

Newsletter

November 2018

'Informational Dispersion of Spin-Wave Dispersion': image of spin-wave dispersion of SmFe12. Credit: Taro Fukazawa (National Institute of Advanced Industrial Science and Technology, Japan).

Newsletter of the IEEE Magnetics Society

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From the President

By **Manuel Vázquez**, *President of the IEEE Magnetics Society*

The short interval between the April 2018 INTERMAG Conference in Singapore and the July 2018 ICM meeting in San Francisco, meant that we delayed some meetings of the Magnetics Society, including that of the Administrative Committee (AdCom), until the January 2019 Joint MMM/INTERMAG Conference.



However, the AdCom has been very active in recent months. The Message Board has proven to be a very efficient tool for discussing and solving various matters online. A number of motions, mostly related to financial issues, finalizing the remaining 2018 budget and new projects for 2019, were subject to votes online, using this Forum.

As mentioned, our next flagship meeting is the **Joint MMM/INTERMAG Conference** to be held in Washington, DC, USA during January 14-18, 2019. It will be chaired by Suzanne te Velthuis. We anticipate that the conference will be a great success, and I hope many of us will meet there.

The call for students to apply for and to attend the forthcoming 2019 Summer School at Virginia University in Richmond, VA, USA during June 2-7, 2019 is still open. We expect that the Summer School will be very successful, and students will again have the possibility of proposing and developing small projects in teams of five. Two such teams will receive a financial grant to undertake their projects.

The results of the important election of the President-Elect and the new Treasurer/Secretary for the 2019-2020 term (voted by voting AdCom members) will shortly be announced. In addition, the result of elections for eight positions on the AdCom (voted by all Society members), will be also announced soon.

New Senior Members

The following members of the IEEE Magnetics Society were recently elevated to the grade of Senior Member:

August 2018: Jiming Bao, Rudolf Schaefer and Daniel Fodorean.

October 2018: Yacine Amara, Daniel Roesler, Mark Schultz and Shinji Yuasa.

For more information on elevation to Senior Member, visit the [IEEE Senior Member Grade Web page](#).

I had the opportunity to join the team visiting the candidate sites for the 2023 INTERMAG Conference in the Asia Pacific region. All three candidates—Sendai (Japan), Daejeon (Korea) and Sydney (Australia)—are very highly qualified and would deserve selection. The final decision will be shortly determined via a vote of the Conference Executive Committee.

While I am writing this column, the face-to-face Society review meeting with the IEEE Society/Council Review Committee (SCRC) has just taken place. As you know, this is a review of the activities carried out by the Society during the last five years, from all points of view including Strategy and Governance, Conferences, Education, Publications, Finances, Membership and Technical. Examples of best practices and particularly successful new initiatives were highlighted, such as geographical and gender diversity in governing bodies or in education (student-led projects); conferences (new Magnetic Frontiers), Distinguished Lecturers and the Technical Roadmap. I have the feeling that the Society's actions have been considered very positively. In a few weeks we will receive comments from the SCRC.

Finally, my term as President of the IEEE Magnetics Society comes to a close at the end of the year. This is my last column in the Newsletter as President, and I would like to send a personal message of acknowledgement to all Society members, especially to AdCom members and the Committee Chairs, whose contributions and support have allowed for successful accomplishments during the last two years. Sharing views and discussions within the Society has certainly been an enriching experience for me. I will continue serving the Society as Past President and remain at your disposal for anything that the Society may need.

25th International Workshop on Rare-Earth and Future Permanent Magnets and their Applications (REPM 2018)

Submitted by Jinbo Yang, Workshop Chair

During August 26-30, 2018, the 25th International Workshop on Rare Earth and Future Permanent Magnets and their Applications (REPM 2018) was held successfully at Peking University, in Beijing, China. The conference was hosted by the Applied Magnetics Research Center of Peking University. It was co-sponsored by Beijing University of Technology, the Chinese Academy of Science's Ningbo Institute of Materials Technology & Engineering, China Iron and Steel Technology Group Corporation, Zhongke Sanhuan High-Tech Company and the Chinese Academy of Engineering. REPM is the most important international conference series in the field of permanent



Attendees of REPM 2018 in Beijing.

magnets. It brings together scientists and engineers from around the world to share recent research work, and to cooperate on the research and development of magnetic materials. The goal is to improve the research, development and application of permanent-magnet materials worldwide, to promote the civilization and progress of human society.

