



IGU-63rd IGU ANNUAL CONVENTION (IITB IIG CSIR-NGRI)



Pre-conference workshops

Date: October 31-November 1, 2026

Venue: Department of Earth Sciences, IIT Bombay



The pre-conference workshops are designed to provide participants with exposure to emerging techniques, analytical methods, and data-driven approaches in geosciences. The workshops will cover a diverse range of themes and include hands-on practical training aimed at strengthening technical skills and enhancing research capabilities.

About IGU: Circulating a letter signed by fifteen leading geophysicists of the country in the year 1963 formed the Indian Geophysical Union. The response to this invitation was encouraging, and about 60 geophysicists responded. These geophysicists who enrolled themselves as Members of the Union were styled as Foundation Fellows.

The Indian Geophysical Union was formally inaugurated by Prof. Humayun Kabir, then Minister for Cultural Affairs and Scientific Research, in 1963, at a pleasant function organised in the Geology Department, Osmania University. Dr D.S. Reddy, the then Vice-Chancellor, Osmania University, presided over the function, and Dr S. Bhagavantam, the then Scientific Adviser to the Defence Minister, welcomed the guests. Dr.K.R.Ramanathan, first President of the Union, delivered the Presidential address. Dr M. S. Krishnan explained the aims and objectives of the Union and presented the draft constitution, which was revised in 1964.

The Union adopted its constitution framed by a Sub-Committee consisting of Dr.M.S.Krishnan, Dr. K.R.Ramanathan and Dr.S.Balakrishna and the Union was registered on 11th March 1964.

The aims and objectives of the Union are:

- To bring together all geophysicists active in various disciplines such as seismology, magnetism, meteorology, geodesy, volcanology, oceanography, hydrology and tectonophysics and to provide them with opportunities for meeting and discussing current problems of geophysics of the solid earth and the oceans.
- To encourage the study of and research in geophysical problems and to provide a medium for the publication of the results.
- To organise and arrange for the meetings and conferences of the Union and encourage the publication and dissemination of knowledge of geophysics and of important research in various branches of geophysics.

- To cooperate with similar learned societies in organising and taking part in meetings, symposia, research projects, etc, and to represent geophysics both in the national and international sphere.
- To secure and administer funds, grants and endowments for the furtherance of research in geophysics.
- To undertake and execute all other acts which shall assist and promote the usefulness, aims and purposes of the Union.

About CSIR-NGRI: CSIR-National Geophysical Research Institute (CSIR-NGRI), established in 1961, is a premier CSIR research laboratory dedicated to multidisciplinary research on the Earth system and its processes. Its research focuses on Geodynamics, Earthquake Hazards, and Natural Resources, with applications in natural hazard mitigation and sustainable management of water, energy, and mineral resources. The Institute has expertise in seismology, geophysics, geochemistry, geology, geodesy, geomagnetism, geochronology, and Earth-process modelling, contributing to scientific advancement and societal development.



About CSIR-Integrated Skill Initiative: The CSIR known for its cutting-edge research and Development knowledge base in diverse S & T areas, is a contemporary R & D organization. CSIR has dynamic network of 37 national laboratories, 39 outreach

centers, 1 innovation complex and 3 units with pan India presence. CSIR covers a wide spectrum of science and technology - from oceanography, geophysics, chemicals, drugs genomics, biotechnology and nanotechnology to mining etc. CSIR envisages A vision of CSIR @ 2030 as to “enhance quality of life of the citizens of India through innovative science and technology, globally competitive R & D, by developing sustainable solutions and capacity building to fulfill the dream of Atmanirbhar Bharat”

About the Department of Earth Sciences, IIT Bombay: IIT Bombay was established in 1958. It attracts top-tier students. Its renowned faculty drives research and academic excellence, forging collaborations with peers across the nation and the world. Alumni excel in various fields, contributing to industry, academia, research, and more. The institute offers innovative short-term courses, continuing education, and distance learning. Faculty members have received prestigious awards, including the Shanti Swarup Bhatnagar Prize, Padma Awards, and many others. It provides a fully residential experience with hostels, dining, sports, and recreational facilities. IIT Bombay is an autonomous institute and deemed university governed by a board of governors, chaired by the president of India. It operates under the guidance of the IIT Council, established by India's Ministry of Education (MoE) (earlier called the Human Resource Development).



