



Legacy that Inspires the Future



R&D Newsletter

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

Vol. 9, April-June, 2026



Director
Prof. Sukumar Mishra

Dean (R&D)
Prof. Parthasarathi Das

Associate Dean (R&D)
Prof. Sukha Ranjan Samadder

PIC SRIC
Prof. Ejaz Ahmad

PIC R&D
Prof. Sarthak S. Singh

Office of the Dean
(Research and Development)
IIT(ISM) Dhanbad

www.https://people.iitism.ac.in/~research/



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/](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.

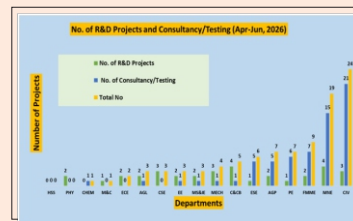


Dean (R&D)

R&D Newsletter Vol. 9, April-June, 2026

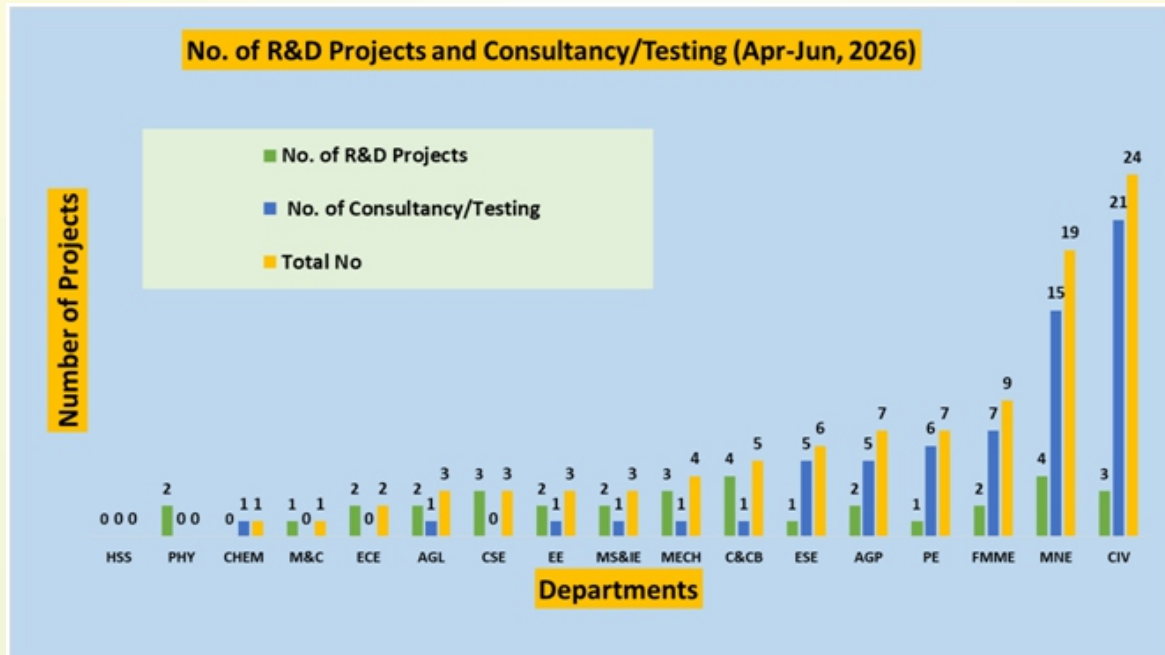
R&D News Letter

	Page No.
R&D Funding of the Institute	03
Research Achievements	05
Total Publications	
Selected Publications	
Patents	
Major Instrumental Facilities Created	12
Individual Faculty Achievement	13
Major Research Output	15
Women Faculty Achievers	17
MoU Signed	18
International Visits	19
Workshops / Conferences / Seminars	22

