Barman<sup>2</sup>, Y. Otani<sup>3</sup> and A. Barman<sup>1</sup> *1. S. N. Bose National Centre for Basic Sciences, Kolkata, India; 2. Institute of Engineering and Management, Kolkata, India; 3. The University of Tokyo, Chiba, Japan*

10:15

- GF-05. Propagating spin waves and reprogrammability in 1D Fibonacci magnonic quasicrystals.** F. Lisiecki<sup>1</sup>, J. Rychly<sup>2</sup>, P. Kuswik<sup>1,3</sup>, H. Glowinski<sup>1</sup>, M. Zelent<sup>2</sup>, F. Gross<sup>4</sup>, I. Bykova<sup>4</sup>, M. Weigand<sup>4</sup>, G. Schütz<sup>4</sup>, J.W. Klos<sup>2,5</sup>, M. Krawczyk<sup>2</sup>, F. Stobiecki<sup>1,6</sup>, J. Dubowik<sup>1</sup> and J. Gräfe<sup>4</sup> *1. Institute of Molecular Physics Polish Academy of Sciences, Poznan, Poland; 2. Faculty of Physics, Adam Mickiewicz University, Poznan, Poland; 3. Centre for Advanced Technology, Adam Mickiewicz University, Poznan, Poland; 4. Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 5. Institute of Physics, Ernst Moritz Arndt University, Greifswald, Germany; 6. NanoBioMedical Centre, Adam Mickiewicz University, Poznan, Poland*

10:30

- GF-06. 3D magnonic crystals.** E. Beginin<sup>1</sup>, A.V. Sadovnikov<sup>1,2</sup>, A. Sharaevskaia<sup>1,2</sup>, A. Stognij<sup>3</sup> and S. Nikitov<sup>1,2</sup> *1. Nonlinear Physics, Saratov State University, Saratov, Russian Federation; 2. Kotel'nikov Institute of Radioengineering and Electronics, Russian Academy of Sciences, Moscow, Russian Federation; 3. Scientific-Practical Materials Research Center, National Academy of Sciences of Belarus, Minsk, Belarus*

10:45

- GF-07. Magnetization Dynamics of Ni<sub>80</sub>Fe<sub>20</sub> Nanowires with Continuous Width Modulation.** L. Xiong<sup>1</sup>, M. Kostylev<sup>2</sup> and A. Adeyeye<sup>1</sup> *1. National University of Singapore, Singapore; 2. University of Western Australia, Crawley, WA, Australia*

11:00

- GF-08. Efficient Modulation of Spin Wave Dynamics in two-dimensional Quasiperiodic magnonic crystals.** S. Choudhury<sup>1</sup>, S. Barman<sup>2</sup>, Y. Otani<sup>3,4</sup> and A. Barman<sup>1</sup> *1. S. N. Bose National Centre for Basic Sciences, Kolkata, India; 2. Institute of Engineering and Management, Kolkata, India; 3. Institute for Solid State Physics, University of Tokyo, Kashiwa, Japan; 4. RIKEN-CEMS, Wako, Japan*

11:15

- GF-09. Low losses YIG based nano-magnonic crystals for tunable frequency filtering.** *H.P. Merbouche<sup>1</sup>, M. Collet<sup>1</sup>, L. Soumah<sup>1</sup>, S. Xavier<sup>2</sup>, V. Cros<sup>1</sup>, P. Bortolotti<sup>2</sup> and A. Anane<sup>1,3</sup>* 1. *Unité Mixte de Physique CNRS/THALES, Palaiseau, France;* 2. *Thales Research & Technology, Palaiseau, France;* 3. *Université Paris-Sud, Orsay, France*

11:30

- GF-10. Integrated magnonic networks based on the lateral magnonic stripes and magnonic crystals.** *A.V. Sadovnikov<sup>1,2</sup>, Y. Sharaevsky<sup>1</sup>, S. Sheshukova<sup>1</sup>, E. Beginin<sup>1</sup> and S. Nikitov<sup>2,1</sup>* 1. *Nonlinear Physics, Saratov State University, Saratov, Russian Federation;* 2. *Kotel'nikov Institute of Radioengineering and Electronics, Russian Academy of Sciences, Moscow, Russian Federation*

11:45

- GF-11. Tunable microwave properties of rhomboid shaped nanomagnet pairs.** *C. Tian<sup>1</sup> and A. Adeyeye<sup>1</sup>* 1. *Electrical and Computer Engineering, National University of Singapore, Singapore*

FRIDAY  
MORNING  
9:00

PEONY III

**Session GG**  
**MODELLING OF MACHINES V**  
Parag Upadhyay, Chair  
ABB Inc., Raleigh, NC, United States

9:00

- GG-01. High-order methods applied to electrical machine modeling.** *L. Friedrich<sup>1</sup>, M. Curti<sup>1</sup>, B. Gysen<sup>1</sup>, J. Jansen<sup>1</sup> and E. Lomonova<sup>1</sup>* 1. *EPE, TU/e, Eindhoven, Netherlands*

9:15

- GG-02. Reluctance Network Model of Permanent Magnet Synchronous Motor Considering Magnetic Hysteresis Behavior.** *Y. Hane<sup>1</sup> and K. Nakamura<sup>1</sup>* 1. *Tohoku University, Sendai, Japan*

9:30

- GG-03. Motor Core Losses Evaluation with PWM and PAM Inverter Excitations in Computational Analysis and Experiments.** *G. Nguyen<sup>1</sup>, S. Odawara<sup>2</sup>, T. Endo<sup>3</sup>, C. Taki<sup>3</sup>, K. Fujisaki<sup>3</sup>, F. Iwamoto<sup>4</sup>, T. Yamada<sup>4</sup> and T. Sasaya<sup>4</sup>* 1. *Research Center for Smart Vehicles, Toyota Technological Institute, Nagoya, Japan;* 2. *Kitami Institute of Technology, Kitami, Japan;* 3. *Electromagnetic Energy System Laboratory, Toyota Technological Institute, Nagoya, Japan;* 4. *Advanced Research and Innovation Div. 3, DENSO CORPORATION, Aichi, Japan*

9:45

- GG-04. Unity Power Factor Control Method for Permanent Magnet Synchronous Generator Based on Flux-Weakening Current Injection.** *Y. Xu<sup>1</sup>, Z. Zhang<sup>1</sup>, Y. Jiang<sup>1</sup>, J. Huang<sup>1</sup> and Z. Miao<sup>1</sup>* *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

10:00

- GG-05. Virtual Flux Direct Power and Voltage Balance Control of Dual-Stator Linear and Rotary Permanent Magnet Generator.** *C. Zhang<sup>1</sup>, L. Xu<sup>1</sup> and X. Hu<sup>1</sup>* *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

10:15

- GG-06. Computation of Cogging Force of a Linear Tubular Flux switching Permanent Magnet Machine Using a Hybrid Analytical Modeling.** *D. Lo<sup>1</sup>, H. Lawali Ali<sup>1</sup>, Y. Amara<sup>1</sup>, G. Barakat<sup>1</sup> and F. Chabour<sup>1</sup>* *1. GREAH, University of Le Havre, France, Le Havre, France*

10:30

- GG-07. A fully magnetic multi-scale model dedicated to power grid planning.** *V.G. Mazauric<sup>1,2</sup> and N. Maïzi<sup>2</sup>* *1. Strategy & Technology, Schneider Electric, Grenoble, France; 2. Centre for Applied Mathematics, MINES ParisTech, PSL Research University, Sophia-Antipolis, France*

10:45

- GG-08. Electromechanical Analysis in Electromagnetic Rail Launcher With Different Cross Section Rails.** *X. Wan<sup>1</sup>, J. Lou<sup>1</sup>, J. Lu<sup>2</sup> and D. Liang<sup>1</sup>* *1. School of Electrical Engineering, Xi'an Jiaotong University, Xi'an, China; 2. School of Electrical Engineering, Naval University of Engineering, China, Wuhan, China*

11:00

- GG-09. Reduced Order Modeling of Axially Laminated Synchronous Reluctance Motors Based on Numerical Field Solutions.** *D. Lin<sup>1</sup>, P. Zhou<sup>1</sup> and M. Rahman<sup>2</sup>* *1. Ansys Inc., Pittsburgh, PA, United States; 2. Memorial University of Newfoundland, St. John's, NL, Canada*

11:15

- GG-10. Development of a New Approach to Core Quality Assessment of Modern Electrical Machines.** *H. Bahmani<sup>1</sup>* *1. Ulster University, Londonderry, United Kingdom*

11:30

- GG-11. Memory Efficient Harmonic Method for Electromagnetic Models Using Scattering Matrices.** *C. Custers<sup>1</sup>, J. Jansen<sup>1</sup> and E. Lomonova<sup>1</sup>* *1. Department of Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands*

- GG-12. Analysis of Temperature Field of High Power Permanent Magnet Driving Motor for Special Vehicle.** *C. Li<sup>1</sup> and J. Gao<sup>1</sup>*  
*1. Hunan University, Chang Sha, China*

FRIDAY  
 MORNING  
 9:00

PEONY II

**Session GH**  
**HIGH SPEED MACHINES II**

Heyun Lin, Co-Chair  
 Southeast University, Nanjing, China  
 Vincent Mazauric, Co-Chair  
 Schneider Electric, Grenoble, France

9:00

- GH-01. Exciting Force and Vibration Analysis of Stator Permanent Magnet Synchronous Motor.** *J. Hong<sup>1</sup>, S. Wang<sup>1</sup>, Y. Sun<sup>1</sup>, J. Li<sup>1</sup> and H. Cao<sup>1</sup>* *1. Tsinghua University, Beijing, China*

9:15

- GH-02. Loss Calculation and Thermal Analysis of a High Speed Permanent Magnet Synchronous Motor with an Amorphous Metal Stator Core.** *W. Tong<sup>1</sup>, R. Sun<sup>1</sup>, C. Zhang<sup>1</sup>, S. Wu<sup>1</sup> and X. Ma<sup>1</sup>* *1. School of Electrical Engineering, Shenyang University of Technology, Shenyang, China*

9:30

- GH-03. Investigation of Losses for a Concentrated Winding High Speed Permanent Magnet Assisted Synchronous Reluctance Motor for Washing Machine Application.** *O.F. Payza<sup>1,2</sup>, Y. Demir<sup>1,3</sup> and M. Aydin<sup>1,3</sup>* *1. Kocaeli University, Kocaeli, Turkey; 2. Arcelik A.S, Istanbul, Turkey; 3. MDS Motor Design Ltd., Kocaeli, Turkey*

9:45

- GH-04. Design and Analysis of Halbach Array Flywheel Motor/Generators.** *M. Yin<sup>1</sup>, K. Liu<sup>1</sup>, Y. Kong<sup>1</sup> and M. Lin<sup>1</sup>*  
*1. Southeast University, Nanjing, China*

10:00

- GH-05. Eddy-Current Loss Measurement of Permanent Magnet Material at Different Frequency.** *C. Zhang<sup>1</sup>, B. Jiang<sup>1</sup>, R. Chen<sup>1</sup>, Y. Li<sup>1</sup> and Q. Yang<sup>2</sup>* *1. Hebei University of Technology, Tianjin, China; 2. Tianjin Polytechnic University, Tianjin, China*

10:15

- GH-06. Reduction of Rotor Losses by Using Amorphous Rotor Core for Ultra-High-Speed Motors.** *Y. Liu<sup>1</sup>, J. Ou<sup>1</sup>, M. Schiefer<sup>1</sup>, P. Breining<sup>1</sup> and M. Doppelbauer<sup>1</sup>* *1. Karlsruhe Institute of Technology, Karlsruhe, Germany*

10:30

**GH-07. Design and Optimize an external rotor Ironless BLDCM used in a Flywheel Energy Storage System.** *K. Liu<sup>1</sup>, M. Yin<sup>1</sup>, X. Fu<sup>1</sup>, M. Lin<sup>1</sup> and Y. Kong<sup>1</sup>* *1. Institute of Electrical Engineering, Southeast University, Nanjing, China*

10:45

**GH-08. Four Degrees of Freedom Self-decoupling Bearingless Motor for Direct-Driven Flywheel.** *Y. Yuan<sup>1</sup>, Y. Sun<sup>1,2</sup>, Z. Zhu<sup>2</sup>, G. Meng<sup>2</sup>, Y. Huang<sup>1</sup> and F. Yang<sup>1</sup>* *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China; 2. School of Power Engineering, Nanjing Institute of Technology, Nanjing, China*

11:00

**GH-09. Comparison of Sleeve Types for Ultra-High-Speed Surface-Mounted PM Motors.** *Y. Liu<sup>1</sup>, J. Ou<sup>1</sup>, M. Schiefer<sup>1</sup> and M. Doppelbauer<sup>1</sup>* *1. Karlsruhe Institute of Technology, Karlsruhe, Germany*

11:15

**GH-10. Simulation and Experimental Research on No-Load Losses of an IPM Motor under the Conditions of both Sinusoidal Supply and Converter Supply.** *W. Tong<sup>1</sup>, Y. Wang<sup>1</sup>, R. Sun<sup>1</sup>, S. Wu<sup>1</sup> and J. Jia<sup>1</sup>* *1. School of Electrical Engineering, Shenyang University of Technology, Shenyang, China*

11:30

**GH-11. A Novel Topology of Magnetic Gear.** *O. Molokanov<sup>1</sup>, P. Dergachev<sup>1</sup>, S. Osipkin<sup>1</sup>, E. Kuznetsova<sup>1</sup> and P. Kurbatov<sup>1</sup>* *1. Moscow Power Engineering Institute, Moscow, Russian Federation*

FRIDAY  
MORNING  
9:00

ORCHID II

**Session GI**  
**RECORDING SYSTEMS AND HEAD-DISK**  
**INTERFACE**

Debashish Tripathy, Co-Chair  
Western Digital, San Jose, CA, United States  
Jun Zhang, Co-Chair  
3M Singapore, R&D Center, Singapore, Singapore

9:00

**GI-01. Channel modeling and multi-island recording scheme on bit patterned media with long-range island orientation fluctuations.** *Y. Wang<sup>1,2</sup>, V. Bhagavatula<sup>2,3</sup>, Y. Wen<sup>1</sup> and P. Li<sup>1</sup>* *1. School of Electronic Information and Electric Engineering, Shanghai Jiao Tong University, SHANGHAI, China; 2. Electrical and Computer Engineering Department, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Carnegie Mellon University, Kigali, Rwanda*

- GI-02. A Bit-Flipping Technique Based on 2D Modulation Constraint in BPMR Systems.** *W. Busyatras<sup>1</sup>, N. Jongsawat<sup>1</sup>, L.M. Myint<sup>3</sup> and C. Warisarn<sup>2</sup>* 1. Faculty of Science and Technology, Rajamangala University of Technology Thanyaburi, Thailand, Thanyaburi, Thailand; 2. King Mongkut's Institute of Technology Ladkrabang (KMITL), Bangkok, Thailand; 3. Shinawatra University, Pathumthani, Thailand

9:30

- GI-03. Unbalanced Track Pitch Combined with 2D Modulation Code in TDMR Systems.** *K. Pituso<sup>1</sup>, C. Warisarn<sup>1</sup> and D. Tongsomporn<sup>2</sup>* 1. College of Advanced Manufacturing Innovation (AMI), King Mongkut's Institute of Technology Ladkrabang, KMITL, Bangkok, Thailand; 2. Seagate Technology (Thailand), Samutprakarn, Thailand

9:45

- GI-04. Spatially-Coupled Codes for Channels with SNR Variation.** *H. Esfahanizadeh<sup>1</sup>, A. Hareedy<sup>1</sup>, R. Wu<sup>1</sup>, R. Galbraith<sup>2</sup> and L. Dolecek<sup>1</sup>* 1. Department of Electrical and Computer Engineering, University of California, Los Angeles, Los Angeles, CA, United States; 2. Hitachi Global Storage Technologies, a Western Digital Company, Rochester, MN, United States

10:00

- GI-05. The Effective Fuzzy Logic Equalizer Based Adaptive Nonlinear Equalization for the Nonlinear Perpendicular Magnetic Recording Channels.** *R. Wongsathan<sup>1</sup> and P. Supnithi<sup>1</sup>* 1. Electrical Engineering, King Mongkut's Institute of Technology Ladkrabang (KMITL), Bangkok, Thailand

10:15

- GI-06. Flexible Inter-track Interference Cancellation for Generalized Interlaced Magnetic Recording.** *S. Yoon<sup>1</sup> and E. Hwang<sup>1</sup>* 1. School of Mechatronics, Gwangju Institute of Science and Technology, Gwangju, The Republic of Korea

10:30

- GI-07. 1/f thermally excited noise in asymmetric oscillators.** *T. Pipathanapoompron<sup>1,5</sup>, A. Stankiewicz<sup>2</sup>, A. Grier<sup>4</sup>, K. Subramanian<sup>3</sup> and A. Kaewrawang<sup>1</sup>* 1. Electrical Engineering, Khon Kaen University, Khon Kaen, Thailand; 2. Seagate Technology, Bloomington, MN, United States; 3. Seagate Technology, Shakopee, MN, United States; 4. Seagate Technology, Spring Town, United Kingdom; 5. Seagate Technology, Korat, Thailand

10:45

- GI-08. Molecularly Structural Change of PFPE Lubricant Accumulated on Pin Surface at Laser Heating.** *H. Tani<sup>1</sup>, Y. Shibahara<sup>2</sup>, R. Lu<sup>1</sup>, S. Koganezawa<sup>1</sup> and N. Tagawa<sup>1</sup>* 1. Mechanical Engineering Dept., Kansai University, Suita-shi, Japan; 2. Graduate School of Kansai University, Suita-shi, Japan

11:00

- GI-09. HAMR Air Bearing, Water Monolayer Vaporization and Diffusion.** *O.J. Ruiz<sup>1</sup> 1. Advance Tribology, Western Digital, San Jose, CA, United States*

11:15

- GI-10. Modified MGL Equation Considering Both Effects of Surface Roughness and Accommodation Coefficient for Ultra-thin Gas Film Lubrication.** *B. Shi<sup>1,2</sup>, K. Guo<sup>1</sup>, Y. Sun<sup>1</sup> and Y. Feng<sup>1</sup> 1. School of Mechanical and Electrical Engineering, Shandong Jianzhu University, Jinan, China; 2. School of Mechanical Engineering, Hebei University of Technology, Tianjin, China*

11:30

- GI-11. Investigation into slider wear under high temperature.** *Y. Wang<sup>1,2</sup> and X. Wei<sup>3</sup> 1. University of California, Berkeley, Berkeley, CA, United States; 2. Xi'an Jiaotong University, Xi'an, China; 3. SAE Magnetics (H.K.) Ltd., Dongguan, China*

11:45

- GI-12. Effect of Pressure and Temperature on Lubricant Transfer from Disk to Slider in Helium-filled Hard Disk Drives.** *Z. Tang<sup>1</sup>, D. Zhou<sup>1</sup>, T. Jia<sup>1</sup>, C. Zhang<sup>2</sup> and B. Shi<sup>3</sup> 1. School of Mechanical Engineering, Guizhou University, Guiyang, China; 2. School of Mechatronics Engineering, Harbin Institute of Technology, Harbin, China; 3. School of Mechanical and Electrical Engineering, Shandong Jianzhu University, Jinan, China*

FRIDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

### Session GP

## ELECTRICAL MACHINES AND CONTROL II (Poster Session)

Mingyao Lin, Co-Chair

Southeast University, Nanjing, China

Po-Wei Huang, Co-Chair

National Cheng Kung University, Tainan, Taiwan

- GP-01. A Torque Compensation Control Scheme of PMSM Considering Wide Variation of Permanent Magnet Temperature.** *S. Cho<sup>1</sup> 1. Electric Power Train System R&D Center, Korea Automotive Technology Institute, Cheonan-si, The Republic of Korea*

- GP-02. Comparison of Unbalanced Forces in a BLDC Motor Considering Difference in Resistance According to the Number of Parallel Circuits and Winding Concept.** *H. Lee<sup>1</sup>, K. Shin<sup>1</sup>, S. Cho<sup>1</sup>, T. Bang<sup>1</sup> and J. Choi<sup>1</sup> 1. Dept. of Electric, Electronic and Comm. Eng. Edu., Chungnam National University, 99 Daehak-ro, Yuseong-gu, Daejeon 34134, Korea, Daejeon, The Republic of Korea*

- GP-03. Improvement of torque ripple characteristics of double winding PMSM with using twin inverter.** *S. Noguchi*<sup>1</sup>  
1. *Motor Drive Laboratory, Tokyo City University, Setagaya-ku, Japan*
- GP-04. Compensation of Imbalanced Current for Dual-Three PM Machine with Asymmetrical Windings by Three-Phase Decomposition.** *J. Zhang*<sup>1</sup> and *Z. Zong*<sup>1</sup> 1. *NanJing University of Aeronautics And Astronautics Graduate School, Nanjing, China*
- GP-05. Comparison of Electromagnetic Vibration of PM Motor Considering time and space Harmonics.** *I. Jang*<sup>1</sup> 1. *Hyundai Mobis, Yongin-si, The Republic of Korea*
- GP-06. Decoupling Control for Bearingless Synchronous Reluctance Motor Based on Exact Feedback Linearization.** *X. Diao*<sup>1</sup> and *H. Zhu*<sup>1</sup> 1. *Jiangsu University, Zhenjiang, China*
- GP-07. Tilting force Control method using lateral displacement force of permanent magnet synchronous motor for independent;y rotating vehicle.** *J. Won*<sup>1</sup>, *Y. Oh*<sup>1</sup>, *S. Oh*<sup>1</sup> and *S. Kim*<sup>2</sup> 1. *Electrical Engineering, Hanyang university, Seoul, The Republic of Korea*; 2. *Korea Testing Certification, Gunpo, The Republic of Korea*
- GP-08. Rotor Position Estimation of Permanent Magnet Synchronous Motor Based on Hall-effect sensors.** *Y. Zhang*<sup>1,2</sup>, *S. Chi*<sup>1,2</sup>, *X. Li*<sup>1,2</sup> and *H. Yang*<sup>1,2</sup> 1. *Hebei University of Technology, Tianjin, China*; 2. *State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Tianjin, China*
- GP-09. Dynamic DC link Voltage Control Strategy of Electric Vehicles Considering the Cross Saturation Effect.** *H. Li*<sup>1</sup>, *J. Gao*<sup>1</sup>, *S. Huang*<sup>1</sup> and *P. Fan*<sup>1</sup> 1. *Hunan University, Changsha, China*
- GP-10. Brushless Wound Rotor Synchronous Machine with Third Harmonic Field Excitation using Single Inverter.** *M. Ayub*<sup>1</sup>, *S. Bukhari*<sup>2</sup>, *G. Sirewal*<sup>1</sup> and *B. Kwon*<sup>1</sup> 1. *Electronic Systems Engineering, Hanyang University ERICA Campus Ansan 15588, Korea, Ansan, The Republic of Korea*; 2. *Department of Electrical Engineering, Sukkur IBA University, Sukkur, Pakistan*
- GP-11. Investigations on the Sensorless Position Estimation of an IPMSM with Short-Circuited Rotor Windings.** *C. Hittinger*<sup>1</sup>, *D. Thyroff*<sup>1</sup> and *I. Hahn*<sup>1</sup> 1. *Institute of Electrical Drives and Machines, University of Erlangen-Nuremberg, Erlangen, Germany*
- GP-12. Analysis of Pole-Slot Combination for Saliency-based Sensorless Controlled IPMSM Considering Noise and Vibration Characteristics.** *M. Lim*<sup>2,1</sup>, *J. Jung*<sup>2</sup>, *D. Ahn*<sup>1</sup> and *J. Hong*<sup>1</sup> 1. *Automotive Engineering, Hanyang University, Seoul, The Republic of Korea*; 2. *Hyundai Mobis, Yongin, Gyeonggi-do, The Republic of Korea*
- GP-13. Position Sensorless Control of Switched Reluctance Motors Eliminating Mutual Inductance Effect.** *H. Wang*<sup>1</sup>, *H. Cai*<sup>1</sup>, *M. Li*<sup>1</sup> and *S. Shen*<sup>1</sup> 1. *Hunan University, Chang Sha, China*

**GP-14. Maximum torque per ampere control for hybrid excited switching flux permanent magnet machines.** *X. Liu<sup>1</sup>, D. Xing<sup>1</sup>, Q. Wang<sup>1</sup> and S. Li<sup>1</sup>* *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*

**GP-15. A Flexible Position Sensorless Control of Switched Reluctance Motors Considering Both Embrace Design and Magnetic Saturation.** *H. Cai<sup>1</sup>, H. Wang<sup>1</sup>, M. Li<sup>1</sup> and S. Shen<sup>1</sup>* *1. Hunan University, Chang Sha, China*

**GP-16. Fault-Tolerant Design and Control of Hybrid Excitation Axial Field Flux-Switching Permanent Magnet Machines.** *W. Zhang<sup>1</sup> and X. Liang<sup>2</sup>* *1. School of Electrical Engineering, Nantong University, Nantong, China; 2. School of Computer Science and Technology, Nantong University, Nantong, China*

FRIDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session GQ**  
**EMERGING AND INTERDISCIPLINARY**  
**APPLICATIONS II**  
**(Poster Session)**

*Julie Grollier, Chair*  
*Unité Mixte CNRS/Thales, Palaiseau, France*

**GQ-01. Tribological and viscoelastic behaviors of core-shell structured carbonyl iron/polystyrene particle based Magnetorheological Fluid.** *Y. Dong<sup>1</sup>, P. Zhang<sup>2</sup>, H. Choi<sup>1</sup> and C. Lee<sup>3</sup>* *1. Polymer Science and Engineering, Inha University, Incheon, The Republic of Korea; 2. Nanjing Research Institute for Agricultural Mechanization Ministry of Agriculture, Nanjing, China; 3. Mechanical Engineering, Inha University, Incheon, The Republic of Korea*

**GQ-02. A Multi-Modular Helical Magnetic Millirobot Composed of Soft Modules Capable of Navigating and Anchoring in Curved Tubular Environments.** *S. Jeon<sup>1</sup>, H. Lee<sup>1</sup>, S. Lee<sup>1</sup>, J. Oh<sup>1</sup> and J. Shin<sup>1</sup>* *1. Mechanical and Automotive Engineering, Kongju National University, Cheonan, The Republic of Korea*

**GQ-03. Hybrid control of magnetic micro-robot using three-axis Helmholtz coil.** *I. Baek<sup>1</sup>, G. Jeon<sup>1</sup>, C. Yu<sup>2</sup> and S. Kim<sup>1</sup>* *1. Department of Electronics Convergence Engineering, Wonkwang University, Iksan, The Republic of Korea; 2. Department of Convergence Technology Engineering, Chonbuk National University, Jeonju, The Republic of Korea*

**GQ-04. Experimental Verification of Transcranial Magnetic Stimulation Using Anatomically Accurate Brain Phantom.** *H. Magsood<sup>1</sup>, F. Syeda<sup>1</sup> and R.L. Hadimani<sup>1</sup>* *1. Virginia Commonwealth University, Henrico, VA, United States*