The conference attracted more than 400 experts, scholars and industry personnel, from 23 countries around the world. The conference covered both traditional areas of research as well as new research trends. The main topics included:

- Resources, extraction and recycling;
- RE-Fe-B magnets and properties;
- Coercivity and magnetic hardening mechanism of magnetic materials;
- Ce-substitution of RE-Fe-B magnets;
- Processing and properties of magnets;
- Non-rare earth-based magnets;
- Thin film and nanocomposite magnetic materials;
- Advanced characterization techniques and methods; and
- Permanent magnet applications.

The Conference Chair Prof. Jinbo Yang of Peking University presided over the opening ceremony, which described the overall situation and schedule of the conference and introduced its main subjects. Academician Wang Chen, Vice President of the Chinese Academy of Engineering, then gave a welcome speech. He first welcomed the visits of scholars from all over the world, and emphasized the important value of scientific research fields and cultural exchanges between

countries in the global era. Finally, he expressed his heartfelt congratulations on the convening of the conference.

Wonderful academic talks were given by Prof. J. M. D. Coey, a well-known scholar in the field of condensed-matter physics and magnetism, Dr. Masato Sagawa, the inventor of NdFeB magnets, as well as other professors and scholars. The talks focused on the progress in research on permanent-magnet materials and prospects for their applications.



Attendees at REPM 2018 listen to presentations during the oral sessions.

The conference was held simultaneously in three sessions, including oral and poster sessions. The academic atmosphere inside and outside the conference venue was strong, with enthusiastic participants sharing their results and exchanging research ideas. The poster exhibition area attracted many visitors and promoted the coming-together of ideas among scholars from different countries, and in different fields of study.

After four days of in-depth academic exchanges, REPM 2018 ended in the afternoon of August 30 with warm applause. Five scientists were presented with Outstanding Achievement awards for their contribution to the research and development of permanent-magnet materials in the past few decades - Prof. J. M. D. Coey, Prof. Jiaping Liu, Dr. Zhengxi Wang, Prof. Kazuhiro Hono and Dr. Takehisa Minowa. The Best Poster and Travel awards were also given in the closing ceremony.

Finally, Prof. George Hadjipanayis of the University of Delaware in the USA, welcomed everyone to the United States as Chair of the next REPM Workshop in 2020.



REPM 2018 award recipients.

IEEE Magnetics Society 2019 Distinguished Service Award

By Ron Goldfarb

In 2016 the IEEE Magnetics Society Distinguished Service Award was established to honor outstanding service to the Magnetics Society. Recipients are characterized by sustained voluntary service significantly beyond the typical. The award is presented at the INTERMAG Conference each year and consists of a certificate and cash prize.



The recipient for 2019 is **David Jiles** of Iowa State University in the U.S. He receives the 2019 Distinguished Service Award for twenty years of leadership in the Magnetics Society as Editor and Editor-in-Chief of *IEEE Transactions on Magnetics* and as an elected member of the Society's Administrative Committee.

David joined the IEEE in 1984 and since then has been a Member, Senior Member, Fellow (1994), and Life Fellow (2019). During that time, he served many terms on the Magnetics Society's Administrative Committee and on the Publications Committee as Editor of *IEEE Transactions on Magnetics* (1992-2005) and subsequently Editor-in-Chief (2005-2011). He also served on the Magnetics Society's Fellow Evaluation Committee (2006-2009).

David is an Anson Marston Distinguished Professor of Engineering at Iowa State University and holds the Stanley Chair of Interdisciplinary Engineering. He was the first holder of the Palmer Endowed Department Chair in Electrical and Computer Engineering. Immediately prior to that he was the Director of the Wolfson Centre for Magnetics and Professor of Magnetics at Cardiff University in the U.K. During that time, he maintained strong ties with Iowa State University as a collaborating professor and with the U.S. Department of Energy's Ames Laboratory as an associate. He holds the rank of Senior Scientist at Ames Laboratory, is an Honorary Professor at Cardiff University's School of Engineering and is a Visiting Professor at Sheffield University's Department of Materials Science and Engineering.

