



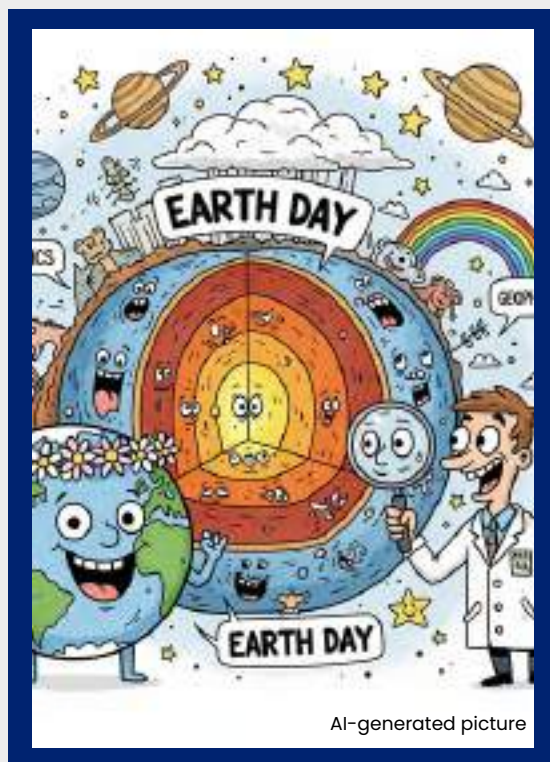
GEOSPECTRUM

Volume 3 (Dec, 2024 – Apr, 2025)



Theme of the volume **World Earth Day**

World Earth Day is celebrated every year on April 22 to raise awareness about environmental protection and sustainability. It reminds us of our collective responsibility to care for the planet. From planting trees and reducing plastic use to promoting clean energy and protecting biodiversity, every action counts. Let us pledge to make conscious choices that nurture the Earth—not just for today, but for generations to come.



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From HoD's Desk

Welcome to the 3rd edition of our Department of Applied Geophysics newsletter. Since our inception in 1957, we have developed into a pioneering department dedicated to advancing knowledge and expertise in geophysical sciences inside country as well as in global space. With programs at the undergraduate, postgraduate, and doctoral levels, we prepare our students to address complex geophysical challenges, contributing significantly to the fields of energy, resource management, geohazards and sustainability. Our curriculum emphasizes both foundational knowledge and cutting-edge advancements, enabling our graduates to excel globally.



Our research focus encompasses seismology, near surface geophysics, seismic studies, rock and fluid physics, remote sensing, formation evaluation, potential fields, ground water and environmental geophysics, with an increasing integration of artificial intelligence, machine learning, and sustainable resource management. Equipped with advanced laboratories and facilities, including a Seismological Observatory and specialized labs for seismic data processing, mining geophysics, global optimization, and rock physics, we are at the forefront of research and development in applied geophysics. Our department has strong expertise in Near Surface Geophysics; Environmental Geophysics; Mining Geophysics; Archaeological Geophysics, Engineering Geophysics and Geotechnical Modelling.

A cornerstone of our department is collaboration. Through strategic partnerships with industry leaders and research institutions, we provide our students with real-world experience and access to state-of-the-art technologies. The Subsurface Resource Characterization Group (sRCg), for instance, is a recent initiative dedicated to exploring innovative solutions for subsurface exploration and environmental sustainability. This group develops software tools and methodologies that enhance subsurface analysis and resource estimation.

Our department's outreach efforts and workshops are designed to strengthen our engagement with the geoscience community and to foster knowledge sharing and skill development among students and professionals. Through our continuous work in early warning systems for geohazards, we are dedicated to creating safer, more resilient communities. As we look to the future, our commitment remains to excellence in education, impactful research, and meaningful contributions to the geoscience sector. Thank you for supporting the Department of Applied Geophysics at IIT (ISM) Dhanbad as we strive to lead in geophysical innovation and knowledge.

Prof. Sanjit Kumar Pal

Professor & Head of the Department
Department of Applied Geophysics
IIT (ISM) Dhanbad, Jharkhand, India

Woman Faculty's Column

Being the only female faculty member in the Department of Applied Geophysics at IIT (ISM) Dhanbad, a journey filled with both challenges and rewards has been experienced. Unique experiences have been encountered while working in a field that has traditionally been dominated by men, and through them, both professional and personal growth have been shaped. A contribution has been made to the advancement of geophysical research and education, and efforts have been directed toward fostering greater diversity and inclusivity within the geosciences.



One of my core beliefs is that innovation and a broader, more inclusive approach to problem-solving are fostered by diversity in academia. Through my teaching and research, particularly in the field of seismology, efforts have been made to inspire the next generation of geoscientists, especially young women, to pursue careers in STEM. It is considered important that the classroom and research environment be maintained as inclusive, supportive, and collaborative spaces—where students are empowered to ask questions, challenge ideas, and contribute meaningfully to scientific advancement.

Over the past few months, several significant roles have been undertaken that have further strengthened my engagement with the academic community. As the Organizing Secretary of SME-2025, hosted by our department in March 2025, the coordination and leadership of a wide range of academic and outreach activities were carried out with great honor. An atmosphere of scholarly exchange and collective achievement was fostered by the event, which brought together researchers, professionals, and students. In this role, conscious efforts were made to encourage diverse participation and ensure that the inclusive values upheld by the department were reflected throughout the event.

Additionally, an invitation was extended to deliver a talk at the Department of Geology, North-Eastern Hill University (NEHU), Shillong. A truly enriching experience was had during this visit, where research was shared, academic discussions were engaged in, and interactions took place with enthusiastic postgraduate students. The warm hospitality and inspiring conversations—particularly those held with aspiring female geoscientists—served to reaffirm my commitment to mentorship and outreach.

An opportunity has been provided by this edition of the Department newsletter to reflect on these experiences, celebrate the department's achievements, and amplify the voices of both students and faculty. Continued excitement is felt for the journey ahead—one that is hoped to be defined by excellence, collaboration, and a shared commitment to building an inclusive scientific community.

Prof. Niptika Jana

Assistant Professor

Department of Applied Geophysics
IIT(ISM) Dhanbad, Jharkhand, India

Departmental Activities – Dec, 2024

Winter Geophysical Field Training (Dec 02–11, 2024)

The **Department of Applied Geophysics** at **IIT(ISM) Dhanbad** held its annual Winter Geophysical Training from **December 02–11, 2024**, at **Hawaipatti, Baliapur**, providing hands-on field experience to **4th-year Integrated MTech** and **2nd-year MSc Tech** students.

The location of the field trip is shown in the map : **Hawaipatti, Baliapur in Jharkhand, India.**



Map credit: **Mr. Litan Dutta**, Project Associate

Through group-based surveys, students gained practical exposure to various geophysical methods, including magnetic (**Prof. Anil K. Chaubey**), gravity (**Prof. Y. Giri**), self-potential and DGPS (**Prof. Niptika Jana**), seismic (**Prof. Saurabh Datta Gupta**), and magnetotellurics (**Prof. U. Borah**). Other techniques such as DC resistivity, ERT, IP, HVSr, and GPR were also covered.

Technical support was provided by **Mr. Raj K. Prasad**, **Mr. Amit K. Rana**, **Mr. Hansraj Kumar**, and **Mr. Chandan P. Saw**. The training successfully bridged theory and practice, preparing students for real-world geophysical exploration.



Ground Penetrating Radar Survey



Magnetic Survey

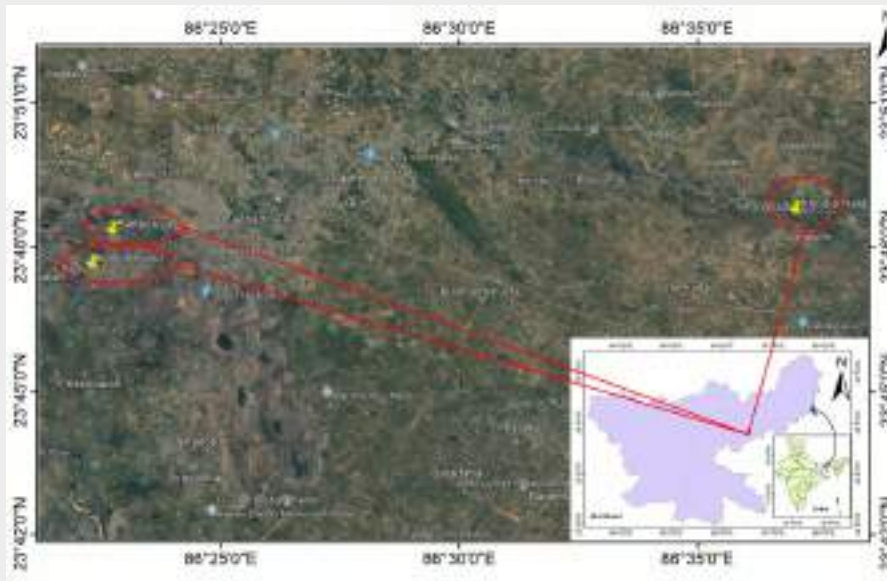


Ground Penetrating Radar Instrument

Departmental Activities – Dec, 2024

Winter Geological Field Training (Dec 08–14, 2024)

The Department of Applied Geology, Indian Institute of Technology (Indian School of Mines), Dhanbad, successfully conducted a geological field trip from December 8 to 14, 2024, providing students with practical exposure to geological formations, structures, and processes. This intensive fieldwork was guided by esteemed faculty members, including **Prof. Upama Dutta** and **Prof. Kripamoy Sarkar**.



