

## From the President

By Manuel Vázquez, President of the Magnetics Society

During September 18-21, 2017 the first Small Conference on Magnetic Frontiers took place in Nancy, France, chaired by Stéphane Mangin and Olga Kazakova. You can read more about this conference on page 8 of this Newsletter. The conference is the first in a series of small conferences promoted and launched by the IEEE Magnetics Society, as proposed by the Planning Committee and later approved by the Administrative Committee (AdCom). The aim is to address many of the emerging topics of research in magnetics by top scientists. The aforementioned conference was devoted to topological insulators, a growing topic in physics with connections to fundamental magnetism and perspectives for new generations of advanced technologies. I was pleased to attend the meeting, and I can confirm that it was a great success. The talks given by Nobel Prize Laureate Albert Fert, Nitin Samarth, Matthias Bode, Ingrid Mertig, Qi-Kun Xue, Zhi Xun Shen, and the other invited speakers, were outstanding. Many high-level  
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## 2018 Society Summer School Goes to Ecuador

By Atsufumi Hirohata, Education Committee Chair

The Education Committee has voted for Universidad San Francisco de Quito in Ecuador as the venue for the 2018 IEEE Magnetics Society Summer School. The local Chair is Prof. Dario Niebieskikwiat and the Secretary is Prof. Vincent Vlaminc. More details on the School, including the tentative program, can be found at the Summer School web page:

[http://ieemagnetics.org/index.php?option=com\\_content&view=article&id=183&Itemid=122](http://ieemagnetics.org/index.php?option=com_content&view=article&id=183&Itemid=122).

The deadline for students' applications is November 15, 2017.



## From The President *continued from page 1*

comments were exchanged among speakers and attendees, and the nearly two-hour-long round-table featured informative discussions of points raised by the attendees. There was a significant number of attendees, although an objective was to maintain a reduced number in order to facilitate the exchange of communication among them. We will have to decide in the near future the location and the topic of the Second Small Conference.

I am currently preparing for a trip to Pittsburgh to join the MMM Conference (November 6-10, 2017) chaired by Pallavi Dhagat. In addition to the outstanding technical symposia and invited talks, together with tutorial and special evening sessions, I would like to emphasize a number of new attractive activities planned at this MMM conference. In the new 'Magnetism as Art Showcase' event, the beauty of magnetism and magnetic materials will be the highlight. Particular attention will be paid to young scientists at the Meet the Experts Panel, where they will meet experts from different fields for advice on long-term career planning or job searches. Additional facilities for communication and networking will be found in the Young Professionals Event and the Students Reception.

New activities and initiatives will be discussed in the Committees meetings as well as in the AdCom meeting during the Pittsburgh conference.

Related to conferences, it is my pleasure to inform you that the next INTERMAG Conference in Europe, will take place in Lyon, France in 2021 and will be chaired by Bernard Dieny. We are sure that it will be a great success.

At the time I am writing this column, we are waiting for the list of the newly elected members of the AdCom. The announcement on our Distinguished Lecturers for 2018 can be found elsewhere in the Newsletter.

As in my previous messages, I wanted to finish my column with a reminder to encourage all of you to advertise among your magnetic colleagues the scientific, educational and professional activities of the Magnetics Society; and to volunteer for the activities promoted by the different committees, when you can. Please, contact the corresponding Chair or me directly, if you would like to volunteer for these activities.

*Manuel Vázquez can be reached via [manuel.v.vazquez@ieee.org](mailto:manuel.v.vazquez@ieee.org).*

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## Special MRAM Poster Session and Forum at IEDM 2017

By Bernard Dieny, Administrative Committee Member, and Bruce Terris, Past President

IEDM is the main annual conference of the IEEE Electron Devices Society. This year it will take place during December 4-6, 2017, at the Hilton Union Square in San Francisco, California. With the rising interest of the microelectronics industry in STT-MRAM, it is very important to strengthen the relationship between the microelectronics and magnetism communities in order to accelerate the development of this new hybrid technology. For this goal, two special events related to the MRAM technology are being organized around IEDM.