He earned the B.Sc. in physics and mathematics from the University of Exeter, the M.Sc. in nuclear physics from the University of Birmingham, the Ph.D. in applied physics from the University of Hull, and the D.Sc. in physics and space research from the University of Birmingham. His research interests include biomedical applications of magnetic fields, nonlinear and hysteretic behavior of magnetic materials, and applications of magnetic measurements to nondestructive evaluation.

David has authored more than 700 scientific papers, has published three textbooks, including *Introduction to Magnetism and Magnetic Materials* (third edition, CRC Press, 2015), and holds 19 patents. In addition to being a Fellow of the IEEE, he is a Fellow of the American Physical Society, the Royal Academy of Engineering, the Institution of Electrical Engineers, the Institute of Physics, the Institute of Materials, and the Institute of Mathematics and Its Applications. He was the founder of the Topical Group on Magnetism and Its Applications (GMAG) of the American Physical Society and served as its inaugural chair for two years, 1996-1998.

IEEE Magnetics Society Distinguished Lecturers for 2019

Submitted by Beth Stadler, Chair, Distinguished Lecturers Committee

The Society has selected four Distinguished Lecturers (DLs) for 2019. They are:

- Victorino Franco (University of Seville, Spain)
- Justin M. Shaw (National Institute of Standards and Technology, USA);
- Hari Srikanth (University of South Florida, USA); and
- Hyunsoo Yang (National University of Singapore, Singapore).

Each DL manages his own schedule, so contact them early via their respective institutions.

Magnetocaloric Effect: From Energy Efficient Refrigeration to Fundamental Studies of Phase Transitions

Victorino Franco

University of Seville, Seville, Spain

The magnetocaloric effect, that is, the reversible temperature change experienced by a magnetic material upon the application or removal of a magnetic field, has become a topic of increasing research interest due to its potential applications in refrigeration at ambient temperature that is energy efficient and environmentally friendly [1].

From a technological point of view, the improvement of magnetic refrigeration systems can have a notable impact on society: a large fraction of the electricity consumed in residential and commercial markets is used for temperature and climate control. From the point of view of magnetic materials, research on this topic mainly focuses on the discovery of new materials with lower cost and enhanced performance. In addition, the characterization of the magnetocaloric effect can be used for more fundamental studies of the characteristics of phase transitions.

I will cover an overview of the phenomenon and a classification of the most relevant families of alloys and compounds. I will analyze possible limitations for the optimal performance of the materials in magnetic refrigerators, including hysteretic response and cyclability. Regarding phase transitions, I will present a new method to quantitatively determine the order of thermomagnetic phase transitions using the field dependence of the magnetic entropy change [2].

For second-order phase transition materials, I will show that critical exponents can be determined using the magnetocaloric effect even in cases where the usual methods are not applicable [3]. In the case of first-order phase transitions, more details about their hysteretic response can be obtained using T-FORC [4].

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[2] J. Y. Law, V. Franco, L. M. Moreno-Ramírez, A. Conde, D. Y. Karpenkov, I. Radulov, K. P. Skokov, and O. Gutfleisch, "A quantitative criterion for determining the order of magnetic phase transitions using the magnetocaloric effect," *Nat. Commun.*, vol. 9, p. 2680, Jul 2018.

[3] V. Franco and A. Conde, "Scaling laws for the magnetocaloric effect in second order phase transitions: From physics to applications for the characterization of materials." *Int. J. Refrig.*, vol. 33, pp. 465-473, May 2010.

[4] V. Franco, T. Gottschall, K. P. Skokov, and O. Gutfleisch, "First-order reversal curve (FORC) analysis of magnetocaloric Heusler-type alloys," *IEEE Magn. Lett.*, vol. 7, 6602904, Mar 2016.