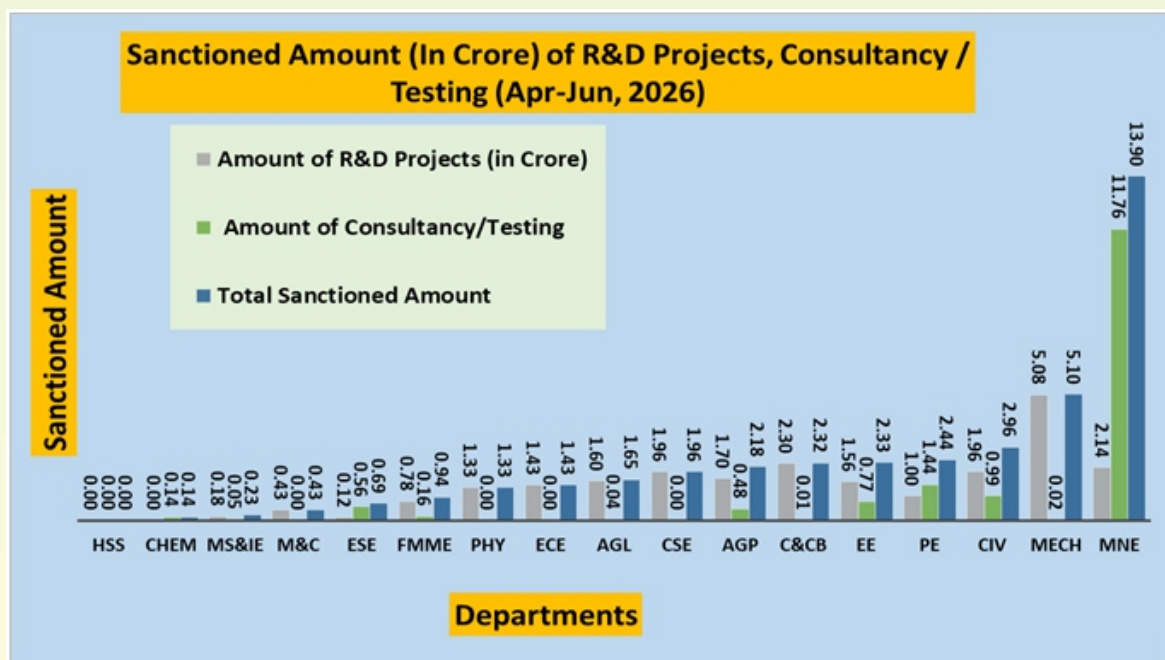


R&D Funding of the Institute

Department wise Number of R&D and Consultancy / Testing Projects

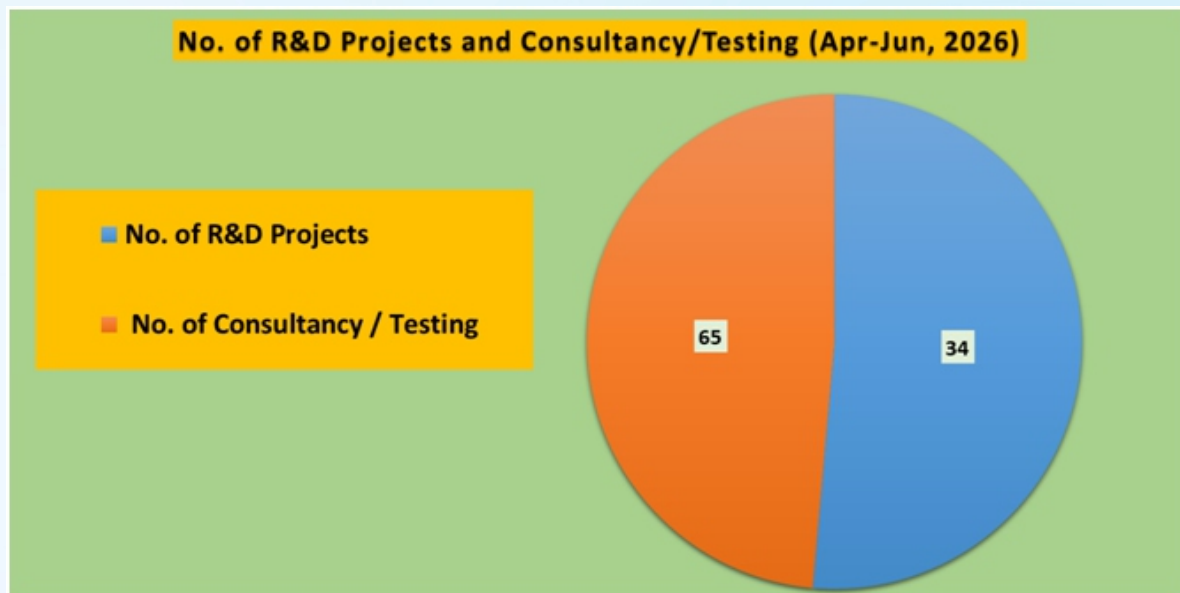