- GQ-05. Magnetically axial-coupled propeller-based portable electromangetic energy-harvesting device using air and water stream.** J. Lee<sup>1</sup>, G. Jeon<sup>1</sup> and S. Kim<sup>1</sup> *1. Department of Electronics Convergence Engineering, Wonkwang University, Iksan, The Republic of Korea*
- GQ-06. Improved Performances of Micro-electromagnetic Energy Harvesting Devices by Minimizing the Demagnetization Field.** D. Mallick<sup>1</sup> and S. Roy<sup>1</sup> *1. Micro-nano-systems Center, Tyndall National Institute, Cork, Ireland*
- GQ-07. Characteristic Analysis of Periodic Electromagnetic Force in Wireless Power Transfer System.** X. Ni<sup>1</sup>, X. Zhang<sup>1</sup>, Q. Yang<sup>1</sup> and Y. Li<sup>1</sup> *1. School of Electrical Engineering and Automation, Tianjin Polytechnic University, Tianjin, China*
- GQ-08. Stress Induced Domain Wall Motion in Zig-zag shaped Microwires for Energy Harvesting in IOT devices.** C. Vaahsan<sup>1</sup>, S. Bhatti<sup>1</sup>, C. Ma<sup>2</sup>, X. Liu<sup>2</sup> and S. Piramanayagam<sup>1</sup> *1. Division of Physics and Applied Physics, Nanyang Technological University, Singapore, Singapore; 2. Department of Electrical and Computer Engineering, Shinshu University, Nagano, Japan*
- GQ-09. Plasma Shape Optimization for EAST Tokamak Using Orthogonal Method.** Y. Chen<sup>1</sup>, X. Bao<sup>1</sup>, W. xu<sup>1</sup> and G. Gao<sup>2</sup> *1. School of Electrical Engineering and Automation, Hefei University Of Technology, Hefei, China; 2. Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China*
- GQ-10. Characteristics of Impulsive Force on coupler of Wireless Power Transfer.** Z. Yuan<sup>1</sup>, X. Zhang<sup>1</sup>, Q. Yang<sup>1</sup> and Y. Li<sup>1</sup> *1. Tianjin Key Laboratory of Advanced Electrical Engineering and Energy Technology, Tianjin Polytechnic University, Tianjin, China*
- GQ-11. Nanoscaled magnetic Cu-Co alloys with tuneable properties processed by high-pressure torsion deformation.** A. Bachmaier<sup>1</sup>, H. Krenn<sup>2</sup>, P. Knoll<sup>2</sup> and R. Pippan<sup>1</sup> *1. Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Leoben, Austria; 2. Institute of Physics, University of Graz, Graz, Austria*
- GQ-12. Preparation and thermoelectric properties of Mn<sub>2</sub>V(Al<sub>1-x</sub>Si<sub>x</sub>) full-Heusler compounds.** H. Li<sup>1</sup>, K. Hayashi<sup>1</sup> and Y. Miyazaki<sup>1</sup> *1. Tohoku University, Sendai, Japan*
- GQ-13. A MLC STT-MRAM based Computing in-Memory Architecture for Binary Neural Network.** Y. Pan<sup>1</sup>, P. Ouyang<sup>1</sup>, Y. Zhao<sup>1</sup>, W. Kang<sup>1</sup>, S. Yin<sup>2</sup>, Y. Zhang<sup>1</sup>, W. Zhao<sup>1</sup> and S. Wei<sup>2</sup> *1. Beihang University, Beijing, China; 2. Tsinghua University, Beijing, China*
- GQ-14. Dual material ferroelectric gate stack Tunnel FET.** M. Zare<sup>1</sup> *1. Electrical Engineering department, Ferdowsi University of Mashhad, Mashhad, The Islamic Republic of Iran*

**Session GR**  
**HARD MAGNETIC MATERIALS AND PROCESSING II**  
**(Poster Session)**

Damien Le Roy, Chair  
Institut Lumière Matière, Villeurbanne, France

- GR-01. Anisotropic SmCo<sub>5</sub> nanocrystalline magnet prepared by hot deformation with bulk amorphous precursors.** *J. Liang<sup>1</sup>, M. Yue<sup>1</sup>, D. Zhang<sup>1</sup>, Y. Li<sup>1</sup> and H. Li<sup>1</sup>* 1. *Beijing University of Technology, Beijing, China*
- GR-02. Magnetic properties of Co-ferrite/FeCo bilayers.** *Y. Hara<sup>2</sup>, S. Shirsath<sup>1</sup>, D. Wang<sup>1</sup>, A. Morisako<sup>2</sup> and X. Liu<sup>2</sup>* 1. *School of Materials Science and Engineering, University of New South Wales, Sydney, NSW, Australia;* 2. *Faculty of Engineering, Shinshu University, Nagano, Japan*
- GR-03. High Content Nd-Fe-B in Polymer Composite by Fused Deposition Modeling.** *T. Chang<sup>2</sup>, J.K. Jyun<sup>3</sup>, W. Lee<sup>3</sup>, M. Tsai<sup>1,2</sup> and C. Cheng<sup>4</sup>* 1. *Mechanical Engineering Department, National Cheng Kung University, Tainan, Taiwan;* 2. *Electric Motor Technology Research Center, National Cheng Kung University, Tainan, Taiwan;* 3. *Department of Electrical Engineering, National Cheng Kung University, Tainan, Taiwan;* 4. *Department of Mechanical Engineering, National Chiao Tung University, Hsinchu, Taiwan*
- GR-04. Micro-Patterning of NdFeB Hard Magnetic Films for Micro Systems.** *A. Dias<sup>1</sup>, G. Shaw<sup>1</sup>, K. Hasselbach<sup>1</sup>, M. Bonfim<sup>2</sup> and N. Dempsey<sup>1</sup>* 1. *Institut Neel, Grenoble, France;* 2. *Universidade Federal do Paraná, Curitiba, Brazil*
- GR-05. The magnetic properties of misch-metal partially substituted Nd-Fe-B magnets sintered by dual alloy method.** *J. Xiong<sup>1</sup>, R. Shang<sup>1</sup>, R. Li<sup>1</sup>, Y. Zhang<sup>1</sup>, J. Zhang<sup>1</sup>, H. Zhang<sup>1</sup>, Y. Liu<sup>1</sup>, F. Hu<sup>1</sup>, J. Sun<sup>1</sup>, T. Zhao<sup>1</sup> and B. Shen<sup>1</sup>* 1. *State Key Laboratory of Magnetism, Institute of Physics, Chinese Academy of Sciences, Beijing, China., Beijing, China*
- GR-06. Nanocomposite Nd-Y-Fe-B-Mo bulk magnets prepared by injection casting technique.** *S. Tao<sup>1</sup> and M. Yan<sup>2</sup>* 1. *China Jiliang University, Hangzhou, China;* 2. *Zhejiang University, Hangzhou, China*
- GR-07. Modeling of piezomagnetic effect in magnetostrictive-electromagnetic hybrid vibration-powered generator.** *B. Yan<sup>1</sup>, J. Hong<sup>1</sup> and C. Zhang<sup>2</sup>* 1. *Guangdong University of Technology, Guangzhou, China;* 2. *Harbin Institute of Technology, Harbin, China*
- GR-08. Novel thermal stability of coercivity in Alnico 8 alloys with thermomagnetic heat-treatment conditions.** *T.J. Zhao<sup>1</sup>, L.Y. Sun<sup>1</sup>, L. Liu<sup>1</sup>, Z. Liu<sup>1</sup>, X. Zhang<sup>1</sup> and C. Feng<sup>1</sup>* 1. *Ningbo Institute of Industrial Technology, Chinese Academy of Sciences, Ningbo, China*

- GR-09. Electromagnetic Transient Analysis and Inductance Characterization in Fractional-Slot Concentrated-Wound Interior Permanent Magnet Synchronous Machines under Rotor Demagnetization.** *A. Pouramin<sup>1</sup>, M. Malekpour<sup>1</sup>, R. Dutta<sup>1</sup> and F.M. Rahman<sup>1</sup> I. School of Electrical Engineering and Telecommunications, University of New South Wales, NSW, Australia*
- GR-10. Effect of Temperature and Pressure on Electrical Resistivity of Permanent Magnet.** *L. Xiao<sup>1</sup>, G. Yu<sup>1</sup>, J. Zou<sup>1</sup>, Y. Xu<sup>1</sup>, H. Lan<sup>1</sup>, M. Wang<sup>1</sup> and F. Gao<sup>1</sup> I. Harbin Institute of Technology, Harbin, China*
- GR-11. Magnetic field annealing effect and superparamagnetic contributions in one-dimensional CoPt nanostructures.** *S. Ali<sup>1</sup>, W. Li<sup>1</sup>, K. Javed<sup>1</sup>, M. Irfan<sup>1</sup> and X. Han<sup>1</sup> I. State Key Lab of Magnetism, Institute of Physics, Beijing, China*
- GR-12. Simplified Magnetic Circuit for Analyzing Demagnetization of Permanent-magnets in PMSMs.** *S. Lee<sup>1</sup> and J. Hur<sup>1</sup> I. Incheon National University, Incheon, The Republic of Korea*
- GR-13. Polar transformed subdomain modeling for double-stator permanent magnet linear synchronous machine.** *R. Guo<sup>1</sup>, H. Yu<sup>1</sup>, T. Xia<sup>1</sup>, X. Liu<sup>1</sup> and G. Yang<sup>1</sup> I. Southeast University, Nanjing, China*
- GR-14. An Analytical and Numerical Hybrid Model for Static Characteristics of a Radial Linear and Rotary Interior Permanent Magnet Actuator.** *P. Jin<sup>1</sup>, Y. Guo<sup>1</sup> and Y. Zhu<sup>1</sup> I. School of Energy and Electrical Engineering, Hohai University, Nanjing, China*
- GR-15. Magnetic characteristics of the ferromagnetic Fe-rich clusters in bulk amorphous Nd<sub>60</sub>Fe<sub>30</sub>Al<sub>30</sub> alloy.** *L. Zhao<sup>1,2</sup>, H. Yu<sup>2</sup>, W. Li<sup>2</sup>, X. Liao<sup>2</sup>, J. Zhang<sup>2</sup>, X. Zhong<sup>2</sup>, K. Su<sup>1</sup>, Z. Liu<sup>2</sup> and J. Greneche<sup>3</sup> I. Innovative Center for Advanced Materials (ICAM), Hangzhou Dianzi University, Hangzhou, China; 2. South China University of Technology, Guangzhou, China; 3. Le Mans Université, Institut des Molécules et Matériaux du Mans CNRS UMR-6283, Le Mans, France*

FRIDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session GS**  
**HIGH SPEED MACHINES I**  
**(Poster Session)**  
Kenji Nakamura, Chair  
Tohoku University, Sendai, Japan

- GS-01. Comparative study of magnet flux linkage influence on IPM synchronous machine for high-speed properties.** *W. Wu<sup>1</sup>, X. Zhu<sup>1</sup> and S. Zheng<sup>1</sup> I. Jiangsu University, Zhenjiang, China*

- GS-02. Improvement of Air Watt in Single-Phase BLDC Motor for 100,000 rpm Applications.** *H. Hwang*<sup>1</sup>, *J. Cho*<sup>1</sup>, *Y. Choo*<sup>1</sup>, *C. Kim*<sup>1</sup> and *C. Lee*<sup>1</sup> *1. Electrical and Computer Engineering, Pusan National University, Pusan, The Republic of Korea*
- GS-03. Multi-physics and multi-objective optimization of a high speed PMSM for aircraft electric propulsion.** *W. Zhao*<sup>1</sup>, *X. Wang*<sup>2</sup>, *C. Gerada*<sup>3,1</sup>, *H. Zhang*<sup>1</sup>, *C. Liu*<sup>1</sup> and *Y. Wang*<sup>1</sup> *1. University of Nottingham Ningbo China, Ningbo, China; 2. Yusheng Group, Ningbo, China; 3. University of Nottingham, Nottingham, United Kingdom*
- GS-04. Design and Characteristic Analysis of High Speed Permanent Magnet Motor for High-speed and High-head Centrifugal Pump.** *G. Jang*<sup>1</sup>, *S. Seo*<sup>1</sup>, *C. Kim*<sup>1</sup>, *K. Shin*<sup>1</sup> and *J. Choi*<sup>1</sup> *1. Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea*
- GS-05. Investigation of Optimal Split Ratio for High-Speed Permanent Magnet Brushless Machines.** *Y. Wang*<sup>1</sup>, *S. Guo*<sup>2</sup>, *Y. Li*<sup>2</sup>, *Z. Chen*<sup>2</sup>, *Y. Wang*<sup>2</sup> and *Z. Zhu*<sup>1</sup> *1. Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom; 2. CRRC Zhuzhou Institute Co. Ltd, Zhuzhou, China*
- GS-06. Design and Experimental Validation of High Speed Motor for Electric Turbo Charger Considering the Variation of L/D Ratio.** *D. Hong*<sup>1,2</sup> and *Y. Jeong*<sup>1</sup> *1. Electric Motor Research Center, Korea Electrotechnology Research Institute, Changwon, The Republic of Korea; 2. Energy and Power Conversion Engineering, National University of Science and Technology, Changwon, The Republic of Korea*
- GS-07. Trial of Superconducting Magnetic Bearings Applied to High Speed Turbine Rotor.** *M. Komori*<sup>1</sup>, *K. Hara*<sup>1</sup>, *K. Asami*<sup>1</sup> and *N. Sakai*<sup>1</sup> *1. Kyushu Institute of Technology, Kitakyushu, Japan*
- GS-08. Fast Calculation of PM eddy current loss in IPMSM under PWM VSI supply.** *S. Zhu*<sup>1</sup>, *M. Cheng*<sup>2</sup> and *Y. Zhu*<sup>1</sup> *1. Department of Energy and Electrical Engineering, Hohai University, Nanjing, China; 2. Department of Electrical Engineering, Southeast University, Nanjing, China*
- GS-09. Thermal-Loss Coupled Analysis of an Electrical Machine Using Improved Temperature Dependent Iron Loss Model.** *S. Xue*<sup>1</sup>, *J. Feng*<sup>2</sup>, *S. Guo*<sup>2</sup>, *Y. Li*<sup>2</sup>, *Z. Chen*<sup>2</sup>, *J. Peng*<sup>2</sup> and *Z. Zhu*<sup>1</sup> *1. Electric and Electrical Engineering, The University of Sheffield, Sheffield, United Kingdom; 2. CRRC Zhuzhou Institute Co. Ltd, Zhuzhou, China*
- GS-10. Harmonic Iron Losses Reduction for Heat Capacity Improvement in Interior Permanent Magnet Synchronous Motor.** *M. Seo*<sup>1</sup>, *Y. Ko*<sup>1</sup>, *Y. Kim*<sup>2</sup> and *S. Jung*<sup>1</sup> *1. Sungkyunkwan University, Suwon, The Republic of Korea; 2. chosun University, Gwangju, The Republic of Korea*
- GS-11. Sensitivity Analysis of Inverse Thermal Modelling to Determine Power Losses in Electrical Machines.** *D.G. Nair*<sup>1</sup> and *A. Arkkio*<sup>1</sup> *1. School of Electrical Engineering, Aalto University, Espoo, Finland*

- GS-12. Analysis on the Number of Axial Segments of Permanent Magnet in SPMSM for Ultra-High-Speed Application.** H. Lee<sup>1</sup>, D. Jung<sup>2</sup> and J. Lee<sup>2</sup> 1. *Electric Automatization, Busan Institute of Science and Technology University, Busan, The Republic of Korea*; 2. *Electrical Engineering, Hanyang University, Seoul, The Republic of Korea*

FRIDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session GT**  
**HYSTERESIS MODELLING I**  
**(Poster Session)**

David Lowther, Chair  
McGill University, Montreal, QC, Canada

- GT-01. Accurate Prediction of Dynamic Hysteresis Loops Using the Modified Jiles-Atherton Model.** Z. Li<sup>1</sup>, X. Huang<sup>1</sup>, L. Wu<sup>1</sup>, J. Ma<sup>1</sup> and Y. Fang<sup>1</sup> 1. *College of Electrical Engineering, Zhejiang University, Hangzhou, China*
- GT-02. Hysteresis modeling of soft and hard multilayer magnetic thin film structure by Stoner-Wohlfart model.** W. Tipcharoen<sup>1</sup>, T. Pipathanapoompron<sup>1</sup>, A. Kaewrawang<sup>1</sup> and A. Siritarativat<sup>1</sup> 1. *Electrical Engineering, Khon Kaen University, Khon Kaen, Thailand*
- GT-03. Characterization and local phenomenological model of Barkhausen noise under mechanical and magnetic excitations.** B. Ducharne<sup>1</sup>, B. Gupta<sup>1</sup>, Y. Hebrard<sup>2</sup> and J. Coudert<sup>2</sup> 1. *INSA LYON, Laboratoire de Génie Electrique et Ferroélectricité, Villeurbanne, France*; 2. *SKF aerospace, Valence, France*
- GT-04. Hysteresis Nonlinearity Modeling for Magnetics Shape Memory Alloy Actuator Based on a Novel Black-box Model with Least Squares Support Vector Machines.** R. Xu<sup>1</sup>, M. Zhou<sup>1</sup> and Y. Wang<sup>1</sup> 1. *Department of control science and engineering, Jilin University, ChangChun, China*
- GT-05. Dynamic magnetic scalar hysteresis lump model, based on Jiles-Atherton quasi-static hysteresis model extended with dynamic fractional derivatives.** B. Ducharne<sup>1</sup>, B. Zhang<sup>2</sup>, B. Gupta<sup>3</sup>, G. Sebald<sup>3</sup> and T. Uchimoto<sup>4</sup> 1. *INSA LYON, Laboratoire de Génie Electrique et Ferroélectricité, Villeurbanne, France*; 2. *Shandong university, Weihai, China*; 3. *ELyTMaX Tohoku University, Sendai, Japan*; 4. *IFS Tohoku University, Sendai, Japan*
- GT-06. An Improved Centered Cycle Method for Identifying the Preisach Distribution Function.** D. Peng<sup>1</sup>, W. Sima<sup>1</sup>, M. Yang<sup>1</sup>, M. Zou<sup>1</sup> and Y. Liu<sup>1</sup> 1. *Chongqing University, Chongqing, China*

- GT-07. Simplified and algorithmic Preisach modeling for soft and hard magnetic hysteresis using general global basis functions.** *A. Bhattacharjee*<sup>2</sup>, *A. Mohanty*<sup>1</sup> and *A. Chatterjee*<sup>2</sup>  
*1. Computational and Data Sciences, Indian Institute of Science, Bangalore, Bangalore, India; 2. Mechanical Engineering, Indian Institute of Technology Kanpur, Kanpur, India*
- GT-08. A Scalar Hysteresis Model of Ferromagnetic Materials.** *W. Xu*<sup>2</sup>, *N. Duan*<sup>1</sup>, *Y. Li*<sup>3</sup>, *S. Wang*<sup>1</sup> and *J. Zhu*<sup>4</sup>  
*1. Xi'an Jiaotong University, Xi'an, China; 2. State Grid Shaanxi Electric Power Company Economic Research Institute, Xi'an, China; 3. Hebei University of Technology, Tianjin, China; 4. University of Technology Sydney, Sydney, NSW, Australia*
- GT-09. Magnetostrictive Characteristics of the Grain-Oriented Electrical Steel in an Epstein Frame Magnetized with a DC Biased Magnetic Field.** *Z. Wang*<sup>1</sup>, *Y. Zhang*<sup>1</sup>, *W. Jiang*<sup>2</sup>, *D. Zhang*<sup>1</sup>, *Z. Ren*<sup>1</sup> and *C. Koh*<sup>3</sup>  
*1. School of Electrical Engineering, Shenyang University of Technology, Shenyang, China; 2. School of Science, Shenyang University of Technology, Shenyang, China; 3. College of Electrical and Computer Engineering, Chungbuk National University, Cheongju, The Republic of Korea*
- GT-10. Study on Calculation Methods of AC Loss for a HTS Magnet with Iron Core.** *Y. Zhang*<sup>1</sup>, *L. Ren*<sup>1</sup>, *S. Yan*<sup>1</sup> and *Z. Wang*<sup>1</sup>  
*1. Huazhong University of Science and Technology, Wuhan, China*
- GT-11. Examination of Temperature Dependent Iron Loss Models Using a Stator Core.** *J. Chen*<sup>1</sup>, *D. Wang*<sup>1</sup>, *Y. Jiang*<sup>1</sup>, *X. Teng*<sup>1</sup> and *S. Cheng*<sup>1</sup>  
*1. Naval University of Engineering, Wuhan, China*
- GT-12. Global Quantities Computation Using Mesh Based Generated Reluctance Networks.** *S. Asfirane*<sup>1</sup>, *S. Hlioui*<sup>1,2</sup>, *Y. Amara*<sup>3,4</sup>, *O. De La Barriere*<sup>1</sup>, *G. Barakat*<sup>3,4</sup> and *M. Gabsi*<sup>1</sup>  
*1. SATIE, CNRS, ENS Cachan, Cachan, France; 2. CNAM, Paris, France; 3. GREAH, Le Havre, France; 4. Université du Havre, Le Havre, France*
- GT-13. Numerical Estimation of Iron Loss with Dual models for Electromagnetic Devices.** *X. Liu*<sup>1</sup> and *W. Fu*<sup>1</sup>  
*1. Electrical Engineering, The hongkong Polytechnic University, Hong Hom, Hong Kong*
- GT-14. A Self-adaptive Play Model with Input-dependent Shape Functions for Hysteresis Loss of Electromagnetic Devices.** *X. Liu*<sup>1</sup> and *W. Fu*<sup>1</sup>  
*1. Electrical Engineering, The HongKong Polytechnic University, Hong Hom, Hong Kong*
- GT-15. Skin Effect and Eddy Current Loss in Electrical Steel Sheets under Applied Excitation Fields.** *J. Li*<sup>1</sup>, *Q. Yang*<sup>2,3</sup>, *S. Wang*<sup>1</sup> and *Y. Li*<sup>2</sup>  
*1. State Key Laboratory of Control and Simulation of Power System and Generation Equipments, Tsinghua University, Beijing, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China; 3. Municipal Key Laboratory of Advanced Technology of Electrical Engineering and Energy, Tianjin Polytechnic University, Tianjin, China*

**GT-16. Efficient Deperming Protocols Considering Magnetic Coercivity Distributions in Magnetic Stealth of Warship.** S. IM<sup>1</sup>, H. Lee<sup>1</sup>, H. Chung<sup>2</sup> and G. Park<sup>1</sup> *1. Electrical and Computer Engineering, Pusan National University, BUSAN, The Republic of Korea; 2. Agency for Defense Development, Changwon, The Republic of Korea*

FRIDAY  
MORNING  
8:30

SIMPOR/ROSELLE BALLROOM

**Session GU  
INDUCTORS  
(Poster Session)**

Lijian Wu, Chair  
Zhejiang University, Zhejiang, China

**GU-01. Electromagnetic-Mechanical Analysis of a Balanced Armature Receiver by Considering the Nonlinear Parameters as the Function of Displacement and Current.** Y. Jiang<sup>1</sup>, D. Xu<sup>1</sup> and S. Hwang<sup>1</sup> *1. Mechanical Engineering, Pusan National University, Busan, The Republic of Korea*

**GU-02. Performance Analysis of Superconducting Coil Impregnated with Epoxy Resin.** Z. Chen<sup>1</sup>, G. Geng<sup>1</sup> and J. Fang<sup>1</sup> *1. Beijing Jiaotong University, School of Electrical Engineering, Beijing, China*

**GU-03. Magnetic Properties of Simultaneously Excited Amorphous and Silicon Steel Hybrid-Cores for Higher-Efficiency Distribution Transformers.** N. Kurita<sup>1</sup>, A. Nishimizu<sup>1</sup>, C. Kobayashi<sup>1</sup>, Y. Tanaka<sup>1</sup>, A. Yamagishi<sup>2</sup>, M. Ogi<sup>2</sup>, K. Takahashi<sup>2</sup> and M. Kuwabara<sup>3</sup> *1. Research & Development Group, Hitachi, Ltd., Hitachi, Japan; 2. Power Business Unit, Hitachi Ltd., Hitachi, Japan; 3. Hitachi Industrial Equipment Systems Co. Ltd., Tainai, Japan*

**GU-04. Inductance analysis for the multi-unit permanent magnet synchronous machine in different operating situations.** D. Zeng<sup>1</sup>, J. Zou<sup>1</sup>, Y. Xu<sup>1</sup> and F. Liu<sup>1</sup> *1. Harbin Institute of Technology, Harbin, China*

**GU-05. Characteristics Analysis of Electric Motor using Ring Core Test and its Experimental Verification.** D. Kim<sup>1</sup>, J. Chin<sup>1</sup>, M. Lim<sup>1</sup> and J. Hong<sup>1</sup> *1. Department of Automotive, Hanyang University, Seoul, The Republic of Korea*

**GU-06. Improving the transmission efficiency of wireless power transfer systems in electric vehicles by using magnetoplated aluminum pipes.** Y. Bu<sup>1</sup>, S. Endo<sup>1</sup> and T. Mizuno<sup>1</sup> *1. Shinshu University, Nagano, Japan*

**GU-07. Accurate Calculation of Eddy Current Loss in Litz-Wired High Frequency Transformer Windings.** Z. Liu<sup>1</sup>, L. Zhu<sup>1</sup> and J. Zhu<sup>2</sup> *1. Tianjin Polytechnic University, Tianjin, China; 2. University of Technology Sydney, Sydney, NSW, Australia*

- GU-08. Applying Response Surface Method to Oil-immersed Transformer Cooling System for Design Optimization.** *Y. Zhang<sup>1</sup>, S. Ho<sup>1</sup> and W. Fu<sup>1</sup> 1. Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*
- GU-09. Improvement of output stability in magnetic resonance wireless power supply using Helmholtz type transmission coil.** *D. Sayama<sup>1</sup>, S. Suzuki<sup>1</sup>, Y. Akimoto<sup>1</sup>, Y. Iijima<sup>1</sup>, T. Kato<sup>1</sup>, M. Ishihara<sup>1</sup> and Y. Kobayashi<sup>1</sup> 1. National Institute of Technology, Oyama College, Oyama, Japan*
- GU-10. Calculation of Magnetic Inductance of the Spiral Coils Including Ferrite Core for Remote Field Energy Transfer Devices.** *Y. Jang<sup>1</sup> and G. Park<sup>1</sup> 1. School of Electrical and Computer Engineering, Pusan National University, Busan, The Republic of Korea*
- GU-11. Magnetostriction impact noise and vibration on power transformer characteristic via PSO method.** *C. Hsu<sup>1,2</sup> and Y. Huang<sup>2</sup> 1. Department of Mechanical Engineering, Oriental Institute of Technology, New Taipei city, Taiwan; 2. Department of Mechanical Engineering, National Central University, Taoyuan, Taiwan*
- GU-12. Electromagnetic characteristics of basic structure of wireless power transmission coil for electric vehicles.** *T. Chen<sup>1</sup> and J. Zhao<sup>1,2</sup> 1. Xuji Power Co. Ltd., Xuchang, China; 2. School of Electronic and Electrical Engineering, Nanyang Institute of Technology, Nanyang, China*
- GU-13. Design and Analysis of Cubical Compact Coils for Wireless Power Transfer.** *C. Jiang<sup>1</sup>, K. Chau<sup>1</sup>, W. Han<sup>1</sup> and W. Liu<sup>1</sup> 1. The University of Hong Kong, Hong Kong*
- GU-14. Move-and-Charge System for Automatic Guided Vehicles.** *C. Jiang<sup>1</sup>, K. Chau<sup>1</sup>, C. Lee<sup>2</sup>, W. Han<sup>1</sup> and W. Liu<sup>1</sup> 1. The University of Hong Kong, Hong Kong; 2. Research Laboratory of Electronics, Massachusetts Institute of Technology, Boston, MA, United States*
- GU-15. Design and Optimization of Quasi-constant Mutual Inductance for Asymmetric Two-Coil Wireless Power Transfer System With Lateral Misalignments.** *Z. Li<sup>1</sup> 1. College of Traffic Engineering, Hunan University of Technology, Zhuzhou, China*