Victorino Franco is a professor in the Condensed Matter Physics Department of the University of Seville, Spain. His main research interests cover magnetic materials for energy applications, including soft-magnetic and magnetocaloric materials. He has published more than 165 peer-reviewed technical articles.

In 2000, he received the Young Scientist Award from the Royal Physical Society of Spain. He served as chair of the Spain Chapter of the IEEE Magnetics Society and chair of the Magnetic Materials Committee of the Minerals, Metals & Materials Society (TMS). Prof. Franco has been editor and publications chair of several Magnetism and Magnetic Materials (MMM) conferences and will be the general chair of the 2022 Joint MMM-Intermag Conference.



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Broadband Ferromagnetic Resonance Spectroscopy: The "Swiss Army Knife" for Understanding Spin-Orbit Phenomena

Justin M. Shaw

National Institute of Standards and Technology, Boulder, Colorado, USA

Modern spin-based technologies rely on multiple, simultaneous phenomena that originate from the spin-orbit interaction in magnetic systems. These include damping, magnetic anisotropy, orbital moments, and spin-orbit torques that are manifested in the spin-Hall and Rashba-Edelstein effects. While cavity based ferromagnetic resonance (FMR) spectroscopy has been used to characterize magnetic materials for many decades, recent advances in broadband and phase-sensitive FMR techniques have allowed further refinement, improved accuracy, and new measurement capability. In fact, broadband FMR techniques can now precisely measure spin-orbit torques at the thin-film level without the requirement of device fabrication [1].

Broadband FMR measurements have also improved our fundamental understanding of magnetic damping. Numerous extrinsic relaxation mechanisms can obscure the measurement of the intrinsic damping of a material. This created a challenge to our understanding of damping because experimental data were not always directly comparable to theory. As a result of the improved ability to quantify all of these relaxation mechanisms, many theoretical models have been refined. In fact, this has recently led to both the prediction [2] and discovery [3] of new materials with ultra-low magnetic damping that will be essential for future technologies based on spintronics, magnonics, spin-logic and high-frequency devices.

I will begin this lecture with a basic introduction to spin-orbit phenomena, followed by an overview of modern broadband FMR techniques and analysis methods. I will then discuss some recent successes in applying broadband FMR to improve our ability to control damping in metals and half-metals, quantify spin-orbit torques and spin-diffusion lengths in multilayers, and determine the interrelationships among damping, orbital moments, and magnetic anisotropy [4], [5]. The impact of these result on specific technologies will also be discussed.

[1] A. J. Berger, E. R. J. Edwards, H. T. Nembach, A. D. Karenowska, M. Weiler, and T. J. Silva, "Inductive detection of fieldlike and dampinglike ac inverse spin-orbit torques in ferromagnet/normal-metal bilayers," *Phys. Rev. B*, vol. 97, 094407, Mar 2018.

[2] S. Mankovsky, D. Ködderitzsch, G. Woltersdorf, and H. Ebert, "First-principles calculation of the Gilbert damping parameter via the linear response formalism with application to magnetic transition metals and alloys," *Phys. Rev. B*, vol. 87, 014430, Jan 2013.

[3] M. A. W. Schoen, D. Thonig, M. L. Schneider, T. J. Silva, H. T. Nembach, O. Eriksson, O. Karis, and J. M. Shaw, "Ultra-low magnetic damping of a metallic

ferromagnet," *Nat. Phys.*, vol. 12, pp. 839–842, Sep 2016.

[4] J. M. Shaw, H. T. Nembach, T. J. Silva, and C. T. Boone, "Precise determination of the spectroscopic g-factor by use of broadband ferromagnetic resonance spectroscopy," *J. Appl. Phys.*, vol. 114, 243906, Dec 2013.

[5] J. M. Shaw, H. T. Nembach, and T. J. Silva, "Resolving the controversy of a possible relationship between perpendicular magnetic anisotropy and the magnetic damping parameter," *Appl. Phys. Lett.*, vol. 105, 062406, Aug 2014.

Justin Shaw earned bachelor's degrees in both materials science engineering and music theory and composition in 1997, and doctoral degrees in physics in 2004 and in materials science engineering in 2007, all at Arizona State University. He was a National Research Council postdoctoral fellow at the National Institute of Standards and Technology (NIST) in Boulder, Colorado, from 2005 to 2007. In 2007 he became a staff scientist at NIST.

