ICC-IMR News

No. 16
Jan. 2026

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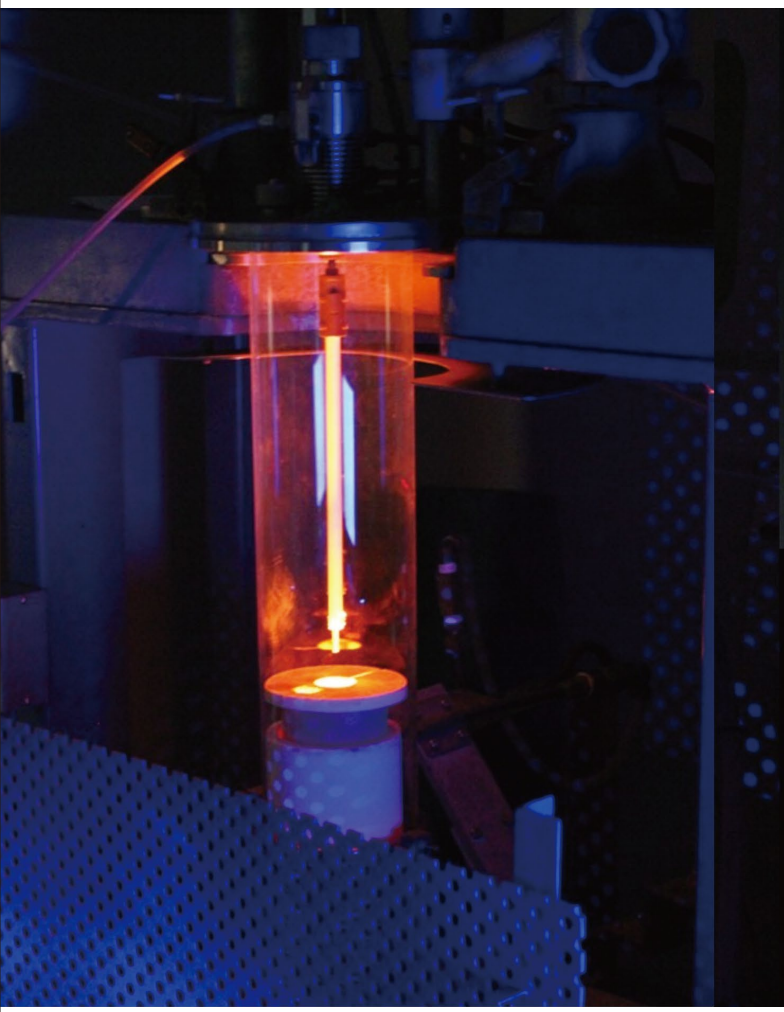
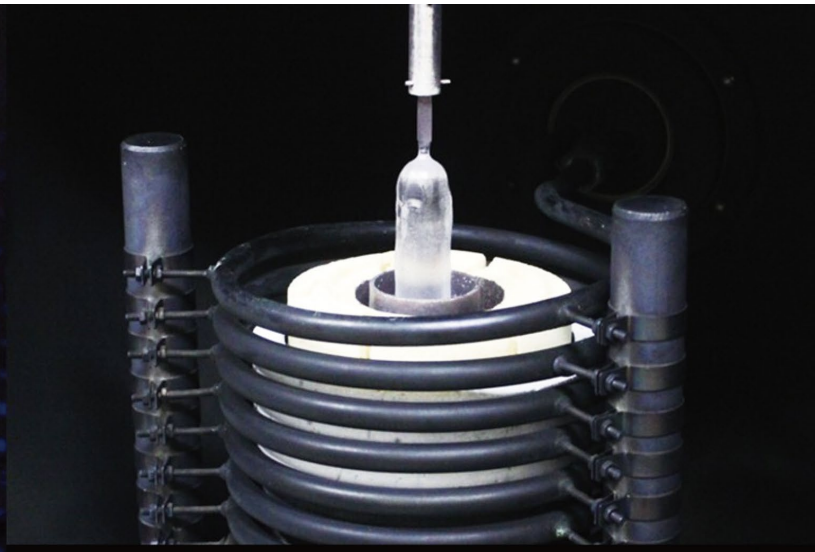