Map credit: **Mr. Litan Dutta**, Project Associate

The field trip covered multiple locations in and around **Dhanbad**, such as **Bansuriya**, **Khudia Nala**, and **Basudevpur** (Locations in the map).

The field study emphasised the identification and analysis of rock types, geological structures, and surface processes shaping the Earth's crust. Students classified igneous, sedimentary, and metamorphic rocks based on texture, grain size, colour, and hardness, while also examining mineral composition, stratification, and weathering. A key component was hands-on structural geology, where students measured dip and strike using clinometers and analysed folds, faults, and unconformities to interpret tectonic history. The trip also included a visit to Basudevpur to study coal mine fires, highlighting environmental issues linked to underground coal seam combustion.



Front and back bearing



Rock sample collection



Metamorphic rock sample



Dip angle measurement using clinometer

Departmental Activities – Mar, 2025

175th Year Celebration of the Geological Survey of India (GSI)

The **Department of Applied Geophysics**, along with the Department of Applied Geology, **Indian Institute of Technology (Indian School of Mines), Dhanbad**, actively participated in the **175th Year Celebration** of the **Geological Survey of India (GSI)**, held in **Kolkata** from **March 4 to 7, 2025**. This prestigious national event brought together researchers, students, and professionals from across the country to celebrate GSI's enduring legacy in geosciences.



The celebration was inaugurated by **Shri G. Kishan Reddy**, Honourable **Minister of Mines, Government of India**. During his visit to the **IIT(ISM) Dhanbad** exhibition stall, he appreciated the research initiatives presented and extended his encouragement for future endeavours. The participation from IIT(ISM) included enthusiastic student involvement, impactful research displays, and meaningful interactions with attendees and dignitaries.



In the debate competition conducted on the inaugural day, **Mr. Yashovardhan Gupta** (Pre-final Year, M.Sc. Tech) secured the second runner-up position. Other students, including **Mr. Sushanta Ghosh** (Pre-final Year, M.Sc. Tech), **Ms. Drishti Sen** (Pre-final Year, Int. M.Tech), and **Ms. Glory Kikon** (Pre-final Year, M.Sc. Tech), also showcased commendable performances through their active participation.

Departmental Activities – Mar, 2025

175th Year Celebration of the Geological Survey of India (GSI)



Throughout the event, the IIT(ISM) exhibition stall attracted widespread attention from visiting school and college students across **West Bengal**. PhD scholars **Mr. Debopam Ghosh** and **Mr. Arpan Das** engaged visitors by explaining ongoing projects and advancements in geophysical research. They were accompanied by faculty members **Prof. Partha Pratim Mandal** and **Prof. Ujjal K. Borah**, who played an instrumental role in the academic interactions.

A special moment of the event was the visit of **Shri Asit Saha, Director General, Geological Survey of India**, on **March 6**. His interaction with young researchers was both insightful and motivating, highlighting GSI's continued role in fostering research talent and scientific curiosity.

The Department extends sincere gratitude to the Geological Survey of India for their exceptional hospitality and for curating such an enriching platform for scientific exchange. Participation in such landmark events reinforces IIT(ISM) Dhanbad's dedication to geoscience education and research excellence.



Departmental Activities – Mar, 2025

The British Petroleum (BP) visit

BP TSI visit to Department of Applied Geophysics IITISM Dhanbad

Date of Visit: **March 18–19, 2025**

Delegates:

Mr. Angeni Jayawickramarajah

Mr. Richard Walters

Ms. Madhur Johri

Ms. Madhumita Jana

Purpose : Leadership Connect session, where bp is looking forward to engaging with faculty and students from the Departments of Geology, Geophysics, Petroleum and any other Earth sciences departments.



Interaction among delegates, Prof. M. K. Sen, and faculty members of the department



Interaction among delegates, research scholars and students of the department

Departmental Activities – Mar, 2025

Centenary National Seminar (March 21–23 , 2025)

Strong Motion Earthquake (SME-2025)

Structural Response Modelling and Aided Designing

The **Department of Applied Geophysics** at IIT(ISM) Dhanbad hosted the **Centenary National Seminar on Strong Motion Earthquake** (Link: [SME-2025](#)): **Structural Response Modelling and Aided Designing** from **March 21–23, 2025**. Marking **100 years celebration of IIT(ISM) Dhanbad, Jharkhand, India**, the seminar brought together experts, researchers, industry professionals, and students from India and abroad for meaningful knowledge exchange and collaboration.

SME-2025, held over three days, **featured 17 keynotes, 24 oral, and 33 poster presentations**, along with exhibitions and hybrid industry-academia sessions. The seminar focused on applying research to practice in earthquake engineering, structural design, geophysical monitoring, and disaster mitigation. Key themes included **AI, fiber-optic sensing, InSAR, and sustainable geotechnical design**. It aimed to advance strong motion modeling, integrate geophysical-geotechnical methods, and promote remote sensing and AI for disaster risk reduction. Discussions covered seismic hazard mapping, performance-based design, AI in prediction, and groundwater sustainability.

Led by **Prof. P.K. Khan** as **Chairman-cum-Convener**, SME-2025 was organized by a distinguished committee including **Prof. Prem Vrat (Chief Patron)**, **Prof. Sukumar Mishra (Patron)**, **Prof. Swarandeeep Sahoo (Co-Convener)** and **Prof. U.K. Borah (Co-Convener)**, **Prof. Niptika Jana (Organizing Secretary)**, and **Prof. Giri Yellalacheruvu (Treasurer)**. They were supported by a national advisory board of experts from IITs, CSIR labs, and other premier R&D institutions. The event was spearheaded by the **Department of Applied Geophysics**, a center of excellence since its **founding in 1957** during the **International Geophysical Year**, with a rich legacy in earth science research and industry engagement.



Discussions during high-tea in SME 2025 conference



Outreach activity for school students

Departmental Activities – Mar, 2025

Centenary National Seminar (March 21–23 , 2025)



Col. Prof. Sanjay Srivastava delivering lecture



Question-answer session after the talk

SME-2025 successfully fostered scientific dialogue and innovation in earthquake science and structural safety, reinforcing **IIT(ISM) Dhanbad's** leadership in Applied Geophysics. It strengthened collaboration among academia, industry, and policymakers, highlighting the importance of integrating advanced technologies with field practices for safer, sustainable infrastructure in seismic zones.



Invited speakers delivering their talks at SME-2025 conference



Faculties' Activities & Achievements

MoUs / Conferences/ Seminars/ Projects



Strategic MoU: The **Geological Survey of India (GSI)** and **IIT (ISM) Dhanbad** have signed an MoU to **explore natural hydrogen** in the **Andaman and Nicobar Islands**. The agreement, signed by **Dr. Sudip Bhattacharyya** (Deputy Director General, GSI) and **Prof. Sagar Pal** (Dean R&D, IIT-ISM) at **GSI's Central Headquarters in Kolkata**, is spearheaded by **Prof. Saurabh Datta Gupta**, Associate Professor, Department of Applied Geophysics. This strategic partnership advances green energy innovation and aligns with India's **Net Zero** targets and sustainable energy vision.

"First Discovery of Natural Hydrogen in South Andaman: A Major Leap toward India's Net-Zero Future"

In a groundbreaking achievement, a collaborative team from the **GSI**, the **Exploration Seismic & Simulation Lab** (Department of Applied Geophysics), and the **Subsurface Energy and Storage Systems Lab** (Department of Petroleum Engineering), **IIT(ISM) Dhanbad**, made **India's first-ever discovery of natural hydrogen** during a field investigation in **South Andaman in March 2025**. The team confirmed the presence of geologic hydrogen in **pillow basalt formations**. Under the scientific leadership of **Prof. Saurabh Datta Gupta**, this milestone marks a significant advancement in India's pursuit of clean and renewable energy, positioning natural hydrogen as a promising contributor to the nation's Net-Zero emission goals and sustainable energy future.



