



Legacy that Inspires the Future

R&D Newsletter

Quarterly Newsletter of the Office of the Dean (R&D), IIT(ISM) Dhanbad

Vol. 4, January-March, 2025



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About R&D Newsletter

The quarterly newsletter of the Office of the Dean (R&D), IIT(ISM) Dhanbad called "*R&D Newsletter*" is an in-house publication. The e-version of this newsletter is available on our official website at www.https://people.iitism.ac.in/~research/

Dear Reader,

This issue of "*R&D Newsletter*" is to showcase our excellence in academic and research activities. With our ever expanding academic network and research base, we are able to show our strength as an Institute of National Importance.



Dean (R&D)

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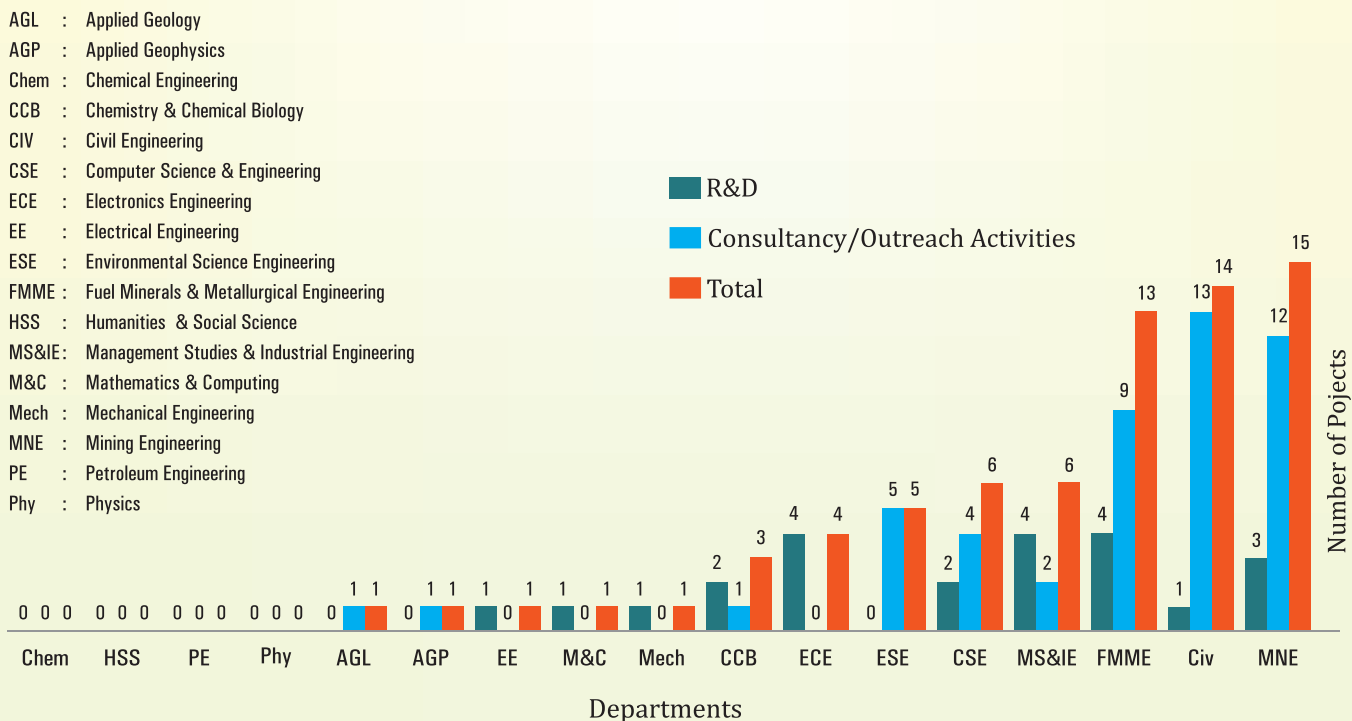
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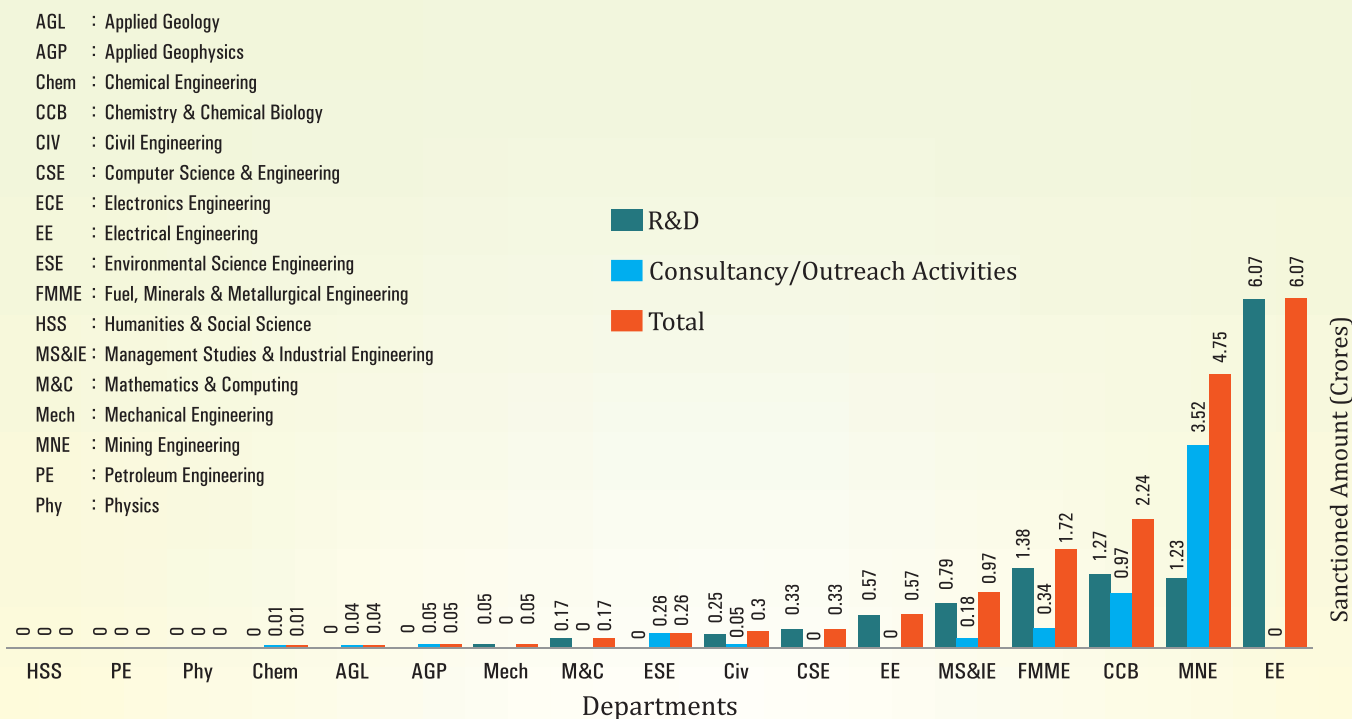


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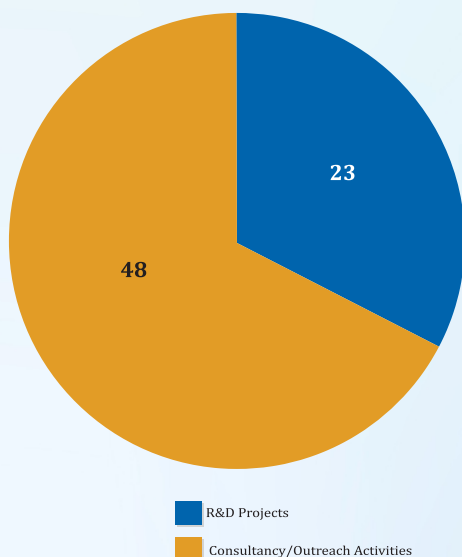
No. of R&D Projects, Consultancy/Outreach Activities (Jan-Mar, 2025)



Sanctioned Amount (in Crore) of R&D Projects, Consultancy/Outreach Activities (Jan-Mar, 2025)