International Collaboration Center
Institute for Materials Research
Tohoku University
ICC-IMR

https://www.icc-imr.imr.tohoku.ac.jp

Top Message

In October 2025, the Institute for Materials Research (IMR) signed an academic exchange agreement with the Institute of Magnetism (IMAG) in Kyiv, Ukraine. This is the second exchange agreement between Tohoku University and an institution in Ukraine, and Tohoku University has accepted many researchers from Ukraine in recent years. Immediately after the outbreak of the Russia's Aggression Against Ukraine, Tohoku University provided a place for researchers who had to leave the country to continue their work. It has also continued to promote academic exchange despite the difficult situation. IMAG is conducting research on magnetism across a wide range of fields—from theoretical to applied topics—under the Academy of Sciences of Ukraine, and we envision many common grounds for collaboration with the Institute for Materials Research, which has also conducted research on magnetism as a key aspect of materials science.
In May 2025, two researchers from IMAG visited the IMR and traveled for almost two full days on an overnight train from Kyiv to Warsaw and then flew to Japan to conduct collaborative research under the Global Institute for Materials Research Tohoku (GIMRT). Although this path of collaborative research has been very long and winding with many challenges, we have certainly forged closer connections between our respective institutions and countries.
As a result of this joint research, we have successfully developed a system that can evaluate magnetization, magnetoresistance, and magnetocaloric effects over a wide range of temperatures, from that of liquid nitrogen to room temperature. We are currently preparing to relocate the system to Ukraine, and it is scheduled to be operational in February 2026.
In the past, research at IMR had to be suspended due to the Great East Japan Earthquake in March 2011. At that time, the IMR received support and solidarity from domestic universities as well as from many overseas research institutes and universities, which enabled us to recover quickly. In the future, we hope that the path of interconnected academic exchange to continue and deepen despite various difficulties as long as researchers are motivated to conduct collaboration research under mutual understanding. The International Collaboration Center at the IMR (ICC-IMR) continues to work towards such collaboration.

ICC-IMR Director
Hiroyuki NOJIRI

Comment from a Visiting Professor

Marcel A.J. SOMERS
Technical University of Denmark

My stay at IMR was most memorable. For a long time, I have had a wish to concentrate on unique results obtained on martensitic transformation in steels in the sub-zero Celsius regime. It has been a privilege to have had this opportunity at IMR in the group of Profs. Furuhara and Miyamoto who have world-leading expertise in martensitic transformations in steels. The friendly, peaceful, helpful and respectful attitude of the group members and the scientific interaction with staff members have been a wonderful experience and has been paramount for me to obtain a comprehensive interpretation of hitherto unpublished data. Apart from this, it was a great pleasure to share part of my research achievements on surface engineering of steels and stainless steels in two lectures at IMR for academic and industrial members of the Japanese Society for Heat Treatment, organized by prof. Miyamoto. Furthermore, a visit to the research laboratories and steel production facilities of Nippon Steel in Kimitsu (Chiba prefecture) emphasized exemplarily the symbiosis between academia and industry in Japan.
Staying in Katahira Guest House, Sendai close to IMR has been most practical. Convenience stores and small restaurants are abundantly available within walking distance. During my stay in Japan, I have everywhere been met with a courteous, humble and respectful approach. This inherent cultural dignity is an important counterweight to today's noisy social-media dominated communication platforms and deserves wide adoption.
I am indebted to ICC-IMR for their support to make this stay possible and to Prof. Miyamoto and Narita-san for all the organizational and practical assistance.

Comment from a Visiting Professor

Eun-Ae CHOI
Korea Institute of Materials Science

I had the great opportunity to visit IMR for two months during the summer, thanks to Professor Kato's kind invitation. When I was first assigned an office, I was pleasantly surprised by how spacious and comfortable it was. At my home institution, space is very limited, and even principal researchers are required to share offices. Here, having my own office allowed me to work efficiently in a pleasant environment. The research facilities were also impressive. While we often face difficulties purchasing new equipment due to space constraints, IMR's ample research space and well-equipped laboratories provided an ideal environment for conducting experiments freely.

During the summer, when the air conditioner in my office broke down, the administrative staff promptly arranged for repairs and even reassigned me to another air-conditioned office in the meantime. I truly appreciated the quick administrative support, which allowed me to focus entirely on my research. I realized how important smooth administrative operations are in creating a research-friendly atmosphere.

The social activities were also memorable. At the beer party, I felt genuinely welcomed as part of the IMR community, and I was deeply impressed by the open-minded and friendly attitudes of the professors toward international visitors. I also had several opportunities to present my research to IMR researchers, which led to stimulating discussions and the discovery of potential collaborative topics. Through these experiences, I could clearly see why IMR serves as an international hub for advanced research. I sincerely hope to visit IMR again and continue collaborative research in the future.