Department wise Sanctioned Amount of R&D and Consultancy / Testing Projects

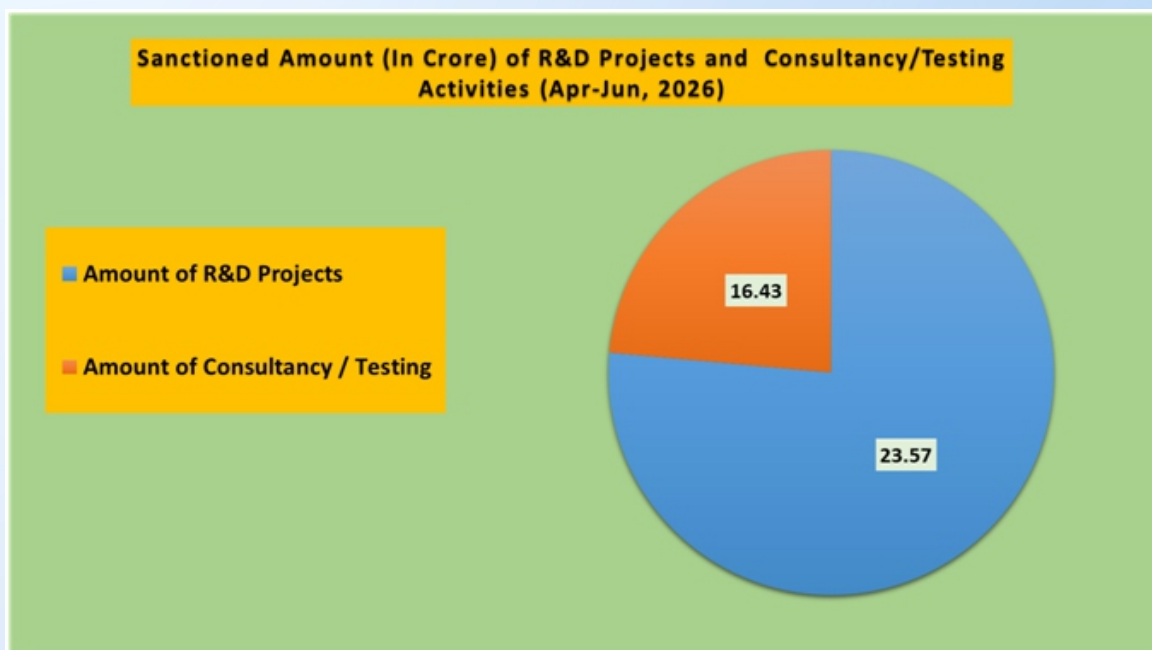


R&D Funding of the Institute

Number of R&D and Consultancy / Testing Projects (Apr-Jun 2026)



