



IEEE International Magnetism Conference INTERMAG 2024

Rio de Janeiro, Brazil • May 5-10, 2024

www.intermag2024.org



It is our great pleasure to invite you to the IEEE International Magnetism Conference, INTERMAG 2024, which will be held in Rio de Janeiro, Brazil, on May 6-10, 2024. The conference will be in-person, with on-demand access to uploaded content provided afterwards.

INTERMAG is the premier international conference on all aspects of fundamental and applied magnetism. The conference will consist of oral and poster presentations, invited talks and symposia, tutorial sessions, and exhibits. A “Lab Tour in Magnetism” is also planned, including visits to Brazilian Center for Research in Physics (CBPF). With its world-class cluster of experimental facilities in magnetism, CBPF is an ideal place for magnetism researchers to gather and discuss their work. Tours to other institutions in the Rio de Janeiro area can be also organized.

The conference will cover a wide range of topics that include spintronics, magnetization dynamics, biomagnetism, electrical machines and power transformers, memory and logics, data storage, sensors, hard and soft magnetic materials, and interdisciplinary and emerging topics.

The Management Committee of INTERMAG 2024 invites you to participate in the conference and to present your latest results. A two-page digest format will be adopted for this conference, and accepted digests will be published in IEEE Xplore with a unique digital object identifier (DOI). Full papers will be published in the IEEE Transactions on Magnetism as usual, subject to peer review.

Rio de Janeiro, the capital of Rio de Janeiro State, is known as the “Cidade Maravilhosa (Marvelous City)”. Rio is known for beaches, Christ the Redeemer, Carnival, warm sun, and welcoming people! But behind all this, there is a long and rich culture and history that perfectly explains the city and its inhabitants. Rio is one of the most diverse cities on the planet. When in Rio, either on beach, downtown or in one of the many university campuses located in the area, you will find people from all over the world. The city is also a home for two biggest urban forests of the world. If you get tired of the hectic city life, just hop into a bus or train and in 30 minutes you’re in the middle of the Atlantic Rainforest watching the wildlife.

We look forward to welcoming everyone to Rio for INTERMAG 2024 and enjoying face-to-face discussions with colleagues from around the world.

GENERAL CHAIRS

Rubem Luis Sommer - CBPF
Mingzhong Wu - Northeastern University

PAST INTERMAG CHAIRS

Bethanie Stadler - U. of Minnesota
Koki Takanashi - JAEA/Tohoku University

NEXT INTERMAG CHAIR

Mark Stikes - NIST

ON-LINE ACTIVITY CHAIRS

João Paulo Sinnecker - CBPF
Laura Steren - UBA

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Sergio Magalhães - UFRGS

LATIN AMERICA COMMITTEE HEADS

João Paulo Sinnecker - CBPF
Laura Steren – UBA



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TECHNICAL SUBJECT CATEGORIES: The conference will cover basic and applied science and technology related to magnetism and magnetic materials. The technical subject categories are as follows:

1. Spintronics

- a. Magnetoresistance (GMR, TMR)
- b. Antiferromagnetic and ferrimagnetic spintronics
- c. Spin-orbitronics (spin-orbit torque, orbital torque, Dzyaloshinskii-Moriya Interaction)
- d. Spin injection and spin transfer torque
- e. Spin currents, spin pumping, spin Hall, and related effects
- f. Voltage-controlled magnetic anisotropy and switching
- g. Skyrmions
- h. 2D spintronics
- i. Topological insulators, Weyl and Dirac semimetals

2. Memory, logic and data storage

- a. MRAM and related devices
- b. Magnetic logic devices
- c. Neuromorphic and unconventional computing
- d. Domains and domain wall devices
- e. Energy-assisted recording
- f. Recording heads and media
- g. Recording physics, modeling and systems (coding, actuators and channels)
- h. Head-disk interface and tribology
- i. New recording technology

3. Magnetization dynamics and micromagnetics

- a. Magnetization dynamics and damping
- b. Magnetic textures, statics, and dynamics
- c. Micromagnetic and hysteresis modeling
- d. Ultrafast and all optical switching
- e. Spin waves and magnonics
- f. Magneto-plasmonics
- g. New approaches in computational magnetism

4. Electrical machines, magnetic devices and control

- a. (Semi-)analytical modelling and techniques
- b. Numerical analysis methods, design and optimization of electrical machines
- c. Magnetic aspects related to motor drives, testing and control
- d. Surface and interior permanent magnet machines
- e. Non-rare earth permanent magnet machines
- f. Memory and variable flux machines
- g. High-speed machines
- h. Wound-field and multi-excited rotating electrical machines
- i. Induction and reluctance machines
- j. Magnetically geared, Vernier, and flux-modulated machines
- k. Linear machines and actuators
- l. Magnetic bearings and magnetic levitation
- m. Transformers, inductors and magnetic aspects related to power electronics