**The first** is a special poster session entirely dedicated to MRAM (MRAM materials/phenomena/technology/testing, hybrid CMOS/MTJ technology and circuits, and spin logic). A similar MRAM poster session took place at IEDM 2016 and was very successful, with 33 posters presented, with very active cross-disciplinary discussions.

This session is organized technically by the IEEE Magnetics Society and will be embedded in the IEDM 2017 conference. It appears as a special MRAM poster session scheduled for the

afternoon of Tuesday December 5, 2017 in the IEDM program (<http://ieee-iedm.org/program/>). This event will be a great opportunity to bring together experts in magnetism and in microelectronics. This year, 35 posters have been accepted for presentation. The list can be found on the IEEE Magnetics Society website.

**The second** event, taking place right after IEDM 2017, is the 9th MRAM Global Innovation Forum, at the Hilton Union Square on December 7, 2017. This is a one-day forum, consisting of 10 invited talks from leading experts, and a panel discussion. The schedule can be seen below.

Various MRAM-related topics will be covered including STT-MRAM technology, memory and processor demonstrations, spin orbit torque MRAM, and the needs, challenges and potential of MRAM. The Forum was originally initiated by Samsung Semiconductor, which is sponsoring the present events so that registration to the Forum is free of charge, including lunch. However the number of attendees is limited.

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## New Senior Members

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

August 2017: Ekkes Bruck, Mohammad Hashmi and Elena Helera.

October 2017: Boris Fridman, Zhenyu He, Guohan Hu, Elio Perigo and Qingsong Wang.

For further information, visit the IEEE Web site at:

[www.ieee.org/membership\\_services/membership/grade\\_elevation.html](http://www.ieee.org/membership_services/membership/grade_elevation.html)

## MRAM Poster Session & Forum at IEDM 2017 *cont. from page 2*

To register, send an email to [sandra.ingrassia@cea.fr](mailto:sandra.ingrassia@cea.fr) with first name, last name, contact email, affiliation. A confirmation email will be sent to you. The deadline for is 3rd November 2017.

We strongly encourage teams from the magnetism community, working on MRAM, to send attendees to IEDM and participate in these two events.

### **9th MRAM Global Innovation Forum 2017 December 7 2017, Hilton Union Square, San Francisco**

08:45-09:00: Welcome and introduction

#### **STT-MRAM Technology**

09:00 – 09:30: Luc Thomas (TDK/Headway)

09:30 – 10:00: Gohan Hu (IBM), STT-MRAM with reduced switching current based on double MTJ

10:00 – 10:30: Cheng-Ming Lin (TSMC)

10:30 – 11:00 : Coffee break

#### **Memory demonstration and impact on processor performance**

11:00 – 11:30: Seung Kang (Qualcomm)

11:30 – 12:00: Dave Eggleston (Global Foundries)

12:00 – 12:30: Yong Kyu Lee (Samsung)

12:30 – 14:00: Lunch break

#### **SOT-MRAM and VCMA**

14:00 – 14:30: S. Fukami (Tohoku University)

14:30 – 15:00: H. Yoda (Toshiba)

#### **The needs (Automotive, IoT and AI) and potential/challenges ahead of MRAM**

15:00 – 15:30: Tetsuo Endoh (Tohoku University) (AI, IoT)

15:30 – 16:00: Thomas Jew (NXP)

16:00 – 16:30: Coffee break

16:30 – 17:30: Panel discussion: PCRAM, ReRAM, MRAM: competing or complementary technologies?

## 2018 Distinguished Lecturers

The IEEE Magnetics Society selected four Distinguished Lecturers (DLs) for 2018. They are:

- ▶ Alison B. Flatau (University of Maryland, USA);
- ▶ Can-Ming Hu (University of Manitoba, Canada);

- ▶ Mitsuteru Inoue (Toyohashi University of Technology, Japan);
- ▶ YoshiChika Otani (University of Tokyo, Japan);

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

# Structural Magnetostrictive Alloys: From Flexible Sensors to Energy Harvesters and Magnetically Controlled Auxetics

Alison B. Flatau, University of Maryland, USA

Novel sensors and energy-harvesting transducers take advantage of the significantly expanded design space made possible by recent advances in structural magnetostrictive alloys. These alloys can be machined and welded, have high fracture toughness, and can actuate, sense, and carry load while subjected to tension, compression, and bending.