**Session GV**  
**MODELLING OF MACHINES IV**  
**(Poster Session)**

Chao Bi, Co-Chair

University of Shanghai for Science & Technology, Shanghai, China

Jiang Quan, Co-Chair

University of Shanghai for Science & Technology, Shanghai, China

- GV-01. Thinning Defect Evaluation and an Application for Thickness Measurement by Eddy Current Testing.** *S. Nagata*<sup>1</sup> *1. Faculty of Engineering, University of Miyazaki, Miyazaki city, Japan*
- GV-02. Seismic circuit breaker with electromagnetic contactor.** *T. Mifune*<sup>1</sup> and *K. Nishimura*<sup>1</sup> *1. National Institute of Technology, Suzuka College, Suzuka, Japan*
- GV-03. Marker-free coil-misalignment detection approach using TMR sensor array for dynamic wireless charging system of electric vehicles.** *X. Liu*<sup>1</sup>, *W. Han*<sup>1</sup>, *C. Liu*<sup>2</sup> and *P. Pong*<sup>1</sup>  
*1. Department of Electrical and Electronic Engineering, the University of Hong Kong, Hong Kong, China; 2. School of Energy and Environment, City University of Hong Kong, Hong Kong, China*
- GV-04. Effects of Heat Treatment under Strong Magnetic Field of 1T or Higher on Magnetic Properties of Non-oriented Electrical Steel Sheet.** *T. Kinoshita*<sup>1,2</sup>, *K. Kohara*<sup>2</sup>, *H. Shimoji*<sup>3</sup>, *T. Sato*<sup>2</sup> and *T. Todaka*<sup>2</sup> *1. Technology Research Center, Sumitomo Heavy Industries, Ltd., Yokosuka, Japan; 2. Oita university, Oita, Japan; 3. Oita Industrial Research Institute, Oita, Japan*
- GV-05. Analytical Modeling of Multi-layer Permanent Magnet Eddy Current Brake With Hybrid Secondary.** *B. Kou*<sup>1</sup>, *W. Chen*<sup>1,2</sup>, *Y. Jin*<sup>1</sup> and *X. Zhao*<sup>1</sup> *1. Harbin Institute of Technology, Harbin, China; 2. Harbin University of Science and Technology, Harbin, China*
- GV-06. Parametric Design of Vehicle Horn Employing Rolled Silicon Steel Sheets Based on Its Analytical Approach.** *J. Sim*<sup>1</sup>, *K. Jung*<sup>1</sup>, *D. Kim*<sup>1</sup> and *J. Hong*<sup>1</sup> *1. Automotive Engineering, Hanyang University, Seoul, The Republic of Korea*
- GV-07. Analytical Modeling of Angular Misalignment for Axial Flux PM Machines: Effects on Cogging Torque.** *B. Guo*<sup>1</sup> and *Y. Huang*<sup>1</sup> *1. School of Electrical Engineering, Southeast University, Nanjing, China*

- GV-08. Investigation of an Axial-Gap Electromagnet-Assisted Ferrite Magnet Motor.** K. Motoki<sup>1</sup>, Y. Kobayashi<sup>1</sup>, N. Jike<sup>1</sup>, T. Fukami<sup>1</sup>, M. Koyama<sup>1</sup>, T. Mori<sup>2</sup>, M. Yamada<sup>2</sup> and M. Nakano<sup>3</sup> *1. Division of Electrical Engineering, Kanazawa Institute of Technology, Nonoichi, Japan; 2. Advanced Technology R&D Center, Mitsubishi Electric Corporation, Amagasaki, Japan; 3. Himeji Works, Mitsubishi Electric Corporation, Himeji, Japan*
- GV-09. Core loss properties of a permanent magnet synchronous motor with nanocrystalline stator and rotor cores under inverter excitation.** A. Yao<sup>1</sup>, T. Sugimoto<sup>1</sup>, S. Odawara<sup>2</sup> and K. Fujisaki<sup>1</sup> *1. Department of Engineering, Toyota Technological Institute, Nagoya, Japan; 2. Department of Electrical and Electronic Engineering, Kitami Institute of Technology, Kitami, Japan*
- GV-10. An Approach Combining Analytical Calculation and FEA for Evaluation of Rotor Strength of IPM Motors.** M. Hsieh<sup>1</sup>, J. Lai<sup>1</sup> and C. Li<sup>1</sup> *1. National Cheng Kung University, Tainan, Taiwan*
- GV-11. 2D Analytical Subdomain Model of Surface-Mounted PM Machines Accounting for Step-skewed Magnets.** S. Zhang<sup>1</sup> and S. Guo<sup>2</sup> *1. Bangor College, Central South University of Forestry and Technology, Changsha, China; 2. State Grid Hunan Electric Power Research Institute, Changsha, China*
- GV-12. Design Strategy of 3-Times Magnetizer for Post-Assembly Magnetization of Spoke-Type Ferrite Magnet Motor.** H. Seol<sup>1</sup>, H. Jun<sup>1</sup>, D. Jung<sup>1</sup>, H. Kim<sup>1</sup>, D. Kang<sup>2</sup> and J. Lee<sup>1</sup> *1. Hanyang University, Seoul, The Republic of Korea; 2. Keimyung University, Daegu, The Republic of Korea*
- GV-13. Numerical Design and Validation of SPMSG for Efficiency Improvement of Engine-Generator System of PHEV compatible to Optimal Operating Line.** D. Lee<sup>2</sup>, S. Cho<sup>1</sup> and H. Jung<sup>1</sup> *1. Advanced Power System R&D Center, Korea Automotive Technology Institute, Cheonan-si, The Republic of Korea; 2. Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, United States*
- GV-14. Development of enhanced magnetic equivalent circuit (eMEC) by considering dominant fringing fluxes in semi-high-speed Maglev train.** C. Ha<sup>1</sup>, J. Jeong<sup>2</sup> and J. Lim<sup>1</sup> *1. Dept. of Magnetic Levitation and Linear Drive, KIMM, Daejeon, The Republic of Korea; 2. Dept. of Electrical Engineering, Chung Nam National University, Daejeon, The Republic of Korea*
- GV-15. Design of Double-Path Magnetic Circuit Structure Hybrid Fuel Injector Considering Demagnetization Characteristics.** H. Liu<sup>1</sup>, S. Oh<sup>1</sup>, Y. Oh<sup>1</sup>, J. Lee<sup>1</sup> and H. Lee<sup>2</sup> *1. Hanyang Univ., Seoul, The Republic of Korea; 2. Busan Institute of Science and Technology University, Busan, The Republic of Korea*
- GV-16. Analytical Model for Axial Flux PM Machines with Halbach Arrays: Taking into Account of Rotor Iron.** B. Guo<sup>1</sup> and Y. Huang<sup>1</sup> *1. School of Electrical Engineering, Southeast University, Nanjing, China*

**Session GW**  
**ULTRATHIN FILMS AND SURFACE EFFECTS I**  
**(Poster Session)**

Sarah Thompson, Co-Chair  
University of York, York, United Kingdom

Stephen McVitie, Co-Chair  
The University of Glasgow, Glasgow, United Kingdom

- GW-01. XMCD study of Ru/Co/W/Ru films with strong Dzyaloshinskii-Moriya interaction.** *A.S. Samardak<sup>1</sup>, A. Kolesnikov<sup>1</sup>, A. Ognev<sup>1</sup>, M. Platonov<sup>2,3</sup> and A. Rogalev<sup>2</sup>* *1. School of Natural Sciences, Far Eastern Federal University, Vladivostok, Russian Federation; 2. European Synchrotron Radiation Facility (ESRF), Grenoble, France; 3. Kirensky Institute of Physics, Krasnoyarsk, Russian Federation*
- GW-02. Tunable interfacial Dzyaloshinskii-Moriya interaction in Ta/W/CoFeB/MgO films.** *T. Kim<sup>1</sup>, I. Cha<sup>1</sup>, Y. Kim<sup>1</sup>, G. Kim<sup>1</sup>, A. Stashkevich<sup>3</sup>, Y. Roussigné<sup>3</sup>, M. Belmeguenai<sup>3</sup>, S.M. Chérif<sup>3</sup>, A.S. Samardak<sup>2</sup> and Y.K. Kim<sup>1</sup>* *1. Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 2. School of Natural Sciences, Far Eastern Federal University, Vladivostok, Russian Federation; 3. LSPM (CNRS-UPR 3407), Université Paris 13, Sorbonne Paris Cité, Villetaneuse, France*
- GW-03. Magnetic proximity effects in Co/Pt/Gd/Pt multilayers.** *A. Rogalev<sup>1</sup>, F. Wilhelm<sup>1</sup> and N. Jaouen<sup>2</sup>* *1. ESRF, Grenoble, France; 2. Synchrotron Soleil, Saint Aubin, France*
- GW-04. XMCD Investigation of CoFeB/MgO Structure.** *Y. Yan<sup>1</sup>, X. Lu<sup>1</sup>, J. Wang<sup>1</sup>, J. Wu<sup>1</sup> and Y. Xu<sup>1</sup>* *1. University of York, York, United Kingdom*
- GW-05. Splitting of Ferromagnetic Resonance Spectra in Periodically Modulated 1-D Magnonic Crystal - II.** *P.N. Sherpa<sup>1</sup>, S. Khanal<sup>1</sup> and L. Spinu<sup>1</sup>* *1. Physics/ Advanced Materials Science Institute, University of New Orleans, New Orleans, LA, United States*
- GW-06. Interface roughness driven magnetic anisotropy and Dzyaloshinskii-Moriya interaction in thin films with broken structural inversion symmetry.** *A. Ognev<sup>1</sup>, A.S. Samardak<sup>1,6</sup>, A. Samardak<sup>1</sup>, L. Chebotkevich<sup>1</sup>, A.V. Sadovnikov<sup>2</sup>, S. Nikitov<sup>3</sup>, A. Gerasimenko<sup>4</sup>, I. Cha<sup>4</sup>, Y.J. Kim<sup>4</sup>, O. Tretiakov<sup>5</sup> and Y.K. Kim<sup>4</sup>* *1. School of Natural Sciences, Far Eastern Federal University, Vladivostok, Russian Federation; 2. Saratov State University, Saratov, Russian Federation; 3. Kotel'nikov Institute of Radioengineering and Electronics, Russian Academy of Sciences, Moscow, Russian Federation; 4. Department of Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 5. Institute for Materials Research, Tohoku University, Sendai, Japan; 6. Center for Spin-Orbitronic Materials, Korea University, Seoul, The Republic of Korea*

- GW-07. Lattice distortion and thermal stability of  $[\text{Fe}_2\text{CoSi/Pt}]_n$  multilayers with high perpendicular magnetic anisotropy.** Y. Liu<sup>1</sup>, Y. Zheng<sup>1</sup>, L. Ren<sup>1</sup>, H. Yang<sup>1</sup> and K. Teo<sup>1</sup> *1. Electrical and Computer Engineering, National University of Singapore, Singapore*
- GW-08. Atomic Layer Deposition of cobalt films.** M. Jullien<sup>1</sup>, C. Chang<sup>1</sup>, D. Barth<sup>1</sup>, S. Robert<sup>1</sup>, L. Badie<sup>1</sup>, D. Lacour<sup>1</sup>, C. Guillemaud<sup>1</sup>, S. Petit-Watlot<sup>1</sup> and F. Montaigne<sup>1</sup> *1. Institut Jean Lamour, Université de Lorraine - CNRS, Vandoeuvre les Nancy, France*
- GW-09. Large Perpendicular Magnetic Anisotropy in Fe-Al/ $\text{MgAl}_2\text{O}_4(001)$  epitaxial heterostructures.** T. Scheike<sup>1</sup>, H. Sukegawa<sup>1</sup>, X. Xu<sup>1</sup>, K. Hono<sup>1,2</sup> and S. Mitani<sup>1,2</sup> *1. National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. University of Tsukuba, Tsukuba, Japan*
- GW-10. In-depth structural analysis of MgO/Co(bcc) by XPS and XPD.** K. Shamout<sup>1</sup>, P. Roese<sup>1</sup>, P. Espeter<sup>1</sup>, U. Berges<sup>1</sup> and C. Westphal<sup>1</sup> *1. Experimentelle Physik I, Technical University Dortmund, Dortmund, Germany*
- GW-11. Perpendicular magnetic anisotropy in annealing-free La/CoFeB/MgO heterostructures.** Y. Iida<sup>1,2</sup>, J. Okabayashi<sup>3</sup>, P. Sheng<sup>2</sup>, M. Hayashi<sup>2,4</sup> and S. Mitani<sup>1,2</sup> *1. Graduate School of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Japan; 2. Research Center for Magnetic and Spintronic Materials (CMSM), National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. Research Center for Spectrochemistry, The University of Tokyo, Bunkyo, Japan; 4. Department of Physics, The University of Tokyo, Bunkyo, Japan*
- GW-12. Structural and magnetic properties of  $\text{CoMnO}_3$ -(0001) orbital ferrimagnet epitaxial thin films.** H. Koizumi<sup>1</sup>, S. Sharmin<sup>1</sup> and H. Yanagihara<sup>1</sup> *1. University of Tsukuba, Tsukuba, Japan*
- GW-13. Interlayer exchange coupling of FeCoB/(Ta,Mo)/FeCoB.** T.J. McKinnon<sup>1</sup>, P. Omelchenko<sup>1</sup>, B. Heinrich<sup>1</sup> and E. Girt<sup>1</sup> *1. Physics, SFU, North Vancouver, BC, Canada*
- GW-14. Influence of inclined perpendicular anisotropy on the current-induced magnetization reversal.** M. Stebliy<sup>1</sup>, A. Kolesnikov<sup>1</sup>, A. Davydenko<sup>1</sup>, A. Ognev<sup>1</sup> and L. Chebotkevich<sup>1</sup> *1. Far Eastern Federal University, Vladivostok, Russian Federation*
- GW-15. Magnetization studies of obliquely sputtered CoFeB for TMR sensors.** S. Willing<sup>2,1</sup>, K. Schlage<sup>1</sup>, T. Guryeva<sup>1</sup> and R. Roehlsberger<sup>1,3</sup> *1. Deutsches Elektronen-Synchrotron (DESY), Hamburg, Germany; 2. PIER Helmholtz Graduate School, Hamburg, Germany; 3. Hamburg University, Hamburg, Germany*
- GW-16. Magneto-optical properties of Pt/TbCo heterostructure films.** S. Iemoto<sup>1</sup>, S. Sumi<sup>1</sup>, H. Awano<sup>1</sup> and M. Hayashi<sup>2,3</sup> *1. Toyota Technological Institute, Nagoya, Japan; 2. The University of Tokyo, Tokyo, Japan; 3. National Institute for Materials Science (NIMS), Tsukuba, Japan*

**Session HA**  
**SYMPOSIUM ON ATOMS, MOLECULES AND**  
**INTERFACES FOR SPIN QUANTUM ENGINEERING**

Ilaria Bergenti, Chair  
ISMN-CNR, Bologna, Italy

**2:00**

- HA-01. Interface as key unit in molecular spintronic devices. (Invited) V.A. Dediu<sup>1</sup>** *1. DSCTM, CNR-ISMN, BOLOGNA, Italy*

**2:30**

- HA-02. Activating the molecular spinterface. (Invited) M. Cinchetti<sup>1</sup>** *1. Experimentelle Physik VI, Technical University Dortmund, Dortmund, Germany*

**3:00**

- HA-03. Under-barrier spin-phonon relaxation in molecular magnets. (Invited) A. Lunghi<sup>1</sup>, F. Totti<sup>2</sup>, R. Sessoli<sup>2</sup> and S. Stefano<sup>1</sup>** *1. School of Physics and CRANN, Trinity College Dublin, Dublin, Ireland; 2. Dipartimento di Chimica "Ugo Schiff", Universita' degli Studi di Firenze, Firenze, Italy*

**3:30**

- HA-04. Portraying the spin dynamics of molecular nanomagnets by four-dimensional inelastic neutron scattering. (Invited) S. Carretta<sup>1</sup>** *1. University of Parma, Parma, Italy*

**4:00**

- HA-05. Operating Quantum States in Single Magnetic Molecules: Implementation of Quantum Gates and Algorithm. (Invited) C. Godfrin<sup>1</sup>, R. Ballou<sup>1</sup>, E. Bonet<sup>1</sup>, S. Klyatskaya<sup>3</sup>, M. Ruben<sup>3</sup>, W. Wernsdorfer<sup>3,1</sup> and F. Balestro<sup>1,2</sup>** *1. CNRS-UGA-Institut Néel, Grenoble, France; 2. Institut Universitaire de France, Paris, France; 3. Institute of Nanotechnology (INT), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany*

**4:30**

- HA-06. Electron spin resonance of single atoms in scanning tunneling microscopy. (Invited) A.J. Heinrich<sup>1</sup>, Y. Bae<sup>1</sup> and P. Willke<sup>1</sup>** *1. Center for Quantum Nanoscience, Institute for Basic Science, Seoul, The Republic of Korea*

**Session HB**  
**HARD MAGNETS II**

Yanglong Hou, Chair  
Peking University, Beijing, China

2:00

- HB-01. Microstructure and magnetic properties of anisotropic polycrystalline  $\text{Sm}(\text{Fe}_{0.8}\text{Co}_{0.2})_{12}$  thin films with  $\text{ThMn}_{12}$  structure.** D. Ogawa<sup>1,2</sup>, Y. Takahashi<sup>1,2</sup>, S. Hirose<sup>1,2</sup> and K. Hono<sup>1,2</sup> 1. Elements Strategy Initiative Center for Magnetic Materials (ESICMM), Tsukuba, Japan; 2. National Institute for Materials Science (NIMS), Tsukuba, Japan

2:15

- HB-02. Intrinsic magnetic properties of  $\text{Sm}(\text{Fe}_{1-x}\text{Co}_x)_{11}\text{Ti}$  and Zr-substituted  $\text{Sm}_{1-y}\text{Zr}_y(\text{Fe}_{0.8}\text{Co}_{0.2})_{11.5}\text{Ti}_{0.5}$  compounds with  $\text{ThMn}_{12}$  structure toward the development of permanent magnets.** P. Tozman<sup>1</sup>, H. Sepehri-Amin<sup>1</sup>, Y. Takahashi<sup>1</sup>, S. Hirose<sup>1</sup> and K. Hono<sup>1</sup> 1. National Institute for Materials Science (NIMS), Tsukuba, Japan

2:30

- HB-03. Intrinsic Magnetic Properties of  $\text{SmFe}_{12-x}\text{V}_x$  Alloys with reduced V-content.** A.M. Schönhöbel<sup>1</sup>, R. Madugundo<sup>1</sup>, J.M. Barandiarán<sup>1,3</sup> and G.C. Hadjipanayis<sup>2</sup> 1. BCMaterials, Leioa, Spain; 2. Physics and Astronomy, University of Delaware, Newark, DE, United States; 3. Electricity and electronics, University of the Basque country, Leioa, Spain

2:45

- HB-04. Solidification behavior and its effect on mechanical properties of  $\text{Sm}_2\text{Co}_{17}$ -type sintered magnets.** K. Song<sup>1</sup>, Y. Fang<sup>1</sup>, S. Wang<sup>1</sup>, H. Chen<sup>1</sup>, N. Yu<sup>1</sup>, M. Zhu<sup>1</sup> and W. Li<sup>1</sup> 1. Division of Functional Materials, Iron & Steel Research Institute, Beijing, China

3:00

- HB-05. Microstructure and magnetic properties of casted strips  $[(\text{La}_{0.352}\text{Ce}_{0.648})_x(\text{Nd}_{0.796}\text{Pr}_{0.204})_{1-x}]_{2.14}\text{Fe}_{14}\text{B}$  ( $0.6 \leq x \leq 1.0$ ).** Y. Liu<sup>1</sup>, B. Peng<sup>1</sup>, J. Jin<sup>1</sup> and M. Yan<sup>1</sup> 1. Zhejiang University, Hangzhou, China

3:15

- HB-06.  $\text{YCo}_5$  and  $\text{CeCo}_5$  thin films with perpendicular magnetic anisotropy grown by molecular beam epitaxy.** S. Sharma<sup>1</sup>, E. Hildebrandt<sup>1</sup>, M. Major<sup>1</sup>, P. Komissinskiy<sup>1</sup>, I.A. Radulov<sup>1</sup> and L. Alff<sup>1</sup> 1. Institute of Materials Science, Technische Universität Darmstadt, Darmstadt, Germany

**HB-07. Confirmation of hard magnetic L1<sub>0</sub> FeNi phase precipitated in FeNiSiBPCu alloy by anomalous X-ray diffraction.**

*P. Sharma*<sup>1</sup>, *S. Okamoto*<sup>2</sup>, *H. Tajiri*<sup>3</sup>, *Y. Zhang*<sup>4</sup>, *O. Kitakami*<sup>2</sup> and *A. Makino*<sup>1</sup> 1. *New Industry Creation Hatchery Center (NICHe), Tohoku University, Sendai, Japan*; 2. *Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan*; 3. *Japan Synchrotron Radiation Research Institute (SPring-8), Sayo, Japan*; 4. *Institute for Materials Research, Tohoku University, Sendai, Japan*

3:45

**HB-08. Magnetic and Structural Properties of L1<sub>0</sub> (MnAl)-Ga Epitaxially Grown Thin Films of Island Structure.**

*S. Zhao*<sup>1,2</sup>, *Y. Tanaka*<sup>3</sup>, *T. Satoh*<sup>1,3</sup>, *K. Kamiya*<sup>1,3</sup>, *G.J. Mankey*<sup>1,4</sup> and *T. Suzuki*<sup>1,2</sup> 1. *Center for Materials for Information Technology (MINT), University of Alabama, Tuscaloosa, AL, United States*; 2. *Metallurgical and Materials Engineering, University of Alabama, Tuscaloosa, AL, United States*; 3. *Materials Development Center & IP HQ, TDK Corporation, Ichikawa, Japan*; 4. *Physics and Astronomy, University of Alabama, Tuscaloosa, AL, United States*

4:00

**HB-09. Synthesis of Phase-Pure  $\tau$ -MnAlC Using Mechanical Alloying and a Single-Step Annealing Route.**

*V. Øygarden*<sup>1</sup>, *J. Rial*<sup>2</sup>, *A. Bollero*<sup>2</sup> and *S. Deledda*<sup>1</sup> 1. *Institute for Energy Technology, Kjeller, Norway*; 2. *Permanent Magnets and Applications, IMDEA Nanoscience, Madrid, Spain*

4:15

**HB-10. Tuning permanent magnet properties in MnAl nanocrystalline powder processed by ultrafast-milling with different milling media.**

*J. Rial*<sup>1</sup>, *P. Svec*<sup>2</sup>, *E. Palmero*<sup>1</sup>, *J. Camarero*<sup>1</sup>, *P. Švec Sr*<sup>2</sup> and *A. Bollero*<sup>1</sup> 1. *Division of Permanent Magnets and Applications, IMDEA Nanoscience, Madrid, Spain*; 2. *Institute of Physics, Slovak Academy of Sciences, Bratislava, Slovakia*

4:30

**HB-11. Spark Plasma Sintered MnGa-alloys for Permanent Magnet Applications.**

*S. Perween*<sup>1,2</sup>, *B. Gahtori*<sup>1,2</sup>, *A. Rathi*<sup>2</sup>, *R. Singh*<sup>3</sup>, *A. Bhattacharya*<sup>1</sup>, *B. Sivaih*<sup>1,2</sup>, *P. Rout*<sup>1</sup>, *R. Pant*<sup>1</sup>, *A. Dhar*<sup>1,2</sup> and *G. Basheed*<sup>1,2</sup> 1. *CSIR - National Physical Laboratory, Delhi, India*; 2. *CSIR - National Physical Laboratory, Academy of Scientific and Innovative Research, Delhi, India*; 3. *Department of Physics, Indian Institute of Science Education and Research (IISER), Bhopal, India*

4:45

**HB-12. Tailoring Magnetic Properties of Al-substituted M-Type Strontium Hexaferrites.**

*Y. Dai*<sup>1</sup>, *Z. Lan*<sup>1</sup>, *K. Sun*<sup>1</sup>, *Z. Yu*<sup>1</sup>, *R. Guo*<sup>1</sup> and *X. Jiang*<sup>1</sup> 1. *University of Electronic Science and Technology of China, Chengdu, China*

**Session HC**

**MAGNETIC TUNNEL JUNCTIONS AND STT-MRAM**

Bernard Dieny, Chair  
Spintec, Grenoble, France

**2:00**

**HC-01. Resonance Spin Transfer Torque Magnetoresistive Memory.**  
*(Invited) J. Zhu<sup>1</sup> and A. Shadman<sup>1</sup> 1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States*

**2:30**

**HC-02. Top-pinned STT-MRAM devices with high thermal stability hybrid free layers for high density memory applications.**  
*E. Liu<sup>1,2</sup>, J. Swerts<sup>1</sup>, A. Vaysset<sup>1</sup>, Y. Wu<sup>1,2</sup>, S. Couet<sup>1</sup>, S. Mertens<sup>1</sup>, S. Rao<sup>1</sup>, W. Kim<sup>1</sup>, S. Van Elshocht<sup>1</sup>, J. De Boeck<sup>1,2</sup> and G.S. Kar<sup>1</sup> 1. Imec, Leuven, Belgium; 2. Department of Electrical Engineering, KU Leuven, Leuven, Belgium*

**2:45**

**HC-03. X nm Magnetic Tunnel Junctions with Perpendicular Anisotropy.** *K. Watanabe<sup>1</sup>, B. Jinnai<sup>2</sup>, S. Fukami<sup>1,2</sup>, H. Sato<sup>1,2</sup> and H. Ohno<sup>1,2</sup> 1. RIEC, Tohoku University, Sendai, Japan; 2. CSIS, Tohoku University, Sendai, Japan*

**3:00**

**HC-04. Etch Process Technology for High Density STT-MRAM.**  
*(Invited) T. Endoh<sup>1,2</sup>, S. Kang<sup>3</sup>, T. Kudo<sup>3</sup> and Y. Yagi<sup>3</sup> 1. Center for Innovative Integrated Electronic Systems (CIES), Tohoku University, Sendai, Japan; 2. Graduate School of Engineering, Tohoku University, Sendai, Japan; 3. Tokyo Electron Ltd., Yamanashi, Japan*

**3:30**

**HC-05. High thermal tolerance synthetic ferrimagnetic reference layer with modified buffer layer by ion irradiation for perpendicular anisotropy magnetic tunnel junctions.**  
*H. Honjo<sup>1,2</sup>, S. Ikeda<sup>1,3</sup>, H. Sato<sup>1,3</sup>, K. Nishioka<sup>1,2</sup>, T. Watanabe<sup>1,2</sup>, S. Miura<sup>1,3</sup>, T. Nasuno<sup>1,2</sup>, Y. Noguchi<sup>1,2</sup>, H. Inoue<sup>1,2</sup>, M. Yasuhira<sup>1,2</sup>, T. Tanigawa<sup>1,2</sup>, H. Koike<sup>1,2</sup>, M. Muraguchi<sup>4,2</sup>, M. Niwa<sup>1,2</sup>, H. Ohno<sup>3,5</sup> and T. Endoh<sup>1,4</sup> 1. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan; 2. JST-ACCEL, Saitama, Japan; 3. Center for Spintronics Integrated Systems, Tohoku University, Sendai, Japan; 4. Graduate School of Engineering, Tohoku University, Sendai, Japan; 5. RIEC, Tohoku University, Sendai, Japan*

**3:45**

**HC-06. Role of Curie temperature on thermal stability limits of perpendicular STT-MRAM.** *L. Tillie<sup>1,2</sup>, R.C. Sousa<sup>2</sup>, J. Chatterjee<sup>2</sup>, N. Lamard<sup>2</sup>, J. Guelfucci<sup>2</sup>, E. Nowak<sup>1</sup>, B. Dieny<sup>2</sup> and I.L. Prejbeanu<sup>2</sup> 1. CEA-Leti, Grenoble, France; 2. CEA-SPINTEC, Grenoble, France*

4:00

- HC-07. Back hopping in spin-transfer-torque devices, possible origin and counter measures.** C. Abert<sup>1</sup>, H. Sepehri-Amin<sup>2</sup>, F. Bruckner<sup>1</sup>, C. Vogler<sup>1</sup>, M. Hayashi<sup>2</sup> and D. Suess<sup>1</sup> *1. Physics of Functional Materials, University of Vienna, Vienna, Austria; 2. National Institute for Materials Science (NIMS), Tsukuba, Japan*

4:15

- HC-08. Spin Transfer Torque efficiency enhancement utilizing precessional spin current (PSC) structure for STT-MRAM application.** M. Pinarbasi<sup>1</sup>, B. Kardasz<sup>1</sup>, G. Wolf<sup>1</sup>, J. Vasquez<sup>1</sup>, S. Watts<sup>1</sup>, T. Boone<sup>1</sup>, J. Hernandez<sup>1</sup>, K. Bozdogan<sup>1</sup>, D. Guarisco<sup>1</sup>, M. Schabes<sup>1</sup>, P. Manandhar<sup>1</sup>, E. Dobisz<sup>1</sup>, P. Shrivastava<sup>1</sup>, Y. Chin<sup>1</sup>, E. Ryan<sup>1</sup> and G. Jagtiani<sup>1</sup> *1. Spin Transfer Technologies Inc., Fremont, CA, United States*