5. Sensors and high-frequency devices

- a. Magnetic field sensors (non-recording)
- b. Sensors (not of magnetic fields)

- c. High frequency, microwave and millimeter wave materials and devices
- d. Terahertz materials and devices
- e. Applications to Internet of Things (IoT)

6. Multi-functional magnetic materials and applications

- a. Magneto-optic materials and devices
- b. Magneto-elastic materials and devices
- c. Magneto-caloric materials and devices

7. Soft magnetic materials

- a. Ferrites and garnets
- b. Crystalline alloys
- c. Amorphous and nanocrystalline materials
- d. Magneto-dielectric materials and meta-materials

8. Hard magnetic materials

- a. Rare-earth compounds
- b. Intermetallic alloys and L10 alloys
- c. Rare-earth free hard magnetic materials
- d. Nanostructured, composite, and other hard magnetic materials

9. Magnetoelectronic materials and phenomena

- a. Multiferroics
- b. Magnetoelectric phenomena

10. Fundamental properties and cooperative phenomena

- a. Complex oxides
- b. Half-metallic materials
- c. Magnetic semiconductors

11. Nano-structured materials

- a. Thin films and surface effects
- b. Multi-layered films and superlattices
- c. Patterned films and elements
- d. Nanoparticles and nanowire arrays and self-assembly
- e. Individual nanoparticles and nanowires
- f. Magnetic nanocomposites

12. Biomagnetics

- a. Biomagnetism
- b. Biomedical diagnostics and imaging
- c. Biomedical therapies and nanomedicine

13. Microscopy, imaging and characterization

- a. Magnetic domains
- b. Novel imaging instrumentation

14. Interdisciplinary and emerging topics

- a. AI and machine learning
- b. Quantum transduction
- c. Spin qubits
- d. Interdisciplinary topics related to magnetism and magnetic materials
- e. Emerging topics related to magnetism and magnetic materials
- f. Magnetic fluids and separation



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CONFERENCE FORMAT

The INTERMAG 2024 technical program will include invited and contributed papers in oral and poster sessions with live Q&A, symposia, a tutorial, a plenary session and IEEE awards ceremony, and several special sessions. There will be no live streaming of any onsite events, however, online access to many of these onsite presentations and sessions will be available the week after the onsite conference and will last for three months. All oral presentations, both invited and contributed, will be held live onsite.

CONFERENCE PRESENTATIONS AND SYMPOSIA

Individual invited presentations and symposia consisting of 6 invited presentations are an important aspect of the program. Invited speakers will be selected from nominations and will be contacted by the Program Co-Chairs in late December. The Program Committee may also upgrade a certain number of contributed digests on important late-breaking results to invited status.

Nominations for invited speakers and symposia will be accepted until November 13, 2023 at <https://intermag2024.org> under "Authors, Nominations for Invited Speakers and Symposia". We are seeking nominations that represent the most exciting work and diversity of the international magnetism community.

DIGEST SUBMISSION

INTERMAG 2024 will use a two page digest format. Accepted digests will be published in IEEE Xplore, with author approval, and will receive a digital object identifier (DOI). In addition to this, authors may also publish full papers, as before. All uploaded oral and poster presentations will be linked to the digests on IEEE Xplore, with presenter approval. Presenters retain the copyright to their videos. The deadline for digest submission is January 8, 2024. All digests must be submitted online following the instructions posted at the Conference website at <https://intermag2024.org>. Digests should provide a clear summary of the work and results obtained. Authors will be informed of the status of their submission via e-mail by February 12, 2024.

PRESENTATIONS

Contributed presentations accepted for the Conference will be presented either orally (in-person) or as posters (in-person or online). Authors are requested to indicate their preference for oral or poster presentation on the digest submission site; however, the Program Committee will make the final decision. Authors will be notified by email of their presentation format and specific session.

At the time of digest submission, authors must also indicate their preference for an in-person poster or an online poster. After a digest has been accepted, there will be an opportunity for the presenter to change this preference for an in-person or online poster. If the digest has been assigned an oral slot, but the speaker is unable to attend, the authors are responsible for immediately notifying the conference of that, and the digest will be given in a poster format. On-site participation is required for oral contributed and invited talks.

There will be no online contributed oral presentations. Online poster presentations will be in the form of a 5-minute-long pre-recorded talk with a one-page electronic poster in PDF. No video will be allowed for this upload.

ONSITE ORAL PRESENTATIONS

Contributed oral presentations will consist of a 12-minute-long talk by a registered author, followed by a 3-minute Q&A period for in-person attendees. The length for invited presentations is 25 minutes followed by a 5-minute Q&A period. On-site attendees will deliver their talks in-person but must also submit their presentation slides for upload (it can be done right after the in-person conference).