The talk includes an introduction to magnetostrictive materials and transduction, and a discussion on the use of low-cost rolling and annealing methods in lieu of more costly crystal growth methods for making bulk iron-gallium (Galfenol) and iron-aluminum (Alfenol) alloys.

The process of using magnetostrictive materials to convert mechanical energy into magnetic energy and then into electrical energy is explained and demonstrated using sensors

and energy harvesting devices as examples. Examples of magnetostrictive devices include prototypes ranging in size from nanowire-based pressure sensors to huge structures floating in the ocean that convert wave energy into electrical power for “community-scale” energy needs.

The recent discovery of a particularly unique attribute of these alloys, their auxetic behavior, will also be discussed. In both Galfenol and Alfenol, both strain and magnetic fields can produce simultaneous increases in lateral and longitudinal dimensions, with measured values of the resulting Poisson ratio being not only negative, but as low as  $-2.0$  in some cases.

Mechanical, aerospace and civil engineers should find the discussion on the use of magnetic fields to control auxetic behavior quite interesting.

**Alison Flatau** received the undergraduate degree in chemical engineering from the University of Connecticut and the M.S. and Ph.D. degrees in mechanical engineering from the University of Utah. She taught engineering mechanics at Iowa State University for eight years prior to joining the University of Maryland’s Department of Aerospace Engineering in 2002.

Prof. Flatau served as the program director for the Dynamic Systems Modeling, Sensing, and Control Program at the National Science Foundation during 1998–2002 and as the associate dean of research for the University of Maryland’s Clark School of Engineering during 2009–2015. Her teaching and research interests are in the areas of smart materials and structures, with emphasis on magnetostrictive actuator and sensor technologies, from the nano- to the macro-scale. Her experience includes four years at the National Small Wind Systems Test Center (now the National Renewable Energy Laboratory) in Golden, Colorado, where she was a senior research engineer in the Wind Energy Conversion Systems Test Program.

Prof. Flatau received the Clark School of Engineering’s Faculty Service Award in 2009, the Women in Aerospace (WIA)

Aerospace Engineering Educator of the Year Award in 2010, the SPIE Smart Structures and Materials Lifetime Achievement Award in 2010, and the American Society of Mechanical Engineers (ASME) Adaptive Structures and Materials Systems Prize in 2013. She was a University of Maryland ADVANCE Professor in 2011–2013 and was a Dresden Fellow while on sabbatical at the Technical University of Dresden, Germany, in 2016. Prof. Flatau became a Fellow of the ASME in 2006 and of the American Institute of Aeronautics and Astronautics (AIAA) in 2013.



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## Cavity Spintronics

Can-Ming Hu, University of Manitoba, Canada

Cavity spintronics (also known as spin cavitronics) is a newly developing, interdisciplinary field that brings together microwave and optical communities with researchers in spintronics and magnetism. The field started around 2014 when it was found that ferromagnets in cavities hybridize with both microwaves and light by light-matter interaction [1].

Since then, the emergence of cavity spintronics has attracted broad interest from groups studying quantum electrodynamics, cavity polaritons, optomechanics, superconductivity, plasmonics, and phononics. At the center stage of the topic is the physics of magnon-photon coupling. Via quantum physics of spin-photon entanglement on the one hand and classical electrodynamic coupling on the other, magnon-photon coupling connects some of the most exciting concepts in modern physics, such as quantum information and quantum optics, with one of the oldest sciences on earth, magnetism.

This talk aims to provide an introduction to this new frontier of condensed matter physics to researchers working in magnetism, spintronics, quantum information, and microwave technologies. The talk starts with a historical review, tracing this new field back to some of the most courageous work in the history of magnetism, spintronics, cavity quantum electrodynamics, and polaritons.