The Department of Earth Sciences at IIT Bombay was established as an independent department in 1982. Prior to that, it was operated as a part of the Geology Section of the Department of Civil Engineering. The department currently offers M.Sc. Programs in Applied Geology and Applied Geophysics, M.Tech programs in Geoexploration and Petroleum Geoscience. From 2025 onwards, the B.S. Program in Applied Geophysics is started. Currently, the department boasts a strong reputation, supported by its 26 faculty members, who specialise in diverse research areas across a range of Geosciences, catering to academic and societal interests. The faculty

members are actively involved in both teaching and research, significantly advancing various disciplines within Geoscience. In addition to their teaching responsibilities, the faculty participate in several sponsored research projects, consulting assignments, and short-term courses through IIT Bombay's Continuing Education Programme (CEP). All core and elective courses in the programs are tailored to meet industry standards and research needs. The department's strong connections with industry and research organizations which greatly enhanced the quality of its students.



About Indian Institute of Geomagnetism: Indian Institute of Geomagnetism is a premier autonomous research institution of the Government of India dedicated to the study of geomagnetism and allied fields of Earth, atmospheric, space, and planetary sciences. Established in 1971 as the successor to the historic Colaba–Alibag Magnetic Observatory, whose geomagnetic observations dated back to 1841, IIG has emerged as a globally recognised centre of excellence in geomagnetic, space and geophysical research. Headquartered at New Panvel, Navi Mumbai, the institute functions under the Department of Science and Technology (DST), Government of India. IIG operates a nationwide network of magnetic observatories and regional research laboratories located at Prayagraj, Tirunelveli, and Shillong, providing high-quality geomagnetic data for scientific and societal applications.



The institute's research encompasses a broad spectrum of disciplines, including Geomagnetism and paleomagnetism, Solid Earth geophysics and tectonics, Seismology and earthquake precursor studies, Electromagnetic imaging of the Earth's interior, Space physics and space weather, Atmospheric and ionospheric sciences, Planetary magnetospheres, Groundwater and environmental studies, and Antarctic and Arctic geoscience research.

IIG hosts the World Data Centre for Geomagnetism, Mumbai, the only international geomagnetic data center in South Asia, and actively collaborates with leading research institutions worldwide. The institute also develops advanced magnetometers and provides geomagnetic survey, calibration, and consultancy services to government agencies, industry, aviation, and defense sectors. Through its cutting-edge research, observatory network, scientific training programs, and international collaborations, IIG continues to make significant contributions to understanding Earth's magnetic field, natural hazards, space weather, and the dynamic processes linking Earth's interior, atmosphere, and near-space environment.

Details of Pre-conference Workshops

Workshop 1: Analytical Techniques in Geosciences (25 participants)

About the program: The two-day workshop is designed with the objective of developing a strong conceptual and practical understanding of advanced analytical techniques. The course covers analytical techniques that are widely used in Earth science research, including X-ray Fluorescence (XRF), Electron Probe Micro-Analyzer (EPMA), Inductively Coupled Plasma Mass Spectrometry (ICP-MS), and Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS). The workshop integrates fundamental theory with hands-on training in instrumentation, sample preparation, data acquisition, processing, and data interpretation. Through interactive lectures, practical sessions, and case studies, the program aims to build a solid knowledge base and technical competence required for conducting independent research, advanced teaching, and effective utilization of state-of-the-art analytical facilities.