4:30

- HC-09. Polar Coding for Spin-Torque Transfer Magnetic Random Access Memory (STT-MRAM).** Z. Mei<sup>1</sup>, K. Cai<sup>1</sup> and B. Dai<sup>2</sup> *1. Singapore University of Technology and Design, Singapore, Singapore; 2. Beihang University, Beijing, China*

4:45

- HC-10. Effect of free-layer size on magnetic properties in nanoscale magnetic tunnel junctions.** M. Shinozaki<sup>1</sup>, J. Igarashi<sup>1</sup>, H. Sato<sup>2,3</sup> and H. Ohno<sup>1,3</sup> *1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Center for Spintronics Research Network, Tohoku University, Sendai, Japan; 3. Center for Spintronics Integrated Systems, Tohoku University, Sendai, Japan*

FRIDAY

PEONY IV

AFTERNOON

2:00

### Session HD

## SPIN INJECTION AND TRANSPORT

Cheng Song, Chair

Tsinghua University, Beijing, China

2:00

- HD-01. Enhanced spin relaxation and spin-to-charge conversion at the surface of Cu thin film decollated with molecules.** S. Takizawa<sup>1</sup>, K. Kondou<sup>2</sup>, H. Isshiki<sup>1</sup>, K. Shimose<sup>3</sup>, T. Kawabe<sup>3</sup>, S. Miwa<sup>3</sup> and Y. Otani<sup>1,2</sup> *1. ISSP, The University of Tokyo, Kashiwa, Japan; 2. CEMS, RIKEN, Wako, Japan; 3. Graduate School of Engineering Science, Osaka University, Suita, Japan*

2:15

- HD-02. TiO<sub>2</sub> as diffusion barrier at Co/Alq<sub>3</sub> spinterface studied by X-ray standing wave technique.** V. Phatak Londhe<sup>1</sup>, D. Gupta<sup>2</sup> and N. Ponpandian<sup>1</sup> *1. Bharathiar University, Coimbatore, India; 2. Amity Center for Spintronic Materials, Amity University, Noida, India*

2:30

**HD-03. Creation and Control of Spin Current in 2D Materials Heterostructures. (Invited) S.P. Dash<sup>1</sup>** *1. Microtechnology and Nanoscience, Chalmers University of Technology, Gothenburg, Sweden*

3:00

**HD-04. Quenching of Spin-Polarization Switching in Organic Multiferroic Tunnel Junctions by Ferroelectric “Ailing-Channel” in Organic Barrier.** S. Liang<sup>1</sup>, X. Devaux<sup>1</sup>, A. Ferri<sup>2</sup>, R. Desfeux<sup>2</sup>, W. Huang<sup>3</sup>, X. Li<sup>3</sup>, D. Chaudhuri<sup>4</sup>, H. Yang<sup>4</sup>, M. Chshiev<sup>4</sup>, S. Migot<sup>1</sup>, S. Mangin<sup>1</sup> and Y. Lu<sup>1</sup> *1. Institut Jean Lamour, Nancy, France; 2. Univ. Artois, Lens, France; 3. University of Science and Technology of China, Hefei, China; 4. CEA-SPINTEC, Grenoble, France*

3:15

**HD-05. Tuning Spin Injection Efficiency by Molecular Design.** A.D. Wittmann<sup>1</sup>, G. Schweicher<sup>1</sup>, K. Broch<sup>2</sup>, A. Marks<sup>3</sup>, C. Jellett<sup>3</sup>, I. McCulloch<sup>3</sup>, E. McNellis<sup>4</sup>, J. Sinova<sup>4</sup>, J. Wunderlich<sup>5</sup> and H. Siringhaus<sup>1</sup> *1. Physics, University of Cambridge, Cambridge, United Kingdom; 2. Institut für Angewandte Physik, Universität Tübingen, Tübingen, Germany; 3. Chemistry, Imperial College London, London, United Kingdom; 4. Physics, Johannes Gutenberg University, Mainz, Germany; 5. Hitachi Cambridge Laboratory, Cambridge, United Kingdom*

3:30

**HD-06. Large spin-valve effect in Si nano spin-valve devices.** H.D. Duong<sup>1</sup>, M. Tanaka<sup>2,3</sup> and N. Pham<sup>1,3</sup> *1. Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Tokyo, Japan; 2. Department of Electrical Engineering and Information Systems, The University of Tokyo, Tokyo, Japan; 3. Center for Spintronics Research Network, Graduate School of Engineering, The University of Tokyo, Tokyo, Japan*

3:45

**HD-07. Large local magnetoresistance at room temperature in Si<100> devices.** M. Ishikawa<sup>1,2</sup>, M. Tsukahara<sup>1</sup>, M. Yamada<sup>1</sup>, Y. Saito<sup>2</sup> and K. Hamaya<sup>1,3</sup> *1. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. Corporate Research & Development Center, Toshiba Corporation, Kawasaki, Japan; 3. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan*

4:00

**HD-08. Nonlinear spin detection in a biased ferromagnetic tunnel contact.** R. Jansen<sup>1</sup>, A. Spiesser<sup>1</sup>, H. Saito<sup>1</sup>, Y. Fujita<sup>2,1</sup>, S. Yamada<sup>2</sup>, K. Hamaya<sup>2</sup> and S. Yuasa<sup>1</sup> *1. AIST, Tsukuba, Japan; 2. Osaka University, Toyonaka, Japan*

4:15

- HD-09. Observation and quantification of spin drift in non-local devices with a heavily-doped Si channel.** *A.M. Spiesser*<sup>1</sup>, H. Saito<sup>1</sup>, Y. Fujita<sup>2</sup>, S. Yamada<sup>2,3</sup>, K. Hamaya<sup>2,3</sup>, W. Mizubayashi<sup>4</sup>, K. Endo<sup>4</sup>, S. Yuasa<sup>1</sup> and R. Jansen<sup>1</sup>  
*1. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 2. Department of Systems Innovation, Graduate School of Engineering Science, Osaka University, Osaka, Japan; 3. Center for Spintronics Research Network, Graduate School of Engineering Science, Osaka University, Osaka, Japan; 4. Nanoelectronics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

4:30

- HD-10. Intrinsic generation of propagating spin waves by a magnonic “black hole” in a current-driven nano-constricted wire.** M. Dvornik<sup>1</sup>, R. Khymyn<sup>1</sup>, J. Åkerman<sup>1,3</sup>, V.S. Tiberkevich<sup>2</sup> and A.N. Slavin<sup>2</sup> *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 2. Department of Physics, Oakland University, Rochester, MI, United States; 3. Department of Applied Physics, KTH Royal Institute of Technology, Stockholm, Sweden*

4:45

- HD-11. Electrical spin injection into an AlGaAs/GaAs-based high-mobility two-dimensional electron system.** Z. Lin<sup>1</sup>, D. Pan<sup>2</sup>, M. Rasly<sup>1</sup> and T. Uemura<sup>1</sup> *1. Graduate School of Information Science and Technology, Hokkaido University, Sapporo, Japan; 2. School of Engineering, Hokkaido University, Sapporo, Japan*

FRIDAY  
AFTERNOON  
2:00

ROSELLE II

**Session HE**  
**DYNAMICS OF SKYRMIONS**

Christian Back, Chair  
University of Regensburg, Regensburg, Germany

2:00

- HE-01. 140% voltage induced modification of interfacial DMI to tune skyrmionic bubbles in Ta/FeCoB/TaOx trilayers.** *T. Srivastava*<sup>1</sup>, M. Schott<sup>2,1</sup>, M. Belmeguenai<sup>3</sup>, Y. Roussigné<sup>3</sup>, A. Bernard-Mantel<sup>2</sup>, L. Ranno<sup>2</sup>, V. Krizakova<sup>2</sup>, S. Pizzini<sup>2</sup>, S.M. Chérif<sup>3</sup>, A. Stashkevich<sup>3</sup>, S. Auffret<sup>1</sup>, M. Chshiev<sup>1</sup>, C. Baraduc<sup>1</sup> and H. Béa<sup>1</sup> *1. Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, INAC-Spintec 38000, Grenoble, France; 2. Univ. Grenoble Alpes, CNRS, Néel Institute, F-38042, Grenoble, France; 3. Laboratoire des Sciences des Procédés et des Matériaux, Univ. Paris 13 Nord, Villetaneuse, France*

2:15

**HE-02. Manipulating magnetic skyrmions in ultrathin Pt/Co/MgO<sub>x</sub> nanostructures.** *R. Juge*<sup>1</sup>, *S. Je*<sup>1</sup>, *D. de Souza Chaves*<sup>2</sup>, *S. Pizzini*<sup>3</sup>, *L.D. Buda-Prejbeanu*<sup>1</sup>, *L. Aballe*<sup>3</sup>, *M. Foerster*<sup>3</sup>, *A. Locatelli*<sup>4</sup>, *T.O. Mentès*<sup>4</sup>, *F. Maccherozzi*<sup>5</sup>, *S. Dhési*<sup>5</sup>, *S. Auffret*<sup>1</sup>, *G. Gaudin*<sup>1</sup>, *J. Vogel*<sup>2</sup> and *O. Boulle*<sup>1</sup> *1. CEA-SPINTEC, Grenoble, France; 2. Institut Néel CNRS, Grenoble, France; 3. ALBA Synchrotron Light Facility, Barcelona, Spain; 4. Elettra Sincrotrone, Trieste, Italy; 5. Diamond Light Source Ltd, Didcot, United Kingdom*

2:30

**HE-03. Dynamics of Skyrmions in Magnetic Multilayers at Room Temperature. (Invited)** *S. Woo*<sup>1</sup> *1. Center for Spintronics, Korea Institute of Science and Technology, Seoul, The Republic of Korea*

3:00

**HE-04. Hybrid Chiral Skyrmions in Multilayered Magnetic Stacks.** *W. Legrand*<sup>1</sup>, *J. Chauleau*<sup>1,2</sup>, *D. Maccariello*<sup>1</sup>, *N. Reyren*<sup>1</sup>, *S. Collin*<sup>1</sup>, *K. Bouzehouane*<sup>1</sup>, *N. Jaouen*<sup>2</sup>, *V. Cros*<sup>1</sup> and *A. Fert*<sup>1</sup> *1. Unité Mixte de Physique CNRS/Thales, Univ. Paris Sud, Université Paris-Saclay, Palaiseau, France; 2. Synchrotron SOLEIL, L'Orme des Merisiers, Gif-sur-Yvette, France*

3:15

**HE-05. Skyrmion and antiskyrmion dynamics in ultrathin ferromagnetic films driven by spin-orbit torques.** *U. Ritzmann*<sup>1,2</sup>, *S. von Malottki*<sup>3</sup>, *J. Kim*<sup>4</sup>, *J. Sinova*<sup>1</sup>, *S. Heinze*<sup>3</sup> and *B. Dupé*<sup>1</sup> *1. Institut für Physik, Johannes Gutenberg Universität Mainz, Mainz, Germany; 2. Department for Physics and Astronomy, Uppsala University, Uppsala, Sweden; 3. Institute of Theoretical Physics and Astrophysics, Christian-Albrechts-Universität zu Kiel, Kiel, Germany; 4. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Sud, Université Paris-Saclay, 91405 Orsay, France*

3:30

**HE-06. Electrical detection of skyrmions in multilayer nanostructures. (Invited)** *K. Zeissler*<sup>1</sup>, *K. Shahbazi*<sup>1</sup>, *J. Massey*<sup>1</sup>, *S. Finizio*<sup>2</sup>, *J. Raabe*<sup>2</sup>, *M. Rosamond*<sup>3</sup>, *E. Linfield*<sup>3</sup>, *T.A. Moore*<sup>1</sup>, *G. Burnell*<sup>1</sup> and *C.H. Marrows*<sup>1</sup> *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. Swiss Light Source, Paul Scherrer Institut, Villigen, Switzerland; 3. School of Electronic and Electrical Engineering, University of Leeds, Leeds, United Kingdom*

4:00

**HE-07. Dynamics of a magnetic skyrmionium driven by a spin wave.** *S. Li*<sup>1,2</sup>, *J. Xia*<sup>3</sup>, *X. Zhang*<sup>3</sup>, *W. Kang*<sup>1</sup>, *M. Ezawa*<sup>4</sup>, *X. Liu*<sup>5</sup>, *Y. Zhou*<sup>3</sup> and *W. Zhao*<sup>1</sup> *1. Fert Beijing Institute, BDBC, and School of Electronic and Information Engineering, Beihang University, Beijing, China; 2. Shenyuan Honors college, Beihang University, Beijing, China; 3. School of Science and Engineering, The Chinese University of Hong Kong, Shenzhen, China; 4. Department of Applied Physics, University of Tokyo, Tokyo, Japan; 5. Department of Electrical and Computer Engineering, Shinshu University, Nagano, Japan*

4:15

**HE-08. A theory on skyrmion size and profile.** X. Wang<sup>1,2</sup>, H. Yuan<sup>3</sup> and X. Wang<sup>2,4</sup> *1. University of Electronic Science and Technology of China, Chengdu, China; 2. Physics, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong; 3. Physics, Southern University of Science and Technology, Shenzhen, China; 4. HKUST Shenzhen Institute, Shenzhen, China*

4:30

**HE-09. High speed bilayer skyrmion transport by voltage controlled magnetic anisotropy gradient.** C.C. Ang<sup>1</sup>, W. Gan<sup>1</sup> and W. Lew<sup>1</sup> *1. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*

4:45

**HE-10. Magnetic Skyrmion Dynamics in Wedge-shaped Nanotrack and Its Potential Applications.** X. Chen<sup>1</sup>, W. Kang<sup>1</sup>, D. Zhu<sup>1</sup>, X. Zhang<sup>2</sup>, Y. Zhang<sup>1</sup>, Y. Zhou<sup>2</sup> and W. Zhao<sup>1</sup> *1. Beihang University, Beijing, China; 2. The Chinese University of Hong Kong, Shenzhen, China*

FRIDAY  
AFTERNOON  
2:00

PEONY I

### Session HF

## ULTRATHIN FILMS AND SURFACE EFFECTS II

Weisheng Zhao, Chair  
Beihang University, Beijing, China

2:00

**HF-01. Various ways to tune non-collinear magnetism in ultrathin films. (Invited)** A. Finco<sup>1</sup>, P. Hsu<sup>1,2</sup>, L. Rózsa<sup>1,3</sup>, A. Kubetzka<sup>1</sup>, E. Vedmedenko<sup>1</sup>, K. von Bergmann<sup>1</sup> and R. Wiesendanger<sup>1</sup> *1. University of Hamburg, Hamburg, Germany; 2. Department of Physics, National Tsing Hua University, Hsinchu, Taiwan; 3. Institute for Solid State Physics and Optics, Wigner Research Centre for Physics, Budapest, Hungary*

2:30

**HF-02. Electrical field induced directional motion of skyrmionic bubbles in a micro-racetrack.** X. Liu<sup>1</sup>, X. Zhang<sup>2,1</sup>, C. Ma<sup>1</sup>, J. Xia<sup>2</sup>, M. Ezawa<sup>3</sup>, W. Jiang<sup>4</sup>, Y. Zhou<sup>2</sup>, S. Piramanayagam<sup>5</sup> and T. Ono<sup>6</sup> *1. Department of Electrical and Computer Engineering, Shinshu University, Nagano, Japan; 2. School of Science and Engineering, The Chinese University of Hong Kong, Shenzhen, China; 3. Department of Applied Physics, The University of Tokyo, Tokyo, Japan; 4. Department of Physics, Tsinghua University, Beijing, China; 5. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore; 6. Institute for Chemical Research, Kyoto University, Kyoto, Japan*

- HF-03. Strong Dzyaloshinskii-Moriya interaction in symmetric crystalline [Co/Pd(111)]<sub>n</sub> superlattices.** *A. Davydenko*<sup>1</sup>, *A. Kozlov*<sup>1</sup>, *M. Steblyi*<sup>1</sup>, *A. Ognev*<sup>1</sup> and *L. Chebotkevich*<sup>1</sup>  
1. *Far Eastern Federal University, Vladivostok, Russian Federation*

- HF-04. Magnetic domain texture and Dzyaloshinskii-Moriya interaction in systems with perpendicular exchange bias.** *R.A. Khan*<sup>1</sup>, *H. Nembach*<sup>2</sup>, *M. Ali*<sup>1</sup>, *T.A. Moore*<sup>1</sup> and *C.H. Marrows*<sup>1</sup>  
1. *School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom*; 2. *Quantum Electromagnetics Division, National Institute of Standards and Technology, Boulder, CO, United States*

- HF-05. In-situ Annealing Study of Pt/Co Interface and its Effect on Perpendicular Magnetic Anisotropy of Pt/Co/MgO.** *H. Xie*<sup>1</sup>, *Y. Yang*<sup>1</sup>, *M. Zhang*<sup>1</sup> and *Y. Wu*<sup>1</sup>  
1. *Department of Electrical and Computer Engineering, National University of Singapore, Singapore*

- HF-06. Exploring interfacial Dzyaloshinskii-Moriya interaction for in-plane thin film permalloy nanostructures using micromagnetic simulations and Lorentz microscopy.** *K. Fallon*<sup>1</sup>, *S. Azzawi*<sup>2</sup>, *D. Atkinson*<sup>2</sup> and *S. McVitie*<sup>1</sup>  
1. *University of Glasgow, Glasgow, United Kingdom*; 2. *Durham University, Durham, United Kingdom*

- HF-07. Enhancement of perpendicular magnetic anisotropy in Co/Ni multilayer by inserting MoS<sub>2</sub> under layer.** *Q. Xie*<sup>1,2</sup>, *B. Yang*<sup>3</sup>, *S. Chen*<sup>1</sup>, *W. Lin*<sup>1</sup>, *L. Liu*<sup>1</sup>, *T. Zhou*<sup>1</sup>, *X. Han*<sup>3</sup>, *J. Chai*<sup>2</sup> and *J. Chen*<sup>1</sup>  
1. *Department of Material Science and Engineering, National University of Singapore, Singapore*; 2. *Institute of Material Research and Engineering, A\*STAR, Singapore, Singapore*; 3. *Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, University of Chinese Academy of Sciences, Beijing, China*

- HF-08. Voltage tailoring of the magnetic anisotropy of CoFeB with graphene oxide membranes.** *K. Ning*<sup>1,3</sup>, *H. Liu*<sup>1,3</sup>, *X. Liu*<sup>1,3</sup>, *Y. Li*<sup>1,3</sup>, *C. Fang*<sup>2</sup>, *C. Wan*<sup>2</sup>, *Y. Yang*<sup>1,3</sup> and *T. Ren*<sup>1,3</sup>  
1. *Institute of Microelectronics, Tsinghua University, Beijing, China*; 2. *Beijing National Laboratory of Condensed Matter Physics, Institute of Physics, University of Chinese Academy of Science, Chinese Academy of Sciences, Beijing, China*; 3. *Tsinghua National Laboratory for Information Science and Technology, Tsinghua University, Beijing, China*

- HF-09. Control of magnetic anisotropy by lattice distortion in cobalt ferrite thin film.** *H. Onoda*<sup>1</sup>, *H. Sukegawa*<sup>2</sup>, *E. Kita*<sup>1</sup> and *H. Yanagihara*<sup>1</sup>  
1. *Inst. Appl. Phys, University of Tsukuba, Tsukuba, Japan*; 2. *National Institute for Materials Science (NIMS), Tsukuba, Japan*

4:30

- HF-10. Torque magnetometry of perpendicular anisotropy exchange-spring heterostructures.** P. Vallobra<sup>1</sup>, T. Huet<sup>1</sup>, F. Montaigne<sup>1</sup>, E. Shipton<sup>2</sup>, E. Fullerton<sup>2</sup> and S. Mangin<sup>1</sup>  
*1. Institut Jean Lamour, Université de Lorraine, Nancy, France;*  
*2. CMRR, University of California, San Diego, La Jolla, CA, United States*

4:45

- HF-11. Effects of Heavy Metal Microstructure on Spin Transport in the Ultrathin Limit.** S.J. Brennan<sup>1</sup>, J. Liao<sup>1</sup>, T. Vemulkar<sup>1</sup>, L. O'Brien<sup>2</sup> and R. Cowburn<sup>1</sup> *1. University of Cambridge, Cambridge, United Kingdom; 2. University of Liverpool, Liverpool, United Kingdom*

FRIDAY  
AFTERNOON  
2:00

PEONY III

**Session HG**  
**PERMANENT MAGNET AND RELUCTANCE**  
**MACHINES VII**

Weinong Fu, Chair  
The Hong Kong Polytechnic University, Hong Kong, Hong Kong

2:00

- HG-01. Nonlinear Modeling of the Flux Linkage in Two-Dimensional Plane for the Planar Switched Reluctance Motor.** G. Cao<sup>1</sup>, N. Chen<sup>1</sup>, S. Huang<sup>1</sup>, S. Xiao<sup>1</sup> and J. He<sup>2</sup>  
*1. Shenzhen Key Laboratory of Electromagnetic Control, Shenzhen, China; 2. GE Global Research, Schenectady, NY, United States*

2:15

- HG-02. Validation of Efficiency Maps of an Outer Rotor Surface Mounted Permanent Magnet Machine for Evaluation of Recyclability of Magnets.** A. Garcia Gonzalez<sup>1</sup>, A.K. Jha<sup>3</sup>, L. Ziwei<sup>2</sup>, P. Upadhayay<sup>2</sup> and P.O. Rasmussen<sup>1</sup> *1. Energy Technology, Aalborg University, Aalborg, Denmark; 2. VALEO Electrical Systems, Créteil, France; 3. G2Elab, Grenoble INP, Grenoble, France*

2:30

- HG-03. Axial Magnetic Force Analysis of Conical-rotor Permanent Magnet Synchronous Motor.** J. Wang<sup>1</sup>, S. Huang<sup>1</sup> and C. Guo<sup>1</sup>  
*1. College of Electrical & Information Engineering, Hunan University, Changsha, China*

2:45

- HG-04. Analysis and experimental validation of performance for a switched reluctance motor with pre-fabricated soft magnetic core.** *V. Krishnan*<sup>1</sup>, *K. Selvam*<sup>2</sup> and *K. Radhakrishnan*<sup>3</sup> *1. EEE, avviyar college of engineering, Puducherry, India; 2. Research and Development, Greenergy solar solutions, Pondicherry, India; 3. EEE, Sri Venkateswara college of Engineering, Tamilnadu, India*

3:00

- HG-05. Study on Static Magnetic Characteristics of a Switched Reluctance Motor with 12/10 Poles under Different Operation Modes.** *Y. Hu*<sup>1</sup> and *W. Ding*<sup>1</sup> *1. Xi'an Jiaotong University, Xi'an, China*

3:15

- HG-06. Demagnetization under normal operation in variable flux PM-assisted Synchronous Reluctance Machines.** *I. Manolas*<sup>1</sup>, *A. Kladas*<sup>2</sup>, *D. Svehkarenko*<sup>1</sup> and *R. Chin*<sup>1</sup> *1. Corporate Research Sweden, ABB, Västerås, Sweden; 2. School of Electrical and Computer Engineering, National Technical University of Athens, Zografou, Greece*

3:30

- HG-07. Design Procedure for a 4-pole, External Rotor Synchronous Reluctance Motor (Ex-R SynRM) for the Application Mechanical Constraints.** *R. Azhagar*<sup>1</sup> and *A. Kavitha*<sup>1</sup> *1. Electrical and Electronics Engineering, College of Engineering, Anna University, Chennai, India*

3:45

- HG-08. Design of a High-Effective Fault-Tolerance Double-Stator Magnetless Vernier Machine for Direct-Drive Robotics.** *J. Yu*<sup>1</sup> and *C. Liu*<sup>1</sup> *1. School of Energy and Environment, City University of Hong Kong, Hong Kong, China*

4:00

- HG-09. Analysis of Local Demagnetization in Magnet for PM-Assisted Synchronous Reluctance Motors.** *H.T. Anh*<sup>2</sup> and *M. Hsieh*<sup>1</sup> *1. Department of Electrical Engineering, National Cheng Kung University, Tainan, Taiwan; 2. Department of Systems and Naval Mechatronic Engineering, National Cheng Kung University, Tainan, Taiwan*

4:15

- HG-10. An Integrated Motor-Drive and Battery-charging System Utilizing Doubly Salient Electro-magnet Machine with Split Field Windings.** *T. Zhang*<sup>1</sup>, *J. Wei*<sup>1</sup>, *P. Liu*<sup>1</sup>, *W. Tao*<sup>1</sup> and *B. Zhou*<sup>1</sup> *1. Jiangsu Key Laboratory of New Energy Generation and Power Conversion, Nanjing University of Aeronautics and Astronautics, Nanjing, China*

4:30

- HG-11. Electromagnetic Performance comparison of multi-layered Interior PM machines for EV Traction Applications.** *M. Xie*<sup>1</sup> *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

- HG-12. Design and Characterization of a single-phase Main Exciter for Aircraft Starter-Generator.** *J. Li<sup>1</sup>, Z. Zhang<sup>1</sup>, Y. Liu<sup>1</sup>, J. Lu<sup>1</sup> and Z. Chen<sup>1</sup>* *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

FRIDAY  
AFTERNOON  
2:00

PEONY II

**Session HH**  
**HYSTERESIS MODELLING II**

Kay Hameyer, Chair  
RWTH Aachen University, Aachen, Germany

2:00

- HH-01. Broadband modeling of magnetic components with saturation and hysteresis for circuit simulations of power converters.** *B. Wunsch<sup>1</sup>, S. Skibin<sup>1</sup>, T. Christen<sup>1</sup> and V. Forsstrom<sup>2</sup>* *1. ABB Corporate Research, Baden, Switzerland; 2. ABB Oy Drives, Helsinki, Finland*

2:15

- HH-02. Temperature Dependence in the Jiles-Atherton Model for Non-Oriented Electrical Steels: An Engineering Approach.** *S. Hussain<sup>1</sup>, A. Benabou<sup>3</sup>, S. Clenet<sup>2</sup> and D. Lowther<sup>1</sup>* *1. Elec and Comp Eng, McGill University, Montreal, QC, Canada; 2. L2EP, Arts et Metiers ParisTech, Lille, France; 3. L2EP, Universite Lille 1, Villeneuve d'Ascq, France*

2:30

- HH-03. A Hybrid Algorithm for Parameter Extraction of Energetic Hysteresis Model.** *R. Liu<sup>1</sup> and L. Li<sup>1</sup>* *1. School of Electrical and Electronic Engineering, North China Electric Power University, Beijing, China*

2:45

- HH-04. Loss Simulation by Finite Element Magnetic Field Analysis Considering Dielectric Effect and Magnetic Hysteresis in EI-Shaped Mn-Zn Ferrite Core.** *K. Shimizu<sup>1</sup>, A. Furuya<sup>1</sup>, Y. Uehara<sup>1</sup>, J. Fujisaki<sup>1</sup>, H. Kawano<sup>2</sup>, T. Ataka<sup>1</sup>, T. Tanaka<sup>1</sup> and H. Oshima<sup>2</sup>* *1. Fujitsu Limited, Kawasaki, Japan; 2. Fujitsu Laboratories Limited, Atsugi, Japan*

3:00

- HH-05. Prandtl-Ishlinskii Modeling for Giant Magnetostrictive Actuator Based on Internal Time-delay Recurrent Neural Network.** *Y. Wang<sup>1</sup>, R. Xu<sup>1</sup> and M. Zhou<sup>1</sup>* *1. Department of control science and engineering, Jilin University, Changchun, China*

3:15

- HH-06. Vector Hysteresis Modeling of Soft Magnetic Composite by the Improved Preisach Model Considering Anisotropic Characteristic.** X. Zhao<sup>1</sup>, H. Zhang<sup>1</sup>, L. Li<sup>1</sup>, F. Xiao<sup>1</sup>, X. Liu<sup>1</sup> and Y. Li<sup>2</sup> *1. North China Electric Power University, Baoding, China; 2. Hebei University of Technology, TianJing, China*