Dr. Shaw received an U.S. Department of Commerce Bronze medal in 2013 for his work in magnetodynamic measurements of nanostructures. As leader of the spin dynamics and microscopy project at NIST, his current research includes the study of spin dynamics and relaxation mechanisms in magnetic thin films and nanostructures, which extends from the



nanosecond to the femtosecond regimes, using both microwave and optical techniques. Much of Dr. Shaw's work is focused on the development of new measurement capability to access and better quantify the dynamics in these systems. He is currently working on techniques to extend these dynamic studies to include imaging methods that employ an ultra-fast, high-harmonic generation coherent light source.

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Tuning Magnetic Anisotropy in Nanostructures for Biomedical and Electromagnetic Applications

Hari Srikanth

National Institute of Standards and Technology, Boulder, Colorado, USA

Magnetic nanoparticles have been building blocks in applications ranging from high density recording to spintronics and nanomedicine [1]. Magnetic anisotropies in nanoparticles arising from surfaces, shapes, and interfaces in hybrid structures are important in determining the functional response in various applications. In this talk I will first introduce the basic aspects of anisotropy and discuss resonant radio-frequency (RF) transverse susceptibility, which we have used extensively, as a powerful method to probe the effective anisotropy in magnetic

materials. The tuning of anisotropy has a direct impact on the performance of functional magnetic nanoparticles in biomedical applications such as contrast enhancement in magnetic resonance imaging and magnetic hyperthermia for cancer therapy.

I will focus on the role of tuning surface and interfacial anisotropy with a goal to enhance specific absorption rate or heating efficiency. Strategies going beyond simple spherical structures to include exchange coupled core-shell nanoparticles, nanowires, and nanotubes, can be exploited to increase heating efficiency in magnetic hyperthermia [2], [3]. In addition to biomedical applications, composites of anisotropic nanoparticles dispersed in polymers pave the way to a range of electrically and magnetically tunable materials for RF and microwave device applications [4]. This lecture will combine insights into fundamental physics of magnetic nanostructures along with recent research advances in their application to nanomedicine and electromagnetic devices.

[1] E. A. Périgo, G. Hemery, O. Sandre, D. Ortega, E. Garaio, F. Plazaola, and F. J. Teran, "Fundamentals and advances in magnetic hyperthermia," *Appl. Phys. Rev.*, vol. 2, 041302, 2015.

[2] Z. Nemati, J. Alonso, H. Khurshid, M. H. Phan, and H. Srikanth, "Core/shell iron/iron oxide nanoparticles: Are they promising for magnetic hyperthermia?" *RSC Advances*, vol. 6, 38697, 2016.

[3] H. Khurshid, M.-H. Phan, P. Mukherjee, and H. Srikanth, "Tuning exchange bias in Fe/ γ -Fe₂O₃ core-shell nanoparticles: Impacts of interface and surface spins," *Appl. Phys. Lett.*, vol. 104, 072407, 2014.

[4] K. Stojak, S. Pal, H. Srikanth, C. Morales, J. Dewdney, T. Weller, and J. Wang, "Polymer nanocomposites exhibiting magnetically tunable microwave properties," *Nanotechnology*, vol. 22, 135602, 2011.

Hari Srikanth is a professor of physics at the University of South Florida (USF). He received the Ph.D. in experimental condensed matter physics from the Indian Institute of Science. After postdoctoral research for several years, he joined USF in 2000, where he established the Functional Materials Laboratory. Prof. Srikanth's research spans a wide range of topics including magnetic nanoparticles, magnetic refrigerant materials, spin calorics, and complex oxides. He has published about 250 journal articles and given numerous invited talks.



Prof. Srikanth is a Fellow of the American Physical Society and a Senior Member of IEEE. He is an associate editor of the *Journal of Applied Physics*. He has been closely involved with the *Magnetism and Magnetic Materials* and *INTERMAG* conferences for more than 15 years, serving as editor, publications chair, and as a member of program committees.