Comment from a Visitor

Haribrahma SINGH
Ph.D. Student,
Indian Institute of Technology Delhi, India

During my three-month research visit to IMR Sendai, from August through the end of October, I had the privilege of experiencing both a stimulating academic environment and the rich cultural charm of northern Japan. This journey broadened my scientific perspective while giving me a deeper appreciation of Sendai's welcoming community and vibrant daily life. I am sincerely grateful to ICC and GIMRT for their generous support, which made this academic exchange possible. My heartfelt thanks also go to Prof. Rie Y. Umetsu, whose guidance and encouragement made my time in Sendai both productive and memorable.

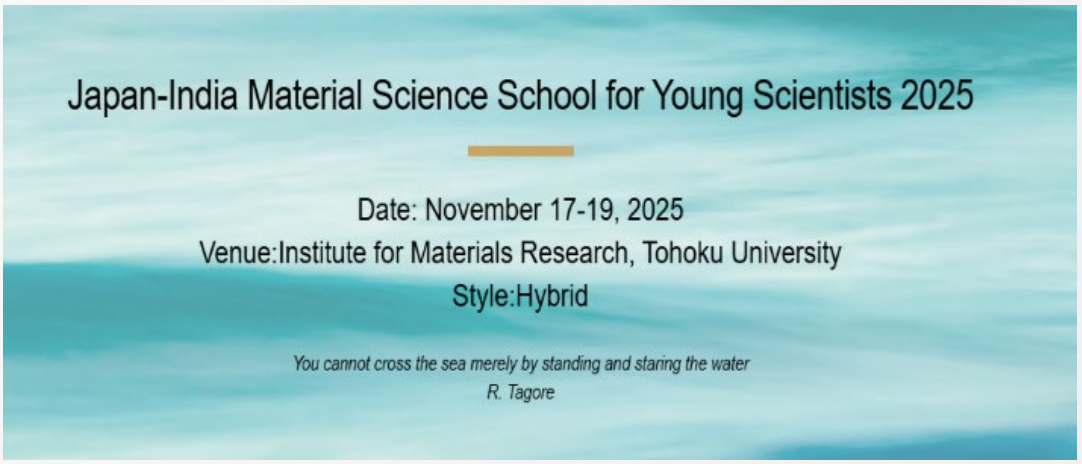
Beyond the laboratory, Sendai offered an atmosphere that was both peaceful and inspiring. Often called the "City of Trees," its wide green avenues and scenic parks created an ideal setting for reflection and research. Whether walking through the tranquil grounds of Zuihōden or enjoying the autumn colors at Aoba Castle's hilltop, I found countless moments where nature encouraged clarity of thought and creativity in my work.

Academically, IMR impressed me with its cooperative spirit and strong emphasis on high-quality research. I found the environment exceptionally supportive for young researchers. Discussions with faculty and fellow students were open, thoughtful, and grounded in scientific rigor. What stood out to me was not just the precision in their experimental methods or the depth of their analyses, but also their honesty in acknowledging challenges and limitations, an approach that strengthened my own understanding of research.

The institute also fostered international collaboration through seminars, and informal group discussions. These interactions provided invaluable opportunities to exchange ideas with researchers from different backgrounds, broadening my academic network. This spirit of openness and cross-cultural exchange was one of the most meaningful aspects of my stay.

Over these three months, I gained much more than research outcomes. I learned from the professionalism of Japanese researchers and deeply appreciated the warmth of the people I met. This experience has left a lasting impact on both my academic and personal growth.

Japan-India Materials Science School for Young Scientists 2025 Successfully Concludes



The Institute for Materials Research (IMR) at Tohoku University hold an annual Materials Science School for Young Scientists. This year marked the 20th time the event has been held since its inception in March 2005. In 2025, as a special initiative focusing on the rapidly expanding collaborative research between Japan and India, the “Japan-India Young Scientists Materials Science School 2025” was held at the IMR Auditorium from November 17 to 19, welcoming approximately 40 participants, including 22 attendees from India (both on-site and online).

Expert Lectures and International Exchange

The three-day school featured lectures delivered by specialists in the field. A total of six lecturers contributed their expertise: three lecturers from India lectured online, while from Japan, two lecturers lectured on-site and one lecturer presented online.

Lecturers:

Prof. Ashok Kumar Ganguli, Indian Institute of Technology- Delhi (Online)
Dr. Kaustuv Manna, Indian Institute of Technology- Delhi (Online)
Prof. Mukannan Arivanandhan, Anna University (Online)
Assoc. Prof. Seigo Soma, AIMR, Tohoku University (On-site)
Prof. Masashi Watanabe, IMR, Tohoku University (Online)
Assoc. Prof. Kei Kamada, IMR, Tohoku University (On-site)

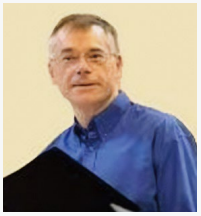
Participants listened attentively to the diverse presentations over the course of the three days, fostering a broad intellectual exchange.