Conference: **Prof. Saurabh Datta Gupta** presented key findings from the *first-phase feasibility study on geosequestration in the Precambrian basement reservoirs of the Jaisalmer Basin* at the **46th AEG Annual Convention, Seminar, and Exhibition** held in Hyderabad, India on **December, 2024**.

Seminar: **Prof. Saurabh Datta Gupta** delivered a presentation on *Geothermal Energy and Geosequestration* at the Symposium on the **Role of Upstream Petroleum Engineering in Energy Transition**, held at **IIT Guwahati on 5th May 2025**.



Faculties' Activities & Achievements

MoUs / Conferences/ Seminars/ Projects

The **Department of Applied Geophysics, IIT (ISM) Dhanbad**, in collaboration with the **Seismic Data Processing (SDP) group of C-DAC Pune** and the **Department of Earth Sciences, IIT Roorkee**, successfully conducted a three-day workshop on “*Seismic Modelling and Migration using SeisRTM*” from **February 8 to 10, 2025**. The event was organized under the leadership of **Prof. Saurabh Datta Gupta**, Department of Applied Geophysics and coordinator of the Exploration Seismic and Simulation Lab, IIT (ISM) Dhanbad.

With over **140 enthusiastic student participants**, the workshop aimed to promote the usage and development of the **SeisRTM software to advance seismic imaging research**. The valedictory session was graced by **Prof. M.K. Singh, Dean Academics, IIT (ISM) Dhanbad**, as Chief Guest, along with **Ms. Richa Rastogi, Scientist F, C-DAC Pune**, and other dignitaries. Participants received certificates of completion during the concluding ceremony.



Faculties' Activities & Achievements

MoUs / Conferences/ Seminars/ Projects



Conference: **Prof. Soumen Maiti** delivered a keynote address on the topic "*Resource Characterization and Modelling using AI/ML*" at the **46th AEG Annual Convention**, Seminar, and Exhibition held in **Hyderabad, India** on **December, 2024**. The conference was on the topic of "**Geo-exploration for Critical Minerals and Precious Metals**".

Field Training: **Prof. Saumen Maiti** carried out the responsibility as the **in-charge** of **Winter Geophysical Field training** of the year **2024** organised by the Department for the pre-final year students from 3-Year M.Sc.(Tech.) and 5-Year Int. M.Tech. The field training was held in **Baliapur, Jharkhand** from **2nd to 11th December, 2024**. The training covered SP, DC resistivity, magnetic, gravity, IP, seismic, GPR, HVSR, ERT, and MT surveys. Emphasis was placed on hands-on experience in data acquisition and initial interpretation.



Lecture: The **INSA** (Indian National Science Academy) Overseas Chair Lecture on "*Physics and ML for Seismic Data Analysis*" was coordinated by **Prof. Saumen Maiti** and delivered by **Prof. Mrinal K. Sen**, the 2024 awardee of Sectional Committee (SC)-IV – Earth & Environmental Sciences.

- **PhD submission:** Under the supervision of **Prof. Soumen Maiti, IIT(ISM) Dhanbad** and co-supervision of **Prof. Gangumalla Srinivasa Rao, IIT Bombay**, PhD scholar **Mr. Anirban Biswas** submitted his thesis titled "*Lithospheric Structure and Mechanical Strength Variations over the Indo-Burma Subduction Zone, Southeast Asia*" on **26th December 2024**.

Projects:

- **Prof. Partha Pratim Mandal** awarded Prime Minister's Early Career Research Grant (**PMECRG**) under Anusandhan National Research Foundation (ANRF), DST ,Government of India on "**Natural Hydrogen prospect screening in India**"
- **Prof. Partha Pratim Mandal** awarded project from Ministry of Mines, Government of India on "*Reconnaissance survey of Natural Hydrogen in and around Singhbhum Shear Zone and adjacent iron ore belts, Jharkhand and Odisha states, India*".

Faculties' Activities & Achievements

MoUs / Conferences/ Seminars/ Projects



Springer Editorial Contribution Award 2025

Dr. Sanjit K. Pal received the prestigious **Springer Editorial Contribution Award 2025** in recognition of his outstanding service as an **Associate Editor** of **Acta Geophysica**. This honor reflects his significant contributions to maintaining the journal's high editorial standards and promoting excellence in geophysical research and publication.

Editorial Post: **Dr. Sanjit K. Pal** serves as **Guest Editor** for the **Frontiers in Earth Science** Research Topic "*Exploring Near-Surface Geophysics and Tectonics: From Conventional Modeling to AI Solutions.*" He plays a key role in guiding submissions, peer review, and shaping the integration of traditional geophysics with AI-based approaches. [Link of the Journal](#)



Invited Talk on Remote Sensing and Geophysical Insights into Archaeology

Dr. Sanjit K. Pal delivered an invited talk titled "**State-of-the-Art Remote Sensing and Geophysical Insights into Archaeological Potential in Kṛmilā and Eastern India**" at the International Seminar "**Revisiting Kṛmilā: Archaeology, Art and Heritage**," held from 25–27 November 2024 at the **Lakhisarai Museum, Bihar**. The seminar commemorated the excavation of Lali Pahari, a significant hilltop Buddhist monastery, and was organized by the District Administration under the aegis of the **Art, Culture and Youth Department, Government of Bihar**.

Expert Opinion on Geophysical Investigation at Tilpara Barrage

Dr. Sanjit K. Pal conducted a site visit to **Tilpara Barrage** on 7th December 2024 to assess suitable geophysical methods for detecting subsurface voids. Based on field observations, methods like **Electrical Resistivity Tomography (ERT)** and **Ground Penetrating Radar (GPR)** were recommended to locate voids and estimate the volume of material needed for filling. This investigation will support effective remediation and structural safety of the barrage.



Faculties' Activities & Achievements

MoUs / Conferences/ Seminars/ Projects

- **Keynote presentation:** **Prof. Sanjit K. Pal** presented in the International Seminar & Exhibition on '**Current Trends of Sustainable Underground Mining**' entitled "*Integrated Geophysical Approaches for Mine Safety and Hazard Assessment: Enhancing Productivity in Sustainable Mining*" on **November 29th & 30th, 2024** at **Biswa Bangla Convention Centre, New Town, Kolkata** organising by **ISM Alumni Association Kolkata Chapter**.
- **Mine Expedition:** **Prof. Sanjit K. Pal** and his team did geophysical investigations of **Rock Mass Rippability** for **Joda East and Khondbond Mines** of **Tata Steel Limited** on **22 December, 2024**. They assessed Rock Mass Rippability through geophysical methods for aiding selection of suitable ripper for Joda East and Khondbond Mines.
- **Editorial Post:** **Prof. Sanjit K. Pal** is also appointed as **guest editor** in **Discover Geoscience, Springer**, on the topic: **Climate Change and Water Insecurity: Insights from Semiarid Hydrology**.
- **Hackathon Invitation:** **Dr. Sanjit K. Pal** was invited to the **Hackathon on R&D 2025**, organized by **CMPDI, Ministry of Coal**, focusing on advanced methods for predicting minor faults, dykes, sills, and water bodies up to 350m ahead of underground mine panels. His expertise supported discussions on improving mining safety and efficiency.

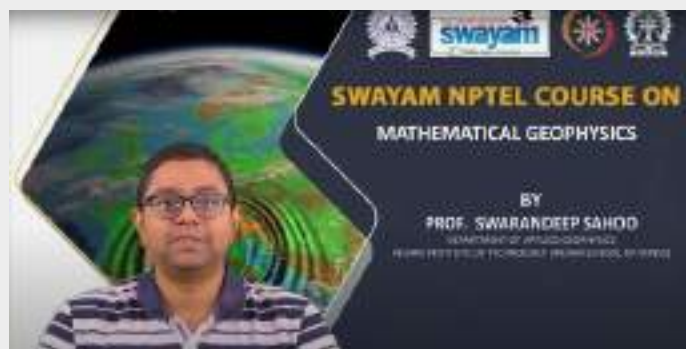
Faculties' Activities & Achievements

Courses & Development Programs by the Faculty Members



Prof. Saurabh Datta Gupta from the **Department of Applied Geophysics, IIT(ISM) Dhanbad**, has launched a **12-week NPTEL course** titled '*Reservoir Geophysics for Hydrocarbon Exploration*'. The course is designed to provide a comprehensive understanding of geophysical methods applied to **reservoir characterization** and **hydrocarbon exploration**, bridging theoretical concepts with **real-world applications**.

Prof. Swarandeeep Sahoo from the **Department of Applied Geophysics, IIT(ISM) Dhanbad**, has launched a **8-week NPTEL course** titled '*Mathematical Geophysics*'. The course is designed to describe the **physical** and **mathematical principles** of various aspects of **geophysical problems** ranging from **atmospheric sciences, climate dynamics** to **deep interiors of planets**.