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Spin-Orbit Technologies: From Magnetic Memory to Terahertz Generation

Hyunsoo Yang

National University of Singapore, Singapore

Spintronic devices utilize an electric current to alter the state of a magnetic material and thus find great application in magnetic memory. Over the last decade, spintronic research has focused largely on techniques based on spin-orbit coupling, such as spin-orbit torques (SOTs), to alter the magnetic state. The phenomenon of spin-orbit coupling in magnetic heterostructures was also recently used to generate terahertz emission and thus bridge the gap between spintronics and optoelectronics research.

I will introduce the basic concepts of SOTs, such as their physical origin, the effect of SOTs on a magnetic material, and how to quantitatively measure this effect [1], [2]. Next, I will discuss the latest trends in SOT research, such as the exploration of novel material systems like topological insulators and two-dimensional materials to improve operation efficiency [3]. Following this, some of the technical challenges in SOT-based magnetic memory will be highlighted.

Moving forward, I will introduce the process of terahertz generation in magnetic heterostructures [4], where the spin-orbit coupling phenomenon plays a dominant role. I will discuss the details of how this terahertz emission process can be extended to novel material systems such as ferrimagnets [5] and two-dimensional materials. The final section will focus on how the terahertz generation process can be used to measure SOTs in magnetic heterostructures, thus highlighting the interrelation between terahertz generation and the SOTs, which are linked by the underlying spin-orbit coupling.

[1] X. Qiu, Z. Shi, W. Fan, S. Zhou, and H. Yang, "Characterization and manipulation of spin orbit torque in magnetic heterostructures," *Adv. Mater.*, vol. 30, 1705699, Apr. 2018.

[2] Y. Wang, R. Ramaswamy, and H. Yang, "FMR-related phenomena in spintronic devices" *J. Phys. D: Appl. Phys.*, vol. 51, 273002, Jun. 2018.

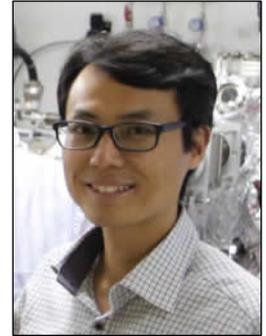
[3] R. Ramaswamy, J. M. Lee, K. Cai, and H. Yang, "Recent advances in spin-orbit torques: Moving towards device applications" *Appl. Phys. Rev.*, vol. 5, 031107, Sep. 2018.

[4] Y. Wu, M. Elyasi, X. Qiu, M. Chen, Y. Liu, L. Ke, and H. Yang, "High-performance THz emitters based on ferromagnetic/nonmagnetic heterostructures" *Adv. Mater.*, vol. 29, 1603031, Jan. 2017.

[5] M. Chen, R. Mishra, Y. Wu, K. Lee, and H. Yang, "Terahertz emission from compensated magnetic heterostructures," *Adv. Opt. Mater.*, vol. 6, 1800430, Sep. 2018.

Hyunsoo Yang obtained the bachelor's degree from Seoul National University. He worked at C&S Technology, Seoul, Korea; LG Electronics, San Jose, California, USA; and Intelligent Fiber Optic Systems, Sunnyvale, California, USA. In 2006, he received the doctorate from Stanford University, where he worked on optoelectronic devices.

From 2004 to 2007, Dr. Yang was at the IBM-Stanford Spintronic Science and Applications Center. He is currently a GlobalFoundries chaired associate professor in the Department of Electrical and Computer Engineering, National University of Singapore, working on various magnetic materials and devices for spintronics applications.



Dr. Yang has authored 170 journal articles, given 100 invited presentations, and holds 15 patents. He won the Outstanding Dissertation Award for 2006 from the American Physical Society's Topical Group on Magnetism and Its Applications.

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Magnetic Frontiers 2019: Magnetic Sensors

By Susana Cardoso & Olga Kazakova, Conference Chairs

On behalf of the program and organising committees, it is our great pleasure to announce **Magnetic Frontiers 2019: Magnetic Sensors**. This is the second event in the sequence of small topical conferences under the general title Magnetic Frontiers, which are technically sponsored by the IEEE Magnetics Society and *IEEE Magnetics Letters*.