Recent experiments focusing on the development of new cavity-mediated techniques, such as coupling of magnetic moments, distant manipulation of spin current, qubit-magnon coupling, and conversion between optical and microwave photons, will be highlighted.

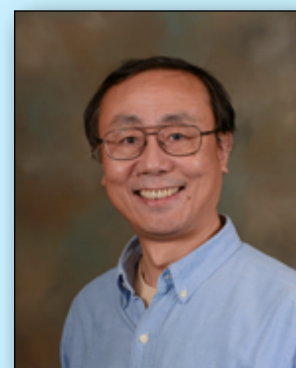
[1] Can-Ming Hu, "Dawn of cavity spintronics," <https://arxiv.org/abs/1508.01966>.

**Can-Ming Hu** graduated in 1988 from Fudan University in China. He received the doctorate degree in 1995 from Wuerzburg University in Germany. From 1998 to 1999, he spent a year at NTT Basic Research Laboratories in Japan working on semiconductor spintronics.

In 2005, after receiving the habilitation degree from the University of Hamburg, Germany, Prof. Hu and his group moved to University of Manitoba, Canada, where he became a full professor in 2012. In 2015 his group was the first to develop a method for electrical detection of cavity magnon polaritons, thereby making a strong contribution to the emergence of the new field cavity spintronics.

Prof. Hu has published over 130 technical articles in peer-reviewed journals, including book chapters and invited review articles. He has given some 100 invited presentations on semiconductor physics, spintronics, magnetism, and microwave technologies. He co-organized several international workshops:

Spin Mechanics IV (Canada, 2017), Magnetic North III (Canada, 2012), Magnetic North I (Canada, 2010), and International Symposium on Quantum Hall Systems and Quantum Materials (Germany, 2004). Prof. Hu served as a deputy director of the State Key Laboratory of Infrared Physics in China, a regional councillor for the Canadian Association of Physicists, and is currently a member of the Commission on Magnetism (C9) of the International Union of Pure and Applied Physics.



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# Magnetic Phase Interference in Artificial Magnetic Lattices: Functions and Applications to Optical, High-Frequency, and Spin Wave Devices

Mitsuteru Inoue, Toyohashi University of Technology, Japan

The introduction of artificial magnetic structures into magnetic materials can induce novel electromagnetic and spin-wave behavior. Nano- and submicrometer-scale artificial magnetic lattices (AMLs) can control optical (electromagnetic) waves in magnetophotonic crystals [1], volumetric magnetic holograms [2], and labyrinthian magnetic domain structures [3], and can affect spin waves in magnonic crystals [4].

In this talk, the fundamental properties of such AMLs, mainly in magnetic garnet films and alloy thin films, are discussed, followed by demonstrations of their applications in optical and spin-wave micro-devices driven by magnetic phase interference: volumetric magneto-optic (MO) hologram memories [2] and three-dimensional MO holographic displays [5] with magnetophotonic crystals; high-speed MO Q-switch micro-chip lasers with iron-garnet films with labyrinthian magnetic domain structures [3]; and highly sensitive magnetic sensors and spin-wave logic circuits with magnonic crystals [6]. Prospective future spin-wave devices with AMLs will be discussed in the context of the new paradigm of magnonics (electron non-

transport electronics), where spin waves play an important role as the information carrier.

- [1] T. Goto et al., "Magnetophotonic crystal comprising electro-optical layer for controlling helicity of light," *J. Appl. Phys.*, vol. 111, 07A913, 2012.
- [2] Y. Nakamura et al., "Error-free reconstruction of magnetic hologram via improvement of recording conditions in collinear optical system," *Optics Exp.*, vol. 25, pp. 15349-15357, 2017.
- [3] R. Morimoto et al., "Magnetic domains driving a Q-switched laser," *Sci. Rep.*, vol. 6, 38679, 2016.
- [4] N. Kanazawa et al., "Metal thickness dependence on spin wave propagation in magnonic crystal using yttrium iron garnet," *J. Appl. Phys.*, vol. 117, 17E510, 2015.
- [5] K. Nakamura et al., "Improvement of diffraction efficiency of three-dimensional magneto-optic spatial light modulator with magnetophotonic crystal," *Appl. Phys. Lett.*, vol. 108, 022404, 2016.
- [6] N. Kanazawa et al., "Demonstration of a robust magnonic spin wave interferometer," *Sci. Rep.*, vol. 6, 30268, 2016.