3:30

- HH-07. Modeling the role of magnetic charges on field cooling memory in low anisotropy polycrystalline materials.** H. ElBidweihy<sup>1</sup>, A. Arrott<sup>2</sup> and V. Provenzano<sup>3</sup> *1. Department of Electrical and Computer Engineering, United States Naval Academy, Annapolis, MD, United States; 2. Physics Department, Simon Fraser University, Burnaby, BC, Canada; 3. Materials Science and Engineering Division, National Institute of Standards and Technology, Gaithersburg, MD, United States*

3:45

- HH-08. Vector Magnetization By A Distribution Of Easy Axes.** A. Jamali<sup>1</sup>, E. Della Torre<sup>1</sup> and A. Aslani<sup>1</sup> *1. Department of Electrical and Computer Engineering, The George Washington University, Falls Church, VA, United States*

FRIDAY  
AFTERNOON  
2:00

ORCHID II

**Session HI**  
**TRANSFORMERS AND INDUCTORS: HIGH**  
**FREQUENCY EFFECTS**

Jianguo Zhu, Chair  
University of Technology, Shanghai, China

2:00

- HI-01. Analysis on variable inductances of planar coils sandwiched by soft magnetic layers.** Y. Wen<sup>1</sup>, P. Li<sup>1</sup>, F. Song<sup>1</sup>, S. Yu<sup>1</sup>, L. Bian<sup>2</sup> and Y. Wang<sup>1</sup> *1. Instrument Science and Engineering, Shanghai Jiaotong University, Shanghai, China; 2. Mechanical Engineering, Nanjing Technology University, Nanjing, China*

2:15

- HI-02. Layout Optimization of Indoor Substation Considering Power Transformer Spatial Acoustic Radiation Characteristics.** D. Wang<sup>1</sup>, L. Ying<sup>1</sup>, W. Wang<sup>2</sup> and J. Wang<sup>1</sup> *1. School of Electrical Engineering, Wuhan University, Wuhan, China; 2. Central Southern China Electric Power Design Institute Co.,Ltd, Wuhan, China*

2:30

- HI-03. 3D Magnetic Properties Measurement of Silicon Steel under Biased Magnetic Excitation along Laminated Direction.** C. Zhang<sup>1</sup>, B. Jiang<sup>1</sup>, Y. Li<sup>1</sup> and Q. Yang<sup>2</sup> 1. Hebei University of Technology, Tianjin, China; 2. Tianjin polytechnic University, Tianjin, China

2:45

- HI-04. Numerical Modeling of Magnetic Characteristics of Ferrite Core Taking Account of Both Eddy Current and Displacement Current.** M.K. Ghosh<sup>1</sup>, Y. Gao<sup>1</sup>, H. Dozono<sup>1</sup>, K. Muramatsu<sup>1</sup>, W. Guan<sup>2</sup>, J. Yuan<sup>2</sup>, C. Tian<sup>2</sup> and B. Chen<sup>2</sup> 1. Dept. of Electrical & Electronic Engineering, Saga University, SAGACITY, Japan; 2. School of Electrical Engineering, Wuhan University, Wuhan, China

3:00

- HI-05. Rapid Design of Litz Wire Through Inverse Surrogate Modeling.** H. Chen<sup>1,2</sup>, Y. Du<sup>2</sup> and Q. Cheng<sup>1</sup> 1. Department of Electrical and Electronic Engineering, Southern University of Science and Technology, Shenzhen, China; 2. Department of Building Service Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong

3:15

- HI-06. The Effect of Different Core Materials on Transformer Inrush Currents.** W. Sima<sup>1</sup>, Y. Liu<sup>1</sup>, M. Yang<sup>1</sup> and D. Peng<sup>1</sup> 1. State Key Laboratory of Power Transmission Equipment & System Security and New Technology, Chongqing University, Chongqing, China

3:30

- HI-07. A Novel High-Q-value Inductor with Vacant Space for a High-frequency Non-isolated DC-DC Converter.** Y. Konno<sup>1</sup>, T. Yamamoto<sup>1</sup>, Y. Chai<sup>1</sup>, S. Kawahara<sup>1</sup>, T. Kenta<sup>1</sup>, Y. Bu<sup>1</sup> and T. Mizuno<sup>1</sup> 1. Department Electric and Electronic Engineering, Shinshu University, Nagano, Japan

3:45

- HI-08. Vibration and Acoustic Noise Emitted by Three-phase Iron-core Reactors under PWM Voltage Excitation.** J. Li<sup>1</sup>, H. Gao<sup>2,1</sup>, S. Wang<sup>1</sup>, J. Hong<sup>1</sup> and M. Liu<sup>2,1</sup> 1. State Key Laboratory of Control and Simulation of Power System and Generation Equipments, Tsinghua University, Beijing, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China

4:00

- HI-09. A Novel Structure Design of Iron Core for Power Transformers Considering Joints Forms and Magnetostriction.** J. Li<sup>1</sup>, S. Wang<sup>1</sup>, H. Gao<sup>2,1</sup>, M. Liu<sup>2,1</sup> and J. Hong<sup>1</sup> 1. State Key Laboratory of Control and Simulation of Power System and Generation Equipments, Tsinghua University, Beijing, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China

- HI-10. Comprehensive Analysis and Control of Maximum Power and Maximum Efficiency for Multiple-Objective Wireless Charging Systems.** Z. Zhang<sup>1</sup>, R. Tong<sup>1</sup>, W. Ai<sup>1</sup>, S. Chang<sup>1</sup> and J. Wang<sup>1</sup> *1. School of Electrical and Information Engineering, Tianjin University, Tianjin, China*

- HI-11. Analysis of High Frequency Effects of Excitation Winding in High Frequency Rotating Tester with Nanocrystalline material.** Y. Li<sup>1</sup>, A. Li<sup>1</sup>, C. Zhang<sup>1</sup> and Q. Yang<sup>1</sup> *1. State Key Laboratory of EFEAR, Hebei University of Technology, Tianjin, China*

FRIDAY  
AFTERNOON  
1:30

SIMPOR/ROSELLE BALLROOM

**Session HP**  
**AB-INTIO CALCULATIONS**  
**(Poster Session)**

Arti Kashyap, Co-Chair  
IIT Mandi, Mandi, India

Jia Zhang, Co-Chair

Huazhong University of Science and Technology, Wuhan, China

- HP-01. Possible Origin of Ferromagnetism in Undoped Magnesium Oxide Film.** M. Wang<sup>1,2</sup>, D. Hou<sup>1</sup>, S. Tang<sup>2</sup>, J. Ren<sup>3</sup>, Y. Li<sup>4</sup>, T. Zhou<sup>5</sup> and Y. Han<sup>6</sup> *1. College of Physics and Information Engineering, Hebei Normal University, Shijiazhuang, China; 2. School of Information Science and Engineering, Hebei University of Science and Technology, Shijiazhuang, China; 3. College of Science, Hebei University of Science and Technology, Shijiazhuang, China; 4. School of Materials Science and Engineering, Hebei University of Technology, Tianjin, China; 5. College of Electronic Information and Optical Engineering, Nankai University, Tianjin, China; 6. Department of Construction Engineering, Hebei Vocational College of Politics and Law, Shijiazhuang, China*
- HP-02. About softening of phonon modes in Heusler alloys.** V. Buchelnikov<sup>1,2</sup>, O. Miroshkina<sup>1,3</sup> and A. Zayak<sup>4</sup> *1. Condensed Matter Physics, Chelyabinsk State University, Chelyabinsk, Russian Federation; 2. National University of Science and Technology "MIS&S", Moscow, Russian Federation; 3. Institute of Radioengineering and Electronics of RAS, Moscow, Russian Federation; 4. Department of Physics & Astronomy, Bowling Green State University, Bowling Green, OH, United States*
- HP-03. Investigation of magnetic and structural properties of FeRh<sub>1-x</sub>Pt<sub>x</sub> (x = 0.5 - 1) alloys by first principles method.** O. Pavlukhina<sup>1</sup>, V. Sokolovskiy<sup>1</sup>, V. Buchelnikov<sup>1</sup> and M.A. Zagrebin<sup>1</sup> *1. Chelyabinsk State University, Chelyabinsk, Russian Federation*

- HP-04. First-principles study of MnAl/MgO/MnAl magnetic tunnel junctions with perpendicular magnetic anisotropy.** X. Zhang<sup>1</sup>, L. Tao<sup>1</sup>, J. Zhang<sup>2</sup>, S. Liang<sup>1</sup>, L. Jiang<sup>1</sup> and X. Han<sup>1</sup>  
1. State Key Lab of Magnetism, Institute of Physics, Beijing, China; 2. Huazhong University of Science and Technology, School of Physics and Wuhan National High Magnetic Field Center, Wuhan, China
- HP-05. Numerical Modeling of Iron Loss Considering Laminated Structure and Excess Loss.** D. Zhang<sup>1</sup>, W. Guan<sup>1</sup>, M. Yang<sup>1</sup>, Y. Gao<sup>2</sup> and K. Muramatsu<sup>2</sup> 1. School of Electrical Engineering, Wuhan University, Wuhan, China; 2. Department of Electrical and Electronic Engineering, Saga University, Saga, Japan
- HP-06. Enhancement of perpendicular magnetic anisotropy in Co/graphene and Co/BN heterostructures by strain.** B. Yang<sup>1,2</sup>, J. Zhang<sup>3</sup>, L. Jiang<sup>2</sup>, W. Chen<sup>2</sup>, P. Tang<sup>2</sup>, Y. Yan<sup>1</sup> and X. Han<sup>2</sup>  
1. Key Laboratory of Physics and Technology for Advanced Batteries (Ministry of Education), Department of Physics, Jilin University, Changchun, China; 2. State Key Lab of Magnetism, Institute of Physics, Beijing, China; 3. Huazhong University of Science and Technology, School of Physics and Wuhan National High Magnetic Field Center, Wuhan, China
- HP-07. Silicene spintronics: Fe(111)/silicene system for efficient spin injection.** J. Zhou<sup>1,2</sup>, A. Bournel<sup>2</sup>, Y. Wang<sup>3</sup>, X. Lin<sup>1</sup>, Y. Zhang<sup>1</sup> and W. Zhao<sup>1</sup> 1. Beihang University, Beijing, China; 2. Université Paris-Sud, Orsay, France; 3. The University of Hong Kong, Hong Kong, China
- HP-08. First-principles investigation of magnetocrystalline anisotropy oscillation in Co<sub>2</sub>FeAl/Ta heterostructure.** J. Qiao<sup>1,2</sup>, S. Peng<sup>1,2</sup>, Y. Zhang<sup>1,2</sup>, H. Yang<sup>3</sup> and W. Zhao<sup>1,2</sup>  
1. School of Electronic and Information Engineering, Beihang University, Beijing, China; 2. Fert Beijing Institute, BDBC, Beihang University, Beijing, China; 3. Key Laboratory of Magnetic Materials and Devices, Ningbo Institute of Material Technology and Engineering, Chinese Academy of Sciences, Ningbo, China
- HP-09. Theory of non-collinear interactions beyond Heisenberg exchange; applications to bcc Fe.** S. Attila<sup>1</sup>, D. Thonig<sup>1</sup>, P.F. Bessarab<sup>2</sup>, Y. Kvashnin<sup>1</sup>, D. Rodrigues<sup>1</sup>, M. Pereiro<sup>1</sup>, L. Nordstrom<sup>1</sup>, A. Bergman<sup>1</sup>, A. Klautau<sup>3</sup>, O. Eriksson<sup>1</sup> and R. Cardias<sup>1</sup> 1. Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden; 2. Science Institute of the University of Iceland, Reykjavik, Iceland; 3. Faculdade de Fisica, Universidade Federal do Para, Reykjavik, Belem, Brazil
- HP-10. Ab initio study of phase stability in Fe-Pd binary alloys.** R. Pathak<sup>1</sup>, O. Golovnya<sup>2,3</sup>, A. Popov<sup>2,3</sup>, R. Skomski<sup>4</sup> and A. Kashyap<sup>1</sup> 1. Physics, School of Basic Sciences, Indian Institute of Technology, Mandi, HP, Mandi, India; 2. Ural Federal University, Ekaterinburg, Russian Federation; 3. M.N. Miheev Institute of Metal Physics of Ural Branch of Russian Academy of Sciences, Str. S. Kovalevskoy, Ekaterinburg, Russian Federation; 4. Nebraska Center for Materials and Nanoscience and Department of Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, NE, United States

**Session HQ**  
**ANALYSIS AND OPTIMISATION OF ELECTRICAL MACHINES II**  
**(Poster Session)**

Georges Barakat, Co-Chair  
University of Le Havre, Le Havre, France

Heyun Lin, Co-Chair  
Southeast University, Nanjing, China

- HQ-01. Analysis and Discussion of the Indirect Testing Method for the Losses of Multi-unit Permanent Magnet Synchronous Machines.** *D. Zeng<sup>1</sup>, J. Zou<sup>1</sup>, Y. Xu<sup>1</sup>, F. Liu<sup>1</sup> and H. Lan<sup>1</sup>*  
*1. Harbin Institute of Technology, Harbin, China*
- HQ-02. Investigation of Unbalanced Magnetic Force and Vibration Performance Degeneration Caused by Asymmetric Design in Permanent Magnet Synchronous Machines.** *H. Lan<sup>1</sup>, J. Zou<sup>1</sup>, Y. Xu<sup>1</sup> and M. Liu<sup>1</sup>* *1. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China*
- HQ-03. Optimal Design of an Ultra-premium Efficiency PMA-Synchronous Reluctance Motor with Winding Method and Slots Size to Considering Nonlinear Slots Saturation and Minimize Torque Pulsations.** *H. Liu<sup>1</sup>, S. Oh<sup>1</sup>, Y. Oh<sup>1</sup>, J. Lee<sup>1</sup> and H. Lee<sup>2</sup>* *1. Hanyang Univ., Seoul, The Republic of Korea; 2. Busan Institute of Science and Technology University, Busan, The Republic of Korea*
- HQ-04. A Novel Doubly Salient Flux Modulation PM Machine with Halbach Magnets.** *K. Xie<sup>1</sup>, D. Li<sup>1</sup>, R. Qu<sup>1</sup>, Y. Gao<sup>1</sup> and Y. Pan<sup>1</sup>* *1. Huazhong University of Science & Technology, Wuhan, China*
- HQ-05. Analysis and Optimization of Cogging Torque in Yokeless and Segmented Armature Axial-Flux Permanent-Magnet Machine with Soft Magnetic Composite Core.** *L. Xu<sup>1</sup> and Y. Xu<sup>1</sup>* *1. School of Electrical Engineering, Shandong University, Jinan, China*
- HQ-06. Withdrawn**
- HQ-07. Development of a Slotted Limited-Angle Torque Motor with Asymmetrical Teeth for Torque Performance Improvement.** *G. Yu<sup>1</sup>, B. Zheng<sup>1</sup>, Y. Xu<sup>1</sup>, J. Zou<sup>1</sup>, L. Xiao<sup>1</sup> and H. Lan<sup>1</sup>*  
*1. Harbin Institute of Technology, Harbin, China*
- HQ-08. Design Optimization of Interior Permanent Magnet Synchronous Motor for Electric Compressors of Air-Conditioning Systems Mounted on EVs and HEVs.** *S. Cho<sup>1</sup>, J. Choi<sup>1</sup>, H. Shin<sup>2</sup>, K. Jung<sup>2</sup> and K. Shin<sup>1</sup>* *1. Chungnam National Univ., Daejeon, The Republic of Korea; 2. Hanon systems, Daejeon, The Republic of Korea*

- HQ-09. Comparison of Modular Spoke-type Permanent-Magnet Machines Using Different Magnets for In-Wheel Traction Applications.** H. Zhang<sup>1</sup> and W. Hua<sup>1</sup> 1. School of Electrical Engineering, Southeast University, Nanjing, China
- HQ-10. Study on the torque ripple reduction design through varying the air-gap magnetic flux density in the SPM motor.** K. Lee<sup>1</sup>, J. Lee<sup>1</sup>, R. Kim<sup>1</sup>, J. Seo<sup>1</sup> and S. Rhyu<sup>1</sup> 1. Korea Electronics Technology Institute, Gyeonggi-do, The Republic of Korea
- HQ-11. A Study on the Shape Optimization Design of Permanent Magnet Assist to Improve Output Performance of WFSMG.** S. Lee<sup>1</sup>, J. Lee<sup>2</sup>, B. Kim<sup>2</sup>, D. Lee<sup>2</sup> and D. Kang<sup>2</sup> 1. Electronic and Electricity Engineering, Keimyung University, Daegu, The Republic of Korea; 2. Electrical Energy Engineering, Keimyung University, Daegu, The Republic of Korea
- HQ-12. Analysis and Optimization of Rotor Deformation in Interior Permanent Magnet Synchronous Motors.** Y. Pei<sup>1</sup>, Y. Li<sup>1</sup>, F. Chai<sup>1</sup> and Y. Yu<sup>1</sup> 1. Harbin Institute of Technology, Harbin, China
- HQ-13. A Robust Design Optimization Method for Electromagnetic Devices with Interval Uncertainties.** B. Ma<sup>1</sup>, J. Zheng<sup>1</sup>, G. Lei<sup>1</sup>, J. Zhu<sup>1</sup> and Y. Guo<sup>1</sup> 1. University of Technology Sydney, Sydney, NSW, Australia
- HQ-14. Optimized design of segmented magnet demagnetization and eddy current loss analysis of fractional pole slot combination IPMSG for ISG.** B. Kim<sup>1</sup>, D. Lee<sup>1</sup>, J. Lee<sup>1</sup>, S. Lee<sup>1</sup> and D. Kang<sup>1</sup> 1. Keimyung University, Daegu, The Republic of Korea
- HQ-15. Discrete-Search Algorithm for Estimation of MTPA Trajectory in Electromagnetic Design Optimization of Interior Permanent Magnet Machines.** A. Pouramin<sup>1</sup>, M. Farshadnia<sup>1</sup>, S. Paul<sup>2,1</sup>, R. Dutta<sup>1</sup> and F.M. Rahman<sup>1</sup> 1. School of Electrical Engineering and Telecommunications, University of New South Wales, Universtiy of NSW, NSW, Australia; 2. Electrical Engineering, Dong-A University, Busan, The Republic of Korea
- HQ-16. Performance Optimization of an Air-core PMSLM with New Double-layer Windings.** W. Mei<sup>1</sup> and Q. Lu<sup>1</sup> 1. College of Electrical Engineering, Zhejiang University, Hangzhou, China

**Session HR**  
**ENERGY HARVESTERS AND GENERATORS II**  
**(Poster Session)**

Shuangxia Niu, Co-Chair  
The Hong Kong Polytechnic University, Hung Hom, Hong Kong  
Shuhong Wang, Co-Chair  
Xi'an Jiaotong University, Xi'an, China

- HR-01. Characteristics of Energy Harvesting in Flywheel Energy Storage System Based on Efficiency Map of Electric Machine.** *J. Cho*<sup>1</sup>, *H. Hwang*<sup>1</sup>, *Y. Choo*<sup>1</sup>, *C. Kim*<sup>1</sup> and *C. Lee*<sup>1</sup>  
*1. Electrical and Computer Engineering, Pusan National University, Pusan, The Republic of Korea*
- HR-02. Influence of Additional Loss in the Rotor Surface on Rotor Temperature Field of 1100MW Half-speed Nuclear Power Turbine Generator.** *L. Hu*<sup>2</sup>, *Y. Su*<sup>1</sup>, *W. Li*<sup>1</sup>, *Y. Li*<sup>1</sup>, *P. Wang*<sup>1</sup> and *W. Liu*<sup>1</sup>  
*1. Electrical Engineering, Beijing jiaotong University, Beijing, China; 2. Shanghai Electric Power Generation Equipment Co., Ltd., Shanghai, China*
- HR-03. Research on an Asymmetric-primary Axis-flux Maglev Generator for the Vertical Axis Wind Turbine.** *J. Liu*<sup>1</sup>  
*1. Hohai University, Nanjing, China*
- HR-04. Modeling and Design of a Efficient Magnetostrictive Energy Harvesting System with Low-Voltage and Low-Power under Low Vibration Excitation.** *S. Cao*<sup>1</sup>, *X. Wang*<sup>1</sup> and *J. Zheng*<sup>1</sup>  
*1. Hebei University of Technology, Tianjin, China*
- HR-05. Performance Analysis of a Novel Brushless Hybrid Excitation Synchronous Generator.** *C. Zhu*<sup>1</sup>, *Y. Yang*<sup>1</sup>, *Y. Zhang*<sup>2</sup> and *Y. Shen*<sup>1</sup>  
*1. School of Electrical Engineering, Shandong University, Jinan, China; 2. Yijun Motor Technology Development Center, Liaochan, China*
- HR-06. Analysis of the Resonance Characteristics by a Variation of Coil Distance in Magnetic Resonant Wireless Power Transmission.** *H. Lee*<sup>1</sup> and *G. Park*<sup>1</sup>  
*1. Department of Electrical Engineering, Pusan National University, Busan, The Republic of Korea*
- HR-07. Optimization of Planar Spiral Coils for Uniform Magnetic Field to Wirelessly Power Moving Targets.** *Y. Xie*<sup>1</sup> and *Q. Xu*<sup>1</sup>  
*1. Key Laboratory of Image Processing and Intelligent Control of Education Ministry, Department of Control Science and Engineering, Huazhong University of Science and Technology, Wuhan, China*
- HR-08. Demagnetization Characteristics of a Permanent Magnet Embedded Salient Pole Wind Generator.** *Y. Guo*<sup>1</sup>, *P. Jin*<sup>1</sup>, *H. Yang*<sup>2</sup> and *Y. Zhu*<sup>1</sup>  
*1. College of Energy and Electrical Engineering, Hohai University, Nanjing, China; 2. School of Electrical Engineering, Southeast University, Nanjing, China*

**HR-09. Design of a Novel Brushless Electrically-Excited Claw-Pole Generator for Hybrid Electric Vehicles.** *X. Zhao*<sup>1</sup> and *S. Niu*<sup>1</sup>  
*1. Electrical Engineering, The Hong Kong Polytechnic University, Kowloon, Hong Kong*

**HR-10. Study of Air-gap Magnetic Field of a Novel Integrated Brushless Excitation Generator.** *S. Zhu*<sup>1</sup> and *C. Li*<sup>1</sup> *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

**HR-11. Performance of Hybrid Excitation Synchronous Machine for Small Hydropower Generation.** *Y. Xia*<sup>1</sup>, *W. Gu*<sup>1</sup>, *L. Zhou*<sup>1</sup>, *C. Zhang*<sup>1</sup> and *Z. Wen*<sup>1</sup> *1. School of Information Engineering, Nanchang University, Nanchang, China*

**HR-12. Research of an Axial Flux Stator Partition Hybrid Excitation Brushless Synchronous Generator.** *C. Ye*<sup>1,2</sup>, *Y. Du*<sup>1</sup>, *J. Yang*<sup>1</sup>, *X. Liang*<sup>1</sup>, *F. Xiong*<sup>1</sup> and *W. Xu*<sup>1</sup> *1. School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan, China; 2. State Key Laboratory of Advanced Electromagnetic Engineering and Technology, Huazhong University of Science and Technology, Wuhan, China*

**HR-13. A Novel Interior Permanent Magnet Brushless Doubly-fed Generator with Segmented Reluctance Rotor for Wind Power Application.** *J. Zhang*<sup>1</sup>, *Y. Jiang*<sup>1</sup>, *J. Zhao*<sup>1</sup> and *W. Hua*<sup>1</sup>  
*1. School of Electrical Engineering, Southeast University, Nanjing, China*

**HR-14. Electromagnetic energy harvester for harvesting energy from low-frequency vibration.** *K. Zhang*<sup>1</sup>, *Y. Su*<sup>1</sup>, *J. Ding*<sup>1</sup> and *Z. Zhang*<sup>1</sup> *1. School of Mechanical Engineering, Zhengzhou University, Zhengzhou, China*

**HR-15. Parameter Determination of PMSM using Coupled Electromagnetic and Thermal Model Incorporating Current Harmonics.** *S. Mukundan*<sup>1</sup>, *H. Dhulipati*<sup>1</sup>, *J. Tjong*<sup>1</sup> and *N. C. Kar*<sup>1</sup> *1. Electrical & Computer Engineering, University of Windsor, Windsor, ON, Canada*

FRIDAY

SIMPOR/ROSELLE BALLROOM

AFTERNOON

1:30

### Session HS

## SHIELDING, ELECTROMAGNETIC COMPATIBILITY, MOTORS AND GENERATORS II

### (Poster Session)

Jonathan Bird, Chair

Portland State University, Portland, OR, United States

**HS-01. Electromagnetic Shielding Measurement of Magnetic Absorbing Sheets Using IC-stripline.** *H. Park*<sup>1</sup> *1. School of Electrical and Electronic Engineering, The University of Suwon, Hwaseong-si, The Republic of Korea*

- HS-02. Influence of Sleeve Material on Electromagnetic Field Based on Multi-Physical Field for Permanent Magnet Synchronous Motor.** W.L. Li<sup>1</sup>, L. Li<sup>1</sup>, J. Li<sup>2</sup>, J. Shen<sup>3</sup>, J. Cao<sup>1</sup> and D. Li<sup>1</sup>  
*1. School of Electrical Engineering, Beijing Jiaotong University, Beijing, China; 2. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin 150001, China, Harbin, China; 3. College of Electrical and Electronic Engineering, Harbin University of Science and Technology, Harbin, China, Harbin, China*
- HS-03. Design and Analysis of a Linear Interior Permanent Magnet Vernier Machine.** C. Shi<sup>1</sup>, R. Qu<sup>1</sup>, Y. Gao<sup>1</sup>, D. Li<sup>1</sup> and Y. Zhou<sup>1</sup> *1. School of Electrical and Electronics Engineering, Huazhong University of Science & Technology, Wuhan, China*
- HS-04. Reduction of magnetically induced vibration and noise in SPM motors due to segmented magnets.** J. Song<sup>1</sup>, S. Sung<sup>1</sup>, H. Jang<sup>1</sup>, C. Kang<sup>1</sup> and G. Jang<sup>1</sup> *1. Dept of Mechanical Convergence Engineering, Hanyang University, Seoul, The Republic of Korea*
- HS-05. A High Torque Density Concentrated Winding Vernier Reluctance Machine with DC-Biased Current.** S. Jia<sup>1,3</sup>, D. Liang<sup>1,3</sup>, D. Li<sup>2</sup>, W. Kong<sup>2</sup> and R. Qu<sup>2</sup> *1. School of Electrical Engineering, Xi'an Jiaotong University, Xi'an, China; 2. School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan, China; 3. State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an, China*
- HS-06. The Vibration Reduction Design and Experimental Validation of Generator for Range Extended Electric Vehicle.** B. Son<sup>1</sup>, G. Park<sup>1</sup>, H. Jung<sup>2</sup>, Y. Kim<sup>3</sup> and S. Jung<sup>1</sup>  
*1. Sungkyunkwan Univ., Suwon-si, The Republic of Korea; 2. Korea Automotive Technology Institute, Cheonan, The Republic of Korea; 3. Chosun Univ., Gwangju, The Republic of Korea*
- HS-07. Comparative Study of Airgap Field Modulation in Flux Reversal and Vernier Permanent Magnet Machines.** H. Li<sup>1</sup>, Y. Liu<sup>1</sup> and Z. Zhu<sup>1</sup> *1. Department of Electronic and Electrical Engineering, The University of Sheffield, Sheffield, United Kingdom*
- HS-08. Low Cost High Torque Density Dual-Stator Permanent Magnet Vernier Machine.** N. Baloch<sup>1</sup>, B. Kwon<sup>1</sup> and Y. Gao<sup>2</sup>  
*1. Electronic Systems Engineering, Hanyang University, Ansan, The Republic of Korea; 2. School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan, China*
- HS-09. A Generalized Method of Electromagnetic Vibration Analysis of Amorphous Alloy Permanent Magnet Synchronous Machines.** S. Wu<sup>1</sup>, W. Tong<sup>1</sup>, R. Sun<sup>1</sup> and R. Tang<sup>1</sup> *1. Shenyang University of Technology, Shenyang, China*
- HS-10. A Double Stator Flux Reversal PM Machine with Halbach Consequent Pole in Slot Opening.** H. Huang<sup>1</sup>, D. Li<sup>1</sup>, R. Qu<sup>1</sup> and K. Xie<sup>1</sup> *1. Huazhong University of Science & Technology, Wuhan, China*