Sanctioned Amount of R&D and Consultancy / Testing Projects



Publications

Total No. of Publications : 242

Selected Publications

- Dasgupta, T., Mishra, D. P., 2026. Oxygen-flux-controlled thermal stability and escalation severity in low-temperature coal oxidation: Experimental investigation for spontaneous combustion risk assessment. *Process Safety and Environmental Protection* 214 (2026) 109053. <https://doi.org/10.1016/j.psep.2026.109053>.
- Verma, R., Choudhary, B.S., Deressa, G.W. et al. Pre-blast prediction of ground vibration in surface mining using rock acoustic impedance and wave attenuation calibrated with in-situ measurements. *Sci Rep* (2026). <https://doi.org/10.1038/s41598-026-52066-w>.
- Deressa, Geleta Warkisa & Choudhary, Bhanwar. (2026). Comparative evaluation of empirical and regression-based models for predicting blast-induced ground vibrations in Indian coal surface mines. *Current Science*. 130. 712-724. 10.18520/cs/v130/i8/712-724. (Q3, IF-0.9)
- Santanu Mondal and Rashmi Singh (2026). Enhancing Cyber Resilience in Financial Networks: A High uncertainty Simulation Tool for Probabilistic Risk Assessment and Strategic Resource Allocation. *Reliability Engineering & System Safety*, 277, 112961.
- Deependra Pal, Rashmi Singh and Niladri Das (2026). Adaptive Entrepreneurial Logics and Rural Enterprise Performance: Role of Dynamic Capabilities and Digital Technology Adoption. *Management Decision*, DOI: [10.1108/MD-11-2025-3409](https://doi.org/10.1108/MD-11-2025-3409). Impact Factor – 6.6, Q1-WoS.
- S. Kumar, L. Nainegali and Rajib Sarkar, Seismic Fragility of Pile Groups with Batter Piles in Slope: A Three-Dimensional Finite Element Investigation, *Probabilistic Engineering Mechanics*, Vol. 84, 103937, April 2026.
- F. Bhat, A. Verma and Punyabeet Sarangi, Beyond Adoption: Linking Built Environment and Attitudes to Electric Two-wheeler Usage, *Transportation Research Part D: Transport and Environment*, Vol. 156, 105356, April 2026.
- A. Dixit, P. N. Mishra and Sarat Kumar Das, Assessment of Heavy Metal Contamination in Sand and Water Using Time Domain Reflectometry, *Journal of Environmental Engineering*, Vol. 152(6), 04026024, May 2026.
- K. Sharma, K. J. Thakur, A. Kumar, and Sarat Kumar Das, Mechanical and microstructural assessment of copper slag, rice husk ash and alkali activator composite as a sustainable pavement construction material: experimental and sustainability approach, *Journal of Material Cycles and Waste Management*, Vol. 1-19, May 2026.
- L. V. Rathod, P. V. Timbadiya, and Bandita Barman, Flow Hydrodynamics in a Compound Channel with Submerged Flexible Floodplain Vegetation, *Journal of Hydraulic Engineering*, Vol. 152(5), 04026021, May 2026.
- S. Kumar, A. Anand, L. Nainegali and Rajib Sarkar, Investigation on Seismic Performance of Micropile-Reinforced Soil Slope with Different Configurations, *Transportation Infrastructure Geotechnology*, Vol. 13:152, May 2026.
- S. S. Vadavadagi, and Sowmiya Chawla, Cyclic model tests and numerical investigation of back-to-back geosynthetic-reinforced MSE walls supporting railway embankment, *Transportation Geotechnics*, 102128, May 2026.
- A. Dixit, P. N. Mishra and Sarat Kumar Das, Assessment of Heavy Metal Contamination in Sand and Water Using Time Domain Reflectometry, *Journal of Environmental Engineering*, Vol. 152(6), 04026024, June 2026.
- K. Sharma, K. J. Thakur, A. Kumar, and Sarat Kumar Das, Mechanical and microstructural assessment of copper slag, rice husk ash and alkali activator composite as a sustainable pavement construction material: experimental and sustainability approach, *Journal of Material Cycles and Waste Management*, Vol. 1-19, June 2026.
- L. V. Rathod, P. V. Timbadiya, and Bandita Barman, Flow Hydrodynamics in a Compound Channel with Submerged Flexible Floodplain Vegetation, *Journal of Hydraulic Engineering*, Vol. 152(5), 04026021, June 2026.
- S. Kumar, A. Anand, L. Nainegali and Rajib Sarkar, Investigation on Seismic Performance of Micropile-Reinforced Soil Slope with Different Configurations, *Transportation Infrastructure Geotechnology*, Vol. 13:152, June 2026.