Conveners: Prof. N Prabhakar (IITB), Dr. Sameer Ranjan (IITB), Dr. Bivin George (IITB)

Minimum Eligibility Criteria: 2nd year M. Sc. Geology/Earth Sciences, 1st and 2nd year PhD. Students of a relevant topic/discipline

Workshop 2: Geophysical Field Training and Data Analysis (25 participants)

About program: This two-day workshop aims to provide participants with exposure to state-of-the-art geophysical instruments, including their underlying principles and applications in geological mapping and natural resource exploration. The programme will include field demonstrations and hands-on training on various geophysical instruments utilized in a wide range of geological and societal applications, such as DGPS, total station, magnetometer, Self-Potential and Electrical Resistivity Tomography (ERT), Transient Electromagnetics (TEM), ground-penetrating radar (GPR), Multichannel Analysis of Surface Waves (MASW), and Broadband seismographs. Additionally, it will cover field data quality assessment, data-processing workflows, visualisation, data integration, and quick-look interpretation using dedicated geophysical software and in-house Python-based tools. Through a combination of theoretical lectures, field-based exercises, and case studies, the workshop aims to develop a strong foundation in applied geophysics and enhance participants' technical skills in geophysical data acquisition, processing, and integrated interpretation.

Conveners: Dr. G. Srinivasa Rao (IITB), Dr. Anand Singh (IITB), Dr. Vivek Kumar (IITB), Dr. S.P. Anand (IIG)

Minimum Eligibility Criteria: 1st year, 2nd year M. Sc. (Geophysics), PhD students in Geophysics

Workshop 3: Geoscientific data analysis workflow for critical mineral exploration (25 participants)

About the program: This two-day workshop provides a comprehensive overview of the critical mineral exploration workflow from regional-scale target identification to resource estimation. The first day focuses on resource classification, prospecting and exploration-area selection, followed by drilling strategies, sampling and assaying, multi-disciplinary data integration, and mineral resource/reserve estimation. The second day introduces passive seismic methods for characterising subsurface structures associated with critical mineral deposits, including mafic-ultramafic intrusions, faults and basement architecture. Additionally, it includes hands-on sessions on Multichannel Analysis of Surface Waves (MASW) using passive seismic recordings and Distributed Acoustic Sensing (DAS), which includes ambient-noise cross-correlation, dispersion curve extraction, and shear-wave velocity profiling. These practical sessions provide participants with exposure to modern geophysical tools for high-resolution subsurface characterisation and their application in identifying and delineating geological features relevant to critical mineral exploration.

Conveners: Dr. Sakthi Saravanan Chinnasamy (IITB), Dr. Satish Maurya (IITB)

Minimum Eligibility Criteria: 2nd year M. Sc. Geology/Earth Sciences/Geophysics, 1st and 2nd year PhD. Students of a relevant topic/discipline

Workshop 4: Application of AI/ML in Geosciences (25 participants)

About the program: This two-day workshop is designed to introduce fundamental concepts of AI and ML techniques as well as their application in natural resource exploration. The programme will cover both supervised and unsupervised learning ML algorithms used for both regression and classification problems, which include random forests, XGBoost, support vector machines, neural networks, as well as K-means, Fuzzy C-means clustering and Self-organising map. Additionally, participants will be introduced to Python-based practical exercises for automation of geophysical well logs for lithology prediction, resource estimation from drill holes, and integration of multi-modal geoscience data for mineral prospectivity mapping.

Conveners: Dr. Anand Singh (IITB), Dr. G. Srinivasa Rao (IITB)

Minimum Eligibility Criteria: 2nd year M. Sc. Geology/Earth Sciences/Geophysics, 1st and 2nd year PhD. Students of a relevant topic/discipline

Workshop 5: Space-based Radio/Microwave Techniques for Natural Hazard Monitoring (25 participants)

About the program: Natural Hazards such as cyclones, landslides, floods, earthquakes, volcanoes and tsunamis pose serious risks to human lives and infrastructure. Space-based radio and microwave remote sensing techniques serve as powerful tools for detection and monitoring these events, enabling early warning systems and effective disaster response. The proposed workshop will introduce principles, basic functioning and applications of these satellite-based technologies in natural hazard monitoring to the participants. The workshop will address techniques

including GNSS-based methods for atmospheric sounding to determine vertical profiles of temperature, pressure, humidity and ionospheric sounding during earthquakes, volcanoes and tsunamis, Synthetic Aperture Radar (SAR), Interferometric SAR (InSAR) and Differential InSAR (D-InSAR) for monitoring ground surface deformations and glacier movements, microwave radiometry for soil moisture mapping, cyclone monitoring and rainfall estimation etc. The role of these techniques in real-time disaster monitoring will be emphasised. The workshop is structured around lectures and discussions. An attempt will be made to organise hands-on sessions using open-source satellite data and basic processing tools.