**HS-11. Analysis on a Novel Flux Adjustable Permanent Magnet Eddy Current Coupler with a Double-layer Permanent Magnet Rotor.** *M. Tian*<sup>1</sup>, *X. Wang*<sup>1</sup>, *W. Zhao*<sup>1</sup>, *Y. Yang*<sup>1</sup>, *J. Diao*<sup>2</sup> and *X. Ma*<sup>2</sup> *1. School of Electrical Engineering, Shandong University, Ji'nan, China; 2. Shandong Jiemeng Energy Conservation and Environmental Protection Technology Co., Ltd, Ji'nan, China*

FRIDAY  
AFTERNOON  
1:30

SIMPOR/ROSELLE BALLROOM

**Session HT**  
**MICROMAGNETICS II**  
**(Poster Session)**

Oksana Chubykalo-Fesenko, Chair  
Instituto de Ciencia de Materiales de Madrid, CSIC, Madrid, Spain

- HT-01. Peaked linewidth broadening of ferromagnetic resonance induced by Dzyaloshinskii-Moriya interaction.** *J. Oh*<sup>1</sup>, *I. Hong*<sup>1</sup> and *K. Lee*<sup>1</sup> *1. Material Science Department, Korea University, Seoul, The Republic of Korea*
- HT-02. Spin transport model including thermal effect of GMR based devices.** *N. Saenphum*<sup>2</sup>, *J. Chureemart*<sup>1</sup>, *R.W. Chantrell*<sup>3</sup> and *P. Chureemart*<sup>2</sup> *1. Physics, Mahasarakham University, Mahasarakham, Thailand; 2. Physics, Mahasarakham University, Mahasarakham, Thailand; 3. Physics, University of York, York, United Kingdom*
- HT-03. Electrical Modeling of Double-Barrier Magnetic Tunnel Junction with Reliability Analyses.** *G. Wang*<sup>1,2</sup>, *Y. Zhang*<sup>1,2</sup>, *Z. Zhang*<sup>1,2</sup>, *Z. Zheng*<sup>1,2</sup>, *K. Zhang*<sup>1,2</sup>, *Y. Zhang*<sup>1,2</sup> and *W. Zhao*<sup>1,2</sup> *1. Fert Beijing Institut, Beihang University, Beijing, China; 2. Electronics and Information Engineering School, Beihang University, Beijing, China*
- HT-04. Role of Defect on Stabilizing Skyrmion in Magnetic Nanostructure.** *A. Talapatra*<sup>1</sup> and *J. Mohanty*<sup>1</sup> *1. Physics, Indian Institute of Technology, Hyderabad, Hyderabad, India*
- HT-05. Comparison of Computational Speed between Landau-Lifshitz-Gilbert and Hybrid-Monte-Carlo Micromagnetics.** *J. Song*<sup>1</sup>, *Z. Zhao*<sup>1</sup> and *D. Wei*<sup>1</sup> *1. School of Materials Science and Engineering, Tsinghua University, Beijing, China*
- HT-06. Realistic micromagnetic model in exchange bias: The parametric study including thermal activation as setting process.** *W. Daeng-am*<sup>1</sup>, *P. Chureemart*<sup>1</sup>, *L.J. Atkinson*<sup>2</sup>, *R.W. Chantrell*<sup>2</sup> and *J. Chureemart*<sup>1</sup> *1. Physics, Mahasarakham University, Kantharawichai, Thailand; 2. Physics, University of York, York, United Kingdom*

- HT-07. Micromagnetic Studies of Laser-induced Magnetization Dynamics in FePt-C Films.** *J. Miao*<sup>1</sup>, *J. Wang*<sup>2</sup>, *R. Mandal*<sup>2</sup>, *D. Wei*<sup>1</sup>, *Y. Takahashi*<sup>2</sup> and *K. Hono*<sup>2</sup> *1. School of Materials Science and Engineering, Tsinghua University, Beijing, China; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan*
- HT-08. Micromagnetic simulation for the effects of Fe nanowires distribution on the magnetic properties of the Nd<sub>2</sub>Fe<sub>14</sub>B/ $\alpha$ -Fe nanocomposite magnets.** *W. Li*<sup>1</sup>, *L. Zhao*<sup>1</sup> and *Z. Liu*<sup>1</sup> *1. South China University of Technology, Guangzhou, China*
- HT-09. Parallelization with locality optimization of ultra-large-scale micromagnetics simulation using OSCAR Compiler.** *K. Ono*<sup>1</sup>, *M. Shimaoka*<sup>2</sup>, *H. Mikami*<sup>2</sup>, *H. Tsukahara*<sup>1</sup>, *K. Iwano*<sup>1</sup>, *C. Mitsumata*<sup>3</sup> and *H. Morita*<sup>4</sup> *1. High Energy Accelerator Research Organization, Tsukuba, Japan; 2. Waseda University, Tokyo, Japan; 3. National Institute for Materials Science (NIMS), Tsukuba, Japan; 4. Hitachi, Ltd., Tokyo, Japan*
- HT-10. Voltage induced strain-mediated perpendicular magnetization control for in-memory computing device.** *Q. Wang*<sup>1</sup>, *C. Liang*<sup>1</sup> and *G.P. Carman*<sup>1</sup> *1. Department of Mechanical and Aerospace Engineering, University of California, Los Angeles, Los Angeles, CA, United States*
- HT-11. Three-dimensional Domain Calculations by Hybrid Monte Carlo Micromagnetics.** *L. Bao*<sup>1</sup>, *M. Dai*<sup>2</sup>, *D. Wei*<sup>2,3</sup> and *G. Yun*<sup>1,3</sup> *1. Inner Mongolia Key Lab of Nanoscience and Nanotechnology and School of Physical Science and Technology, Inner Mongolia University, Hohhot, China; 2. Key Laboratory of Advanced Materials, School of Materials Science and Engineering, Tsinghua University, Beijing, China; 3. College of Physics and Electronic Information, Inner Mongolia Normal University, Hohhot, China*
- HT-12. Design and Optimization of Skyrmion-based Racetrack Memory by Overcoming Clogging and Annihilation of Skyrmion Signals.** *G. Zhao*<sup>1</sup> *1. Physics, Sichuan Normal University, Chengdu, China*

**Session HU**  
**PERMANENT MAGNET AND RELUCTANCE**  
**MACHINES VI**  
**(Poster Session)**

Ming Liu, Chair  
Xi'an Jiaotong University, Xian, China

- HU-01. 3D Structure Line Start Synchronous Reluctance Motor Design Based on Selective Laser Melting of 3D Printing.** P. Huang<sup>2</sup>, M. Tsai<sup>1</sup> and I. Jiang<sup>2</sup> *1. Mechanical Engineering Department, National Cheng Kung University, Tainan, Taiwan; 2. Electrical Motor Technology Research Center, National Cheng Kung University, Tainan, Taiwan*
- HU-02. Quantitative Comparison of Interior Permanent Magnet Machines and Vernier Permanent Magnet Machines for Integrated Charging Applications.** W. Li<sup>2</sup>, T. Ching<sup>1</sup>, Q. Li<sup>4</sup>, X. Zhang<sup>3</sup> and L. Zhang<sup>4</sup> *1. University of Macau, Taipa, Macao; 2. The University of Hong Kong, Hong Kong; 3. Shenzhen In Drive Ampere Co. Ltd, Shenzhen, China; 4. Nanjing University of Science and Technology, Nanjing, China*
- HU-03. Novel Dual-Stator Permanent-Magnet Vernier Machines with Various Magnet Arrangements for Large Telescope Application.** H. Wang<sup>1,2</sup>, S. Fang<sup>1</sup>, T. Jahns<sup>2</sup>, H. Yang<sup>1</sup>, K. Wang<sup>1</sup> and H. Lin<sup>1</sup> *1. School of Electrical Engineering, Southeast University, Nanjing, China; 2. Wisconsin Electric Machines and Power Electronics Consortium (WEMPEC), University of Wisconsin-Madison, Ma, WI, United States*
- HU-04. A New Double-Winding Vernier Permanent Magnet Wind Power Generator for Hybrid AC/DC Microgrid Application.** Q. Wang<sup>1</sup> and S. Niu<sup>1</sup> *1. Department of Electrical Engineering, The Hong Kong Polytechnic University, Hung Hom, Hong Kong*
- HU-05. Ring-shaped surface-mounted permanent magnet generators with modular stator for small wind turbines – a comparison of topologies.** J.A. Oliveira<sup>1,2</sup>, A.F. Flores Filho<sup>1</sup> and D.G. Dorrell<sup>3</sup> *1. Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil; 2. Universidade Federal de Mato Grosso, Rondonopolis, Brazil; 3. Howard College Campus, University of KwaZulu-Natal, Durban, South Africa*
- HU-06. A novel doubly fed wind energy power split system with partial-scale converter and control strategy.** X. Liu<sup>1</sup>, M. Li<sup>1</sup> and S. Huang<sup>1</sup> *1. Electrical and Information Engineering College, Hunan University, Changsha, China*
- HU-07. Partitioned Stator Hybrid Excitation Machine with Separated Field Sources and Armature Winding.** Y. Du<sup>1</sup>, W. Lu<sup>1</sup>, X. Zhu<sup>1</sup>, F. Xiao<sup>1</sup> and L. Quan<sup>1</sup> *1. Jiangsu University, Zhenjiang, China*

- HU-08. Low-Loss Design and Analysis of Magnetic-Field Modulated Brushless Double-Rotor Machine.** J. Bai<sup>1</sup>, J. Liu<sup>1</sup>, P. Zheng<sup>1</sup> and Y. Liu<sup>1</sup> *1. Harbin Institute of Technology, Harbin, China*
- HU-09. Development of a New Stator Module Type Vernier Motor utilizing Amorphous Cut Core.** H. Nakagawa<sup>1</sup>, T. Sato<sup>1</sup> and T. Todaka<sup>1</sup> *1. Oita Univ., Oita, Japan*
- HU-10. Optimal Arrangement of Permanent Magnets in a Dual-permanent-magnet-excited Synchronous Motor.** Y. Chen<sup>1</sup> and W. Fu<sup>1</sup> *1. Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*
- HU-11. Loss and efficiency of a flux-switching permanent-magnet double-rotor machine with high torque density.** L. Mo<sup>1</sup> *1. Huaiyin Institute of Technology, Huaian, China*
- HU-12. Design, modeling, analysis of a traction motor in railway with independently rotating wheelsets.** Y. Oh<sup>1</sup> and S. Kim<sup>2</sup> *1. Hanyang University, Seoul, The Republic of Korea; 2. Yuhan University, Bucheon-si, The Republic of Korea*
- HU-13. Investigation of Flux Modulation Effect on Double-Side-Excited Permanent Magnet Vernier Machine with Various Magnet Topologies.** M. Jiang<sup>1</sup> and X. Zhu<sup>1</sup> *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*
- HU-14. Investigation of Dual Stator Spoke Type Vernier Machine for EV Application.** K. Jung-Woo<sup>1</sup> and B. Kwon<sup>1</sup> *1. Electronic Engineering, Hanyang University, Ansan, The Republic of Korea*
- HU-15. Hybrid Rectangular Bar Wave Windings to Minimize Winding Losses of Permanent Magnet Machines for EV/HEVs over a Driving Cycle.** X. Fan<sup>1</sup>, D. Li<sup>1</sup>, R. Qu<sup>1</sup>, C. Wang<sup>1</sup> and J. Li<sup>1</sup> *1. School of Electricity and Electronic Engineering, Huazhong University of Science and Technology, State Key Laboratory of Advanced Electromagnetic Engineering and Technology, Wuhan, China*
- HU-16. Reduction of Vibration and Acoustic Noise in Fractional-Slot Concentrated-Windings Permanent-Magnet Machine.** S. Zhu<sup>1</sup>, W. Zhao<sup>1</sup>, J. Ji<sup>1</sup> and J. Zheng<sup>1</sup> *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

**Session HV**  
**RECORDING SYSTEMS: CODING AND HEAD-DISK  
INTERFACE**

**(Poster Session)**

Sergiu Ruta, Chair  
University of York, York, United Kingdom

- HV-01. SNR Improvement of Envelope Demodulation Using Two Temporal Magnetization Dynamics from Dual Spin-Torque Oscillator.** *Y. Nakamura<sup>1</sup>, M. Nishikawa<sup>1</sup>, H. Osawa<sup>1</sup>, Y. Okamoto<sup>1</sup>, T. Kanao<sup>2</sup> and R. Sato<sup>2</sup>* *1. Graduate School of Science and Engineering, Ehime University, Matsuyama, Japan; 2. Corporate Research & Development Center, Toshiba Corporation, Kawasaki, Japan*
- HV-02. Two-dimensional Signal Processing Systems Using CRC-polar Coding and List Decoding for Bit-patterned Magnetic Recording.** *H. Saito<sup>1</sup>* *1. School of Advanced Engineering, Kogakuin University, Tokyo, Japan*
- HV-03. Performance of Bit-Patterned Media Recording According to Island Patterns.** *S. Jeong<sup>1</sup>, J. Kim<sup>1</sup> and J. Lee<sup>1</sup>* *1. Soongsil University, Seoul, The Republic of Korea*
- HV-04. A Rate-5/6 2D Modulation Code for Single-Reader/Two-Track Reading in BPMR Systems.** *K. Buahing<sup>1</sup>, W. Busyatras<sup>2</sup> and C. Warisarn<sup>1</sup>* *1. College of Advanced Manufacturing Innovation, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand; 2. Faculty of Science and Technology, Rajamangala University of Technology Thanyaburi, Pathumthani, Thailand*
- HV-05. Control Scheme for Read/Write Head Positioning in Dual-Stage Magnetic Disk Drive Servo System.** *B. Shi<sup>1,2</sup>, Y. Meng<sup>1</sup> and C. Jin<sup>1</sup>* *1. School of Mechanical and Electrical Engineering, Shandong Jianzhu University, Jinan, China; 2. School of Mechanical Engineering, Hebei University of Technology, Tianjin, China*
- HV-06. Reduced-complexity window decoding of spatially coupled LDPC codes for magnetic recording systems.** *S. Khittiwitthayakul<sup>1</sup>, W. Phakphisut<sup>1</sup> and P. Supnithi<sup>1</sup>* *1. Faculty of Engineering, King Mongkut's Institute of Technology Ladkrabang, Ladkrabang, Thailand*
- HV-07. A study on iterative decoding with LLR modulator by parity check information in SMR system.** *M. Nishikawa<sup>1</sup>, Y. Nakamura<sup>1</sup>, H. Osawa<sup>1</sup>, Y. Okamoto<sup>1</sup>, Y. Kanai<sup>2</sup> and H. Muraoka<sup>3</sup>* *1. Ehime University, Matsuyama, Japan; 2. Niigata Institute of Technology, Kashiwazaki, Japan; 3. Tohoku University, Sendai, Japan*
- HV-08. Thermal decomposition of the polymeric lubricant and the viscoelastic effects on the head-disk interface in heat-assisted magnetic recording.** *P. Chung<sup>1</sup>* *1. Energy Engineering, Inje University, Gimhae-si, The Republic of Korea*

- HV-09. Numerical Study of Particle Rebound on the Slider Air Bearing Surface.** F. Cui<sup>1</sup>, H. Li<sup>1</sup>, H. Shang<sup>1</sup>, S. Shen<sup>1</sup>, S. Wu<sup>1</sup> and S. Liu<sup>2</sup> 1. School of Power and Mechanical Engineering, Wuhan University, Wuhan, China; 2. Department of Mechanical Engineering, Colorado School of Mines, Golden, CO, United States
- HV-10. Frequency analysis of disturbance torque exerted on a carriage arm in hard disk drives using Hilbert-Huang Transform.** S. Koganezawa<sup>1</sup> 1. Kansai University, Suita, Japan
- HV-11. Dynamic Performance of Head-disk Interface in HAMR Using Molecular Dynamics Simulation Method.** T. Shu<sup>1</sup>, H. Li<sup>1</sup>, S. Shen<sup>1</sup>, X. Dai<sup>1</sup>, W. Shen<sup>1</sup> and F. Cui<sup>1</sup> 1. School of Power and Mechanical Engineering, Wuhan University, Wuhan, China
- HV-12. Effect of Assembly Errors on Position Accuracy in a Rotary Magnetic Recording System.** H. Hsiao<sup>1</sup>, L. Chen<sup>1</sup>, C. Sung<sup>1</sup> and J. Chang<sup>1</sup> 1. Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan
- HV-13. Optimising dual layer recording using antiferromagnetic exchange coupling.** S. Greaves<sup>1</sup>, T. Kikuchi<sup>1</sup>, Y. Kanai<sup>2</sup> and H. Muraoka<sup>1</sup> 1. Tohoku University, Sendai, Japan; 2. Niigata Institute of Technology, Kashiwazaki, Japan
- HV-14. A General LDPC code Design Framework for High-density Magnetic Recording with 2D-ISI.** L. Kong<sup>1</sup> and X. Jiang<sup>2</sup> 1. Nanjing University of Posts & Telecommunications Nanjing, NANJING, China; 2. Donghua University, Shanghai, China
- HV-15. Reduced Complexity Multi-track Joint Equalization and Detection of High Areal Density Magnetic Recording.** L.M. Myint<sup>1</sup>, C. Warisarn<sup>2</sup> and P. Supnithi<sup>3</sup> 1. School of Science and Technology, Shinawatra University, Thailand, Pathum Thani, Thailand; 2. College of Advanced Manufacturing Innovation, King Mongkut's Institute of Technology Ladkrabang (KMITL), Bangkok, Thailand; 3. Telecommunications Engineering Department, King Mongkut's Institute of Technology Ladkrabang (KMITL), Bangkok, Thailand

FRIDAY  
AFTERNOON  
1:30

SIMPOR/ROSELLE BALLROOM

**Session HW**  
**MAGNETO-CALORIC MATERIALS II**  
**(Poster Session)**

Jia Yan Law, Chair  
Sevilla University, Sevilla, Spain

- HW-01. Effect of Si doped on magnetic and magnetocaloric properties of Ni-Co-Mn-Sn alloys.** S. Ghosh<sup>1</sup>, P. Sen<sup>2</sup> and K. Mandal<sup>1</sup> 1. Condensed Matter Physics and Material Sciences, S.N.Bose National Centre for Basic Sciences, Kolkata, India; 2. Physics Group, Variable Energy Cyclotron Centre, Kolkata, India

- HW-02. Magnetocaloric effect, large coercivity and exchange bias in melt-spun rare earth intermetallic compound SmNi.** J. Kurian<sup>1</sup>, A. Chelvane<sup>2</sup>, A. Morozkin<sup>3</sup>, A.K. Nigam<sup>4</sup>, S.K. Malik<sup>5</sup> and N. R<sup>1</sup> 1. *Physics, Indian Institute of Technology Madras, Chennai, India*; 2. *DMRL, Hyderabad, India*; 3. *Lomonosov Moscow State University, Moscow, Russian Federation*; 4. *TIFR, Mumbai, India*; 5. *UFRN, Natal, Brazil*
- HW-03. Burst-like superelasticity and elastocaloric effect in Ni-Fe-Ga-Co magnetic shape memory alloys.** J. Liu<sup>1</sup> and D. Zhao<sup>1</sup> 1. *Ningbo Institute of Materials Technology and Engineering, Ningbo, China*
- HW-04. Evaluation of different magnetocaloric heat exchanger stacks in a demonstrator with upcycled Nd-Fe-B permanent magnets.** D. Benke<sup>1</sup>, J. Wortmann<sup>1</sup>, M. Specht<sup>1</sup>, I.A. Radulov<sup>1</sup>, K. Skokov<sup>1</sup>, D. Proserpi<sup>2</sup>, P. Afiun<sup>2</sup>, M. Zakotnik<sup>2</sup> and O. Gutfleisch<sup>1</sup> 1. *Funktionale Materialien, TU Darmstadt, Darmstadt, Germany*; 2. *Urban Mining Company, Austin, TX, United States*
- HW-05. Design of an Efficient Magnetic Circuit for a Magneto-Caloric Air-Conditioning System.** C. Jäschke<sup>1</sup>, P. Schegner<sup>1</sup> and J. Seifert<sup>1</sup> 1. *Technische Universität Dresden, Dresden, Germany*
- HW-06. Magnetic properties and magnetocaloric effect of Ni<sub>2</sub>Mn<sub>1+x</sub>Sn<sub>1-x</sub> Heusler alloy thin films.** H. Yako<sup>1</sup>, T. Shima<sup>1</sup> and M. Doi<sup>1</sup> 1. *Tohoku Gakuin University, Tagajo, Japan*
- HW-07. Influences of sintering temperature on the microstructure and magnetocaloric effect of Mn<sub>1.15</sub>Fe<sub>0.85</sub>P<sub>0.65</sub>Si<sub>0.13</sub>Ge<sub>0.2</sub>B<sub>0.02</sub> prepared by spark plasma sintering.** Z. Zhao<sup>1</sup>, T. Jing<sup>1</sup>, G. Wang<sup>2</sup>, B. Yang<sup>2</sup> and X. Zhang<sup>1</sup> 1. *School of Science, Inner Mongolia University of Science and Technology, Baotou, China*; 2. *Key Laboratory of Integrated Exploitation of Bayan Obo Multi-Metal Resources, Inner Mongolia University of Science and Technology, Baotou, China*
- HW-08. Customizing Magnetic and Structural Properties of Nanomaterials.** A. Aslani<sup>1</sup>, M. Ghahremani<sup>2</sup>, M. Zhang<sup>3</sup>, L.H. Bennett<sup>1</sup> and E. Della Torre<sup>1</sup> 1. *Electrical and Computer Engineering, George Washington University, Washington, DC, United States*; 2. *Computer Science, Mathematics, and Engineering, Shepherd University, Shepherdstown, WV, United States*; 3. *Chemistry, George Washington University, Washington, DC, United States*
- HW-09. Magnetocaloric effect in La<sub>0.7</sub>Ca<sub>0.3</sub>MnO<sub>3</sub> compounds with different pressure.** W. Nan<sup>1</sup>, D. Pham<sup>1</sup>, S. Yu<sup>1</sup>, W. Shon<sup>2</sup>, J. Rhyee<sup>2</sup>, S. Demyanov<sup>3</sup>, N. Kalanda<sup>3</sup>, M. Yarmolich<sup>3</sup> and L. Kovalev<sup>3</sup> 1. *Department of Physics, Chungbuk National University, Cheongju, Cheongju, The Republic of Korea*; 2. *Department of Applied Physics, Kyung Hee University, Yongin, The Republic of Korea*; 3. *Scientific-Practical Research Centre of NAS of Belarus, Minsk, Belarus*

**Session HX**  
**POWER TRANSFORMERS**  
**(Poster Session)**

Kai Wang, Chair

Nanjing University of Aeronautics and Astronautics, Nanjing, China

- HX-01. Calculation Method of Transformer Residual Flux by Using Hysteresis Loops of Different Frequencies.** *W. Yuan<sup>1</sup>, Y. Shangguan<sup>1</sup> and J. Yuan<sup>1</sup> 1. Dept. of Electrical Engineering, Tsinghua University, Beijing, China*
- HX-02. Influence of the Winding Geometry and its Materials on the Resonance Behavior of Transformer Coils.** *M. Nilges<sup>1</sup> and P. Schegner<sup>1</sup> 1. Institute of Electrical Power Systems and High Voltage Engineering, Technische Universitaet Dresden, Dresden, Germany*
- HX-03. An Optimized Strategy Based on backflow power of Dual-active-bridge Converters with Extending Dual-phase-shifting Control.** *Z. Feng<sup>1</sup> and S. Chi<sup>1</sup> 1. Hebei University of Technology, Tianjin, China*
- HX-04. Study of Analysis and experiment for Ability to Withstand DC Bias in Power Transformers.** *D. Chen<sup>1</sup>, Z. Feng<sup>1</sup>, B. Bai<sup>1</sup> and L. Fang<sup>1</sup> 1. School of Electrical Engineering, Shenyang University of Technology, Shenyang, China*
- HX-05. Vibration Research of Magnetically Controlled Saturated Reactors under AC and DC Excitations.** *Y. Gao<sup>2,3</sup>, R. Yan<sup>2,3</sup>, H. Liu<sup>2,3</sup> and J. Chen<sup>2,3</sup> 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China; 3. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province, Hebei University of Technology, Tianjin, China*
- HX-06. Research on transformer core vibration Based on Thermal Analogy Method.** *B. Zhang<sup>1</sup>, J. Du<sup>1</sup> and N. Yan<sup>1</sup> 1. Shenyang University of Technology, Shenyang, China*
- HX-07. Performance Optimization of a Novel Saturated Core Fault Current Limiter Considering Eddy current Loss of Permanent Magnet.** *L. Wei<sup>1,2</sup>, B. Chen<sup>1</sup>, Y. Liu<sup>3</sup>, H. Zhou<sup>1</sup>, Y. Zhong<sup>1</sup>, J. Yuan<sup>1</sup>, K. Muramatsu<sup>4</sup> and C. Wang<sup>1</sup> 1. Wuhan University, Wuhan, China, Wuhan, China; 2. Department of Electrical Engineering, Kyoto University, Kyoto 606-8501, Japan; 3. Anhui Electric Power Research Institute, Hefei, China; 4. Department of Electrical and Electronic Engineering, Saga University, Saga, Japan*

**HX-08. Analysis of a Novel Near-Field Plate applied in Wireless Power Transmission System.** *X. Zhang<sup>1</sup> and Z. Zhang<sup>1</sup>*  
*1. Tianjin Normal University, Tianjin, China*

**HX-09. Research on Hot-spot Temperature of Nanofluid Filled Transformer.** *X. Yang<sup>1,2</sup>, S. Ho<sup>1</sup>, W. Fu<sup>1</sup>, G. Xu<sup>2</sup> and D. Peng<sup>2</sup>*  
*1. Department of Electrical Engineering, Applied Electromagnetics Laboratory and Electrical Machine Laboratory, Hung Hom, Hong Kong; 2. Hebei University of Technology, Tianjin, China*