The conference will be held in Lisbon, Portugal during June 24-27, 2019.

Magnetic Frontiers is the premier topical conference on emerging aspects of fundamental and applied magnetism. The forum provides a range of plenary and invited talks delivered by key researchers in the field as well as oral and poster presentations. The conference will cover the following topics:

- Ultra-small sensors / ultra-low noise sensors;
- Robustness against harsh environments;
- New materials and approaches for magnetic sensors;
- Autonomous and low power magnetic sensors / harvesters for magnetic sensors;
- Integration challenges: CMOS, Flexible electronics, packaging, etc.;

- Reaching the technological limits;
- Sensor networks and the Internet of Things (IoT); and
- Applications: information recording, scanners and NDT, encoders, biosensors, automotive and space, RF and communications and robotics.

Conference-related papers will be published in *IEEE Magnetics Letters*.

IMPORTANT DATES

4 February 2019: Student Travel Grants submission open

4 February 2019: Abstract submission open

25 March 2019: Abstract submission close

25 April 2019: Notification of orals and posters acceptance

10 June 2019: Early Registration deadline

2 September 2019: Call for papers close

PLENARY SPEAKERS (Confirmed):

- Dieter Suess, University of Vienna;
- Jurgen Kosel, KAUST;
- Nam-Trung Nguyen, Queensland Micro-and Nanotechnology Centre, Griffith University; and
- Paulo Freitas, INESC-Microsystems and Nanotechnologies and INL.

INVITED SPEAKERS (Confirmed):

- Denys Makarov, Helmholtz-Zentrum Dresden;
- Marina Diaz, Space Magnetism Laboratory, Insituto Nacional de Técnica Aeroespacial (INTA);
- Shan Wang, Stanford University;
- Song Yue, Multidimension; and
- Xiufeng Han, Beijing National Laboratory for Condensed Matter Physics.

Lisbon, the charming capital city of Portugal, the country on the western edge of the Iberian Peninsula, is a city full of authenticity where old customs and history meets cultural entertainment and hi-tech innovation. Experience our wonderful climate all year, our unique pastries and gastronomy specially the bacalhau (salted cod), listen to Fado and enjoy the warmth of our people.

We look forward to seeing you in Lisbon, the “world’s leading break destination 2017” (World Travel Awards) and welcome your contribution to an exciting and enjoyable conference at **Magnetic Frontiers 2019: Magnetic Sensors**.

Seoul Chapter News

By Jongill Hong, Seoul Chapter Chair

The Seoul Chapter of the IEEE Magnetics Society held three seminars at Yonsei University in Seoul in 2018—two IEEE Magnetics Society Distinguished Lectures and one invited lecture. In April, 2018 Distinguished Lecturer Prof. Mitsuteru



2018 Distinguished Lecturer Prof. Mitsuteru Inoue presents to members of the Seoul Chapter.

Inoue presented his lecture on magnetic phase interference in artificial magnetic lattices. He also presented at KIST and UIST.

In October, the Chapter had the chance to learn about magnetostrictive materials and their applications, from 2018 Distinguished Lecturer Prof. Alison Flatau. She also visited other institutes such as DGIST and Kunkook University, to give her presentation.

Chapter members also had the benefit of learning about hetero-multiferroic materials and their applications, from Prof. Nianxiang Sun of Northeastern University in November.

The Seoul Chapter has been active in supporting several seminars and invited talks, and to encourage IEEE member students to participate in chances to learn about emerging topics in magnetics in 2018.

Joint Executive Meeting of the IEEE Magnetics Society Chapters in Japan and the Magnetics Society of Japan

By Masaki Nakano, Magnetics Society of Japan Director

The 42nd Annual Conference on Magnetics in Japan was held at Nihon University Surugadai Campus, Tokyo during September 11-14, 2018. The conference was organized by the Magnetics Society of Japan (MSJ), a sister society to the IEEE Magnetics Society. It is the most popular conference on magnetics in Japan based on Internet keyword searches for “magnetics” and “magnetism”. The majority of top-level researchers from academia and industries gathered together along with numerous students. During the four days some 220 oral and 61 posters presentations were made. An award ceremony and banquet was also held.