- S. S. Vadavadagi, and Sowmiya Chawla, Cyclic model tests and numerical investigation of back-to-back geosynthetic-reinforced MSE walls supporting railway embankment, *Transportation Geotechnics*, Vol. 102128, June 2026.
- P. N. Mishra, S. Tiwari, S. O. Olaya, CSSU Srikanth, B. J. Ramaiah, A. Kumar, J. T. Chavda, P. Das, T. V. Bharat, R. Bag, P. V. Divya, B. G. Rajesh, D. Airey, P. Thanayamwatte, P. To, B. Shannon, J. Kodikara, Sarat Kumar Das, A Round Robin Study for Benchmarking the Measurement of Soil Shrinkage Curve (SSC), *Canadian Geotechnical Journal*, Just-IN, June 2026.
- S. Keshav, A. Das, S. Singh, R. Singh, M. Singh, New Generalised Semi-Analytical Approach for the Multidimensional Nonlinear Collisional Fragmentation Equations, *International Journal for Numerical Methods in Fluids*, April 2026.
- S. Roy, P. K. Tiwari, G. Kumar, R.K. Upadhyay, The Role of Selective Predation in Predator-Prey Systems with Indirectly Transmitted-Disease in Prey, *International Journal of Bifurcation and Chaos*, 36, 9, 2650112, 1-30, April 2026.
- J. Datta, A. K. Sethy, R.K. Upadhyay, Understanding the spatiotemporal dynamics and pattern analysis of population model with Holling type-IV functional response, *Pramana – J. of Physics*, 100, 69, 1-26, April 2026.
- D Pradhan, R.K. Upadhyay, Unravelling the Spatiotemporal Dynamics of Amyloid- β -Induced
- Astrocyte-Neuron Network Model in Alzheimer's Disease, *Journal of Mathematical Biology*, 92, 5, 81, 1-51, April 2026.
- S. A. Sahu and S. Shukla, Closed-form analysis of SH wave propagation in viscous loaded flexomagnetic-piezomagnetic plate with microstructural substrate effects, *The European Physical Journal Plus*, 141, 354, April 2026.
- X. Tao, D. Ma, L. Li, M. Verma, L. Chen, X. Xie, S. Chen, W. Li, J. Kato, B. Zhang, and X. Hu, LIBS: Instructional Action Quality Assessment via Supervoxel-Based Fine-Grained Attribution, *IEEE Transactions on Computers*, 75, 5, 1835-1848, May 2026.
- A. Jayswal, G. Uniyal, Wolfe Type Duality for a Semi-Infinite Variational Problem Involving Caputo-Fabrizio Fractional Derivative, *Journal of Optimization Theory and Applications*, 210, 1, June 2026.
- S. Das, S. Laxmi, Adaptive residual refinement in physics-informed neural networks for breast cancer thermal modeling and data-driven partial differential equation discovery, *Engineering Applications of Artificial Intelligence*, 173, 114435, June 2026.
- Z. Ansari, M. Dewangan, A. Das, S. Heinrich, R. Ramachandran, M. Singh, Bridging hydrodynamics and granulation kinetics: An efficient 2D CFD-coupled compartmental PBM approach for fluidised bed granulation, *Computer Methods in Applied Mechanics and Engineering*, 461, 119154, June 2026.
- S. Pujari, R. Agrawal, R.K. Upadhyay, Modeling Predator-Prey Systems with Strong Allee Effect and Mutual Interference among Predators, *International Journal of Bifurcation and Chaos*, 36, 12, 2650188, 1-30, June 2026.
- S. Mandal, P. K. Tiwari, R.K. Upadhyay, A.K. Misra, Impacts of cooperative hunting and Allee effect on the stability of a three-species system with sexually reproducing top predators, *Mathematical Biosciences*, 399, 109749, 1-17, September 2026.
- Md Yeasin, A. Sarkar, R. K. Upadhyay, B. Mandal, A. Thakur, H. S. Roy, P. Kumar, and R. K. Paul, Exploring the Impact of Climate Change on Crop Yields: A Deep Dive with Dual Wavelet Enhanced Nonlinear ARDL Modeling, *Theoretical and Applied Climatology*, 2026.
- H. K. Mishra, On generalization of Williamson's theorem to real symmetric matrices, *Journal of Symplectic Geometry*, 2026
- N. Meghana, V. Zimba and J. Nayak, "Enhanced room-temperature acetic acid gas sensing properties of graphitic carbon nitride having two-dimensional lamellar structures," *Journal of Materials Science: Materials in Electronics*, 2026. DOI: 10.1007/s10854-026-16898-6.
- Ashutosh Yadav and Bobby Antony, "Investigation of positron scattering from atomic fluorine and fluorine-containing molecules," *RSC Advances*, 2026.
- Manika Dandapat, Priyadarshi Sahoo and Umakanta Tripathy, "Detecting toxic species in the aggregation of amyloid beta in real time," *Journal of Physics: Photonics*, Vol. 8, 025017, 2026. DOI: 10.1088/2515-7647/ae65f1.
- Zhiwei Peng, Vhaskar Chakraborty, Pankaj Mishra and Mingfeng Qiu, "Dispersion of active particles in oscillatory Poiseuille flow," *Journal of Fluid Mechanics*, 2026. DOI:

10.1017/jfm.2026.11543.