**Mitsuteru Inoue** received the B.S. degree in information engineering and the M.S. and Dr. Eng. degrees in electrical and electronic engineering in 1981, 1983, and 1989 from Toyohashi University of Technology (TUT), Japan. He was an associate professor at TUT from 1993 to 1996, and with the Research Institute of Electrical Communication, Tohoku University, from 1997 to 1999. From 2001 to 2013 he served as professor in the Department of Electrical and Electronic Engineering, TUT. Since 2014, Prof. Inoue is jointly serving as Professor of the Graduate School of TUT and as an executive trustee and vice president of TUT. He was a visiting professor at Stanford University in 2003 and at Moscow State University in 2004.

Prof. Inoue's research interests include spin-coupled wave propagation phenomena in amorphous alloy and magnetic garnet thin films, including phase modulation of magneto-surface-acoustic-waves, control and phase modulation of optical waves, and control of high-frequency magnetostatic and spin waves, together with their applications in magneto-optical (MO) spatial light modulators, three-dimensional MO displays, non-

destructive MO imaging, magnetic hologram recording, and spin-wave logic circuits. He has served as the director of Magnetics Society of Japan from 2013 to 2015 and as the general chair of the Magnetics and Optics Research International Symposium (MORIS, 2015 and 2018). He is currently the chair of the 147th Committee on Amorphous and Nano-Crystalline Materials of the University-Industry Cooperative Research Committees, Japan Society for the Promotion of Science (JSPS).



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# Spin Conversion Phenomena in Spintronics

YoshiChika Otani, University of Tokyo, Japan

Since the discovery of giant magnetoresistance, spintronics research has been evolving and has reached a new phase in which the concept of spin currents, i.e., the flow of spin angular momenta, helps us understand various spintronics phenomena. These phenomena include all the recently discovered conversion effects, such as the direct and inverse spin Hall effects, spin Seebeck and Peltier effects, spin pumping, and the inverse Faraday effect. More recently, Rashba interfaces and the surface states of topological insulators were found to exhibit the so-called Edelstein effect, in which spin-momentum locking behavior brings about non-equilibrium spin accumulation.

These interface and surface effects thus provide an effective means of interconversion among spin, charge, and heat currents. Most of the above-mentioned spin conversion phenomena take place at simple nanoscale interfaces between two different types of materials (e.g., magnets, non-magnets, semiconductors, and insulators). These structures may enable us to advance spin-mediated interconversion among physical entities such as electricity, light, sound, vibration, and heat.

I will first give an introduction to the general spin-mediated spin-conversion processes and then will focus on magneto-electric spin conversion in conductive solids, including spin Hall effects and new conversion mechanisms: Edelstein effects arising at Rashba interfaces [1] and surface states of topological insulators [2], as discussed in a recently published progress article [3].

[1] S. Karube, K. Kondou, and Y. Otani, "Experimental observation of spin-to-charge current conversion at non-magnetic metal/Bi<sub>2</sub>O<sub>3</sub> interfaces," *Appl. Phys. Exp.*, vol. 9, 033001, 2016.

[2] K. Kondou et al., "Fermi-level-dependent charge-to-spin current conversion by Dirac surface states of topological insulators," *Nature Phys.*, vol. 12, pp. 1027-1031, 2016.