Prof. Mohit Agrawal from the **Department of Applied Geophysics, IIT(ISM) Dhanbad**, has launched a **12-week NPTEL course** titled '*Earthquake Seismology*'. ***What shakes the Earth... shouldn't shake your understanding!*** Dive deep into the science of Earthquake Seismology from **21st July to 10th October 2025** with **Prof. Mohit Agrawal** at **IIT(ISM) Dhanbad**. Enrolments are open and free for all.

A **six-day online** Short-Term Course/Faculty Development Programme on '*Climate Change, Energy Resources, and Natural Hazards*' was organized by the **Department of Applied Geophysics, IIT(ISM) Dhanbad**, from **January 13 to 18, 2025**. Conducted under the **Ministry of Education's MMTPP scheme**, the programme was coordinated by **Dr. Swarandeeep Sahoo**. It brought together **faculty members, postdoctoral researchers, and advanced PhD scholars** from various institutions, fostering a collaborative academic environment.



Faculties' Activities & Achievements

Courses & Development Programs by the Faculty Members



**Indian National Science Academy (INSA)
Overseas Chair Lecture**

**"Physics and
ML for seismic data analysis"**



Speaker

Prof. Mrinal K. Sen
Professor
Dept. of Earth and Planetary Sciences &
Institute for Geophysics,
University of Texas at Austin, USA

Brief Bio-data

Mrinal K. Sen is a professor of Geophysics and holder of Jackson Chair in Applied Seismology at the University of Texas at Austin, USA. He is currently serving as the academic director of the Institute for Geophysics at the University of Texas at Austin. During 2011 and 2012, Prof. Sen served as the director of the National Geophysical Research Institute, Hyderabad, India. He received his Ph.D. from the University of Illinois at Urbana, USA, in 1987. Prof. Sen is known internationally for his work in theoretical and computational seismology, and applied geophysics. He has published over 200 peer-reviewed journal papers and has been on Geophysical Research Letters for the past 20 years. He has received many awards including the President's Fellowship of the Society of Exploration Geophysicists. "The geophysical research award" at the University of Texas. Several institutions in the Indian Geophysical Union, the Indian Society of Seismology, the Geological Society of India, and the International Union of Pure and Applied Physics (IUPAP) have awarded him the highest honor of the IUGG. He is also a member of the IUGG. He is also a member of the IUGG. He is also a member of the IUGG.

Abstract

Recent progress in Seismology are being using model based approaches to find the physics of wave propagation in and to relatively sparse data sets. This has led to a paradigm shift in the way we think about seismic data analysis. In order to take advantage of both approaches and avoid their drawbacks, we have developed several approaches to combine data driven and model based approaches. For the last several years, we have been working on a deep learning based approach to find the physics of wave propagation in and to relatively sparse data sets. This has led to a paradigm shift in the way we think about seismic data analysis. In order to take advantage of both approaches and avoid their drawbacks, we have developed several approaches to combine data driven and model based approaches. For the last several years, we have been working on a deep learning based approach to find the physics of wave propagation in and to relatively sparse data sets.

18 March, 2025 (Tuesday)

8.30 AM IST (Dhanbad)

9:00 PM (Dhanbad)

Prof. Sanku Kumar Pal
Coordinator
Department of Applied Geophysics, IIT(ISM) Dhanbad



Global Initiative of Academic Networks (GIAN)
A Two Weeks Course on "ENGINEERING SEISMOLOGY"
Organized by Indian Institute of Technology (Indian School of Mines), Dhanbad, India
Last Date for Registration: **July 31, 2025**

Course Overview

Engineering Seismology focuses on the application of seismological principles to engineering. It involves studying the earthquake source and its propagation, the propagation of seismic waves from the source to various engineering locations, ground motion characteristics, and its assessment for engineering design purposes. This course provides an introduction to plate tectonics, Earth's structure, and geophysical methods, equipping students with the knowledge to evaluate earthquake hazards, understand the seismic behavior of a region, and estimate future seismic risks more effectively. The primary objectives of the course are as follows:

- Developing an understanding of seismic wave generation inside the Earth.
- Comprehending the internal structure of the Earth and the physical properties of the Earth's composition.
- Identifying seismic hazard potential in seismic zones.
- Understanding the principles of operations of seismometers and seismologic data recording systems.
- Analyzing ground motion characteristics, Fourier, and response spectra.
- Assessing seismic data and computer numerical ground motion parameters.
- Major ground motion characteristics in the design of structures and buildings.
- Common probabilistic seismic hazard, seismic risks, and seismic design principles.

Faculty:



Prof. Ujjal Datta
(Course Faculty)



Prof. Mohit Agrawal
(Course Faculty and Course Coordinator)



SWAYAM-NPTEL COURSE

'Earthquake Seismology'

Course Duration: 12 Weeks

- Course Start Date: 21 Jul 2025
- Course End Date: 10 Oct 2025
- Exam Date: 02 Nov 2025

For Enrollment, please visit

https://onlinecourses.nptel.ac.in/noc25_ee127/preview

Learn for FREE



Prof. Mohit Agrawal
Department of Applied Geophysics

Researchers' Activities & Achievements

PhD Thesis Submission



Anirban Biswas (PhD Scholar), has submitted his PhD thesis, entitled "***Lithospheric structure and mechanical strength variations over the Indo-Burma Subduction zone, Southeast Asia***" on **26th December 2024** under the supervision of **Prof. Saumen Maiti**, IIT(ISM) Dhanbad and **Prof. Gangumalla Srinivasa Rao**, IIT Bombay.

Associated Lab: Machine Learning & Geo-computing Lab
Publication details: [Google Scholar Link](#)

- **Vijayakumar Dommeti** (PhD Scholar), has awarded with PhD degree on 20th May, 2025 under the supervision of **Prof. Sanjit K. Pal**, IIT(ISM) Dhanbad and **Prof. Gangumalla Srinivasa Rao**, IIT Bombay. His thesis entitled "***MULTI-SCALE GEOPHYSICAL INVESTIGATIONS FOR GEOLOGICAL DIFFERENTIATION AND CONCEALED MINERAL TARGETING IN THE CUDDAPAH BASIN, SOUTHERN INDIAN SHIELD***".

Associated Lab: Engineering Geophysics Lab, Publication details: [Journal publication](#)

- **Arvind Yadav** (PhD Scholar), has awarded with PhD degree on 10th March, 2025 under the supervision of **Prof. Sanjit K. Pal**, IIT(ISM) Dhanbad and **Prof. Shalivahan**, Director, IPE, Visakhapatnam. His thesis entitled "***GEOLOGICAL CHARACTERIZATION USING GEOPHYSICAL TECHNIQUES FOR COAL EXPLORATION IN THE PARTS OF TALCHER AND IB VALLEY COALFIELDS, ODISHA, INDIA***".

Associated Lab: Engineering Geophysics Lab, Publication details: [Journal publication](#)

- **Seelam Naresh Kumar** (PhD Scholar), has awarded with PhD degree on 10th March, 2025 under the supervision of **Prof. Sanjit K. Pal**, IIT(ISM) Dhanbad and **Prof. Gangumalla Srinivasa Rao**, IIT Bombay. His thesis entitled "***INTERPRETATION OF SEISMIC AND WELL LOG DATA IN EASTERN INDIAN COALFIELDS USING ADVANCED SIGNAL PROCESSING TECHNIQUES: A NOVEL APPROACH FOR BUILDING SUBSURFACE LITHOLOGICAL MODEL***".

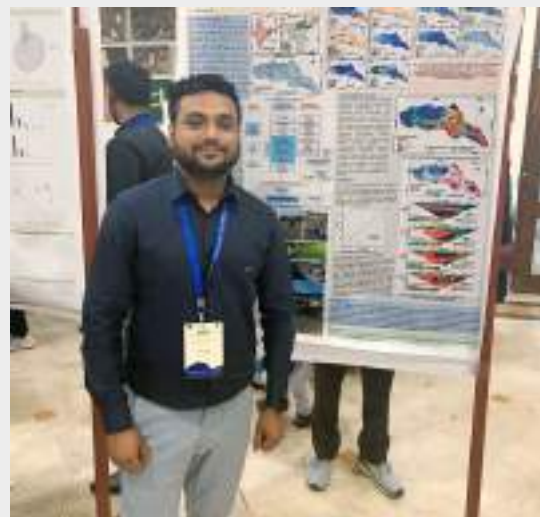
Associated Lab: Engineering Geophysics Lab, Publication details: [Journal publication](#)

Researchers' Activities & Achievements

Call for Post-Doc

Dr. Amit Bera, formerly a **project staff** member of the department, has been selected as a **TEXMiN Post-Doctoral Fellow** at **IIT(ISM) Dhanbad**. He earned his PhD from the **Department of Earth Sciences, IEST Shibpur**. His postdoctoral research will focus on evaluating aquifer health in the hard-rock terrain of the Barakar River Basin, a semi-arid, water-stressed region. By integrating tree-based machine learning models (Random Forest and Decision Tree), deep learning (CNN), and the SWAT hydrological model, his interdisciplinary approach aims to advance sustainable groundwater management in data-scarce and geologically complex areas.