ONSITE POSTER PRESENTATIONS

Poster presentations will consist of well-prepared visual materials about the work posted on a designated board during the assigned poster session, with the author available to explain the details and answer questions. Simply posting a hard copy of the paper is inappropriate. For further details, including poster board size, please check the conference webpage <https://intermag2024.org>. On-site attendees will present their posters in-person but must also submit a poster presentation slide for upload.



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PUBLICATION

Authors of accepted digests are encouraged to submit full papers for publication in IEEE Transactions on Magnetics. Detailed instructions on the preparation of manuscripts will be available from the submission site at <https://intermag2024.org> (under "Publications") in February 2024. Some brief notes regarding full paper publications are given below.

- To be eligible for publication, all papers must be presented at the Conference by a registered author who is knowledgeable about the work.
- All papers will be submitted to the IEEE online submission site, Scholar One Manuscript Central.
- The paper submission site opens on March 1, 2024. Papers must be received by March 21, 2024. Post-deadline papers will not be accepted and will not be forwarded for review.
- The recommended paper length is ten (10) journal pages for invited papers and five (5) journal pages for contributed papers.
- Reviewing and revisions will be handled through the online system. Review standards will mirror those used for regular articles submitted to IEEE Transactions on Magnetics.
- All papers will have at least two peer reviews, and the final decision on the publication of the manuscripts will be made by the INTERMAG editors
- Accepted conference-related papers will be posted online with DOIs as "Early Access" papers. They will be published in final form as regular articles (not as conference papers) in a special issue of IEEE Transactions on Magnetics.
- Some papers not accepted for IEEE Transactions on Magnetics may instead be published in the IEEE Magnetics Society Conference Proceedings on IEEE Xplore. There is no cost to the authors for this, unless the authors want open access.

BEST STUDENT ORAL PRESENTATION AWARD

Following the establishment of this prestigious award by the IEEE Magnetics Society in 2008, a competition will be held during the Conference for the IEEE Magnetics Society Best Student Oral Presentation Award, which recognizes and encourages excellence in graduate studies of magnetism. Full-time graduate students who will be presenting an oral contribution may apply. Students should apply at the same time as they submit their digests by providing the supplementary information requested in the digest submission process. The supplementary information must include: (1) Ph.D. candidacy, the expected graduation date, student IEEE membership number, advisor name, advisor IEEE membership number; (2) a one-page description of the motivation for the research, the significance of the research results, and the applicant's contribution to the work being presented; (3) a letter of support from the student's advisor. The deadline for student award applications is January 8, 2024. Incomplete applications will not be considered. Up to five finalists will be selected based on accepted digests and supplementary information. Only the finalists will be notified by the selection committee. The three awardees will be selected at the conference by the Best Student Oral Presentation Award subcommittee and announced during the conference. The award consists of a cash prize and a certificate.

NEIL SMITH AWARD

The IEEE award is in memory of Dr. Neil Smith, whose productive industrial research career was underpinned by a mastery of experimental measurement techniques and theoretical analysis. More information on this prize will be updated soon.





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CHILD CARE & STUDENT TRAVEL SUPPORT

INTERMAG 2024 will offer a limited number of child care support to parents with childcare responsibilities who wish to attend the conference. Participants who are bringing small children to the conference, or who incur extra expenses in leaving their children at home (i.e., extra day care or babysitting services), are invited to apply for reimbursement of allowable expenses upon receipt of digest acceptance notification.

Student travel support is intended to partially offset travel costs. Additional support will be available specifically for students from underrepresented countries. The deadline for submitting applications and letters of endorsement is February 24, 2024. For additional details on eligibility requirements and the application process, go to <https://intermag2024.org> under "Travel."

REGISTRATION

Conference registration fees and the online registration link will be available on the Conference website on February 1, 2024.



IMPORTANT DATES

Invited Speaker & Symposia Nominations Site Opens	October 20, 2023
Invited Speaker and Symposia Nominations Deadline	November 13, 2023
Digest Submission Site Opens	November 17, 2023
Digest Submission Deadline	January 8, 2024
Best Student Oral Presentation Award Application Deadline	January 8, 2024
Neil Smith Award Application Deadline	January 8, 2024
Conference Registration Opens	February 1, 2024
Magnetism as Art Submission Site Opens	February 1, 2024
Acceptance/Rejection Notices	February 12, 2024
Manuscript Submission Open	February 24, 2024
Manuscript Submission Deadline	March 17, 2024
Presentation Upload Deadline	Mid-April 2024
Magnetism as Art Submission Deadline	End-April 2024
INTERMAG 2024 Conference	May 5-10, 2024
Online (On-demand) Conference	A week after the Onsite Conference
IEEE Transactions on Magnetics Publication	Fall 2024