Conveners: Dr. Mala S. Bagiya (IIG), Dr. Amar Kakad (IIG)

Minimum Eligibility Criteria: 2nd year M. Sc. Physics/Geophysics/Geology/Earth Sciences/Space Physics/Mathematics/Remote Sensing, 1st and 2nd year PhD. Students of a relevant topic/discipline.

REGISTRATION

Applicants must complete the registration process through either of the following two modes by **30th September, 2026**:

Mode 1: Online Registration

Complete the registration through the Google Form:

<https://forms.gle/6kDYCy9QDTArhxAw7>

Mode 2: Applicants are requested to submit the duly filled-in **Registration form** in CAPITAL LETTERS, as per the prescribed format, along with the following documents to iquitb2026@gmail.com:

- Valid Student ID Card
- Endorsement Letter from the Head of the Department (HoD)
- Statement of Interest (150-200 words)

Preference may be given to applicants whose academic background and research interests are closely aligned with the theme of the selected workshop. Since each workshop is limited to 25 participants, submission of the registration form does not guarantee participation. Selection will be based on eligibility, academic/research relevance, and the Statement of Interest.

Note: Applications that do not meet the minimum eligibility criteria or fail to submit the required documents may not be considered for selection.



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Date: October 31-November 1, 2026

Venue: Department of Earth Sciences, IIT Bombay



REGISTRATION FORM

A. APPLICANT DETAILS

1. Name: (Mr/Mrs/Ms)
2. Date of Birth & Age:
3. Gender: ☐ Male ☐ Female ☐ Prefer not to say
4. Programme: ☐ M.Sc. ☐ M.Tech. ☐ Ph.D.
5. Year of Study: ☐ 1st Year ☐ 2nd Year
6. Discipline / Specialisation: ☐ Geology ☐ Geophysics ☐ Space Physics
☐ Physics ☐ Others
7. CPI/CGPA in the Previous Degree (B.SC/M.Sc/M.Tech):
8. CPI/CGPA in Current Programme:
9. University/institution:
10. Department / School / Centre:
11. Address for Correspondence:
12. Mobile No:
13. Email ID:
14. Any other relevant information:
[Please attach a separate sheet if required]

B. WORKSHOP PREFERENCE

15. Please indicate at least THREE workshop preferences (1, 2, 3, etc.) in order of priority.
☐ Analytical Techniques in Geosciences
☐ Geophysical Field Training and Data Analysis
☐ Geoscientific Data Analysis Workflow for Critical Mineral Exploration
☐ Application of AI/ML in Geosciences
☐ Space-based Radio/Microwave Techniques for Natural Hazard Monitoring

C. REQUIRED DOCUMENTS

16. Applicants must submit the following documents along with the registration form:
☐ Valid Student ID Card
☐ Endorsement Letter from the Head of the Department (HoD)
☐ Statement of Interest (150-200 words)

D. DECLARATION

16. I hereby certify that the information provided above is true and correct to the best of my knowledge. I confirm that I meet the minimum eligibility criteria for the selected Workshop. I understand that participation is subject to selection and availability of seats.

Place:

Date:

Signature of the Applicant

ENDORSEMENT LETTER

I certify that Mr./Ms./Mrs. _____ is a student of _____ Department, _____ Institution / University, and is currently enrolled in the _____ Year of the M.Sc. / M.Tech. / Ph.D. Programme. I hereby endorse the student's application to participate in the IGU Pre-Conference Workshop, to be held at the Department of Earth Sciences, Indian Institute of Technology Bombay, Mumbai, from 31 October to 1 November 2026, as part of the 63rd Annual Convention of the Indian Geophysical Union (IGU).

Name of Head of the Department: _____

Department: _____

Institution/University: _____

Email & Contact No.: _____

Date:

(Signature of HoD & Official Seal)

Program Coordinator:

Dr. Abhey Ram Bansal
Scientist G & Honorary Secretary, IGU
Email: igu123@gmail.com; hsec.igu@gmail.com