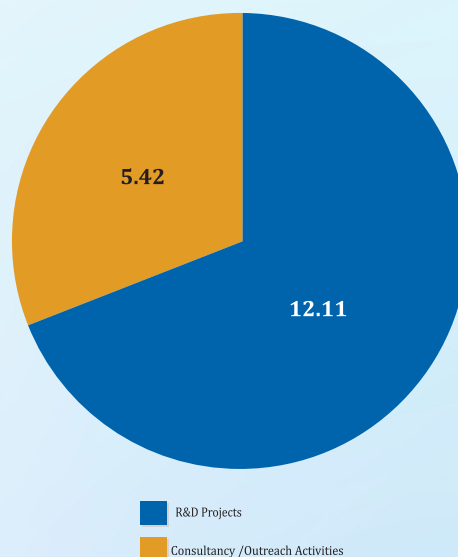


No. of R&D Projects, Consultancy/ Outreach Activities (Jan-Mar, 2025)



R&D Projects (No)	Consultancy/Outreach Activities (No)
23	48

Sanctioned Amount (in Crore) of R&D Projects, Consultancy/ Outreach Activities (Jan-Mar, 2025)



Sanctioned amount of R&D Projects (Crores)	Sanctioned amount of Consultancy/Outreach Activities (Crores)
12.11	5.42

Major R&D Projects/Consultancy / EDP/CoEs

- **Prof. V.G.K. Villuri/MNE** (Coordinator) along with his team members (Prof. S. Pasupuleti, Prof. A. S. Venkatesh, Prof. D. Gopi Krishna, Prof. D. P. Mishra) received a Consultancy Project (**199.7 lakhs**) titled “Scientific Hydro-Geological Survey in Kuya OCP Bastacolla Mines Area BCCL, Dhanbad” funded by BGR Mining Infra Pvt. Ltd., Ranchi.
- **Prof. Biswajit Chowdhury / C&CB** along with his team members (Prof. A K Nirala, Prof. U Tripathy, Prof. S P Tiwari, Prof. S. A. Sahu, Prof. M. K. Singh, Prof. S. K. Dey, Prof. N. R. Lakinga, Prof. S. Sethupathy, Prof. T. Maity, Dr. Samir Mondal, Dr. Sanjeev Soni) received R&D Project (**114.66 lakhs**) titled “Bioscopy - Towards modern transdisciplinary education and research in microscopy” under Indo-Norwegian Cooperation Programme 2024 (INCP2) funded by University Grants Commission, New Delhi.
- **Prof. Mrinal Sen / ECE** along with his team members (Prof. M. K. Das, Prof. Debjani Mitra) received a R&D Project (**283.26 lakhs**) titled “Development of lab-scale quantum fiber network, and design of plug-and-play photonic integrated modules for its transmitter & receiver towards secure 6G communication” funded by Department of Telecommunication (DoT), Ministry of Communication, New Delhi.
- **Prof. Himanshu Bhusan Mishra / ECE** along with his team members (Dr. Ekant Sharma, Dr. Prem Singh.) received R&D Project (**55.7 Lakh**) titled “TeraHertz Communication: Prototype Development and Algorithm Design” funded by Department of Telecommunication (DoT), Ministry of Communication, New Delhi.

- **Prof. Kartick Chandra Jana / EE** received R&D Project (**57.84 lakh**) titled “Integration of Multilevel Multiphase Motor for Electric Vehicles: Design, Development, Real-time Fault Diagnosis, and Fault-Tolerant Control for Reduced Harmonics and Torque Ripples at All Speed” funded by Anusandhan National Research Foundation (ANRF) New Delhi.
- **Prof. Dheeraj Kumar / MNE** along with his team members (Prof. R. K. Gangwar, Mr. Suraj Prakash, Dr. S. Chakraborty) received R&D Project (**68.84 lakh**) titled “NeTS Small NSF-DST Modernizing Underground Mining Operations with Millimeter-Wave Imaging and Networking” funded by DST-NSF, United States.
- **Prof. Devendra Chack / ECE** along with his team members (Prof. Anil Prabhakar, Prof. D. Venkitesh, Prof. Mukesh) received R&D Project (**198.38 lakhs**) titled “Silicon Photonic Chip based NxN Photonic Switches for 6G and Beyond” funded by Department of Telecommunication (DoT), Ministry of Communication, New Delhi.
- **Prof. Samrat Mukhopadhyay / ECE** along with his team members (Prof. Jitendra Kumar, Prof. H. B. Mishra) received R&D Project (**70.44 lakh**) titled “Development of Quantum Algorithms for Next Generation Wireless Communication Systems” funded by Department of Telecommunication (DoT), Ministry of Communication, New Delhi.

Publications

Total No. of Publications : **198**

Selected Publications

- S. G. Dastidar, **K. Sarkar**, D. Chandra, B. Hazra, V. Vishal, "ACS Omega"10(5), 4395-4405, **2025**.
- D. Keshri, S. L. Chattoraj, R. K. Pandey, **K. Sarkar**, "Journal of the Geological Society of India", 101(3), 384-396, **2025**.
- Avishek Dutta, **K. Sarkar**, "Journal of Earth System Science", 134(64), 1-27, **2025**.
- S. Baidya, **R. Anand**, S. Bose, N. L. Singh, "Geological Journal", 60, 2, 509-530, **2025**.
- P. Agrawal, J. Sinha, N. Jangre, F. Kumar, Kamalkant, A. Sinha, A. Singh, A. Banerjee, A. S. Venkatesh, **S. Pasupuleti**, "Ain Shams Engineering Journal", 16, 2, 103272, **2025**.
- L. V. Rathod, P. V. Timbadiya, **B. Barman**, "Ecohydrology", 18, 1-19, **2025**.
- M. Mohanty, **R. Sarkar** and **S. K. Das**, "Springer", 24 (1), 83-99, **2025**.
- N. Banik, Md. Emad Uddin, **R. Sarkar**, "Springer", 32, 2123-2145, **2025**.
- Sajal, **P. Roy**, "Springer", 7(3), **2025**.
- S. N. Kashyap, **B. Barman**, "Physics of Fluids", 37(3), **2025**.
- S. Sahu, D. R. Sahoo, **R. Bhartiya**, "Structures", 73, 108380, **2025**.
- D. Jain, P. K. Sarker, **S. D. Adhikary**, "Structures Journal", 75, 108805, **2025**.
- Md. A. Hussain, **S. C. Dutta**, "Structural Engineering and Mechanics", 93, 6, 425-444, **2025**.
- A Santra**, M Orsi, B Chakraborty, J F. Morris, "Physical Review Research", 7, 013275, **2025**.
- A. Kumar, H. Gupta, O. Ghangrekar, **S. Sengupta**, S. De, "Physics of Fluids", 37, 022040, **2025**.
- M. Chaurasia, **A. K. Pal**, S. H. Islam and J. Pradhan, "IEEE Transactions on Consumer Electronics", March **2025**.
- M. K. Kumari, **N. Tripathi**, P. Joshi, "IEEE Transactions on Network Science and Engineering", 1-14, **2025**.
- Ranjan, Rakesh, A. Bhattacharya, **S. Mukhopadhyay**, **Himanshu B. Mishra**, "AEU International Journal of Electronics and Communications", 155698, **2025**.
- M. Rautela, **J. Kumar**, "IEEE Journal of the Electron Devices Society", 2168-6734, **2025**.
- S. K. Singh, **J. Kumar**, "Journal of Nanophotonics", 19, 016005, **2025**.
- S. Sagar, S. Bhattarai, **J. Kumar**, **A. Kumar**, **S. Mukhopadhyay**, "Solar Energy", 288, 113299, **2025**.
- G. S. Sharma, A. Gupta, **R. K. Gangwar**, A. K. Pandey, "International Journal of Communication Systems", **2025**.
- Tripta Kumari, Kundan Kumar Suman, **R. K. Gangwar**, R. K. Chaudhary, "IEEE Transactions on Dielectrics and Electrical Insulation", **2025**.
- A.K. Pandey, **R. K. Gangwar**, R. K. Chaudhary, "IEEE Internet of Things Journal", 12, 3, 2385-2394, **2025**.
- Amit Kr. Pandey, **R. K. Gangwar**, Raghvendra Kumar Chaudhary, "IEEE Transactions on Antennas and Propagation" **2025**.
- S. Kumar**, D. Yadav, R. Ramesh, S. Stathopoulos, A. Tsiamis, and T. Prodromakis, "IEEE Transactions on Electron Devices", 72, 4, 1780-1787, **2025**.
- S. K. Raghuwanshi**, Vikash Kumar, Purnendu Shekhar, "Optical and Quantum Electronics", 57, 167, **2025**.
- S. K. Raghuwanshi**, Vikash Kumar, Md Tauseef Iqbal Ansari, "Optical Engineering", 64, 1, 016101 **2025**.
- S. Kumar**, A. Rai, S. S. A. Askari, "Optik - International Journal for Light and Electron Optics 321", 172159, **2025**.
- Swati Rajput**, Tithi Saha, and Ajay Agarwal, "IEEE Journal of Quantum Electronics" **2025**.
- Sivodia C., **A. Sinha**, "Environmental Science and Pollution Research", 32 (8), 4603-4618, **2025**.
- Singh R., **A. Sinha**, "Journal of Environmental Management", 377, 124663, **2025**.
- Ujjwal R., Abhrajyoti Tarafdar, Kamal N., Burman I., **A. Sinha**, "International Journal of Environmental Research", 19 (2), 59, **2025**.
- R. Ghosh, **A. A. Selvan**, "Applied Numerical Mathematics", 207, 1-23, **2025**.
- A. Jayswal**, P.S., J. C. Yao, "Optimization", 1-25, **2025**.
- B.K. Lenka, **R. K. Upadhyay**, "J. Innovation Sciences and Sustainable Technologies", 5(1), 1-37, **2025**.
- B.K. Lenka, **R. K. Upadhyay**, "Differential Equations and Dynamical Systems", 025-00711-7, **2025**.
- S. Yadav, J. P. Tripathi, S. Bhuri, S. K. Tiwari, D. Tripathi, V. Tiwari, **R. K. Upadhyay**, Y. Kang, "Differential Equations and Dynamical Systems", 12591-025-00712-6, **2025**.
- M. Biswas, **S. A. Sahu**, "Mathematics and Mechanics of Solids (SAGE)", **2025**.
- P. S. Rao**, S. Chowdhury, "Numerical Study of Unsteady Bioconvective Transport of Axytactic Microorganism over a Stretching Cone", **2025**.