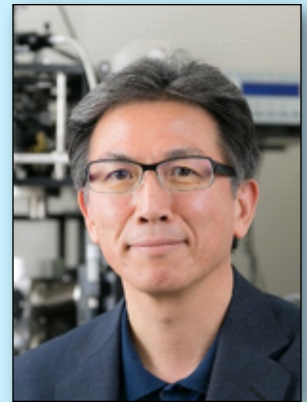
[3] Y. Otani et al., "Spin conversion on the nanoscale," *Nature Phys.*, vol. 13, pp. 829-832, 2017.

**YoshiChika Otani** received the B.S., M.S., and Ph.D. degrees from Keio University, Japan, in 1984, 1986, and 1989. He was a research fellow at the Physics Department of Trinity College Dublin, the University of Dublin, Ireland (1989–1991), and a researcher at the Laboratoire Louis Néel, CNRS, France (1991–1992). He was an assistant professor at the Department of Physics, Keio University (1992–1995) and an associate professor at the Department of Materials Science, Tohoku University (1995–2002).

In 2001–2004 Prof. Otani led the Quantum Nano-Scale Magnetics Research Team, part of RIKEN's Frontier Research System (FRS). In 2004 he became a professor at the Institute for Solid State Physics (ISSP), University of Tokyo. Since 2013 he has additionally been the leader of the Quantum Nano-Scale Magnetism Research Team at the RIKEN Center for Emergent Matter Science (CEMS).

Prof. Otani has published over 250 technical articles in peer-reviewed journals, including book chapters and review articles,

and has given more than 100 invited and plenary presentations at international conferences. He has been coordinating the Nano Spin Conversion Science project, supported by the Japanese Ministry of Education, Culture, Sports, Science, and Technology, since 2014 to elucidate the interconversion mechanisms among phonons, photons, magnons, and electrons. He has been a committee member of Commission on Magnetism (C9) of the International Union of Pure and Applied Physics since 2011 and will become vice chair in 2018.



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# Topological Insulators 2017 Conference Review

By Olga Kazakova, Topological Insulators Conference Co-Chair

The first event in a new series of Magnetic Frontiers conferences, founded and supported by the IEEE Magnetics Society took place in Nancy, France during September 18-21, 2017. Magnetic Frontiers was established as a premier small topical conference on emerging aspects of fundamental and applied magnetism. The series aims at providing a range of plenary and invited talks, and a unique possibility for students and young researchers to discuss their work with leading scientists in an informal and creative environment.

The first conference in the series was related to the emerging topic of topological insulators – unique electronic materials that in addition to a bulk band gap, as in an ordinary insulator, have protected conducting states on their edge or surface that are possible due to the combination of spin-orbit interactions and time-reversal symmetry.

The conference was co-chaired by Stephane Mangin (University of Lorraine, France) and Olga Kazakova (NPL, UK) and attracted key researchers from all over the world. The plenary lectures were given by Albert Fert (Nobel Prize in Physics, Paris Sud University, France), Matthias Bode (Wurzburg University, Germany), Ingrid Mertig (Martin Luther

University, Germany), Qi-Kun Xue (Tsinghua University, China), Zhi Xun Shen (Stanford University, USA) and Nitin Samarth (Penn State University, USA).

Additionally, 13 invited talks were presented, covering emerging topics in topological insulators including materials and interface design, characterization techniques, electronic transport in topological materials, theory and modeling of topological materials, and prospects for applications.

The program also included contributed talks, poster sessions and a very popular round table discussion, which was moderated by Manuel Vásquez, President of the Magnetics Society. The conference was very well attended (nearly 100 attendees in comparison to the planned number of 80 people) and attracted a large number of students and female scientists. Six students (among them three female students) received travel grants from the Society.

The conference also hosted a spectacular social event held in the Haut Koenigsbourg Castle and a Gala Dinner at the beautiful Château d'Art sur Meurthe. The conference was generously sponsored by the Society.



**Attendees of the Magnetic Frontiers: Topological Insulators conference in Nancy, France.**



# ISEM 2017 Conference Review

By Vincent Mazauric, ISEM 2017 Conference Chair

During September 3-6, 2017 the 18th International Symposium on Applied Electromagnetics and Mechanics (ISEM) was held in Chamonix Mont-Blanc, France and was organized jointly by G2Elab, Institut Néel, and MINES ParisTech.