Associated Lab: Engineering Geophysics Lab



Mr. Abhishek Kumar (PhD Scholar) has been selected for a **postdoctoral position** at **IFP Energies Nouvelles (IFPEN), France**. He is nearing completion of his **joint PhD** under the collaborative program between **IIT(ISM) Dhanbad, India** and **Curtin University, Australia**. His postdoctoral research will focus on sustainable subsurface characterisation with applications in geothermal energy, lithium exploration, carbon dioxide sequestration, and natural hydrogen detection. This interdisciplinary work aims to advance data-driven approaches for subsurface exploration and support the global shift toward sustainable energy solutions.

Associated Lab: Global Optimization and Statistical Simulation Lab

Researchers' Activities & Achievements

Conferences/Seminar/Workshops



Mr. Shubham Kumar (PhD Scholar) presented his research work virtually at the **American Geophysical Union 2025 on December**. His presentation, entitled "*Geophysical Modeling of Serpentinite along the Bartlett Springs Fault Zone Using Joint Inversion of Gravity and Magnetic Data*", was co-authored with **Dr. Upendra K. Singh**.

Associated Lab: Global Optimization and Statistical Simulation Lab

Mr. Tanmay Singh (PhD Scholar) presented his research work at the **India Energy Week 2025, held at Yashobhoomi, New Delhi on February**. His presentation, entitled "*Building Petrophysical Workflow with Subsurface Natural Hydrogen*", was co-authored with **Dr. R. Mukherjee, Dr. J. Bourdet, Dr. F. Glass, Prof. Partha Pratim mandal**.

Associated Lab: Subsurface Resource Characterisation Group(sRCg)



Dr. Pradeep Kumar Shukla (Post-Doctoral fellow) presented his research work and secured the **2nd position** at the **Strong Motion Earthquake (SME) national seminar 2025** at **IIT(ISM) Dhanbad, Jharkahnd, India on March**. His work, entitled "*1D Geomechanical Framework for Hydrogen Storage in the Dongara Field, Perth Basin, Western Australia*".

Associated Lab: Subsurface Resource Characterisation Group(sRCg)

Mr. Amit Bajpai (PhD Scholar) presented his research work and secured the **1st position** at the **Strong Motion Earthquake (SME) national seminar 2025** at **IIT(ISM) Dhanbad, Jharkahnd, India on March**. His work, entitled "*2D Transdimensional Bayesian Inversion of Electrical Resistivity Tomography Data – A Case Study from Pathuria Village, Dhanbad*", was co-authored with **Dr. Arun Singh**.

Associated Lab: Electromagnetic Simulation Lab



Researchers' Activities & Achievements

Conferences/Seminar/Workshops



Ms. Mona Kumari (PhD Scholar) presented her research work at the **Strong Motion Earthquake (SME) national seminar 2025** at **IIT(ISM) Dhanbad, Jharkahnd, India on March**. Her work, entitled "*Evaluating CO2 Plume Migration for subsurface evaluation*", was co-authored with **Prof. Partha Pratim mandal** and **Prof. Vikram vishal (IIT Bomaby)**.

Associated Lab: Subsurface Resource Characterisation Group(sRCg)

Mr. Gautam Chaurasia (PhD Scholar) attended two Days Hands on Workshop on "*Next-Gen Geotechnical Engineering: Numerical Modelling Workshop in Railway and Mining Applications*" **on March, 2025**. The workshop was hosted by **Civil Engineering Department** of **IIT(ISM) Dhanbad, Jharkhand, India**, and part of **IIT(ISM) Dhanbad's centennial celebrations**.

Associated Lab: Observational Seismology Lab



Mr. Koustav Ghosal (PhD Scholar) presented his work **in-person** at the **European Geosciences Union (EGU) General Assembly 2025** in Vienna, Austria **on April**. His presentation, titled "*Efficient Transdimensional Bayesian Inversion of 2D Magnetotelluric Data with Deep Learning-Based Surrogate Modelling*", was co-authored with **Dr. Arun Singh** and **Dr. Deepak Gupta**.

Associated Lab: Electromagnetic Simulation Lab

Mr. Tirtharaj Barman (PhD Scholar) presented his research work **virtually** at the **European Geosciences Union (EGU) General Assembly 2025** on **April**. His presentation, titled "*Back reaction of magnetic field on rotating convection in presence of thermal heterogeneity*", was co-authored with **Ms. Tannistha Haldar** and **Dr. Swarandeeep Sahoo**.

Associated Lab: Geophysical Fluid Dynamics Lab



Students' Activity & Achievements

Conferences/Seminar/Workshops



Mr. Shashank Singh (Final year M.Sc.(Tech.) student) presented his masters' thesis research work at the **Indian Geophysical Union-2024** at **Banaras Hindu University (BHU)**, Varanasi, India on **December**. His work, entitled "*Impact of diffusivity ratios on the onset of thermo-chemical convection at the Earth's core*", was co-authored with **Mr. Tirtharaj Barman** and **Dr. Swarandeeep Sahoo**.

Associated Lab: Geophysical Fluid Dynamics lab

Ms. Anwasha Kodal (Final year M.Sc.(Tech.) student) presented her masters' thesis research work at the **EAGE Workshop** on Carbon Capture and Storage (CCS) at **IIT Gandhinagar**, Gujarat, India on **February, 2025**. Her work, entitled "*3D Internal Lava Flow Architecture of Deccan Basalts with Implications for Carbon Storage*", was co-authored with **Dr. Debasmita Datta**, **Dr. Shubhangi Kala**, **Prof. P.P. mandal**, **Dr. Pankaj Khanna**.

Associated Lab: Subsurface Resource Characterisation Group(sRCg)



Mr. Navneet Babu M (Final year M.Sc.(Tech.) student) presented his research work at the **Strong Motion Earthquake (SME)** national seminar 2025 at **IIT(ISM) Dhanbad**, Jharkahnd, India on **March**. His work, entitled "*Risk Assessment and Fault Reactivation in Carbon Sequestration: A Geomechanical Study of the Calliance Storage Field, Western Australia*", was co-authored with **Prof. Partha Pratim mandal**.

Associated Lab: Subsurface Resource Characterisation Group(sRCg)

Mr. Honey Singh Tomar and **Mr. Subhajit Majhi** (M.Tech. students) attended two days Hands on Workshop on "*Next-Gen Geotechnical Engineering: Numerical Modelling Workshop in Railway and Mining Applications*" on **March, 2025**. The workshop was **hosted by Civil Engineering department** of **IIT(ISM) Dhanbad**, Jharkhand, India, and part of **IIT(ISM) Dhanbad's centennial celebrations**.

Associated Lab: Observational Seismology Lab



Students' Activity & Achievements

Conferences/Seminar/Workshops

- **Ms. Tannistha Haldar** (Final year M.Sc.(Tech.) student) presented her masters' thesis research work at the **Indian Geophysical Union-2024** at **Banaras Hindu University (BHU)**, Varanasi, India on **December**. Her work, entitled *"Influence of heterogeneous thermal structure on the onset of convection in the presence of magnetic field at the Earth's core"*, was co-authored with **Mr. Tirtharaj Barman** and **Dr. Swarandeeep Sahoo**.
Associated Lab: Geophysical Fluid Dynamics lab
- **Mr. Shashank Singh** (Final year M.Sc.(Tech.) student) presented her masters' thesis research work at the **European Geoscience Union-2025** via **online** mode on **April**. His work, entitled *"Impact of boundary condition on the onset of thermo-chemical convection at the Earth's core"*, was co-authored with **Mr. Tirtharaj Barman** and **Dr. Swarandeeep Sahoo**.

Associated Lab: Geophysical Fluid Dynamics lab

Group Activities

Team sRCg Secures 3rd Place at National Mineral Exploration Competition 2025

Group members: **Prof. Partha Pratim Mandal**(1), **Mr. Dinesh Munda**(1), **Mr. Litan Dutta**(1), **Mr. Tanmay Singh**(1), and **Prof. G. S. Rao**(2)

Affiliations: (1) Department of Applied Geophysics, IIT(ISM) Dhanbad, Jharkhand-826004, India

(2) Department of Earth Sciences, IIT Bombay, Maharashtra-400076, India

Team **sRCg** from the Department of Applied Geophysics secured **3rd place** in the **national-level “Mineral Exploration Techniques 2025” competition**, organized by the **Geological Survey of India (GSI), Ministry of Mines, Government of India**. Held on **19th January 2025** at the **Odisha Convention Center, Bhubaneswar**, the event centered on the theme *“Innovative Mineral Hunt Techniques”*, spotlighting AI/ML-driven advancements in mineral exploration.