- **G. K. Vishwakarma**, P. Kumari, A. Bhattacharjee, S. H. Ong, "Quality & Quantity", **2025**.
- A. Tarafdar, J. Mahato, **R. K. Upadhyay**, P. Bhattacharya, "Physica D-Nonlinear Phenomena", 474,134563, **2025**.
- B. Mondal, S. Mandal, P. K. Tiwari, **R. K. Upadhyay**, "Applied Mathematics and Computation", 498, 129380, **2025**.
- N. Sriwastav, **A. Das**, O. Shardt, J. Kumar, M. Singh, "Applied Mathematical Modelling", 116035, **2025**.
- **A. Jayswal**, G. Uniyal, "Journal of Applied Mathematics and Computing", 025-02469-1, **2025**.
- T. Nuradha, **H. K. Mishra**, Felix Leditzky, M. M. Wilde, "Journal of Physics A: Mathematical and Theoretical", **2025**.
- P. Joshi, **A. Kalita**, M. Gurusamy, "IEEE Communications Surveys and Tutorials", **2025**.
- **A. A. Selvan**, R. Radha, "Numerical Algorithms", **2025**.
- D. Pradhan, **R. K. Upadhyay**, "Expert Systems with Applications", 276,1-21, **2025**.
- **R. K. Upadhyay**, N. M. Tripathi, D. Barman, "Communications in Nonlinear Science and Numerical Simulation", 145,1-36, **2025**.
- **R. K. Upadhyay**, V. Pandey, R. D. Parshad, From multi-scale to non-local models: Comment on "Mathematical models on Alzheimer's disease and its treatment: A review" by M. Maji & S. Khajanchi, Physics of Life Reviews, 53, 125–127, **2025**.
- Md. Asif, **Keka Ojha**, D C Panigrahi, "Journal of Cleaner Production", 501,145308, **2025**.
- G. Chakraborty, **Keka Ojha**, **A. Mandal**, **N. Patra**, "Physical Chemistry Chemical Physics", 8, **2025**.
- **P. P. Mandal**, A. HAS., M. Sarmadivaleh, R. Rezaee, S. Ghosh, "Interpretation", 14(1), **2025**.
- D. Joshi, A. Kumar, **N. K. Maurya**, **A. Mandal**, "Journal of Molecular Liquids", 127445, **2025**.
- R. Chakraborty, **A. Mandal**, "Journal of Petroleum Exploration and Production Technology (PEPT)", **2025**.
- G. Chakraborty, K. Ojha, **A. Mandal**, **N. Patra**, "Physical Chemistry Chemical Physics", 27(8), 4429-4445, **2025**.
- R. Chakraborty, L. Jangid, R. Pandey, R.K. Pasivedala, T. Shaw, R. Dutta, **A. Mandal**, "Energy Fuels", 39, 7, 3462–3476, **2025**.
- T. Akash, V. Verma, M. Ali, **A. Mandal**, **N. Pal**, "Journal of Molecular Liquids", 126924, **2025**.
- P. K. Singh, D. Joshi, **A. Mandal**, **N. Pal**, "Energy Fuels", 39, 4, 1870–1888, **2025**.
- G. L. P. Rao, **A. Mandal**, N. Pal, "Chemical Physics", 588, 112496, **2025**.
- **R. Upadhyay**, R. Kumar, A. Kumar, G. Mobarsha, **R. Kiran**, **V. K. Rajak**, "International Journal of Coal Science & Technology", **2025**.
- N. R. Dadi, **N. K. Maurya**, "Journal of Molecular Liquids", 422,126927, ISSN 0167- 7322, **2025**.
- C. M. Banerjee, D. Kishra, **A. Baral**, S. Chakravorti, "IEEE Sensors Journal, (Early Access)", **2025**.
- S. B. Mitikiri, Y. Tiwari, **V. L. Srinivas**, M. Pal, "Sustainable Energy, Grids and Networks", 101704, 2352-4677, **2025**.
- A. Alzhrani, P. K. Sahay, N. C. Sreeram, **V. L. Srinivas**, "IEEE Access", 13, 51632-51644, **2025**.
- S. B. Mitikiri, **V. L. Srinivas** and M. Pal, "e-Prime - Advances in Electrical Engineering, Electronics and Energy", 100911, 2772-6711, **2025**.
- **B. Panda**, S. Kumar, **A. Ghoshal**, "IEEE Transactions on Power Electronics", 40, 6, 7777 - 7788, **2025**.
- A. Yadav, J. Patra, R. Verma, **N. Pal**, S. Samantray, K. B. Sahoo, P. Singh, R. S. Parihar, A. K. Panda, "Iranian Journal of Science and Technology, Transactions of Electrical Engineering–Springer Nature", 2228-6179, **2025**.
- F. Sadeque, M. Gursoy, **D. Sharma**, B. Mirafzal, "IEEE Transactions on Industry Applications", 60, 3, 4313-4323, **2025**.
- K. C. Tripathy, **A. Bhandari**, "Targeted drug delivery to the deviated regions of the human nasal cavities: An in-silico investigation and in vitro validation, Computer Methods and Programs in Biomedicine", 264,108706, **2025**.
- Rakesh Kumar, **S. Sarkar**, "Renewable Energy", ELSEVIER, 242, 122485, **2025**.
- Aadil Kureshee, S. Narayanan, **D. K. Mandal**, "International Journal of Multiphase Flow", 183, 105070, 1-10, **2025**.
- Suraj Prasad, Subhramanian Narayanan, **D. K. Mandal**, "Heat Transfer Engineering", 46, 6, **2025**.
- A. Gond, **A. Sengupta**, "AI Thermal Fluids", 1:100007, **2025**.
- **A. Sengupta**, A. Guha, "Frontiers in Aerospace Engineering", 4:1531916, **2025**.
- N K Jha, Vikram, N K Sah, **R. N. Hota**, "Sadhana", 50:50, **2025**.
- K Bharatheedasan, T Maity, **L. A. Kumaraswamidhas**, M Durairaj, "Alexandria Engineering Journal", 115, 355-369, **2025**.
- M Prashanth, **L. A. Kumaraswamidhas**, R Karunanithi, S Sivasankaran, "Inorganic Chemistry Communications", 114158, **2025**.
- G. K. Ghosh, S. Panda, **N. Kumar**, **S. K. Ghosh**, A. Kotia, "Heat Transfer Research", 56, **2025**.
- Samala Thirupathi, **A. R. Dixit**, P. K. Shaw, Suryank Dwivedi, "Materials Today Communications", 44, 2025, 112037, **2025**.
- S. K. Pandey, **A. R. Dixit**, "J. Korean Ceram. Soc.", **2025**.
- Hemlata Jangid, **Nirmal K. Singh**, Amlan Kar, "Processes (MDPI)", 13, 367, pp1-21, **2025**.