Valuable On-Site Experience for Indian PhD Students

A notable highlight was the attendance of five selected PhD students from India, who traveled to Japan specifically for the school. Beyond attending the lectures, they gained valuable, multi-faceted experiences. This included touring various experimental facilities within IMR and visiting Tohoku University's cutting-edge Nano Terrace facility. This successful in-person engagement further deepened the international exchange among the young scientists, providing them with essential practical exposure.

ICC-IMR Activities in FY 2024

Visiting Professors



Jean-Marc Debierre

Aix-Marseille University, France
May 15, 2024-June 14, 2024

"Theoretical Study on Kinetics at Crystal/Melt Interface"
(Host: K. Fujiwara, IMR)

Yida Xiong

Nanyang Technological University, Singapore (-2025.1)/
Sun Yat-sen University, China (2025.2 -)
July 1, 2024-June 30, 2025

"Corrosion/Stress Corrosion Cracking Behaviors of Binder Jet Printed and Conventionally Manufactured 316L Stainless Steel"
(Host: E. Akiyama, IMR)

Zhongwen Ouyang

Wuhan National High Magnetic Field Center,
Huazhong University of Science and Technology, China
October 11, 2024-November 19, 2024

"Investigation on New Quantum States in Triangular-Lattice Dimer Antiferromagnets"
(Host: H. Nojiri, IMR)

Arvind Maurya

Mizoram University, India
November 1, 2024-January 28, 2025

"Search for Quantum Criticality in Low Dimensional Ferromagnet UNi_4P_2"
(Host: D. Aoki, IMR)

Jaegeun Hah

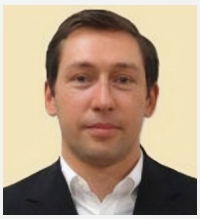
Kwangwoon University, Korea
January 20, 2025-February 26, 2025

"Novel Fabrication of Self-Organized Nano-Thin Films"
(Host: T. Seki, IMR)

Jack C. Gartside

University College London, UK
February 17, 2025-March 28, 2025

"Fabricating 3D Nanomagnetic Arrays for Reconfigurable Magnon Frequency Combs and Neuromorphic Computing"
(Host: T. Seki, IMR)



Oleg Tretiakov

UNSW Sydney, Australia
March 3, 2025-May 9, 2025

"Synthetic Antiferromagnet Spintronics"
(Host: H. Nojiri, IMR)

International Workshops

GIMRT Workshop: The 19th International Workshop on Biomaterials in Interface Science, Sendai 2024.8.6
Organizer: K. Yamanaka, IMR

GIMRT Workshop: Workshop on Polarized Neutron Sciences and Technology, Sendai, 2024.10.21-22
Organizer: M. Fujita, IMR

GIMRT Workshop: The 8th Symposium for the Core Research Clusters for Materials Science and Spintronics and the 7th Symposium on International Joint Graduate Programs in Materials Science and Spintronics (CRCGP-MSSP2024), Sendai, 2024.11.18-21
Organizer: S. Orimo, IMR

Summit of Materials Science 2024 and GIMRT User Meeting 2024, Sendai, 2024.11.27-28
Organizer: T. Sasaki, IMR

Major Publications

S. Holm-Janas, M. Akaki, E. Fogh, T. Kihara, MD. Le, PC. Forino, SE. Nikitin, T. Fennell, A. Painganoor, D. Vaknin, M. Watanabe, NB. Christensen, H. Nojiri, R. Toft-Petersen
"Magnetic Structure and Magnetoelectric Properties of the Spin-Flop Phase in $LiFePO_4$", Phys. Rev. B 109(2024) 174413

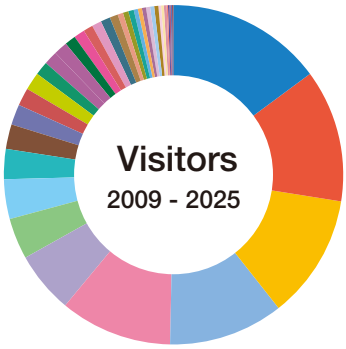
A. Kosogor, R. Y. Umetsu, G. Vladimir, X. Xu, R. Kainuma
"Magnetic Properties, Phase Diagram and Low-Temperature Specific Heat of $Ni_{50}Mn_{50-x}Sb_x$ Alloys", J. Alloy. Compd. 988(2024) 174130