The award was conferred by **Shri V. L. Kantha Rao** (Secretary, Ministry of Mines) and **Shri Asit Saha** (DG, GSI), in the esteemed presence of **Prof. Sukumar Mishra**, Director, IIT(ISM) Dhanbad. The five-member team—**Dinesh Munda, Litan Dutta, Tanmay Singh, Prof. G. S. Rao**—led by **Prof. Partha Pratim Mandal**, was recognized for their pioneering integration of geophysical datasets with AI/ML to improve subsurface mineral targeting.



Competing against top institutions nationwide, Team sRCg's solution stood out for its scientific rigor, technological innovation, and practical relevance. This achievement underscores the department's commitment to cutting-edge, impact-driven research in India's mineral exploration sector. Congratulations to Team sRCg for this remarkable national recognition.

Group Activities

Integrated Seismic and Ground Penetrating Radar Survey at Tilpara Barrage

Group members: **Prof. Sanjit K. Pal, Dr. Rajvardhan Kumar, Mr. Umakanta Das, Mr. Vivek Vikash**

Associated Lab: Engineering Geophysics Lab

Affiliation: Department of Applied Geophysics, IIT(ISM) Dhanbad, Jharkhand-826004, India

A **2D MASW** and **Ground Penetrating Radar (GPR)** survey was conducted on the **barrage spillway** to evaluate its structural integrity. The setup included a 26-channel Atom Seismograph and a GSSI Hyperstacking 350 MHz GPR system. The resulting profiles revealed distinct subsurface stratigraphy, with variations in shear wave velocity (V_s) and dielectric properties indicating differences in material composition and stiffness—key indicators of the spillway's geotechnical stability. They also did a **Seismic Data Acquisition** survey at the same barrage.



Stability and Near-surface Characterization of NH-19 using Integrated Geophysical Approach

Group members: **Prof. Sanjit K. Pal, Mr. Vivek Vikash, Dr. Rajvardhan Kumar**

Associated Lab: Engineering Geophysics Lab

Affiliation: Department of Applied Geophysics, IIT(ISM) Dhanbad, Jharkhand-826004, India

This study focuses on the stability assessment and near-surface characterization at **NH-19**, near **Bogra village** using an integrated geophysical approach. **Electrical Resistivity Tomography (ERT)** was conducted to image subsurface resistivity variations, with the objectives of evaluating geotechnical stability and detecting possible underground galleries or voids that may threaten the highway's structural integrity.



Group Activities

Archaeological investigation at Itkhori

Associated Lab: Engineering Geophysics Lab

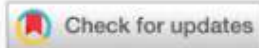
Affiliation: Department of Applied Geophysics, IIT(ISM) Dhanbad, Jharkhand-826004, India



Journal Publications

 No Access | GEOPHYSICS | Volume 90, Issue 3

Hierarchical transdimensional Bayesian inversion of 2D magnetotelluric data



Authors:

Amit Bajpai , Arun Singh  , and Suraj Varma 

<https://doi.org/10.1190/geo2024-0449.1>

Details: **Bajpai, A., Singh, A. and Varma, S., 2025.** Hierarchical transdimensional Bayesian inversion of 2D Magnetotelluric data. Geophysics, 90(3), pp.1-63. ([Link](#))

Earth Science Informatics (2025) 18:206
<https://doi.org/10.1007/s12145-025-01709-z>

RESEARCH



Ensemble learning-based interpretable method for pore pressure prediction using multivariate well logging data of IODP site U1517

Goutami Das¹ · Saumen Maiti¹

Received: 21 October 2024 / Accepted: 9 January 2025
© The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature 2025

Details: **Das, G. and Maiti, S., 2025.** Ensemble learning-based interpretable method for pore pressure prediction using multivariate well logging data of IODP site U1517. Earth Science Informatics, 18(2), p.206. ([Link](#))

J Seismol (2025) 29:485–503
<https://doi.org/10.1007/s10950-025-10288-x>

RESEARCH



Statistical analysis on background seismicity of Southern California region: application of nearest neighbour declustering and network analysis

Aditi Seal · Swarandeeep Sahoo · Antonella Peresan · Prosanta Kumar Khan ·
Niptika Jana

Details: **Seal, A., Sahoo, S., Peresan, A., Khan, P.K. and Jana, N., 2025.** Statistical analysis on background seismicity of Southern California region: application of nearest neighbour declustering and network analysis. Journal of Seismology, 29(2), pp.485–503. ([Link](#))

Journal Publications

Natural Hazards (2025) 121:9043–9066
<https://doi.org/10.1007/s11069-025-07160-z>

ORIGINAL PAPER



Towards synergistic AI-driven ensemble framework for earthquake and rainfall induced landslide risks in Sikkim Himalayas

Litan Dutta¹ · Niptika Jana¹ · Yunus Ali Pulpadan²

Details: Dutta, L., Jana, N. and Pulpadan, Y.A., 2025. Towards synergistic AI-driven ensemble framework for earthquake and rainfall induced landslide risks in Sikkim Himalayas. Natural Hazards, pp.1–24. ([Link](#))

Water Air Soil Pollut (2024) 235:664
<https://doi.org/10.1007/s11270-024-07459-w>



Prediction of Groundwater Quality Index and Identification of Key Variables Using Bayesian Neural Network

Saumen Maiti · Surabhi Gupta ·
Praveen Kumar Gupta

Details: Maiti, S., Gupta, S. and Gupta, P.K., 2024. Prediction of Groundwater Quality Index and Identification of Key Variables Using Bayesian Neural Network. Water, Air, & Soil Pollution, 235(10), p.664. ([Link](#))

Open Access Article

A Hybrid Approach for Assessing Aquifer Health Using the SWAT Model, Tree-Based Classification, and Deep Learning Algorithms

by Amit Bera ¹ , Litan Dutta ¹ , Sanjit Kumar Pal ¹ , Rajwardhan Kumar ¹ ,
Pradeep Kumar Shukla ¹ , Wafa Saleh Alkhuraiji ², Bojan Đurin ^{3,*} and Mohamed Zhran ^{4,*}

Details: Bera, A., Dutta, L., Pal, S.K., Kumar, R., Shukla, P.K., Alkhuraiji, W.S., Đurin, B. and Zhran, M., 2025. A Hybrid Approach for Assessing Aquifer Health Using the SWAT Model, Tree-Based Classification, and Deep Learning Algorithms. Water, 17(10), p.1546. ([Link](#))

Geophysical Society and Student Chapters

For the year 2025-26, the Department of Applied Geophysics appointed new office bearers for the Geophysical Society(GS) and student chapters . Details: [GS Website](#)