Patents

Granted:

- Suraj Prasad, Deepak Kumar Mandal, S. Narayanan, *"System and Method for Enhancing Evaporation Rate of Multicomponent Drops by Acoustic Streaming"* Patent No. 557965.
- U. Sur, R. S. Dhar, M. K. Dutta, P. Dutta, P. Bhardwaj, V. Shukla, G. Jain, S. Sarkar, J. Das, M. B. Chindappa, S. T. Malleshappa, P. K. S. Parashivamurthy, R. Bilagi, S. Tarikere Manjunath, *"Wall-Mounted Compact Electric Vehicle Charging Unit"* Patent no. 6431507.
- Prof. Sekhar Chandra Dutta, Prof. Sarat Kumar Panda, Prof. Sanket Nayak, Prof. Lohitkumar Nainegali, Prof. Sumit Kumar Published Indian patent No. 202231040574 for their invention titled *"A Method of Constructing I Building Structures on Backfilled Opencast Mines"*.
- Dr. Lalima Banerjee, Prof. Sowmiya Chawla and Prof. Sujit Kumar Dash. Published Indian patent No. 202331077988 for their invention titled *"A Method of Building Geocell Reinforced Railway Tracks, Over Weak Subgrade, Using Recycled Coal Overburden as Sub-ballast"*
- Prof. Satadru Das Adhikary, Mr. Dipanshu Jain. Published Indian patent No. 202431006089 on 16.02.2024 for their invention titled *"A cement-free mortar (CFM) composition"*.

Individual Faculty Achievements

- **Prof. Srinivas Pasupuleti** is granted Fellowship of Indian Water Resources Society for his professional contribution in the field of Water Resources.
- **Prof. R. K. Upadhyay** has been appointed as Associate Editor for the Babylonian Journal of Mathematics (Mesopotamia Academic Press).
- **Prof. R. K. Upadhyay** has been nominated as subject editor for the National Academy Science Letters (Springer).
- **Prof. T. Ojha** has been appointed as an Editorial Board Member of Scientific Report (Springer Nature).
- **Prof. H. K. Mishra** has been appointed Associate Editor in the Indian journal JISST.
- **Prof. S. Chatterjee** has been appointed as the IEEE Senior Member.
- **Prof. R. K. Upadhyay** has been appointed as the Associate Editor for Franklin Open (Elsevier Journal).
- **Prof. T. Ojha** has been appointed as a TPC member for premier IEEE Conferences - IEEE PIMRC 2025 and IEEE VTC-Spring 2025.
- **Prof. P. Mahato** visited IIT, Mandi on 20th March 2024 as an examiner of PhD Viva-Voce of Mr. Minku Arora, a PhD student of Dr. Rajesh Ghosh in the Schools of Mechanical and Materials Engineering.



- **Prof. Subhankar Sen** delivered an invited talk offline on the topic "Prediction of second critical Reynolds number of symmetric objects based on two-dimensional flow solutions" in the five-day JCSTI sponsored workshop on "*Taming Turbulence: Advancement in Flow and Acoustic Control*"

conducted by the Department of Mechanical Engineering, NIT Jamshedpur during 20-24 January, 2025.

- **Prof. Subhankar Sen** delivered an online lecture titled "*Introduction to variational methods*" at the twelve-day multidisciplinary online refresher course under the aegis of Malaviya Teacher Training Programme (MMTTP) conducted in the department on 28th February 2025.
- **Prof. Subhankar Sen** delivered an online lecture titled "*Comparison of different discretization methods for 1-D heat conduction*" at the refresher course on Heat and Mass Transfer- Basic and Advanced organized by the Malaviya Mission Teachers Training Centre, IITDM Kancheepuram during 10-22 March, 2025.
- **Prof. Ajay Mandal** delivered a lecture on "*Low salinity water flooding for potential enhanced oil recovery in SPE Ptero Fest*" Dibrugarh University on 21st March 2025.
- **Prof. Keka Ojha** delivered a lecture on "*Enhancing Coalbed Methane Recovery: Exploring CO₂-ECBM, Microbial Stimulation, and Wettability Alteration Techniques*" in the Oil and Gas International Conclave Petrofest 2025.
- **Prof. Rajeev Upadhyay** delivered a lecture on "*CBM Well Production Optimization using CBM specific Inflow Performance Relationship (IPR) and Vertical Lift Performance (VLP) analysis*" in Workshop on Coal Bed Methane (CBM) Exploration & Production scheduled during 9 – 10 March' 2025.
- **Prof. Keka Ojha** delivered a lecture on "*Enhancing Coalbed Methane Recovery: Exploring CO₂-ECBM, Microbial Stimulation, and Wettability Alteration Techniques*" delivered lecture in Workshop on Coal Bed Methane (CBM) Exploration & Production scheduled on 9–10 March 2025.
- **Prof. Keka Ojha** along with other faculties showcased the collaborative projects in India Energy Week 2025.
- **Prof. Arijit Baral** is selected as a Senior Individual Member of Indian National Academy of Engineering (INAE).

Major Research Output

- A lab scale technology was developed in the laboratory of Industrial Wastewater Treatment where mechanically synthesized nano-scrap carbon iron filings (nSCIF) was used as a cost-effective and sustainable catalyst in heterogeneous electro-Fenton process. The catalytic behaviour of nSCIF was studied for the oxidation of an anticancer drug, cytarabine (CBN), under the influence of various experimental parameters such as pH, catalyst dose and applied current density. The highest removal efficiency ($\sim 99\%$) was achieved in 90 min of reaction at pH 3, 0.4 g L⁻¹ of nSCIF dose and applied current density of 40 mA/cm². Being a solid catalyst, nSCIF enhanced the production of $\bullet\text{OH}$ radicals and promoted the cathodic regeneration of iron species (Fe^{3+} to Fe^{2+}). The mineralization efficiency reached 78% within 3 h of reaction time. The daughter products generated during the reaction were identified. The degradation of CBN was mainly contributed by the oxidation of aromatic ring. These findings corroborate the potential of utilizing industrial waste in the electro-catalytic oxidation of persistent pollutants (Ref: ESPR, 32(8), 4603-4618, 2025).
- Title of the project *“Development of guidelines for delineation of water stressed areas and designing of environmental friendly water storage structure for meeting the water needs in mining areas”*, Project Code-CIL/R&D/04/16/2022, Amount -**107.84** Lakh, **Prasoon Kumar Singh** (PI). The work aimed to delineate and demarcate water-stressed zones near mining areas of CCL, a subsidiary of Coal India Limited and to propose Environmental friendly water storage structure by in-depth study of long-term monsoonal water table fluctuations, qualitative analysis of surface water/groundwater, soil characteristics including infiltration behaviour and recharge-discharge patterns. The outcome of this project is to provide sustainable guidelines near mining areas for

identification of groundwater potential zones, water stress areas and categorization of safe, semi-critical and critical zones based on Groundwater Development percentage and with Artificial Neural Network technique.

- During the period January to March 2025, a significant research outcome was the development of advanced anomaly detection methodologies for electric vehicle (EV) charging infrastructure. This includes the publication titled *“Regression Based Anomaly Detection in Electric Vehicle State of Charge Fluctuations Through Analysis of Electric Vehicle Charging Infrastructure Data”* in the journal Sustainable Energy, Grids and Networks. The study presents a data-driven approach to identify irregularities in EV battery charging patterns, enhancing the reliability and safety of EV grid integration. Such advancements are crucial for the evolving smart grid and sustainable transport systems, aligning with national clean energy goals.

Major Instrumental Facilities Created

Dielectric Assessment kit for thin layers



Regenerative DC Power Supply
(800V, $\pm 16\text{A}$, 4kW)



Women Faculty Achievers

- **Prof. Piya Sengupta** was felicitated on 7 February, 2025 in the ASCE International Conference on Challenges and Innovations for Sustainable Smart Cities (CISSC) 2025, held during 7-9 February, 2025 at Novotel Hotel, Chandigarh for her contribution in the domain of Structural Engineering and also for her leadership in ASCE India Section: Eastern Region. She also served as Session Chair in two sessions of the International conference on 8th and 9th February, 2025.



- **Prof. Leeza Malik** has been reappointed as an Associate Editor for IATSS Research "The International Association of Traffic and Safety Sciences journal" for the term 2025-2027. She also served as Associate Editor for the journal during the 2023-2025 term. IATSS Research is a peer-reviewed, international journal published by Elsevier on behalf of the International Association of Traffic and Safety Sciences (IATSS), Japan. The journal promotes interdisciplinary research in transportation and traffic safety, including engineering, planning, psychology, and public health.