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Cros, V. (AE-01) . . . . .	8	Demidov, V.E. (BV-04) . . . . .	60
Cros, V. (AR-15) . . . . .	23	Demidov, V.E. (FV-01) . . . . .	158
Cros, V. (BD-06) . . . . .	39	Demidov, V.E. (GF-01) . . . . .	170
Cros, V. (BE-05) . . . . .	40	Demir, Y. (AG-04) . . . . .	12
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Fan, T. (BT-02) . . . . .	56	Finocchio, G. (CE-09) . . . . .	70
Fan, T. (BT-05) . . . . .	57	Finocchio, G. (CQ-05) . . . . .	79
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Feng, J. (GS-09) . . . . .	183	Freitas, P. (BH-01) . . . . .	45
Feng, M. (BW-02) . . . . .	51	Freitas, P. (DA-04) . . . . .	92
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Feng, Y. (GI-10) . . . . .	177	Fruchart, O. (CD-01) . . . . .	67
Feng, Z. (BS-04) . . . . .	55	Fruchart, O. (CD-06) . . . . .	68
Feng, Z. (HX-03) . . . . .	221	Fruchart, O. (DF-03) . . . . .	98
Feng, Z. (HX-04) . . . . .	221	Fu, H. (CR-09) . . . . .	82
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Fernandez-Scarioni, A. (FE-06) . . . . .	139	Fu, W. (GU-08) . . . . .	187
Fernández, M. (AP-01) . . . . .	17	Fu, W. (HU-10) . . . . .	217
Fernández, M.A. (FR-08) . . . . .	151	Fu, W. (HX-09) . . . . .	222
Ferrara, E. (AV-09) . . . . .	30	Fu, X. (GH-07) . . . . .	175
Ferrari, G. (BC-09) . . . . .	37	Fu, Y. (AI-01) . . . . .	15
Ferreira, R. (BE-07) . . . . .	41	Fu, Z. (FQ-10) . . . . .	150
Ferri, A. (HD-04) . . . . .	197	Fu, Z. (GD-04) . . . . .	167
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Fujita, S. (BD-01) . . . . .	38	Gao, J. (EG-09) . . . . .	112
Fujita, Y. (AR-10) . . . . .	22	Gao, J. (ER-10) . . . . .	121
Fujita, Y. (HD-08) . . . . .	197	Gao, J. (GG-12) . . . . .	174
Fujita, Y. (HD-09) . . . . .	198	Gao, J. (GP-09) . . . . .	178
Fujiwara, H. (CE-06) . . . . .	70	Gao, K. (AF-06) . . . . .	11
Fujiwara, K. (AV-03) . . . . .	29	Gao, K. (FQ-12) . . . . .	150
Fujiwara, K. (CV-04) . . . . .	88	Gao, L. (EF-06) . . . . .	110
Fujiwara, K. (CV-14) . . . . .	89	Gao, T. (GE-08) . . . . .	170
Fujiwara, K. (EI-01) . . . . .	114	Gao, X. (AT-05) . . . . .	26
Fukami, S. (BD-02) . . . . .	38	Gao, X. (CT-09) . . . . .	85
Fukami, S. (ED-10) . . . . .	108	Gao, Y. (AG-08) . . . . .	13
Fukami, S. (FC-06) . . . . .	134	Gao, Y. (CE-04) . . . . .	69
Fukami, S. (GD-03) . . . . .	167	Gao, Y. (CG-06) . . . . .	73
Fukami, S. (HC-03) . . . . .	195	Gao, Y. (CG-11) . . . . .	74
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Fukushima, A. (BE-05) . . . . .	40	Gao, Y. (HS-08) . . . . .	213
Fukushima, A. (EC-01) . . . . .	105	Gao, Y. (HX-05) . . . . .	221
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Fukuzawa, H. (GA-03) . . . . .	163	Garcia-Hernandez, K. (BV-04) . . . . .	60
Fullerton, E. (HF-10) . . . . .	202	García-Hernández, M. (GB-02) . . . . .	163
Furdyna, J. (EP-10) . . . . .	117	Garcia-Sanchez, F. (FE-06) . . . . .	139
Furdyna, J. (GF-02) . . . . .	170	Garcia, J. (EV-08) . . . . .	128
Furuya, A. (BE-06) . . . . .	40	Garcia, K. (CA-01) . . . . .	62
Furuya, A. (CH-10) . . . . .	76	Garello, K. (GD-06) . . . . .	168
Furuya, A. (EQ-09) . . . . .	119	Garg, C. (CF-07) . . . . .	72
Furuya, A. (HH-04) . . . . .	204	Gargiani, P. (DB-03) . . . . .	93
Futamato, M. (AF-10) . . . . .	11	Gaspar, J. (BH-01) . . . . .	45
Futamato, M. (EB-06) . . . . .	103	Gatel, C. (AC-06) . . . . .	5
Fuzer, J. (AV-11) . . . . .	30	Gaudin, G. (CD-10) . . . . .	68
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Leong, Z. (AV-16).....	31	Li, L. (HH-06).....	205
Leong, Z. (CB-04).....	64	Li, L. (HS-02).....	213
Leong, Z. (CV-03).....	88	Li, M. (BU-06).....	59
Lequeux, S. (BD-03).....	38	Li, M. (ET-05).....	124

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Li, M. (GB-06)	164	Li, Y. (FH-07)	145
Li, M. (GP-13)	178	Li, Y. (FR-15)	152
Li, M. (GP-15)	179	Li, Y. (FS-08)	153
Li, M. (HU-06)	216	Li, Y. (FS-10)	153
Li, N. (AP-04)	18	Li, Y. (GH-05)	174
Li, N. (AP-12)	19	Li, Y. (GQ-07)	180
Li, N. (BS-12)	56	Li, Y. (GQ-10)	180
Li, N. (EV-13)	129	Li, Y. (GR-01)	181
Li, P. (AH-11)	15	Li, Y. (GS-05)	183
Li, P. (CC-07)	66	Li, Y. (GS-09)	183
Li, P. (GI-01)	175	Li, Y. (GT-08)	185
Li, P. (HI-01)	205	Li, Y. (GT-15)	185
Li, Q. (AQ-02)	19	Li, Y. (HF-08)	201
Li, Q. (BT-02)	56	Li, Y. (HH-06)	205
Li, Q. (BT-05)	57	Li, Y. (HI-03)	206
Li, Q. (HU-02)	216	Li, Y. (HI-11)	207
Li, R. (BQ-06)	50	Li, Y. (HP-01)	207
Li, R. (EH-08)	113	Li, Y. (HQ-12)	210
Li, R. (FS-02)	152	Li, Y. (HR-02)	211
Li, R. (GR-05)	181	Li, Z. (AQ-01)	19
Li, S. (AD-11)	8	Li, Z. (BU-12)	59
Li, S. (AQ-02)	19	Li, Z. (BV-03)	60
Li, S. (AQ-08)	20	Li, Z. (FT-02)	154
Li, S. (BV-12)	61	Li, Z. (GT-01)	184
Li, S. (EI-07)	115	Li, Z. (GU-15)	187
Li, S. (GP-14)	179	Liang, C. (HT-10)	215
Li, S. (HE-07)	199	Liang, D. (BG-11)	44
Li, T. (FB-12)	133	Liang, D. (FT-13)	155
Li, W. (AS-03)	24	Liang, D. (FW-01)	160
Li, W. (AV-07)	30	Liang, D. (GG-08)	173
Li, W. (BS-01)	54	Liang, D. (HS-05)	213
Li, W. (BU-08)	59	Liang, G. (EH-09)	113
Li, W. (BV-06)	61	Liang, H. (BT-07)	57
Li, W. (EP-14)	118	Liang, H. (FT-12)	155
Li, W. (FB-10)	133	Liang, J. (AH-08)	14
Li, W. (FR-13)	151	Liang, J. (BU-03)	58
Li, W. (GB-06)	164	Liang, J. (CW-11)	91
Li, W. (GR-11)	182	Liang, J. (EW-10)	130
Li, W. (GR-15)	182	Liang, J. (GR-01)	181
Li, W. (HB-04)	193	Liang, P. (CG-08)	74
Li, W. (HR-02)	211	Liang, S. (AV-07)	30
Li, W. (HT-08)	215	Liang, S. (HD-04)	197
Li, W. (HU-02)	216	Liang, S. (HP-04)	208
Li, W.L. (HS-02)	213	Liang, X. (FW-06)	160
Li, X. (AB-02)	3	Liang, X. (GP-16)	179
Li, X. (AR-13)	23	Liang, X. (HR-12)	212
Li, X. (AT-07)	26	Liang, Y. (FW-01)	160
Li, X. (EP-11)	117	Liao, J. (BF-05)	42
Li, X. (EP-13)	117	Liao, J. (HF-11)	202
Li, X. (ET-08)	125	Liao, X. (BU-09)	59
Li, X. (FB-07)	133	Liao, X. (FT-12)	155
Li, X. (FC-02)	134	Liao, X. (GR-15)	182
Li, X. (FC-07)	135	Lim, D. (CU-11)	87
Li, X. (FC-09)	135	Lim, G.J. (BV-12)	61
Li, X. (FS-06)	153	Lim, J. (CT-04)	84
Li, X. (GP-08)	178	Lim, J. (CT-06)	85
Li, X. (HD-04)	197	Lim, J. (CU-11)	87
Li, Y. (AP-04)	18	Lim, J. (CU-12)	87
Li, Y. (AP-07)	18	Lim, J. (ER-03)	120
Li, Y. (AP-12)	19	Lim, J. (GA-02)	162
Li, Y. (AQ-14)	21	Lim, J. (GV-14)	189
Li, Y. (AQ-15)	21	Lim, M. (FQ-09)	150
Li, Y. (AQ-16)	21	Lim, M. (GP-12)	178
Li, Y. (AW-07)	32	Lim, M. (GU-05)	186
Li, Y. (BT-05)	57	Lim, P.B. (EB-08)	104
Li, Y. (BU-12)	59	Lim, S. (BD-07)	39
Li, Y. (CR-07)	81	Lim, S. (BV-05)	60
Li, Y. (CV-06)	88	Lim, S. (EC-05)	106
Li, Y. (EG-05)	111	Lin, C. (AU-14)	28
Li, Y. (EI-09)	116	Lin, C. (EI-10)	116
Li, Y. (EQ-03)	118	Lin, D. (GG-09)	173
Li, Y. (EQ-11)	119	Lin, H. (AG-10)	13
Li, Y. (ET-14)	125	Lin, H. (AQ-08)	20
Li, Y. (EU-06)	126	Lin, H. (ED-08)	108
Li, Y. (EV-13)	129	Lin, H. (FH-03)	144
Li, Y. (FB-02)	132	Lin, H. (HU-03)	216
Li, Y. (FF-10)	142	Lin, J. (EP-05)	116

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Lin, J.G. (BV-13) . . . . .	61	Liu, L. (AQ-08) . . . . .	20
Lin, K. (AS-07) . . . . .	24	Liu, L. (BT-10) . . . . .	57
Lin, K. (CR-11) . . . . .	82	Liu, L. (DE-03) . . . . .	97
Lin, K. (EP-09) . . . . .	117	Liu, L. (EU-01) . . . . .	126
Lin, M. (AU-03) . . . . .	27	Liu, L. (FB-12) . . . . .	133
Lin, M. (BS-12) . . . . .	56	Liu, L. (FS-03) . . . . .	152
Lin, M. (FU-07) . . . . .	156	Liu, L. (GD-11) . . . . .	168
Lin, M. (GH-04) . . . . .	174	Liu, L. (GR-08) . . . . .	181
Lin, M. (GH-07) . . . . .	175	Liu, L. (HF-07) . . . . .	201
Lin, P. (ED-08) . . . . .	108	Liu, M. (AS-06) . . . . .	24
Lin, P. (ED-11) . . . . .	108	Liu, M. (AW-07) . . . . .	32
Lin, W. (CR-12) . . . . .	82	Liu, M. (BU-14) . . . . .	59
Lin, W. (GD-11) . . . . .	168	Liu, M. (BW-01) . . . . .	51
Lin, W. (HF-07) . . . . .	201	Liu, M. (BW-02) . . . . .	51
Lin, X. (AR-09) . . . . .	22	Liu, M. (CW-08) . . . . .	91
Lin, X. (EI-10) . . . . .	116	Liu, M. (EC-04) . . . . .	105
Lin, X. (GC-01) . . . . .	165	Liu, M. (EQ-07) . . . . .	119
Lin, X. (HP-07) . . . . .	208	Liu, M. (ET-09) . . . . .	125
Lin, Z. (HD-11) . . . . .	198	Liu, M. (FI-07) . . . . .	146
Lindner, J. (AD-05) . . . . .	7	Liu, M. (HI-08) . . . . .	206
Lindner, J. (AE-02) . . . . .	8	Liu, M. (HI-09) . . . . .	206
Lindner, J. (CF-09) . . . . .	72	Liu, M. (HQ-02) . . . . .	209
Lindner, J. (FC-10) . . . . .	135	Liu, P. (AS-02) . . . . .	23
Lindner, J. (FE-01) . . . . .	138	Liu, P. (GA-03) . . . . .	163
Lindner, J. (FE-10) . . . . .	140	Liu, P. (HG-10) . . . . .	203
Linfield, E. (HE-06) . . . . .	199	Liu, Q. (AD-01) . . . . .	6
Ling, T. (GA-02) . . . . .	162	Liu, Q. (AQ-02) . . . . .	19
Lipo, T.A. (AT-12) . . . . .	26	Liu, Q. (ET-06) . . . . .	124
Lisenkov, I. (FF-12) . . . . .	142	Liu, Q. (EU-02) . . . . .	126
Lisiecki, F. (FF-06) . . . . .	141	Liu, Q. (FS-06) . . . . .	153
Lisiecki, F. (GF-05) . . . . .	171	Liu, Q. (FT-03) . . . . .	154
Liu, C. (AG-11) . . . . .	13	Liu, R. (HH-03) . . . . .	204
Liu, C. (AS-15) . . . . .	25	Liu, S. (AB-02) . . . . .	3
Liu, C. (AU-11) . . . . .	28	Liu, S. (AP-12) . . . . .	19
Liu, C. (BB-09) . . . . .	35	Liu, S. (EI-08) . . . . .	115
Liu, C. (BG-08) . . . . .	44	Liu, S. (EP-13) . . . . .	117
Liu, C. (BG-09) . . . . .	44	Liu, S. (EV-13) . . . . .	129
Liu, C. (BV-14) . . . . .	61	Liu, S. (HV-09) . . . . .	219
Liu, C. (CR-12) . . . . .	82	Liu, T. (AQ-16) . . . . .	21
Liu, C. (CT-12) . . . . .	85	Liu, T. (BU-08) . . . . .	59
Liu, C. (DH-08) . . . . .	101	Liu, T. (FF-10) . . . . .	142
Liu, C. (FU-06) . . . . .	156	Liu, T. (FV-12) . . . . .	159
Liu, C. (GS-03) . . . . .	183	Liu, W. (BH-10) . . . . .	46
Liu, C. (GV-03) . . . . .	188	Liu, W. (BR-13) . . . . .	54
Liu, C. (HG-08) . . . . .	203	Liu, W. (BU-12) . . . . .	59
Liu, E. (EP-12) . . . . .	117	Liu, W. (BU-14) . . . . .	59
Liu, E. (ET-08) . . . . .	125	Liu, W. (CH-02) . . . . .	75
Liu, E. (HC-02) . . . . .	195	Liu, W. (EH-02) . . . . .	112
Liu, F. (BT-01) . . . . .	56	Liu, W. (EP-01) . . . . .	116
Liu, F. (GU-04) . . . . .	186	Liu, W. (FB-02) . . . . .	132
Liu, F. (HQ-01) . . . . .	209	Liu, W. (FP-04) . . . . .	147
Liu, G. (AT-13) . . . . .	26	Liu, W. (GU-13) . . . . .	187
Liu, G. (CT-13) . . . . .	85	Liu, W. (GU-14) . . . . .	187
Liu, H. (BP-05) . . . . .	49	Liu, W. (HR-02) . . . . .	211
Liu, H. (CW-04) . . . . .	90	Liu, X. (AB-05) . . . . .	3
Liu, H. (CW-09) . . . . .	91	Liu, X. (AT-08) . . . . .	26
Liu, H. (EP-11) . . . . .	117	Liu, X. (AV-02) . . . . .	29
Liu, H. (EQ-01) . . . . .	118	Liu, X. (CD-04) . . . . .	68
Liu, H. (EQ-13) . . . . .	119	Liu, X. (CQ-14) . . . . .	80
Liu, H. (GA-03) . . . . .	163	Liu, X. (CU-09) . . . . .	87
Liu, H. (GD-11) . . . . .	168	Liu, X. (CV-02) . . . . .	88
Liu, H. (GV-15) . . . . .	189	Liu, X. (EH-06) . . . . .	113
Liu, H. (HF-08) . . . . .	201	Liu, X. (EP-10) . . . . .	117
Liu, H. (HQ-03) . . . . .	209	Liu, X. (EQ-01) . . . . .	118
Liu, H. (HX-05) . . . . .	221	Liu, X. (EQ-13) . . . . .	119
Liu, J. (EA-02) . . . . .	102	Liu, X. (ES-01) . . . . .	122
Liu, J. (EB-07) . . . . .	104	Liu, X. (ES-02) . . . . .	122
Liu, J. (FB-07) . . . . .	133	Liu, X. (ES-13) . . . . .	123
Liu, J. (HR-03) . . . . .	211	Liu, X. (FQ-04) . . . . .	149
Liu, J. (HU-08) . . . . .	217	Liu, X. (FU-14) . . . . .	157
Liu, J. (HW-03) . . . . .	220	Liu, X. (GF-02) . . . . .	170
Liu, K. (AI-04) . . . . .	16	Liu, X. (GP-14) . . . . .	179
Liu, K. (AU-03) . . . . .	27	Liu, X. (GQ-08) . . . . .	180
Liu, K. (CT-07) . . . . .	85	Liu, X. (GR-02) . . . . .	181
Liu, K. (GH-04) . . . . .	174	Liu, X. (GR-13) . . . . .	182
Liu, K. (GH-07) . . . . .	175	Liu, X. (GT-13) . . . . .	185
Liu, L. (AD-10) . . . . .	8	Liu, X. (GT-14) . . . . .	185

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Ma, R. (BS-09) . . . . .	55	Marsilius, M. (BB-01) . . . . .	34
Ma, S. (AB-04) . . . . .	3	Marth, E. (FG-03) . . . . .	142
Ma, T. (AB-03) . . . . .	3	Martín, J.M. (AB-12) . . . . .	4
Ma, X. (GH-02) . . . . .	174	Martín, J.M. (BB-04) . . . . .	34
Ma, X. (HS-11) . . . . .	214	Martin, S. (CD-06) . . . . .	68
Macarulla, T. (EI-04) . . . . .	115	Martínez-García, J.C. (AP-01) . . . . .	17
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Maccariello, D. (HE-04) . . . . .	199	Martins, M. (BC-02) . . . . .	36
Maccherozzi, F. (FE-07) . . . . .	139	Martins, P. (EB-01) . . . . .	103
Maccherozzi, F. (HE-02) . . . . .	199	Marty, A. (BE-04) . . . . .	40
Macêdo, R. (FI-02) . . . . .	146	Marty, A. (CD-01) . . . . .	67
Machida, K. (EU-04) . . . . .	126	Masood, A. (AV-15) . . . . .	31
Machida, K. (FB-05) . . . . .	132	Masood, A. (FW-07) . . . . .	161
Mader, D. (DF-04) . . . . .	98	Masseboeuf, A. (AC-06) . . . . .	5
Madhusudan, C. (AH-10) . . . . .	15	Massey, J. (FE-07) . . . . .	139
Madugundo, R. (HB-03) . . . . .	193	Massey, J. (HE-06) . . . . .	199
Maeda, Y. (EW-11) . . . . .	130	Masuda, K. (BI-10) . . . . .	48
Maeng, C. (CU-03) . . . . .	86	Masuda, T. (CR-05) . . . . .	81
Magsood, H. (CP-15) . . . . .	78	Masumoto, H. (BP-04) . . . . .	48
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Mahajan, A. (DB-05) . . . . .	93	Materne, T. (BH-01) . . . . .	45
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Mai, R. (BG-11) . . . . .	44	Matsumoto, R. (FC-04) . . . . .	134
Maity, T. (AS-08) . . . . .	24	Matsumoto, T. (AC-02) . . . . .	5
Maïzi, N. (GG-07) . . . . .	173	Matsuo, T. (CH-04) . . . . .	75
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Makino, A. (BB-02) . . . . .	34	Mayer, J. (CC-03) . . . . .	66
Makino, A. (HB-07) . . . . .	194	Mazaauric, V.G. (GG-07) . . . . .	173
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Malik, S.K. (HW-02) . . . . .	220	McCloskey, P. (FW-07) . . . . .	161
Malinowski, G. (GD-10) . . . . .	168	McComb, D.W. (CA-05) . . . . .	63
Mallick, D. (GQ-06) . . . . .	180	McCulloch, I. (HD-05) . . . . .	197
Mallick, S. (EV-15) . . . . .	129	McHenry, M. (FD-03) . . . . .	136
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Mandal, K. (HW-01) . . . . .	219	Mehdi, M. (DB-07) . . . . .	94
Mandal, R. (CF-05) . . . . .	71	Mehedi, M.A. (EA-02) . . . . .	102
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Manescu (Paltanea), V. (AV-05) . . . . .	29	Mei, W. (HQ-16) . . . . .	210
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Mangin, S. (ET-04) . . . . .	124	Meier, G. (AH-05) . . . . .	14
Mangin, S. (GD-10) . . . . .	168	Meier, G. (EV-06) . . . . .	128
Mangin, S. (HD-04) . . . . .	197	Meier, G. (FF-03) . . . . .	140
Mangin, S. (HF-10) . . . . .	202	Meier, T. (AE-04) . . . . .	9
Manginas, G. (BB-12) . . . . .	35	Meinert, M. (DE-01) . . . . .	96
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Manna, P. (EP-09) . . . . .	117	Meng, G. (GH-08) . . . . .	175
Manolas, I. (HG-06) . . . . .	203	Meng, H. (GB-10) . . . . .	165
Manzin, A. (AC-05) . . . . .	5	Meng, K. (AD-01) . . . . .	6
Manzin, A. (FE-06) . . . . .	139	Meng, K. (AD-02) . . . . .	6
Mao, Y. (AU-16) . . . . .	29	Meng, K. (BR-06) . . . . .	53
Mao, Y. (CU-01) . . . . .	86	Meng, K. (BV-06) . . . . .	61
Maria, I. (EV-03) . . . . .	127	Meng, K. (BV-10) . . . . .	61
Markandeyulu, G. (BF-03) . . . . .	42	Meng, K. (ED-09) . . . . .	108
Marks, A. (HD-05) . . . . .	197	Meng, K. (GD-01) . . . . .	167
Marrows, C.H. (AS-04) . . . . .	24	Meng, Y. (HV-05) . . . . .	218
Marrows, C.H. (FE-07) . . . . .	139	Mentes, T.O. (CD-06) . . . . .	68
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Meunier, T. (DC-06) . . . . .	95	Mokrousov, Y. (AD-09) . . . . .	7
Mewes, T. (BV-03) . . . . .	60	Mokrousov, Y. (FA-04) . . . . .	131
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Otani, Y. (ET-13) .....	125	Park, J. (CU-03) .....	86
Otani, Y. (FF-02) .....	140	Park, J. (CU-08) .....	87
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Ovari, T.A. (EU-11) .....	127	Parmar, H. (GB-03) .....	164
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Pan, D. (HD-11) .....	198	Payza, O.F. (GH-03) .....	174
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Pan, F. (EC-03) .....	105	Pearson, J. (AA-05) .....	2
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Pan, S. (CV-01) .....	88	Peng, B. (AB-03) .....	3
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Pan, Y. (HQ-04) .....	209	Peng, B. (BU-07) .....	59
Panaccione, G. (BE-09) .....	41	Peng, B. (BU-13) .....	59
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Pang, H. (DG-08) .....	100	Peng, D. (AB-10) .....	4
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Park, C. (ES-10) .....	123	Peng, S. (FC-02) .....	134
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Park, E. (BV-05) .....	60	Peng, S. (HP-08) .....	208
Park, G. (CV-08) .....	88	Peng, X. (CS-04) .....	83
Park, G. (CV-11) .....	89	Peng, Y. (BQ-06) .....	50
Park, G. (CV-15) .....	89	Peng, Y. (EF-06) .....	110
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Radu, E. (EI-06) . . . . .	115	Ren, L. (BR-11) . . . . .	54
Radu, F. (AC-09) . . . . .	6	Ren, L. (FW-13) . . . . .	161
Radu, I.P. (FF-01) . . . . .	140	Ren, L. (GT-10) . . . . .	185
Radulov, I.A. (FD-01) . . . . .	136	Ren, L. (GW-07) . . . . .	191
Radulov, I.A. (HB-06) . . . . .	193	Ren, S. (EW-06) . . . . .	130
Radulov, I.A. (HW-04) . . . . .	220	Ren, T. (HF-08) . . . . .	201
Raghavan, G. (FD-10) . . . . .	137	Ren, W. (FI-07) . . . . .	146
Rahman, F.M. (GR-09) . . . . .	182	Ren, Y. (AC-08) . . . . .	6
Rahman, F.M. (HQ-15) . . . . .	210	Ren, Y. (BW-03) . . . . .	51
Rahman, M. (FG-08) . . . . .	143	Ren, Y. (CW-11) . . . . .	91
Rahman, M. (GG-09) . . . . .	173	Ren, Y. (EP-11) . . . . .	117
Rahmawati, D. (AC-10) . . . . .	6	Ren, Y. (EW-10) . . . . .	130
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Ramanujan, R.V. (FD-11) . . . . .	138	Rhyee, J. (HW-09) . . . . .	220
Ramanujan, R.V. (GB-03) . . . . .	164	Rhyu, S. (BS-07) . . . . .	55
Ramanujan, R.V. (GB-11) . . . . .	165	Rhyu, S. (HQ-10) . . . . .	210
Ramanujan, R.V. (GE-09) . . . . .	170	Rial, J. (GB-05) . . . . .	164
Ramasubramanian, L. (AE-02) . . . . .	8	Rial, J. (HB-09) . . . . .	194
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Ramaswamy, R. (CF-08) . . . . .	72	Ribeiro, P.M. (CV-07) . . . . .	88
Ramaswamy, R. (DE-02) . . . . .	96	Ribeiro, S. (DA-03) . . . . .	92
Ramaswamy, R. (GC-02) . . . . .	165	Rice, K. (CF-01) . . . . .	71
Rameshti, B. (GC-07) . . . . .	166	Richter, J. (BB-03) . . . . .	34
Ramezani, A. (EQ-14) . . . . .	119	Richter, K. (BB-08) . . . . .	35
Rana, B. (ED-05) . . . . .	107	Rinaldi, C. (BC-09) . . . . .	37
Rana, B. (FF-02) . . . . .	140	Rinaldi, C. (BE-09) . . . . .	41
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Randrianantoandro, N. (CS-02) . . . . .	83	Ripka, P. (BH-02) . . . . .	45
Rani, D. (BR-08) . . . . .	53	Ripka, P. (EU-10) . . . . .	127
Rani, J. (BR-09) . . . . .	54	Ritzmann, U. (HE-05) . . . . .	199
Ranno, L. (HE-01) . . . . .	198	Rivas, M. (AP-01) . . . . .	17
Rao, S. (HC-02) . . . . .	195	Rizzi, P. (EV-02) . . . . .	127
Rao, W. (EU-01) . . . . .	126	Robert, S. (GW-08) . . . . .	191
Rao, X. (EA-05) . . . . .	102	Robertson, W. (FG-10) . . . . .	143
Rao, Y. (ET-05) . . . . .	124	Rode, K. (AD-05) . . . . .	7
Rao, Z. (FG-05) . . . . .	143	Rode, K. (FC-10) . . . . .	135
Rasly, M. (HD-11) . . . . .	198	Rodionova, V. (BB-07) . . . . .	35
Rasmussen, P.O. (HG-02) . . . . .	202	Rodionova, V.V. (BB-06) . . . . .	35
Rastogi, A. (BV-03) . . . . .	60	Rodrigues, D. (HP-09) . . . . .	208
Rastogi, P. (CP-02) . . . . .	76	Rodriguez, L. (CC-04) . . . . .	66
Rastogi, P. (CP-04) . . . . .	76	Roehlsberger, R. (AH-05) . . . . .	14
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Rastogi, P. (CP-07) . . . . .	77	Roehlsberger, R. (GW-15) . . . . .	191
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Rathi, A. (FI-06) . . . . .	146	Rogalev, A. (FB-11) . . . . .	133
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Rausch, T. (AF-01) . . . . .	10	Rogalev, A. (GW-01) . . . . .	190
Rausch, T. (DF-04) . . . . .	98	Rogalev, A. (GW-03) . . . . .	190
Rausch, T. (EF-06) . . . . .	110	Rogers, M. (DB-03) . . . . .	93
Rausch, T. (EF-08) . . . . .	110	Rohrmann, H. (BB-03) . . . . .	34
Ravelosona, D. (AR-08) . . . . .	22	Rojas-Sánchez, J. (AI-01) . . . . .	15
Ravelosona, D. (CD-03) . . . . .	67	Rojas-Sánchez, J. (GD-02) . . . . .	167
Ravelosona, D. (EW-13) . . . . .	130	Rojas-Sánchez, J. (GD-10) . . . . .	168
Ravelosona, D. (GC-01) . . . . .	165	Romero-Muñiz, C. (FD-01) . . . . .	136
Rawat, R. (EH-11) . . . . .	114	Ropers, C. (CC-01) . . . . .	65
Rawat, R. (FI-04) . . . . .	146	Rosa, P. (GE-05) . . . . .	169
Re, M.E. (EF-06) . . . . .	110	Rosamond, M. (FI-02) . . . . .	146
Rea, C.J. (DF-04) . . . . .	98	Rosamond, M. (HE-06) . . . . .	199
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Reese, B.A. (CG-03) . . . . .	73	Rosenberg, J. (AP-14) . . . . .	19
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Schegner, P. (HW-05) . . . . .	220	Serrate, C.H. (CP-15) . . . . .	78
Schegner, P. (HX-02) . . . . .	221	Sessoli, R. (HA-03) . . . . .	192
Scheike, T. (GW-09) . . . . .	191	Setiawan, A.D. (AC-10) . . . . .	6
Scherf, L.M. (GB-01) . . . . .	163	Sha, R. (FP-09) . . . . .	148
Scherf, L.M. (GB-12) . . . . .	165	Shadman, A. (HC-01) . . . . .	195
Scheuer, L. (GD-07) . . . . .	168	Shah, S. (BW-04) . . . . .	52
Schiefer, M. (GH-06) . . . . .	174	Shah, S.A. (BF-10) . . . . .	43
Schiefer, M. (GH-09) . . . . .	175	Shah, S.A. (EI-02) . . . . .	114
Schlage, K. (AH-05) . . . . .	14	Shahbazi, K. (HE-06) . . . . .	199
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Schneider, M. (FF-11) . . . . .	142	Shangguan, Y. (HX-01) . . . . .	221
Schöbitz, M. (CD-06) . . . . .	68	Shao, Y. (CU-14) . . . . .	87
Schoen, M. (CF-01) . . . . .	71	Shao, Z. (AB-02) . . . . .	3
Schönhöbel, A.M. (HB-03) . . . . .	193	Shao, Z. (EP-13) . . . . .	117
Schöps, S. (EE-03) . . . . .	109	Shaposhnikov, A. (EB-10) . . . . .	104
Schott, M. (HE-01) . . . . .	198	Shaposhnikov, A. (FV-09) . . . . .	159
Schowalter, M. (AE-04) . . . . .	9	Sharaevskaia, A. (GF-06) . . . . .	171
Schrefl, T. (CS-08) . . . . .	83	Sharaevsky, Y. (FV-02) . . . . .	158
Schulte, B. (AE-05) . . . . .	9	Sharaevsky, Y. (GF-10) . . . . .	172
Schulte, B. (FF-03) . . . . .	140	Sharif, R. (BF-10) . . . . .	43
Schultheiss, H. (BV-02) . . . . .	60	Sharma, H. (GD-09) . . . . .	168
Schulz, S.E. (AE-02) . . . . .	8	Sharma, P. (BB-02) . . . . .	34
Schulze, J. (EB-08) . . . . .	104	Sharma, P. (HB-07) . . . . .	194
Schumacher, H. (AC-05) . . . . .	5	Sharma, R. (CE-07) . . . . .	70
Schutte, B. (CW-16) . . . . .	91	Sharma, S. (GC-07) . . . . .	166
Schütz, G. (FE-09) . . . . .	140	Sharma, S. (HB-06) . . . . .	193
Schütz, G. (FF-05) . . . . .	141	Sharma, V.K. (FD-04) . . . . .	136
Schütz, G. (FF-06) . . . . .	141	Sharmin, S. (EV-14) . . . . .	129
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Schweicher, G. (HD-05) . . . . .	197	Shaw, C. (CS-06) . . . . .	83
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Sebald, G. (EB-02) . . . . .	103	Shaw, J.M. (CF-01) . . . . .	71
Sebald, G. (EW-04) . . . . .	129	Shaw, J.M. (FF-08) . . . . .	141
Sebald, G. (GT-05) . . . . .	184	Shen, B. (GR-05) . . . . .	181
Seifert, J. (HW-05) . . . . .	220	Shen, D. (GA-03) . . . . .	163
Seigler, M.A. (EF-06) . . . . .	110	Shen, H. (FH-11) . . . . .	145
Seki, T. (DE-04) . . . . .	97	Shen, J. (EH-01) . . . . .	112
Sekino, M. (EI-08) . . . . .	115	Shen, J. (HS-02) . . . . .	213
Seleznyova, K. (GE-05) . . . . .	169	Shen, M. (FV-06) . . . . .	158
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Sen, S. (EH-03) . . . . .	113	Shen, W. (HV-11) . . . . .	219
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Seo, K. (AQ-04) . . . . .	20	Sheng, P. (FE-02) . . . . .	138
Seo, M. (FQ-03) . . . . .	149	Sheng, P. (GW-11) . . . . .	191
Seo, M. (GS-10) . . . . .	183	Sherpa, P.N. (CF-11) . . . . .	72
Seo, S. (AT-02) . . . . .	25	Sherpa, P.N. (GW-05) . . . . .	190
Seo, S. (CT-05) . . . . .	84	Sheshukova, S. (FV-02) . . . . .	158
Seo, S. (GS-04) . . . . .	183	Sheshukova, S. (GF-10) . . . . .	172
Seoane, A. (GB-05) . . . . .	164	Sheth, N.K. (EA-04) . . . . .	102
Seol, H. (GV-12) . . . . .	189	Sheth, N.K. (FB-04) . . . . .	132
Sepehri-Amin, H. (EF-04) . . . . .	110	Sheth, N.K. (FB-08) . . . . .	133
Sepehri-Amin, H. (EF-07) . . . . .	110	Shi, B. (GI-10) . . . . .	177
Sepehri-Amin, H. (HB-02) . . . . .	193	Shi, B. (GI-12) . . . . .	177
Sepehri-Amin, H. (HC-07) . . . . .	196	Shi, B. (HV-05) . . . . .	218
Serantes, D. (BI-04) . . . . .	47	Shi, C. (HS-03) . . . . .	213
Serdobintsev, A. (FV-02) . . . . .	158	Shi, G. (DE-05) . . . . .	97
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Serga, O. (FV-07) . . . . .	158	Shi, J. (GE-08) . . . . .	170
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Shi, Y. (FG-09) . . . . .	143	Silveira, M.A. (DG-07) . . . . .	99
Shibahara, Y. (GI-08) . . . . .	176	Sim, J. (BS-13) . . . . .	56
Shibata, N. (AC-02) . . . . .	5	Sim, J. (GV-06) . . . . .	188
Shibayama, T. (AC-03) . . . . .	5	Sim, K. (CU-08) . . . . .	87
Shih, C. (CS-06) . . . . .	83	Sima, W. (CW-01) . . . . .	90
Shih, P. (DH-08) . . . . .	101	Sima, W. (FW-11) . . . . .	161
Shima, T. (HW-06) . . . . .	220	Sima, W. (GT-06) . . . . .	184
Shimada, Y. (AE-08) . . . . .	9	Sima, W. (HI-06) . . . . .	206
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Wang, Z. (FW-13).....	161	Wiebe, J. (GE-03).....	169
Wang, Z. (GT-09).....	185	Wiesendanger, R. (CA-02).....	62
Wang, Z. (GT-10).....	185	Wiesendanger, R. (EP-07).....	117
Warisam, C. (GI-02).....	176	Wiesendanger, R. (GE-03).....	169
Warisam, C. (GI-03).....	176	Wiesendanger, R. (HF-01).....	200
Warisam, C. (HV-04).....	218	Wild, J. (AE-04).....	9
Warisam, C. (HV-15).....	219	Wilhelm, F. (FB-11).....	133
Warmuth, J. (EP-07).....	117	Wilhelm, F. (FE-01).....	138
Warmuth, J. (GE-03).....	169	Wilhelm, F. (GW-03).....	190
Warot-Fonrose, B. (AC-06).....	5	Wille, H. (EV-06).....	128
Wartelle, A. (CD-06).....	68	Williame, J. (DD-05).....	96
Watanabe, K. (HC-03).....	195	Williams, W. (FG-06).....	143
Watanabe, T. (HC-05).....	195	Willing, S. (AH-05).....	14
Watanabe, Y. (EQ-02).....	118	Willing, S. (GW-15).....	191
Water, W. (CH-07).....	75	Willke, P. (HA-06).....	192
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Watts, S. (HC-08).....	196	Wintz, S. (AE-05).....	9
Wee, T. (GA-02).....	162	Wintz, S. (FF-05).....	141
Wegst, U.G. (CG-04).....	73	Witte, R. (CB-05).....	64
Wehbe, N. (CR-07).....	81	Witteveen, J. (GC-05).....	166
Wei, D. (BR-10).....	54	Wittmann, A.D. (HD-05).....	197
Wei, D. (CR-10).....	82	Wittrock, S. (BD-06).....	39
Wei, D. (DF-02).....	98	Wolf, G. (HC-08).....	196
Wei, D. (HT-05).....	214	Won, J. (GP-07).....	178
Wei, D. (HT-07).....	215	Wong, D.H. (FG-04).....	143
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Wong, H. (FS-12)	153
Wong, H. (GC-06)	166
Wong, J. (GA-02)	162
Wong, K. (FC-09)	135
Wong, S. (BD-07)	39
Wong, Y. (BU-10)	59
Wongsathan, R. (GI-05)	176
Wongsuthavas, S. (BQ-15)	51
Wongtrairat, W. (BQ-15)	51
Woo, K. (FU-11)	157
Woo, S. (GA-02)	162
Woo, S. (HE-03)	199
Wortmann, J. (HW-04)	220
Wrona, J. (FC-11)	135
Wu, A.Q. (EF-06)	110
Wu, B. (BR-02)	53
Wu, C. (AD-06)	7
Wu, C. (BG-11)	44
Wu, C. (CB-07)	64
Wu, C. (EQ-13)	119
Wu, D. (BV-01)	60
Wu, D. (FC-09)	135
Wu, G. (EH-07)	113
Wu, G. (EQ-13)	119
Wu, H. (AR-12)	23
Wu, H. (CC-07)	66
Wu, H. (CR-07)	81
Wu, H. (ED-01)	107
Wu, H. (FC-09)	135
Wu, H. (FE-04)	139
Wu, J. (BS-16)	56
Wu, J. (CQ-13)	80
Wu, J. (EP-09)	117
Wu, J. (FV-12)	159
Wu, J. (GW-04)	190
Wu, L. (AT-07)	26
Wu, L. (CC-07)	66
Wu, L. (CU-02)	86
Wu, L. (GT-01)	184
Wu, Q. (BU-03)	58
Wu, Q. (BU-12)	59
Wu, Q. (EU-06)	126
Wu, Q. (FB-02)	132
Wu, R. (GI-04)	176
Wu, S. (CG-10)	74
Wu, S. (DG-03)	99
Wu, S. (FH-01)	144
Wu, S. (GH-02)	174
Wu, S. (GH-10)	175
Wu, S. (HS-09)	213
Wu, S. (HV-09)	219
Wu, T. (AR-14)	23
Wu, T. (CR-07)	81
Wu, W. (AS-07)	24
Wu, W. (CR-11)	82
Wu, W. (GS-01)	182
Wu, X. (BW-03)	51
Wu, X. (CW-11)	91
Wu, X. (EW-10)	130
Wu, X. (FS-08)	153
Wu, X. (GE-04)	169
Wu, Y. (AD-01)	6
Wu, Y. (AG-11)	13
Wu, Y. (AH-07)	14
Wu, Y. (BQ-07)	50
Wu, Y. (BR-06)	53
Wu, Y. (BV-06)	61
Wu, Y. (BV-10)	61
Wu, Y. (CP-12)	77
Wu, Y. (DC-04)	95
Wu, Y. (DE-02)	96
Wu, Y. (EA-02)	102
Wu, Y. (ED-09)	108
Wu, Y. (GD-01)	167
Wu, Y. (HC-02)	195
Wu, Y. (HF-05)	201