Geophysical Society



IGU Student Chapter



SPG Student Chapter



SEG Student Chapter



EAGE Student Chapter

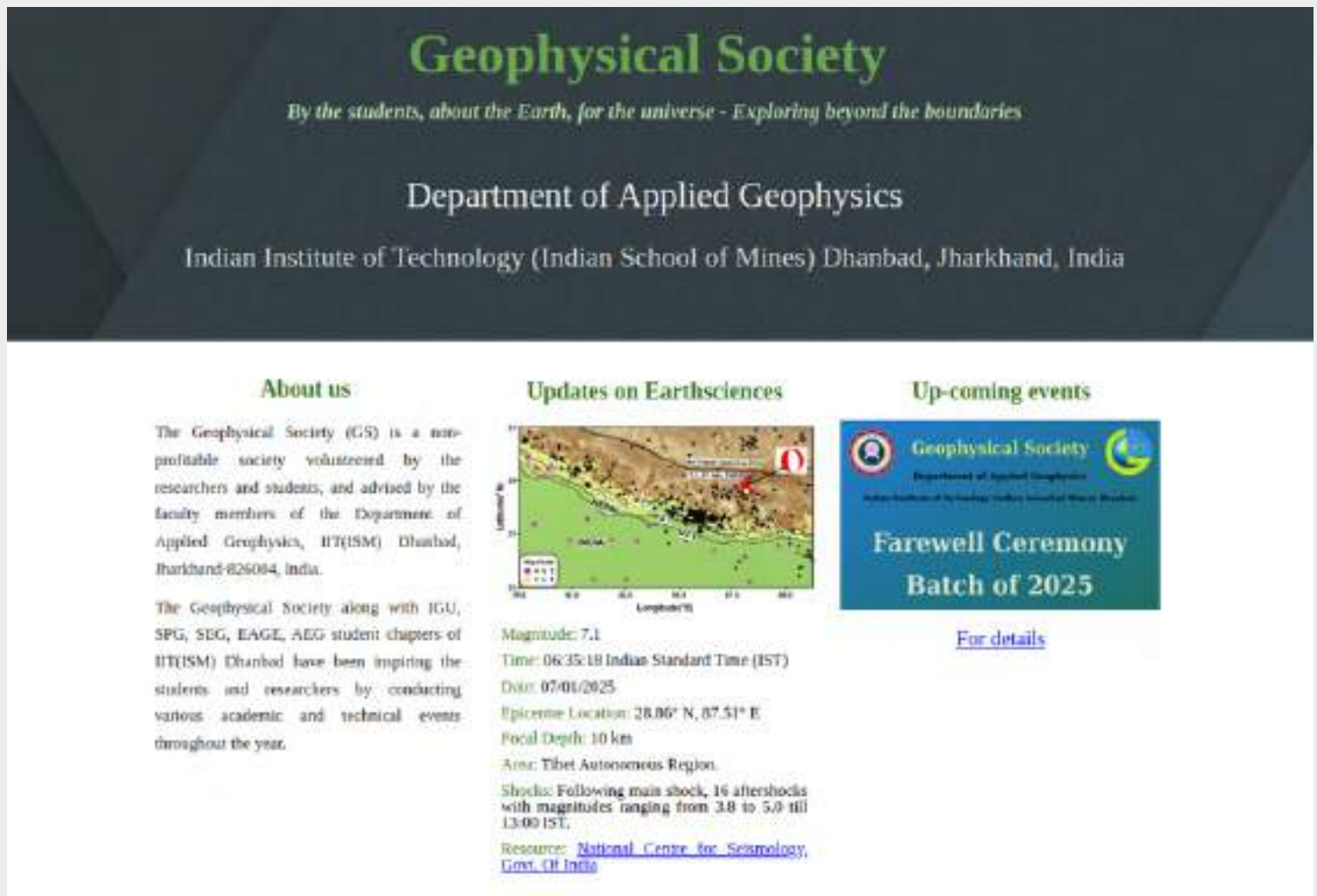


AEG Student Chapter

Geophysical Society's Activities

Geophysical Society's Website Launch

The **Geophysical Society Team** (2025-26) has launched a website for the researchers, students, and faculty members of the department for all the updates related to Geoscience, activities and achievements of the society and student chapters.



The screenshot shows the homepage of the Geophysical Society website. The header features the title "Geophysical Society" in a large, green, serif font, with the tagline "By the students, about the Earth, for the universe - Exploring beyond the boundaries" in a smaller, italicized font below it. The text "Department of Applied Geophysics" and "Indian Institute of Technology (Indian School of Mines) Dhanbad, Jharkhand, India" is displayed in a white serif font on a dark background. The main content area is divided into three columns: "About us" with a paragraph about the society, "Updates on Earthsciences" featuring a map of a seismic event with details like Magnitude 7.1 and Time 06:35:18 Indian Standard Time (IST), and "Up-coming events" with a blue banner for a "Farewell Ceremony Batch of 2025". A "For details" link is provided below the event banner.

Geophysical Society
By the students, about the Earth, for the universe - Exploring beyond the boundaries

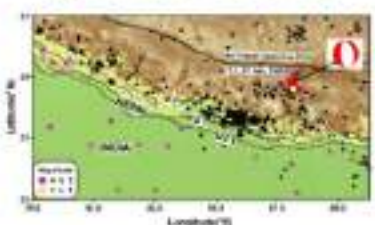
Department of Applied Geophysics
Indian Institute of Technology (Indian School of Mines) Dhanbad, Jharkhand, India

About us

The Geophysical Society (GS) is a non-profitable society volunteered by the researchers and students, and advised by the faculty members of the Department of Applied Geophysics, IIT(ISM) Dhanbad, Jharkhand-826004, India.

The Geophysical Society along with IGU, SPG, SEG, EAGE, AEG student chapters of IIT(ISM) Dhanbad have been inspiring the students and researchers by conducting various academic and technical events throughout the year.

Updates on Earthsciences



Magnitude: 7.1
Time: 06:35:18 Indian Standard Time (IST)
Date: 07/01/2025
Epicentre Location: 28.06° N, 87.51° E
Focal Depth: 10 km
Area: Tibet Autonomous Region.
Shocks: Following main shock, 16 aftershocks with magnitudes ranging from 3.8 to 5.0 till 13:00 IST.
Resources: [National Centre for Seismology, Govt. Of India](#)

Up-coming events



[For details](#)

Website Link : [Geophysical Society](#)

Social Media links

[GS-Instagram](#)

[GS-Facebook](#)

[GS-Youtube](#)

[GS-Linkedin](#)

[GS-X\(Twitter\)](#)

Geophysical Society's Activities

Farewell Ceremony of Pass-out Batch 2025



The junior batches of the Department of Applied Geophysics made the arrangement for the Farewell Ceremony of pass out batch 2025, on **27th March**, to say goodbye to their beloved seniors. The program was started with the photo sessions in **Oval ground** with century old heritage building as the background.



Geophysical Society's Activities

Farewell ceremony of pass out batch 2025



Following the photo session, the juniors organised a cultural evening in the **GJLT auditorium**. The evening session started with an inauguration talk by the **HoD Prof. Sanjit K. Pal** and distribution of gifts by the professors to the final year students. The **Geophysical Society** arranged the evening snacks for the ceremony in the mid-hour of the program in the GJLT dome.



Student Chapters' Activities

IGU-IIT(ISM) Student Chapter Group Discussion & Quiz Competition

An **offline Group Discussion and Quiz Competition** was conducted by the **Indian Geophysical Union (IGU), IIT ISM Dhanbad Chapter** on **29th March 2025** as a prelude to **World Earth Day**, drawing enthusiastic participation from students of Integrated M.Tech and M.Sc. Tech programs across disciplines.

Group Discussion Winners:

- 🥇 1st Prize – **Mr. Ojas Verma**
- 🥈 2nd Prize – **Mr. Shusant Dutta**
- 🥉 3rd Prize – **Ms. Ankurita**

Quiz Competition Winners:

- 🥇 1st Prize – **Ms. Supriya Das, Mr. Sayantan Paul, Mr. Ojas Verma**
- 🥈 2nd Prize – **Mr. Ayush Zawar, Ms. Shruti Chakrobartty, Mr. Karthik**
- 🥉 3rd Prize – **Mr. Pateri Bhaskar, Mr. Debjyoti Biswas, Mr. Abhay Kumar**



The Group Discussion session offered a platform for students to voice their perspectives on pressing contemporary issues, covering topics from carbon capture technology to the impact of Artificial Intelligence on society. Participants contributed thoughtful and informed insights, making the session both engaging and memorable. Following the discussion, a Quiz Competition was held, covering diverse topics in geosciences, environment, and general knowledge. Five teams participated, showcasing impressive teamwork, quick thinking, and solid subject knowledge.

As part of the **World Earth Day celebrations**, a Tree Plantation Ceremony was held on **22nd April 2025** at the campus, with active participation from faculty and students who planted saplings to foster a cleaner, greener environment. The day also featured insightful talks by faculty members, emphasizing the significance of Earth Day, the importance of sustainable practices, and the pivotal role of young geoscientists in addressing environmental challenges and shaping a more sustainable future. The events were a resounding success, and the IGU IIT ISM Dhanbad Chapter extends warm congratulations to all the winners and heartfelt appreciation to all participants for their enthusiastic involvement.

Student Chapters' Activities

World Earth Day Celebration on 22nd April, 2025



Lectures delivered by the faculty members on World Earth Day



Tree plantation program by research scholars and faculty members on World Earth Day



Student Chapters' Activities

SPG-IIT(ISM) Student Chapter Webinar on Enhanced Geothermal System

The **SPG-IIT(ISM) Dhanbad Student Chapter**, in collaboration with **IGU-KUK Student Chapter**, successfully organized a **webinar** on *Enhanced Geothermal Systems* on **March 10, 2025**. The session was delivered by **Dr. Ankush Singh, Senior Consultant Engineer** at **ResFrac Corporation** and **Ph.D. in Geophysics** from **Stanford University**. Dr. Singh provided valuable insights into the principles, challenges, and advancements in **enhanced geothermal systems (EGS)**, a promising technology for sustainable energy production. The event witnessed active participation from students and researchers, fostering academic enrichment and discussion on cutting-edge geothermal technologies.