- **Prof. Sucharita Maji** was recognized by the

National Academy of Psychology (NAOP) as one of the emerging psychologists at their 34th Annual Convention. As part of NAOP's Emerging Psychologist Program, this recognition honored young psychologists Dr. Sucharita Maji was recognized by the National Academy of Psychology as one of the emerging psychologists in FEBRUARY 2025 for their research contributions and provided a distinguished platform to present their work. Dr. Maji presented her research on Mattering and Students' Mental Health at this platform.



- **Prof. Aditi Sengupta** has delivered an expert lecture on "High Accuracy, High Performance Computing of Transition to Turbulence" in workshop on Taming Turbulence: Advancement in Flow and Acoustic Control, NIT Jamshedpur, India on 24th January 2025. She has also contributed a book chapter, details are as follows: A. Sengupta, 2025. "Compressible entropy transport for flow in a low-pressure turbine with unsteady wakes impinging at the inflow", In: D. Zeidan, A. Hidalgo, L. T. Zhang, Goncalves Da Silva, E. (eds) Computational Fluid Dynamics: Novel Numerical and Computational Approaches. Infosys Science Foundation Series". Springer, Singapore.

- **Prof. S. Jagadevan** delivered a Keynote talk entitled "Biochar in the frame of circular economy: Translating success from laboratory to the real world" at the 2nd Annual Workshop on Waste Derived Carbon Applications in Remediation, Energy and Sequestration: Opportunities and Learning (W-CARESOL 2.0) held at IIT Bombay on 28th February and 1st March 2025. This workshop was organized by

the EnReST lab, Environmental Science and Engineering Department in collaboration with Bio- Energy Lab, Department of Energy Science and Engineering. In addition to the workshop, Prof. Sheeja Jagadevan learned about IIT Bombay's Living Lab, which has several ongoing

projects. I had the opportunity to visit 2 initiatives executed under the Living Lab, (i) utilization of pelletized garden waste for supplying heat to the campus kitchen, and (ii) IITB campus compost site and an anaerobic pilot plant site.



International Visits

- **Prof. Biswajeet Pradhan**, Distinguished Professor, University of Sydney visited Department of Civil Engineering, IIT(ISM) Dhanbad on 3rd March, 2025 as foreign faculty in GIAN Programme. He visited various laboratories of Department of Civil Engineering and interacted with faculty members. He discussed regarding his current research areas and known the research interest of faculty members. Later he interacted with Post Doc's, research scholars and M. Tech students and motivated them. Prof. Pradhan interacted with faculty and provided his consent to associate with the department for three to six months for collaborative research. This interaction provided a valuable opportunity to make strong bonding with international faculty which will aid in collaborative research in the near future.



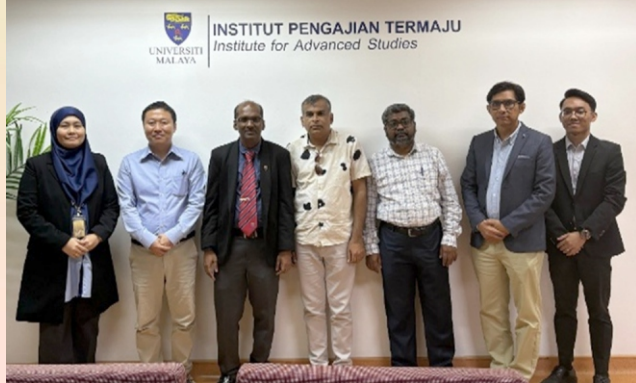
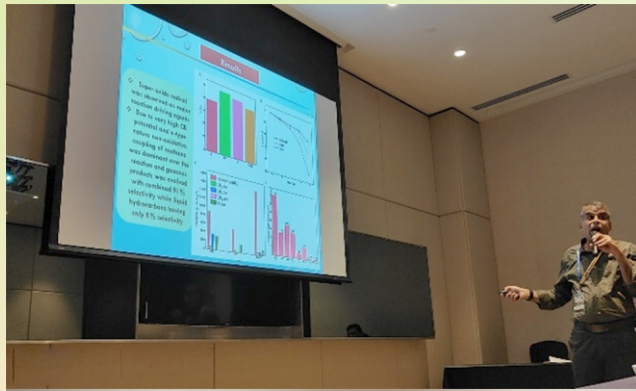
- **Prof. Chiranjeev Kumar** visited Oxford Brookes University's School of Engineering, Computing and Mathematics (ECM) from March 10–26, 2025, as a Visiting Research Academic. He engaged in discussions with key faculty and leadership, observed labs and classes, and explored collaborative opportunities. Productive meetings with Dr. Kashinath Basu and Prof. Muhammad Younas advanced a joint India-UK research grant proposal. Plans for joint PhD programs were also discussed. Prof. Kumar

additionally visited Cardiff Metropolitan University to explore further research collaborations. The visit strengthened academic ties and opened promising avenues for future cooperation between institutions in India and the UK.



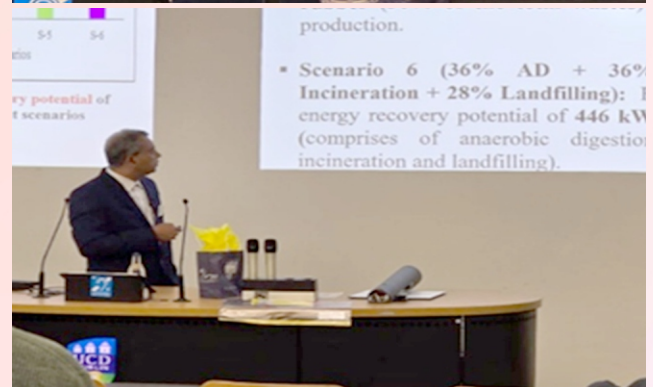
- **Prof. Saravanan** from ESE department presented a work entitled "Built in electric-field active 2D β -BN/ZIS coated water-fed photoelectrode for CH₄ mitigation" in 6th Malaysia-Japan International Conference on Nanoscience, Nanotechnology, and nanoengineering 2025(MJIC 2025) organised by Institute of Science at Universiti Teknologi MARA (UiTM), Malaysia, in collaboration with the Nagoya Institute of Technology (NITech), Japan at Melaka, Malaysia between 21-23 February 2025. During the conference he had dialogues with the Japanese professors Prof. Dr. T Soga and Prof. N. Kishi of Nagoya Institute of Technology Japan for submitting a joint proposal under DST Indo-Japan bilateral R&D scheme 2025. He then visited Institute of Advanced Studies (IAS), Universiti Malaya between 24-25 February 2025 and had an official discussion with the delegates of the IAS

lead of Prof. Dr. Ramesh A/L T. Subramaniam, Dean IAS for potential collaboration between the institute for possible students exchange and research collaboration in the domain of Nanoscience and Nanotechnology. Dr Suresh, Associate Professor, NANOCAT was present during the delegation. The NANOCAT is Centre of Excellence built by University Malaysia.



- **Keynote Lecture** Delivered by **Prof. S. R. Samadder** at Environ 2025, University College Dublin. Prof. S. R. Samadder, Department of Environmental Science & Engineering, IIT (ISM) Dhanbad, was invited to deliver a keynote lecture at the international conference Environ 2025, held at University College Dublin, Ireland, from March 10 to March 12, 2025. The lecture, titled “Assessing Energy Recovery Potential and Environmental Trade-offs in Waste-to-Energy

Systems: A Case Study” focused on a comprehensive assessment of waste-to-energy (WTE) technologies using Dhanbad Municipality as the study area. The presentation covered the identification and evaluation of various WTE technologies, emphasizing their potential for energy recovery and associated environmental implications. A key highlight of the lecture was the application of Life Cycle Assessment (LCA) to compare different WTE options. The system boundaries and methodological steps of LCA were briefly outlined to provide a framework for assessing environmental trade-offs. Overall, the lecture addressed the environmental issues, sustainable municipal solid waste management, and energy recovery potential from municipal solid waste.





- **Prof. Lucas Lestandi**, Associate Professor at Ecole Centrale de Nantes visited the Department of Mechanical Engineering, IIT (ISM) Dhanbad as a part of a research visit for the Indo-French CEFIPRA project, “Data reduction and surrogate modelling of transition to turbulence of Rayleigh-Taylor instability data obtained by DNS” with Prof. A Sengupta. During his visit, Prof. Lestandi also delivered a Centenary Lecture at the department titled, “From big data and HPC to fast inexpensive models.”