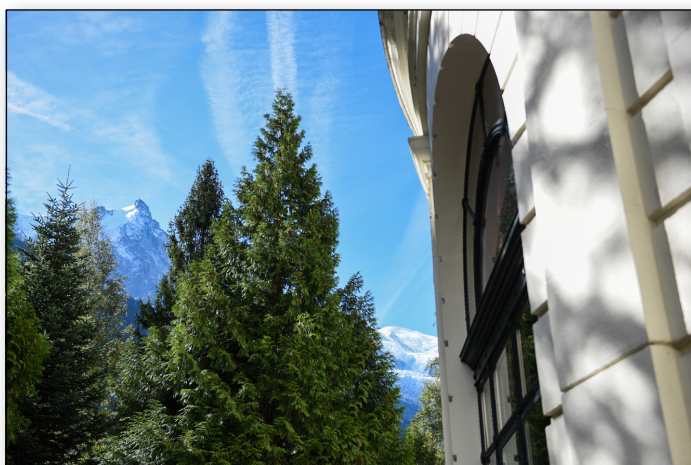
The ISEM series is focused on applications of electromagnetics and mechanics. It emphasizes both basic science and early engineering developments in these interdisciplinary fields. The symposium strongly encourages practical application of emerging technologies to problems of direct relevance to industries. Consequently, both theoretical as well as applied research topics are of interest.

For ISEM 2017, 371 contributions were submitted to the editorial board. After a painstaking review by the editorial committee, seven keynotes were delivered at plenary sessions, 100 presentations were given during 20 parallel oral sessions, and 226 papers had the opportunity to be presented in five poster sessions.

More than 297 participants – a third of whom were students – from 26 countries, registered to attend ISEM 2017. These numbers show the significant interest and great importance of the topics covered by the conference. The next ISEM conference will be held in Nanjing, China, in September 2019.



**Manuel Vásquez, IEEE Magnetics Society President, delivering his keynote, moderated by Alain Fontaine, Past President of the French Physical Society (SFP).**



**View of Mont Blanc (right) and Aiguille du Midi (left) from the conference center.**



**Attendees of the ISEM 2017 conference in Chamonix Mont-Blanc, France.**

## Conference Calendar

November 6-10, 2017 2017 Conference on Magnetism and Magnetic Materials (MMM 2017)  
Pittsburgh, Pennsylvania, USA  
<http://www.magnetism.org>

December 4-6, 2017 2017 International Electronic Devices Meeting (IEDM 2017)  
San Francisco, California, USA  
<http://www.ieee-iedm.org>

December 13-15, 2017 Nanomaterials Applied to Life Sciences (NALS)  
Gijón, Spain  
<http://www.nals2017.es>

February 8-9, 2018 Magnetics 2018  
Orlando, Florida, USA  
<http://www.magneticsmagazine.com/conferences/>

April 9-10, 2018 Magnetism 2018  
Manchester, UK  
<http://magnetism2018.iopconfs.org>

April 23-27, 2018 2018 International Magnetics Conference (INTERMAG 2018)  
Singapore, Singapore  
<http://www.intermag2018.com>

July 15-20, 2018 21st International Conference on Magnetism (ICM 2018)  
San Francisco, California, USA  
<http://www.icm2018sf.org>

August 26-30, 2018 25th Int. Workshop on Rare-Earth Permanent Magnets (REPM 2018)  
Beijing, China  
<http://www.repm2018.org>

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

## About the Newsletter

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

Contributions are solicited from Magnetics Society members, conference organizers, Society Officers & other volunteers, local chapters, and other individuals with relevant material. The Newsletter is published quarterly on the Magnetics Society webpage at

<http://www.ieeemagnetics.org>.

Please send articles, letters & other contributions via email to the Newsletter Editor, Gareth Hatch, at [g.p.hatch@ieee.org](mailto:g.p.hatch@ieee.org).

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