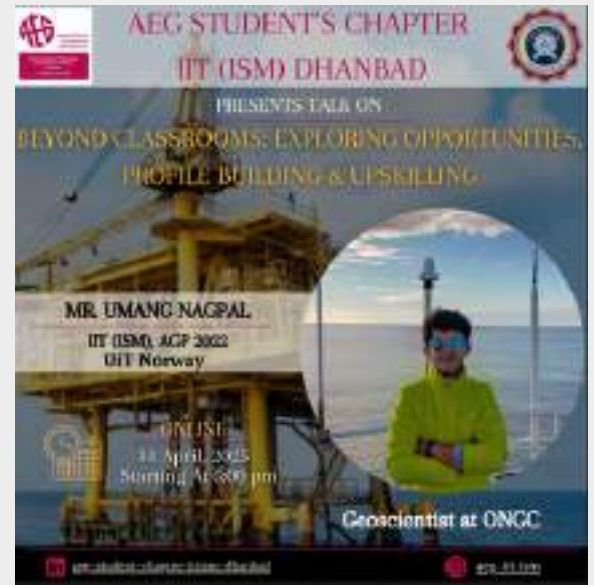
Online lecture delivered by Dr. Ankush Singh

Student Chapters' Activities

AEG-IIT(ISM) Student Chapter

The **AEG-IIT(ISM) Student Chapter** organised an online talk titled *"Beyond Classrooms: Exploring Opportunities, Upskilling, and Profile Building"* on **14th April 2025**, featuring **alumnus Mr. Umang Nagpal**, Geoscientist at ONGC and a 2022 graduate of the Department of Applied Geophysics (3-year M.Tech.).

The session offered valuable insights into **academic and professional development**, covering topics such as **summer schools**, **Geoscience workshops**, **research internships** (with year-wise strategies), **PhD opportunities abroad**, **project-based PhDs**, **conferences**, **competitions**, and **essential lifelong skills**.



Mr. Nagpal concluded with a powerful message:

"Explore relentlessly—you won't always be a student. Seize every opportunity to learn, connect, and step out of your comfort zone."

SUMMER & WINTER RESEARCH INTERNSHIPS

FRESHMEN YEAR

Newbie, Plenty of Time, Can Explore, No prior Research work – Academic Institutes

SOPHOMORE YEAR

Experienced, More Clarity, Comfortable in a Specific Research Topic – Institutes / Industry

DISSERTATION ORIENTED INSTITUTES

SEISMIC BASED INDUSTRY (CAMPUS – PPO)

SENIOR YEAR

Seasoned Candidate, Strong Research Acumen, Experienced in Field Work – Off Campus Jobs / Opportunities Abroad

OFF CAMPUS JOB OPPORTUNITIES

FUNDED IN PERSON INTERNSHIPS ABROAD

1. Lunar and Planetary Institute, USA
2. Taiwan International Internship Program
3. Institut de Physique du Globe de Paris, France
4. NTU-India Research Internship, Singapore
5. TU Delft University, Netherlands
6. University of Bergen (and Oslo), Norway
7. Okazawa Institute of Science Technology, Japan
8. USRP, KAUST, Saudi Arabia

Student Chapters' Activities

EAGE-IIT(ISM) Student Chapter

IIT(ISM) Team "Outcasts" Finalists in Global Energy Contest

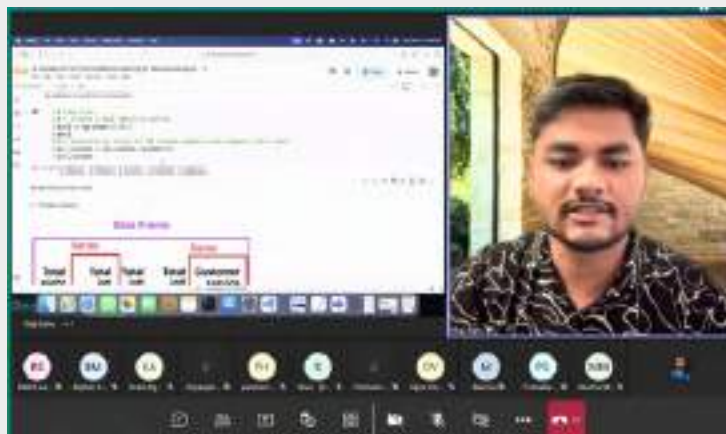


Power the Community is a prestigious global design competition that challenges students to re-imagine how communities access, distribute, and use energy—focusing on sustainability, affordability, and real-world impact. **Mr. Pratyush Singh** (Integrated M.Tech) from **Applied Geophysics** and **team from Petroleum Engineering** were **finalists in Power the Community** for their **innovative, low-cost solution tackling energy and sanitation issues in Thirumazhisai**.

Workshop on Python & Machine Learning for Geosciences

The **EAGE-IIT(ISM) Student Chapter**, with the **Department of Applied Geophysics**, hosted a hands-on workshop on *Python and Machine Learning in geosciences*, led by **Mr. Raj Sahu** (Final Year, Int. M.Tech), **incoming Geophysicist Intern at BP**.

The session featured live demos, real-world case studies, and practical ML workflows, highlighting how data science is transforming subsurface exploration and geophysical interpretation.



GeoQuest Webinar on XAI in Geoscience



As part of the **EAGE IIT(ISM) Student Chapter GeoQuest Series**, **Dr. Heather Bedle** (Univ. of Oklahoma) delivered an engaging session on using **explainable AI (SHAP) to enhance seismic interpretation**.

Drawing from **AASPI research**, the talk highlighted how ML boosts the clarity, accuracy, and transparency of geophysical models.

Student Chapters' Activities

SEG-IIT(ISM) Student Chapter

Earth Echoes: A Debate Competition

The **SEG-IIT(ISM) Student Chapter** hosted **Earth Echoes** at the department, a **spirited debate competition**, on **26th January 2025**. First-year Int. M.Tech and M.Sc.Tech students showcased sharp thinking and oratory skills on topics ranging from wind energy and space exploration to polar policies and the role of Earth Sciences. The event featured vibrant discussions, reflecting a deep enthusiasm for Geosciences and global issues.

Adding to the event's success, **Mr. Aditya Chowdhury** (Final-year student Int. M.Tech) and **Mr. Ayush Kumar Namdeo** (Final-year student M.Sc.Tech) served as judges, sharing valuable insights and presenting prizes to the winners.

🌟 Winners:

🏆 1st Prize: **Mr. Ojas Verma & Ms. Naba Fatima**

🏆 2nd Prize: **Mr. Arkajit Roy**

🏆 3rd Prize: **Ms. Sreeja & Mr. Aryan Sharma**



Student Chapters' Activities

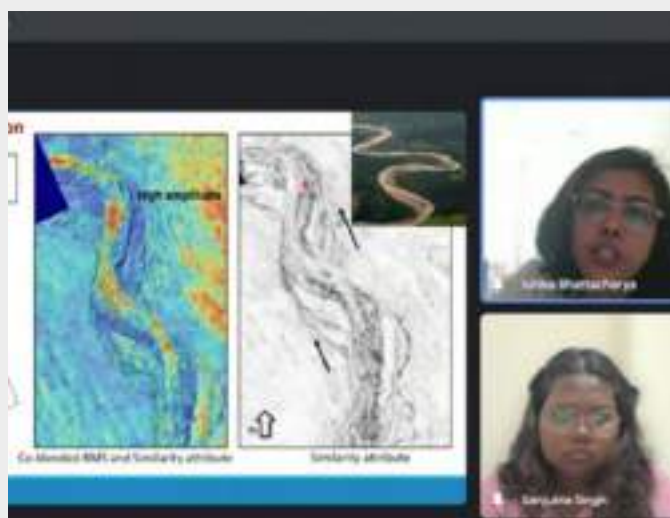
SPWLA-IIT(ISM) Student Chapter TechTrek

As the **SPWLA IIT ISM Dhanbad Student Chapter** embarks on its journey, it is poised to become a vibrant hub of academic and professional growth. It will serve as a vital link between students and the global community of petrophysicists and well-log analysts, preparing the next generation of geoscience professionals to meet the challenges of an evolving energy landscape.



TechTrek1 hosted **Ishika Bhattacharya**, a **Senior Research Fellow** at **IISER Pune** and an alumnus of department of Applied Geophysics, IIT ISM Dhanbad, who specializes in 2D and 3D seismic-based geological interpretation. Her talk entitled, "**Understanding Marine Depositional and Fluid Processes Using Seismic Data Interpretation**" covered the integration of sequence stratigraphy, forward stratigraphic modeling, and numerical simulations to analyze marine subsurface environments.

In **TechTrek2** , **Dr. Bappa Mukherjee**, **Scientist-B** at the **Wadia Institute of Himalayan Geology** and an IIT (ISM) Dhanbad alumnus, delivered a talk on "**Application of AI/ML in Geosciences**"





FACULTY TEAM

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UNTIL NEXT TIME...