- Experts from France and Scotland, UK visited the Department of Mechanical Engineering.

- **Prof. Mamdud Hossain**, Prof. Robert Gordon University, Aberdeen, UK delivered a lecture on Biomass to Syngas via Co-electrolysis: solid Oxide Electrolyser Development in the Department of Mechanical Engineering on 19th February 2025. The event conducted as part of Centenary lecture series in the institute.



- The Department of Petroleum Engineering at IIT(ISM) Dhanbad had the honor of hosting a distinguished delegation from British Petroleum (BP). The visit marked a significant milestone in strengthening academia-industry collaboration and fostering opportunities for

students and researchers. The event served as a platform for knowledge exchange and opened avenues for internships, research projects, and potential recruitment, reinforcing IIT (ISM) Dhanbad’s status as a premier institute for petroleum engineering.



MoUs Signed

- **MoU signed between IIT(ISM) Dhanbad and Gujarat Mineral Research and Industrial Consultancy Society (GMRICS), Ahmedabad, Gujarat.** This MoU outlines the academic collaboration between GMRICS/GMDC and IIT (ISM) Dhanbad. The local coordinator of this MoU is **Prof. Sahendra Singh**.
- **MoU signed between IIT(ISM) Dhanbad and Tata Steel Limited, Mumbai.** The objective of this MoU to develop thin electrical steel laminations (approx. 1 mm or less than, if possible) using High Pressure Die Casting (HPDC). The local coordinator of this MoU is Prof. Rahul M.R, and his team member is **Prof. Ajay Bhandari**.
- **MoU signed between IIT (ISM) Dhanbad and Bradken Resources Pty. Ltd., Australia.** The objective of this MoU are to develop a comprehensive database through systematic literature review on chemical composition, heat-treatment parameters, microstructure and mechanical properties of existing Cr-Mo-Ni and High-Mn Hadfield steels used in the mining industry. This will help in developing clear strategies for design and development of next generation crawler shoe material with improved work hardenability, impact and wear resistance. It also aims to understand and minimize the metallurgical issues like shrinkage cavities, segregation and hydrogen cracking to meet the mechanical design requirements for thicker gauge applications. The local coordinator of this MoU is **Prof. Avnish Kumar**.
- **MoU signed between IIT(ISM) Dhanbad and Ministry of Road Transport and Highways (MoRTH), GoI, New Delhi.**

The MoU aims in reviewing the design and drawings of tunnels and its support systems, and suggest remedial measures, if required, for tunnel projects on various National Highways in the country. The local coordinator of this MoU is **Prof. B. S. Choudhary**.
- **An MoU signed between IIT (ISM) Dhanbad and Geological Survey of India, GoI, Ministry of Mines, Kolkata.**

GSI and IIT (ISM) have agreed upon to provide

a framework for enriching scientific endeavors in R&D Project on "Reconnaissance survey for occurrence of Natural Hydrogen around Beodnabad area of South Andaman District, Andaman & Nicobar Island, India". This project is taken up by GSI during FS 2024-25 through collaboration and knowledge sharing. The local coordinator of this MoU is **Prof. Raj Kiran**.

- **An MoU signed between IIT (ISM) Dhanbad and GeoExpOre Private Limited, Bangalore.**

The primary objective of this MoU is to establish a collaborative framework where IIT-ISM and GeoExpore take a leading role in shaping the direction and execution of joint efforts to develop technological solutions in the area of mineral exploration, processing of rare earth elements, and critical minerals, recycling and extraction. The local coordinator of this MoU is **Prof. Nikkam Suresh**.

- **An MoU signed between IIT (ISM) Dhanbad and National Institute of Advanced Manufacturing Technology, Ranchi (NIAMT).**

The objective of this cooperation is to foster collaboration and facilitate in the advancement Manufacturing of Mining Machineries within a sustainable and circular framework embracing Industry 4.0. It also aims to promote networking and flow of knowledge on the basis of participation, reciprocity, best effort, mutual benefit and frequent interactions. The local coordinator of this MoU is the **Director, IIT(ISM) Dhanbad**.

- **An MoU signed between IIT (ISM) Dhanbad and Management Development Institute, Murshidabad (MDIM), West Bengal.**

The objective of this MoU is to establish a framework for collaboration between IIT (ISM) Dhanbad and MDIM to offer Management Development Programs (MDPs), short-term courses, other academic, professional activities of mutual benefit, utilizing the infrastructure facilities of IIIF Kolkata and Delhi of IIT (ISM), Dhanbad. The local coordinator of this MoU is the **Director, IIT(ISM) Dhanbad**.

Workshop / Conference / Seminar

- **Workshop/conference/seminar in the department:**
- **Department of Civil Engineering, IIT (ISM) Dhanbad**, organized a two-day workshop on "Recent Advancements and Best Practices in Civil Engineering with Emphasis on Application of High-Strength Reinforcement Bars in Concrete Construction" sponsored by TATA TISCON as part of the institute's Centenary Celebrations on 3rd and 4th January 2025. Prof. Rahul Bhartiya was the coordinator and Prof. Pranesh Roy was the co-coordinator of the workshop. A total of 41 participants attended the workshop. The participants were practicing civil engineers and architects from various parts of the country.



The workshop focused on the design of earthquake resistant structures covering both theoretical and practical aspects. The objective of the workshop was to enhance the understanding of the practicing civil engineering professionals about the recent advances in civil engineering with emphasis on use of high-strength reinforcement bars, earthquake resistant design methods, and the importance of use of Indian standard codes.



Several eminent speakers from industry and academia delivered expert lectures in the

workshop. Prof. S.C. Dutta, Professor (HAG), IIT (ISM) Dhanbad, delivered a keynote lecture on "Dos and Don'ts in Earthquake Engineering". Prof. Rajib Sarkar from IIT (ISM) Dhanbad discussed earthquake-resistant design of pile-supported structures with focus on tall building foundations. Prof. Sanket Nayak from IIT (ISM) Dhanbad explained Indian Codes and standard guidelines for estimation of earthquake load on buildings. Prof. Deepak Yadav from IIT Jammu elaborated on modeling using Staad Pro/ETABS of RCC buildings subjected to wind and seismic loads and explained several practical issues. Dr. Priyanka Bhartiya from COWI India Pvt. Ltd., Gurgaon highlighted the importance of soil tests for foundation design. Prof. Pranesh Roy from IIT (ISM) Dhanbad provided a review of the direct stiffness method. Prof. Rahul Bhartiya from IIT (ISM) Dhanbad elucidated a few structural failures of engineering importance and lessons learnt from them. The workshop also included a visit to the concrete and material testing laboratories of the Civil Engineering Department, IIT (ISM) Dhanbad and a demonstration of tensile test of reinforcement bar.

- **Department of Civil Engineering**, in partnership with ASCE India Section: Eastern Region, organized an International Conference on Smart Resilient and Sustainable Infrastructure (SRISTI) on 24-25 January, 2025 at IIT (ISM) Dhanbad.



This interdisciplinary conference had themes of Construction Practice and Construction Materials, Tall Buildings and Special Structures, Disaster Resilient Infrastructure, Smart and Intelligent Infrastructure and Computational Mechanics, Risk and Reliability. This conference had 200 participants and 100 good quality research papers from India and abroad. This conference had 26 keynote sessions by leading experts from academia and Industry from India and abroad. The eminent keynote speakers from academia comprised Prof. Li Bing from NTU Singapore, Prof. Fernando Ortiz Quintana from ETH Zurich, Prof. Ravindra Gettu, V.S. Raju Chair Professor from IIT Madras, Prof. Durgesh Chandra Rai, Professor (HAG) from IIT Kanpur, Prof. Vasant Matsagar, Dogra Chair Professor from IIT Delhi, Prof. Yogendra Singh, Railway Bridge Chair Professor from IIT Roorkee, Prof. Suresh Bhalla, Professor (HAG) from IIT Delhi, Prof. K.V.L. Subramaniam, Professor (HAG) from IIT Hyderabad, Prof. Arghya Deb from IIT Kharagpur, Prof. Anupam Chakrabarti from IIT Roorkee, **Prof. Sekhar Chandra Dutta**, Professor (HAG) from IIT (ISM) Dhanbad, Prof. Radhakrishna G. Pillai from IIT Madras, Prof. Sudib K. Mishra from IIT Kanpur, Prof. S. Suriya Prakash from IIT Hyderabad, Prof. Subrata Chakraborty, Professor (HAG), IIST Shibpur and Prof. Jayadiptra Ghosh from IIT Bombay. Mr. Dilip Kr. Dhar, Managing Director, Con-Tech Business Solutions Pvt. Ltd., Mr. Kaizad Engineer, Technical Director, Ushta Infinity Construction Company Private Limited and Dr. Priyanka Bhartiya, Senior Specialist, COWI India Private Limited were the keynote speakers from industry. This conference paved the way for national and international research collaborations, industry-institute interactions, brainstorming and knowledge disseminations.