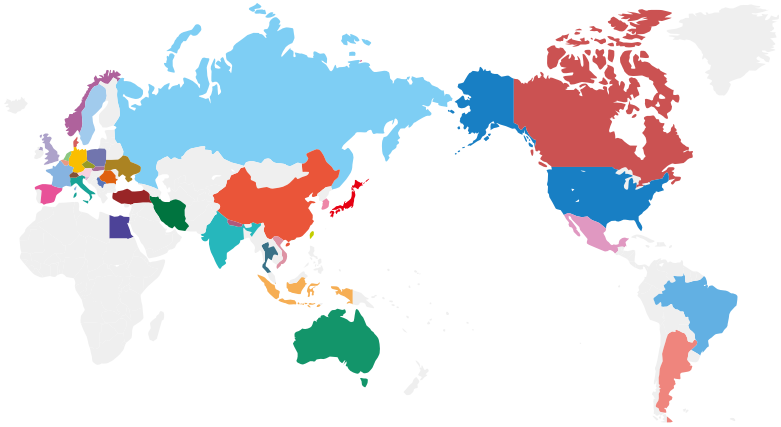
F. Yang, LC. Chuang, K. Maeda, J. Nozawa, H. Morito, K. Fujiwara, T. Duffar
"Dislocation Interaction with Vicinally Faceted Groove at Grain Boundary in Multi-Crystalline Silicon", J. Cryst. Growth, 6639(2024) 127722

S. Yamamoto, D. I. Gorbunov, O. Prokhnenko, E. Weschke, A. Miyata, I. F. Diaz-Ortega, C. Strohm, F. Duc, M.S Henriques, A. Gazizulina, M. Uhlarz, O. Mathon, A. V. Andreev, H. Nojiri, J. Wosnitza
"Field-Induced Magnetic Transitions in the Highly Anisotropic Ferrimagnet $ErFe_5Al_7$ Studied by High-Field X-Ray Magnetic Dichroism", Phys. Rev. B. 109(2024) 148671

D. Aoki, Y. Homma, H. Harima, I. Sheikin
"Quasi-two-dimensional Fermi surfaces of the Antiferromagnet U_2RhIn_8 Revealed by de Haas-van Alphen Measurements", Phys. Rev. B. 111(2024) 35155

Visitors supported by ICC-Programs





USA	114	India	22	Iran	8	Italy	4	Romania	2
China	97	Switzerland	18	Spain	8	Brazil	3	Vietnam	2
Germany	91	Poland	15	Denmark	7	Indonesia	3	Argentina	1
France	85	Canada	13	Mexico	7	Slovakia	3	Egypt	1
Korea	82	Taiwan	13	Thailand	7	Slovenia	3	Nepal	1
UK	46	Australia	10	Hong-Kong	6	Sweden	3	Serbia	1
Netherlands	30	Norway	10	Belgium	4	Ukraine	3	Turkey	1
Russia	29	Singapore	10	Czech Republic	4	Austria	2		

ICC-IMR Programs

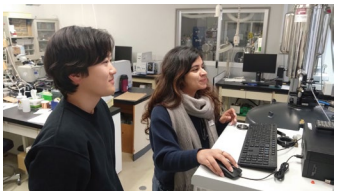
ICC-IMR was founded in April 2008 as the center for international collaboration of the Institute for Materials Research (IMR). As one of the centers of excellence in materials science, IMR holds 27 research groups and six research centers. ICC-IMR works as a gateway of diverse collaborations between international researchers and IMR members. ICC-IMR has invited 94 visiting professors and conducted 26 international research projects since the start-up. The applications are open for foreign researchers and the projects are evaluated by a peer-review process involving international reviewers. Currently, ICC-IMR coordinates five different programs:

1. **International Integrated Project Research**
2. **Visiting Professhorships**
3. **International Workshops**
4. **Fellowships for Young Researchers and PhD Students**
5. **Material Transfer Program**

We welcome applicants from around the globe to participate in these international programs.

The Young Fellowship Program is booming!

ICC-IMR offers several programs in collaboration with GIMRT.
These include the “Covis (Collaborative Research Visit)” program, which began in 2022, the "Young Fellowship" program, which started in 2024, and the support for Ukraine.
In FY2025, we hosted 7 Young Fellows and 2 researchers under the Ukraine support program. Furthermore, 18 Covis visits are currently planned for FY2025.
The Young Fellowship Program is experiencing significant growth.
We hope that our program can provide even more support for students and young researchers.



Contact Information

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On the Cover

Left: Bulk single crystal pulling apparatus
Upper Right: $La_3Ga_{5-x}Al_xSiO_{14}$ bulk single crystal for piezoelectric application
Lower Right: $Y_3Al_5O_{12}$ bulk single crystal for optical application