Wu, Z. (AT-11)	26
Wu, Z. (FT-06)	154
Wunderle, T. (DA-04)	92
Wunderlich, J. (AA-04)	2
Wunderlich, J. (CD-07)	68
Wunderlich, J. (HD-05)	197
Wunsch, B. (HH-01)	204

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Xavier, S. (GF-09)	172
Xi, W. (FB-02)	132
Xia, C. (DH-01)	100
Xia, H. (EU-02)	126
Xia, J. (CQ-13)	80
Xia, J. (CQ-14)	80
Xia, J. (HE-07)	199
Xia, J. (HF-02)	200
Xia, T. (GR-13)	182
Xia, W. (CP-13)	77
Xia, Y. (CU-02)	86
Xia, Y. (HR-11)	212
Xiang, Q. (AQ-16)	21
Xiang, Q. (FC-03)	134
Xiang, Z. (BS-10)	55
Xiang, Z. (FR-09)	151
Xiao, F. (FQ-08)	149
Xiao, F. (HH-06)	205
Xiao, F. (HU-07)	216
Xiao, J. (AT-08)	26
Xiao, L. (AU-13)	28
Xiao, L. (EQ-05)	119
Xiao, L. (GR-10)	182
Xiao, L. (HQ-07)	209
Xiao, S. (HG-01)	202
Xiao, Y. (AU-12)	28
Xiao, Y. (FV-10)	159
Xiao, Y. (FV-11)	159
Xie, C. (FV-10)	159
Xie, C. (FV-11)	159
Xie, G. (BQ-05)	50
Xie, H. (HF-05)	201
Xie, J. (BB-10)	35
Xie, K. (HQ-04)	209
Xie, K. (HS-10)	213
Xie, M. (HG-11)	203
Xie, Q. (GE-04)	169
Xie, Q. (HF-07)	201
Xie, W. (GE-04)	169
Xie, Y. (HR-07)	211
Xing, D. (GP-14)	179
Xing, F. (CU-07)	86
Xing, F. (CU-10)	87
Xing, F. (ER-13)	121
Xing, Z. (CG-12)	74
Xiong, F. (FW-06)	160
Xiong, F. (HR-12)	212
Xiong, J. (GR-05)	181
Xiong, L. (AE-06)	9
Xiong, L. (GF-07)	171
Xu, C. (FC-10)	135
Xu, D. (CT-02)	84
Xu, D. (FT-04)	154
Xu, D. (GU-01)	186
Xu, F. (EP-12)	117
Xu, F. (ET-08)	125
Xu, G. (CP-13)	77
Xu, G. (HX-09)	222
Xu, H. (AT-08)	26
Xu, H. (EU-06)	126
Xu, J. (AP-04)	18
Xu, J. (AQ-02)	19
Xu, L. (FU-07)	156
Xu, L. (GG-05)	173
Xu, L. (HQ-05)	209
Xu, M. (AT-13)	26
Xu, M. (CT-07)	85

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Xu, M. (ED-05) . . . . .	107	Yamada, K. (CF-06) . . . . .	71
Xu, Q. (FT-15) . . . . .	155	Yamada, K. (ET-16) . . . . .	125
Xu, Q. (HR-07) . . . . .	211	Yamada, M. (AR-10) . . . . .	22
Xu, R. (FE-04) . . . . .	139	Yamada, M. (AT-09) . . . . .	26
Xu, R. (GT-04) . . . . .	184	Yamada, M. (ER-02) . . . . .	120
Xu, R. (HH-05) . . . . .	204	Yamada, M. (FR-07) . . . . .	151
Xu, W. (BS-02) . . . . .	54	Yamada, M. (GV-08) . . . . .	189
Xu, W. (EQ-03) . . . . .	118	Yamada, M. (HD-07) . . . . .	197
Xu, W. (ER-09) . . . . .	121	Yamada, S. (AR-10) . . . . .	22
Xu, W. (FW-06) . . . . .	160	Yamada, S. (HD-08) . . . . .	197
xu, W. (GQ-09) . . . . .	180	Yamada, S. (HD-09) . . . . .	198
Xu, W. (GT-08) . . . . .	185	Yamada, T. (BH-09) . . . . .	46
Xu, W. (HR-12) . . . . .	212	Yamada, T. (FT-09) . . . . .	155
Xu, X. (AD-01) . . . . .	6	Yamada, T. (GG-03) . . . . .	172
Xu, X. (AP-07) . . . . .	18	Yamagishi, A. (GU-03) . . . . .	186
Xu, X. (BR-02) . . . . .	53	Yamaguchi, A. (CF-06) . . . . .	71
Xu, X. (BR-06) . . . . .	53	Yamaguchi, M. (AQ-09) . . . . .	20
Xu, X. (BU-03) . . . . .	58	Yamaguchi, M. (CE-06) . . . . .	70
Xu, X. (BV-06) . . . . .	61	Yamaguchi, Y. (BU-01) . . . . .	58
Xu, X. (BV-10) . . . . .	61	Yamamoto, M. (EC-08) . . . . .	106
Xu, X. (EC-01) . . . . .	105	Yamamoto, S. (CB-01) . . . . .	63
Xu, X. (ED-09) . . . . .	108	Yamamoto, S. (CB-02) . . . . .	64
Xu, X. (EP-06) . . . . .	117	Yamamoto, T. (BD-01) . . . . .	38
Xu, X. (EP-08) . . . . .	117	Yamamoto, T. (EC-01) . . . . .	105
Xu, X. (FC-12) . . . . .	136	Yamamoto, T. (FC-08) . . . . .	135
Xu, X. (FR-15) . . . . .	152	Yamamoto, T. (FP-07) . . . . .	148
Xu, X. (GD-01) . . . . .	167	Yamamoto, T. (HI-07) . . . . .	206
Xu, X. (GW-09) . . . . .	191	Yamanaka, K. (ER-12) . . . . .	121
Xu, Y. (AH-07) . . . . .	14	Yamane, K. (BD-09) . . . . .	39
Xu, Y. (AU-13) . . . . .	28	Yamane, K. (GA-02) . . . . .	162
Xu, Y. (BR-13) . . . . .	54	Yamashita, A. (BU-01) . . . . .	58
Xu, Y. (CQ-13) . . . . .	80	Yamauchi, J. (AQ-10) . . . . .	20
Xu, Y. (DH-07) . . . . .	101	Yan, A. (AB-09) . . . . .	4
Xu, Y. (EH-02) . . . . .	112	Yan, A. (BU-04) . . . . .	58
Xu, Y. (EP-01) . . . . .	116	Yan, A. (BU-05) . . . . .	59
Xu, Y. (EP-02) . . . . .	116	Yan, A. (BU-11) . . . . .	59
Xu, Y. (EQ-05) . . . . .	119	Yan, A. (FB-12) . . . . .	133
Xu, Y. (EU-01) . . . . .	126	Yan, B. (AU-04) . . . . .	27
Xu, Y. (FS-08) . . . . .	153	Yan, B. (AW-11) . . . . .	32
Xu, Y. (FV-12) . . . . .	159	Yan, B. (BT-15) . . . . .	58
Xu, Y. (GG-04) . . . . .	173	Yan, B. (GR-07) . . . . .	181
Xu, Y. (GR-10) . . . . .	182	Yan, D. (DH-01) . . . . .	100
Xu, Y. (GU-04) . . . . .	186	Yan, J. (EP-14) . . . . .	118
Xu, Y. (GW-04) . . . . .	190	Yan, J. (FG-01) . . . . .	142
Xu, Y. (HQ-01) . . . . .	209	Yan, M. (AB-03) . . . . .	3
Xu, Y. (HQ-02) . . . . .	209	Yan, M. (BU-07) . . . . .	59
Xu, Y. (HQ-05) . . . . .	209	Yan, M. (BU-13) . . . . .	59
Xu, Y. (HQ-07) . . . . .	209	Yan, M. (CB-07) . . . . .	64
Xu, Z. (AU-07) . . . . .	28	Yan, M. (GR-06) . . . . .	181
Xu, Z. (CU-09) . . . . .	87	Yan, M. (HB-05) . . . . .	193
Xu, Z. (EP-12) . . . . .	117	Yan, N. (FR-13) . . . . .	151
Xu, Z. (EP-13) . . . . .	117	Yan, N. (HX-06) . . . . .	221
Xu, Z. (ET-08) . . . . .	125	Yan, P. (FV-14) . . . . .	159
Xuan, L. (AW-02) . . . . .	31	Yan, Q. (FQ-02) . . . . .	149
Xue, M. (AB-02) . . . . .	3	Yan, R. (HX-05) . . . . .	221
Xue, M. (EP-13) . . . . .	117	Yan, S. (FW-13) . . . . .	161
Xue, S. (GS-09) . . . . .	183	Yan, S. (GT-10) . . . . .	185
Xue, X. (ET-09) . . . . .	125	Yan, X. (BH-04) . . . . .	45
		Yan, X. (FP-03) . . . . .	147
		Yan, Y. (CW-04) . . . . .	90
		Yan, Y. (GW-04) . . . . .	190
		Yan, Y. (HP-06) . . . . .	208
		Yanagihara, H. (BF-01) . . . . .	41
		Yanagihara, H. (BP-03) . . . . .	48
		Yanagihara, H. (EV-14) . . . . .	129
		Yanagihara, H. (GW-12) . . . . .	191
		Yanagihara, H. (HF-09) . . . . .	201
		Yanai, T. (AV-10) . . . . .	30
		Yanai, T. (BU-01) . . . . .	58
		Yanai, T. (BU-02) . . . . .	58
		Yanai, T. (CE-06) . . . . .	70
		Yanai, T. (CS-01) . . . . .	82
		Yang, B. (ED-11) . . . . .	108
		Yang, B. (HF-07) . . . . .	201
		Yang, B. (HP-06) . . . . .	208
		Yang, B. (HW-07) . . . . .	220

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Yang, C. (AS-07).....	24	Yang, Y. (AB-02).....	3
Yang, C. (CR-11).....	82	Yang, Y. (AH-07).....	14
Yang, C. (CS-05).....	83	Yang, Y. (AS-13).....	25
Yang, C. (CS-06).....	83	Yang, Y. (AU-04).....	27
Yang, D. (CC-07).....	66	Yang, Y. (BQ-13).....	51
Yang, F. (FG-01).....	142	Yang, Y. (BT-15).....	58
Yang, F. (FG-11).....	143	Yang, Y. (BW-05).....	52
Yang, F. (GH-08).....	175	Yang, Y. (CH-05).....	75
Yang, G. (AU-03).....	27	Yang, Y. (CS-04).....	83
Yang, G. (BS-12).....	56	Yang, Y. (DE-02).....	96
Yang, G. (GR-13).....	182	Yang, Y. (EP-13).....	117
Yang, H. (AF-07).....	11	Yang, Y. (GA-03).....	163
Yang, H. (AG-10).....	13	Yang, Y. (HF-05).....	201
Yang, H. (BD-09).....	39	Yang, Y. (HF-08).....	201
Yang, H. (BP-09).....	49	Yang, Y. (HR-05).....	211
Yang, H. (BV-07).....	61	Yang, Y. (HS-11).....	214
Yang, H. (CF-08).....	72	Yang, Z. (AU-05).....	27
Yang, H. (CT-07).....	85	Yang, Z. (CG-10).....	74
Yang, H. (DC-01).....	94	Yano, M. (CS-08).....	83
Yang, H. (DC-04).....	95	Yao, A. (FT-05).....	154
Yang, H. (DE-02).....	96	Yao, A. (GV-09).....	189
Yang, H. (ED-03).....	107	Yao, K. (DC-03).....	95
Yang, H. (EH-08).....	113	Yao, T. (DG-03).....	99
Yang, H. (ER-11).....	121	Yap, Q. (BD-07).....	39
Yang, H. (FC-11).....	135	Yarmolich, M. (HW-09).....	220
Yang, H. (FV-14).....	159	Yasuhira, M. (HC-05).....	195
Yang, H. (GA-02).....	162	Yazdan, T. (BS-08).....	55
Yang, H. (GC-02).....	165	Yazdan, T. (EG-04).....	111
Yang, H. (GP-08).....	178	Ye, C. (BS-02).....	54
Yang, H. (GW-07).....	191	Ye, C. (ER-09).....	121
Yang, H. (HD-04).....	197	Ye, C. (FW-06).....	160
Yang, H. (HP-08).....	208	Ye, C. (HR-12).....	212
Yang, H. (HR-08).....	211	Ye, L. (CQ-13).....	80
Yang, H. (HU-03).....	216	Ye, X. (BT-07).....	57
Yang, J. (AB-02).....	3	Yedeas, M.A. (EI-08).....	115
Yang, J. (AR-09).....	22	Yefremenko, V. (EV-03).....	127
Yang, J. (AS-02).....	23	Yen, C. (EI-09).....	116
Yang, J. (EP-13).....	117	Yen, H. (AD-06).....	7
Yang, J. (FW-06).....	160	Yenugonda, V. (BR-08).....	53
Yang, J. (HR-12).....	212	Yesilyurt, C. (EH-09).....	113
Yang, K. (DH-08).....	101	Yi, G. (EI-07).....	115
Yang, M. (CW-01).....	90	Yi, J. (AQ-01).....	19
Yang, M. (EQ-08).....	119	Yildirim, O. (AE-02).....	8
Yang, M. (FW-11).....	161	Yildirim, O. (CF-09).....	72
Yang, M. (GT-06).....	184	Yildirim, O. (FE-10).....	140
Yang, M. (HI-06).....	206	Yildirim, E. (FH-09).....	145
Yang, M. (HP-05).....	208	Yin, H. (EF-06).....	110
Yang, P. (BD-09).....	39	Yin, L. (CW-04).....	90
Yang, P. (DE-03).....	97	Yin, M. (GH-04).....	174
Yang, Q. (AQ-14).....	21	Yin, M. (GH-07).....	175
Yang, Q. (BW-01).....	51	Yin, S. (GQ-13).....	180
Yang, Q. (BW-02).....	51	Yin, W. (AB-09).....	4
Yang, Q. (ET-05).....	124	Yin, W. (BU-06).....	59
Yang, Q. (ET-14).....	125	Yin, X. (CR-07).....	81
Yang, Q. (GH-05).....	174	Yin, Z. (BG-02).....	43
Yang, Q. (GQ-07).....	180	Yin, Z. (BS-09).....	55
Yang, Q. (GQ-10).....	180	Ying, L. (HI-02).....	205
Yang, Q. (GT-15).....	185	Ying, W.C. (CD-11).....	69
Yang, Q. (HI-03).....	206	Ying, Z. (FP-10).....	148
Yang, Q. (HI-11).....	207	Yoda, H. (BD-04).....	38
Yang, S. (CF-07).....	72	Yoda, H. (BP-01).....	48
Yang, W. (AB-02).....	3	Yoda, H. (ED-07).....	108
Yang, W. (AP-06).....	18	Yoda, H. (GA-06).....	163
Yang, W. (CP-08).....	77	Yokoi, Y. (AU-01).....	27
Yang, W. (EP-13).....	117	Yoo, H. (CV-08).....	88
Yang, W. (FV-14).....	159	Yoo, H. (CV-15).....	89
Yang, X. (BT-09).....	57	Yoo, J. (FB-03).....	132
Yang, X. (BU-04).....	58	Yoo, S. (AQ-11).....	20
Yang, X. (BU-05).....	59	Yoon, J. (EU-08).....	126
Yang, X. (BU-11).....	59	Yoon, M. (BS-13).....	56
Yang, X. (BW-03).....	51	Yoon, S. (GI-06).....	176
Yang, X. (CT-15).....	85	Yoong, H. (DE-03).....	97
Yang, X. (CW-11).....	91	Yoong, H. (GD-11).....	168
Yang, X. (ER-13).....	121	Yoshida, C. (BE-06).....	40
Yang, X. (EW-10).....	130	Yoshimura, R. (CD-11).....	69
Yang, X. (FV-06).....	158	Yoshimura, S. (EV-01).....	127

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Zhang, C. (FB-12)	133	Zhang, L. (HU-02)	216
Zhang, C. (FU-15)	157	Zhang, M. (AG-01)	12
Zhang, C. (GG-05)	173	Zhang, M. (BB-10)	35
Zhang, C. (GH-02)	174	Zhang, M. (FW-01)	160
Zhang, C. (GH-05)	174	Zhang, M. (HF-05)	201
Zhang, C. (GI-12)	177	Zhang, M. (HW-08)	220
Zhang, C. (GR-07)	181	Zhang, M.N. (FP-12)	148
Zhang, C. (HI-03)	206	Zhang, N. (CP-16)	78
Zhang, C. (HI-11)	207	Zhang, P. (CT-07)	85
Zhang, C. (HR-11)	212	Zhang, P. (DE-05)	97
Zhang, D. (BH-04)	45	Zhang, P. (GQ-01)	179
Zhang, D. (BU-12)	59	Zhang, Q. (BU-04)	58
Zhang, D. (BU-14)	59	Zhang, Q. (CW-04)	90
Zhang, D. (CT-10)	85	Zhang, Q. (EH-06)	113
Zhang, D. (CU-15)	87	Zhang, R. (EH-02)	112
Zhang, D. (CV-01)	88	Zhang, S. (BT-01)	56
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