- A one-day “**IIT(ISM) Dhanbad Annual R&D Fair**” 2025 was held on 1st February 2025 along with the **Industry Institute Interaction (III)** event. The R&D fair was organized with an aim to create opportunities for all departments to showcase their significant products, technologies, research facilities, and capabilities for possible technology commercialization, industry-academia collaboration, industry-sponsored R&D projects, and consultancies. In accordance, the following list of Patents published by the Civil Engineering Department was displayed.

Two posters displaying the achievements and lab facilities of the Civil Engineering Dept. were

put up in the R&D Fair stall. The event was coordinated by Prof. Shushobhit who was a member of the R&D fair at the Institute level and Prof. Punyabeet who was the FIC from the department with cooperation from IPDFs and research scholars of the department.



- MoE Sponsored GIAN Program—Two Weeks Short Term Course on “*Geospatial Intelligence for Natural Resources Management and Disaster Mitigation*” was organized by the Department of Civil Engineering, IIT (ISM) Dhanbad during 03-12 March, 2025. Prof. Biswajeet Pradhan Distinguished Professor, University of Technology Sydney was the foreign faculty, **Prof. Srinivas Pasupuleti**, HoD, Civil Engineering, IIT (ISM), Dhanbad was the Coordinator and Prof. V. G. K. Villuri, ASP, Mining Engineering, IIT (ISM), Dhanbad was the Co-coordinator of the course.



This GIAN course covered geospatial technology, artificial intelligence, latest advancements, and case studies related to natural resource

management and disaster mitigation. The program was structured with a blend of laboratory sessions and classroom lectures, spanning 10 days and 37 sessions. 51 Participants include engineers, faculty members, research scholars, and students from across India.



- A two-day national workshop titled “*Next-Gen Geotechnical Engineering: Numerical Modelling in Railway and Mining Applications*” held at IIT (ISM) Dhanbad, on 28 and 29th March 2025, bringing together experts, researchers, and professionals from across the country. Organized by the **Department of Civil Engineering** under the aegis of the Indian Geotechnical Society’s (IGS) Dhanbad Chapter, the workshop was conducted in collaboration with MIDAS Research and Development Centre India, the Bureau of Indian Standards, PMT Infra Science, and TEXMIN as a technical partner. The event drew over 100 participants from premier educational and research institutions, including Research Design and Standards Organization (RDSO), Indian Railways.

The workshop was inaugurated by Mr. Ravi Kiran Anne, Director of MIDAS, who served as the chief guest. In his address, he underscored the evolving challenges in civil and geotechnical engineering, highlighting the growing role of advanced simulation software, high-performance computing, and research-driven solutions. **Prof. Sagar Pal**, Dean (R&D) at IIT (ISM) Dhanbad, presided over the inaugural session, emphasizing the increasing investment in research and development in the field. Prof. Sarat Kumar Das, Dean (Faculty) and Chairman of the IGS Dhanbad Chapter, shared the chapter’s milestones and key initiatives. Prof. Srinivas Pasupuleti, Head of the Civil Engineering Department, outlined the department’s academic offerings and ongoing research. Prof. Sowmiya Chawla, the workshop coordinator and Secretary of the IGS Dhanbad Chapter, welcomed the participants.

The first day began with an introduction to

MIDAS by Mr. Divyansh Pandey, Consultant at MIDAS, followed by a technical talk from Prof. Sowmiya Chawla on the application of numerical modelling in sustainable and resilient railway track design. This was succeeded by a hands-on training session on MIDAS GTS NX, focusing on various types of analyses related to railway track design.

The second day opened with a technical lecture by Prof. Gopi Krishna Dondapati on the significance of numerical modelling tools in the stability analysis of mining excavations. This was followed by another hands-on session on MIDAS GTS NX, specifically addressing mining-related problems.

The workshop concluded with a valedictory session graced by Prof. Sukumar Mishra, Director of IIT (ISM) Dhanbad; Prof. Sarat Kumar Das, Dean (Faculty); Prof. R.M. Bhattacharjee, Dean IRA; and Prof. Srinivas Pasupuleti, Head of the Civil Engineering Department. In his address, Prof. Sukumar Mishra spoke about the vital role of numerical modelling in modern engineering applications and how such workshops empower participants with future-ready skills. Prof. Bhattacharjee reflected on the evolution of research practices, noting how the current generation benefits from advanced tools that were unavailable in earlier times.



- RAIT 2025, a flagship conference technically co-sponsored by IEEE Kolkata Section, was held from March 6–8 at the **Department of Computer Science**, IIT ISM Dhanbad. Serving as a bridge between academia and industry, the conference promoted collaboration through technical sessions, keynote speeches, invited talks, and industry exhibits. The event focused on cutting-edge areas such as AI, Big Data, IoT, Cloud Computing, Cybersecurity, and more. Led by Chief Patron **Prof. Prem Vrat** and General Chair Prof. Chiranjeev Kumar, the conference featured

35 sessions in hybrid mode. Out of 700 submissions across four tracks, 300 papers were accepted, with 220 registered for presentation. Major sponsors included Coal India Ltd. (₹4 lakh), Texmin, and Aeroqube. Keynote addresses were delivered by Padma Shri Prof. Bimal Kumar Roy (ISI Kolkata) and Prof. Virendra Singh (IIT Bombay). Cultural performances and a gala dinner complemented the technical sessions. RAIT 2025 concluded with accolades for volunteers and left a lasting impact on the research community.



Communication and Defence Applications”



- **Prof. S. R. Samadder**, Department of Environmental Science & Engineering, IIT (ISM) Dhanbad, delivered a keynote lecture at the Refresher Training Program for CIL Executives held on February 27, 2025, at IIT (ISM) Dhanbad. The lecture, titled “Framework for Protection of Groundwater Using Geospatial Technologies,” focused on evaluating groundwater vulnerability using a geospatial framework and highlighted the ecological and hydrological threats posed by extensive surface coal mining. The lecture highlighted the ecological and hydrological risks posed by surface mining and stressed the importance of Groundwater Vulnerability Assessment (GVA) for sustainable water management. Prof. Samadder outlined three GVA methodologies (the original DRASTIC model, its modified version, and an AHP-enhanced variant) and demonstrated how geospatial tools and datasets such as Landsat 8 imagery, DEMs, rainfall data, and soil maps can be used for spatial analysis. The models were validated using field-based Water Quality Indices (WQI). The lecture emphasized the value of incorporating geospatial technologies and multi-criteria decision-making tools like AHP in developing robust, site-specific frameworks for groundwater protection in coal mining zones. The lecture provided both a theoretical foundation and a practical roadmap for future research and policy in sustainable groundwater management.
- **Department of Humanities and Social Sciences** organized an International Conference on Digital Humanities (DH) and Artificial Intelligence (AI) on 31st January and 1st February, 2025. The event featured distinguished keynote speakers: Geoffrey Rockwell (University of Alberta), Peter Francois (University of Oxford), and Nirmala Menon (IIT Indore). It was organized in

- Department of Electronics has organised 12-day online Malaviya Mission Refresher Course on “Atom to Device Understanding of Emerging Semiconductor Technology”.

Malaviya Mission Teacher Training Programme
An Online Interdisciplinary Refresher Course on
Atom to Device Understanding of Emerging Semiconductor Technology

Distinguished speakers

Dr. Bimal Kumar Roy Department of Physics and Director of Research IIT Bombay	Prof. Virendra Singh Department of Physics IIT Bombay	Prof. S. R. Samadder Department of Environmental Science & Engineering IIT (ISM) Dhanbad	Prof. S. R. Samadder Department of Environmental Science & Engineering IIT (ISM) Dhanbad	Prof. S. R. Samadder Department of Environmental Science & Engineering IIT (ISM) Dhanbad	Prof. S. R. Samadder Department of Environmental Science & Engineering IIT (ISM) Dhanbad

Salient Features:

- Application/Registration is free of cost.
- Mode of delivery: Online.
- Duration: 2 weeks, 12 working days, 72 contact hours.
- Assessment: MCQ based examination for Certificate upon successful completion.
- Eligibility: Faculty members from UGC-recognized universities and colleges.