During the conference, a joint meeting between the executive members of MSJ and the representatives of the IEEE Magnetics Society Chapters in Japan was also undertaken for the first time.

Attendees of the executive meeting included:

- Prof. Koki Takanashi (Tohoku University, President of MSJ);
- Prof. Katsuji Nakagawa (Nihon University, Vice-President of



Attendees at the 42nd Annual Conference on Magnetics in Japan, at Nihon University.

MSJ, General Chair of MSJ's 26th Annual Conference on Magnetics, IEEE Magnetics Society AdCom member);

- Dr. Shiho Nakamura (Toshiba Memory Cooperation, Vice-President of MSJ);
- Prof. Yasushi Takemura (Yokohama National University, Director of MSJ, IEEE Magnetics Society Tokyo Chapter Chair);
- Prof. Masaki Nakano (Nagasaki University, Director of MSJ, IEEE Magnetics Society Fukuoka / Hiroshima Joint Chapter Vice-Chair);
- Prof. Masahiro Yamaguchi (Tohoku University, IEEE Magnetics Society Secretary/Treasurer & Sendai / Sapporo Joint Chapter Chair);
- Prof. Simon Greaves (Tohoku University, IEEE Magnetics Society Sendai / Sapporo Joint Chapter Vice-Chair & IEEE Magnetics Society AdCom member);
- Dr. Yoshito Ashizawa (Nihon University, IEEE Magnetics Society Tokyo Chapter Treasurer); and
- Prof. Kimihide Matsuyama (Kyushu University, IEEE Magnetics Society Fukuoka / Hiroshima Joint Chapter Chair and Kyushu/Chugoku Chapter Chair).

After Prof. Nakano opened the meeting, Prof. Yamaguchi and Prof. Takanashi addressed a few words to enrich the relationship between the IEEE Magnetics Society Chapters in Japan and the Magnetics Society of Japan.

Each Chapter briefly reported on recent activities, and everyone congratulated the establishment of the new IEEE Magnetics Society Kyushu/Chugoku Chapter.

MSJ indicated willingness to invite IEEE Magnetics Society Distinguished Lecturers to a symposium of the next Annual Conference on Magnetics in Japan. MSJ would launch the plan for the conference, to be held in Kyoto during September 27-29, 2019..

MSJ indicated willingness to recommend more invited speakers for INTERMAG and MMM conferences, particularly from MSJ

Paper Award recipients. MSJ also indicated willingness to encourage Japanese students to attend the IEEE Magnetics Society Summer School.

All attendees agreed to continue this joint executive meeting each year during the Annual Conference on Magnetics in Japan, and to contribute to a stronger relationship between MSJ and IEEE Magnetic Society.

The meeting was closed with a warm message from Prof. Takemura, who hosted the wonderful meeting place.

Conference Calendar

By **Gareth Hatch**, Newsletter Editor

2019 Joint MMM-INTERMAG Conference

January 14-18, 2019 - Washington, District of Columbia, USA

Magnetics 2019

January 23-24, 2019 - Orlando, Florida, USA

Magnetism 2019

April 8-9, 2019 - Leeds, UK

International Conference on Fine-Particle Magnetism (ICFPM19)

May 27-31, 2019 - Gijón, Spain

Magnetic Frontiers 2019: Magnetic Sensors

June 24-27, 2019 - Lisbon, Portugal

Frontiers in Biomagnetic Particles

August 5-7, 2019 - Telluride, Colorado, USA

To list your conference in the Newsletter Conference Calendar, please contact the **Newsletter Editor**.

About the Newsletter

The purpose of the Newsletter of the IEEE Magnetics Society is to publicize activities, conferences, workshops and other information of interest to Society members and other people in the area of applied magnetics.

Contributions are solicited from Society members, Officers & other volunteers, conference organizers, local chapters, and other individuals with relevant material. The Newsletter is published quarterly on the Society webpage at: <http://www.ieeemagnetics.org>

Please send all contributions via email to the Newsletter Editor, Gareth Hatch, at: g.p.hatch@ieee.org

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