Registration Deadline: February 22, 2025

Application Procedure:

- Register at <https://www.mission.ac.in> and create an account.
- Click on 'Apply for Online Course' and select 'Refresher Course'.
- Click on 'Course & Programme Detail' and select 'Refresher Course of Physics and Electronics'.
- Fill in other details, upload the NOC duly signed by your Head of Institution and submit the application form.

For more details, contact to our coordinators

Dr. Anshu K. Singh
Coordinator
Email: anshu@mission.ac.in
Phone: 0651-2571212

- Department of Electronics has organised Workshop On “Phased Array Antenna Systems: A Revolutionary Technology For Modern

collaboration with the JPN National Centre, IIT Indore. Students from across India presented their research. **Dr. Shanmugapriya T** was the convener, and Dr. Nirban Manna and Dr. Sameer Ahmed were co-conveners.



- As part of the Expert Talk Series initiated by the **Department of Mathematics & Computing**, a renowned quantum information theorist, **Prof. Mark M. Wilde (IEEE fellow)** from Cornell University delivered a talk titled "*Machina Ex Quanta: Rise of the Quantum Boltzmann Machines*" on January 10, 2025. Prof. Wilde describes his recent contributions for the quantum version of Boltzmann machines which can be understood as parameterized thermal states of local Hamiltonians. While this generalization allows for non-commuting Hamiltonians inaccessible in the classical case, training them for various optimization tasks has remained an obstacle. In the talk, Prof. Wilde discussed how they overcome this obstacle by deriving analytical expressions for the gradient and providing quantum algorithms that can estimate it. He also talked about a new model they introduced, called evolved quantum Boltzmann machines, which uses parameterized time-evolved thermal states as an ansatz, extending the conventional model of quantum Boltzmann machines.
- Prof. P. S. Rao/Dept. of Computer Science and Engg.** organized NPTEL Workshop on "*Data*

Predictive Analytics & Numerical Simulations" during March -12, 2025 on MS Team platform, having Registration of 130 participants for 10 hours duration.

- Prof. Dinabandhu Pradhan/Dept. of Mathematics and Computing** organized a Five-Day GIAN Course on New Trends in Coloring in Graphs from March 24 to 28, 2025. The program aimed to delve into fundamental and advanced concepts in graph coloring, including vertex coloring, edge coloring, face coloring, critical graphs, list coloring, odd coloring, and conflict-free coloring. The course also explored classical theorems such as the Four Color Theorem and Brooks' Theorem, along with modern developments and unsolved problems in the field. The course featured Prof. Riste Škrekovski from the Faculty of Mathematics and Physics, University of Ljubljana, Slovenia, as the Foreign Faculty.



- Prof. Shibayan Sarkar/Dept. of Mechanical Engg.** organized a Five-day Short-term course on "*HydroInnovate: Unleashing the Power of Water with Advanced Hydrokinetic Turbine Technologies*" funded by GIAN from 17.02.2025 - 21.02.2025.

Prof. Mamdud Hossain, Robert Gordon University, Aberdeen, UK, and **Prof. Sarkar** delivered expert lectures in this program. The whole event was video recorded and will be available on the GIAN website. The program was

conducted in the Seminar Hall of the Department of Mechanical Engineering in the presence of 25 numbers of participants from IIT Roorkee, BIT Sindri Jharkhand, VIT University Vellore Tamilnadu, UCET VBU Hazaribag, Brainery Group Ranchi, Asansol Engineering College West Bengal, Coochbehar Govt. Engineering College West Bengal.

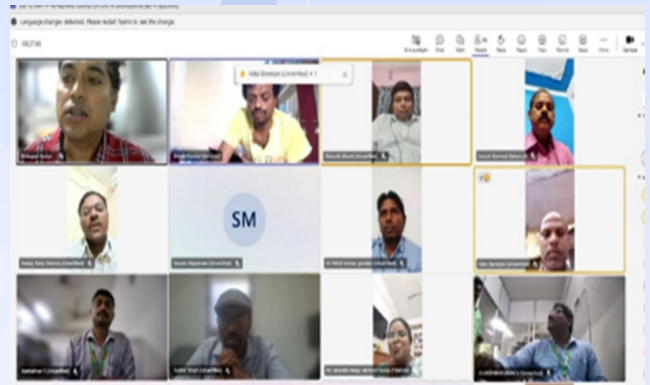


- **Prof. Shibayan Sarkar/ Dept. of Mechanical Engg.** organized a One-day Lab visit One day Lab visit to the Fluid Mechanics and Fluid Machines Lab, Mechanical Engg. and Workshop for the less endowed stakeholders of science, technology, and innovation (STI) and society under the funding of TARE, DST project as Mentor. In this event, Prof. Mamdud Hossain, Robert Gordon University, Aberdeen, UK, addressed 50 participants from the Local Polytechnique and other technical colleges. In addition, Dr. Anuj Kumar, Assistant **Prof. VIT Vellore**, PI of TARE, DST Project was also present. Mr. Indrajit Sarkar and Mr. Susil Soren, Department of Mechanical Engineering coordinated the event.



- **Prof. Subrata Kumar Ghosh/ Dept. of Mechanical Engg.,** and Prof. Shibayan Sarkar/ Dept. of Mechanical Engg. organized a twelve-day online refresher course on “Computational Fluid Dynamics in Engineering” under the funding of MMTTP from 28.02.2025 to

11.03.2025. In this event, 12 numbers of experts from IIT (ISM) Dhanbad and 12 numbers of experts from other IITs and NITs delivered 72 hours lectures.



- Students of IIT ISM Dhanbad recently visited ONGC as part of an educational field trip. The visit offered valuable insights into real-time drilling, production, and reservoir management operations. Students interacted with ONGC engineers and observed advanced technologies in use. This hands-on exposure enhanced their understanding of petroleum engineering beyond textbooks. The experience was both informative and inspiring for aspiring energy professionals.



- On March 21, 2025, the **Department of Petroleum Engineering**, IIT(ISM) Dhanbad, in collaboration with the FIPI IIT(ISM) Student Chapter, successfully hosted the Centenary

Lecture on "*Energy Transition: CCUS*" featuring Baroruchi Mishra Sir as the distinguished speaker. The session provided an in-depth exploration of Carbon Capture, Utilization, and Storage (CCUS) and its critical role in achieving net-zero carbon emissions.



The IADC IIT(ISM) Student Chapter, in collaboration with the **Department of Petroleum Engineering**, IIT(ISM) Dhanbad, successfully hosted a Centenary Lecture on Integrated Reservoir Modelling on March 24, 2024. The lecture was delivered by Mr. Krishnan Raghavan, CTO – Exploration & Production at Hindustan Oil Exploration Company.



All the faculties from the Department of Electrical Engineering, Prof. Sukumar Mishra, Director IIT (ISM) Dhanbad-Patron, Prof. Sukanta Das, HoD, EE- General Chair, Prof. Gauri

Shankar, Prof. Paresh Kumar Nayak, **Prof. B. K. Naick**, Program Chair. An international conference SSDEE 2025 was organized by the **Department of Electrical Engineering** from February 28, 2025 to March 01, 2025. Research scholars, academicians from the various part of the country attended the conference and exchanged their ideas among the attendees on the research works currently they are doing in the different areas of Electrical Engineering. Eminent academicians from India and abroad delivered technical speeches received acclamation beyond imagination. This was the first international conference hosted by the department and without any doubt it could be recorded as one of the successful events recently organized in the institute.



- **Prof. Nital Pal/ Dept. of Electrical Engg.** organized five days Executive Development Program (EDP), No. CONS 7304 E as consultant-in-charge (CI) on "*Preventive Maintenance and Electrical Safety in Mines*", for CIL and its subsidiaries organized by the Department of Electrical Engineering, IIT (ISM), Dhanbad during 20 – 24 January 2025.
- **Prof. Sukanta Halder**, PI & Co-ordinator, Prof. Soumyabrata Barik- Co-PI & Co-ordinator, Co-coordinators and Team Members: Prof. Pradip K. Sadhu, Prof. Nitai Pal, Prof. Anirban Ghoshal organized an FDP course on "*Innovation and Entrepreneurship*" funded by MoE & AICTE (Govt of India)" was organized at the **Department of Electrical Engineering**, IIT (ISM) Dhanbad during 24-28 March, 2025.