- Pankaj Mishra, Moushila Bayen and Rohit Biswas, "Tunable freezing in 2D PMMA colloids: density functional theory of combined Yukawa–Hamaker interactions," *Physica A: Statistical Mechanics and its Applications*, 2026. DOI: 10.1016/j.physa.2026.131578.
- Subhasis Sarangi, Archana Hota, Amritendu Roy and P. M. Sarun, "Structural, electrical, ferroelectric and energy-harvesting performance of $\text{BaV}_x\text{Sn}(0.05-x)\text{Ti}_{0.95}\text{O}_3$ for self-powered micro-electronic applications," *Journal of Alloys and Compounds*, 2026. DOI: 10.1016/j.jallcom.2026.189375.
- Priyadarshi Sahoo, Manika Dandapat, Amit Kumar Pradhan, Prasanta Kumar Datta and Umakanta Tripathy, "Nonlinear photophysics of a PDA-based nanofluid: a potential candidate for two-photon photothermal therapy," *Nanoscale Advances*, 2026. DOI: 10.1039/d6na00128a.
- Zoelnon Abdelwahed Altaher, Sayantan Ghosh, Mrinal Kanti Mukherjee, Control of structural lineaments on the distribution of hazardous coal fire zones in Jharia Coalfield, Eastern India, *Natural Hazards* 122 (326), Mar 2026
- Bouchene Hocine, Souvik Sen, Rabah Chaouchi, Rafik Baouche, Sayantan Ghosh, Tectonic stress state and geomechanical characterization of the Triassic and Devonian reservoirs in north Berkine Basin, Algeria – Framework for reservoir exploitation strategies, *Episodes*, May 202
- Souvik Sen, Sayantan Ghosh, Hakki Aydin, N. Bozkurt Çiftçi & Şükrü Merey, Geomechanical Modeling and Critically Stressed Fracture Analysis for Geothermal Resource Management – A Study from the Menderes Metamorphic Basement, Gediz Graben, Türkiye, April 2026
- Krish Ashwinkumar Patel, Sampa Guin, Vishal Kumar, Palavalasa Vishnu Teja, Tarun Kumar Naiya, Suresh Kumar Yatirajula. Development of a Corn Oil-Based Alkyd Resin as a Sustainable Pour Point Depressant for Enhanced Flow Assurance of Waxy Crude Oil. *Fuel* 2027, 428. <https://doi.org/10.1016/j.fuel.2026.140411>.
- R. Verma, Jaiprakash, M. Sahoo, "Electrothermal Modeling and Reliability Analysis of All-Carbon Interconnects: An Effective Medium Theory-based approach" *Micro and Nanostructures*, Elsevier publishers, vol. 216, No. 208743, 2026.
- N. Kumar, S. Upadhyay, V. Gajraj, A. Sen, and R. K. Ranjan, "Synergistic Oxide–Carbide Heterostructures of VO₂ and Mo₂C Enabling High-Performance Supercapacitor Electrode" *Ceramics International*, 2026.05.431.
- K. Mondal, R. Kumar, B. S. Makhdoomi, Sagar, R. K. Ranjan, and S. Chandra, "Flux-controlled memristor emulator for realizing adaptive intelligence," *AEUE - International Journal of Electronics and Communications* 215 ,2026, 156398.
- R. Prabha and P. K. Varshney, "A Novel Innovative Bi-complementary Resonator Coupled Advanced Substrate Integrated Waveguide Sensor for Angular Positioning Measurement," *IEEE Sensors Journal*, Volume: 26, Issue: 11, 01 June 2026.
- Sanghmitra, Ravi Kumar Gangwar, and Raghvendra Kumar Chaudhary. "A Low-Profile PCB-Compatible Circularly Polarized MIMO Substrate Integrated Octagonal Dielectric Resonator Antenna for mm-Wave IoT-Based Smart Environments" published in *IEEE Internet of Things Journal*. May 2026
- Jan Wegner, MR Rahul, Lars Bruckhaus and Stefan Kleszczynski, Simulation guided in-situ alloying in the medium entropy Fe-Ni-Nb system via laser powder bed fusion, *Journal - Progress in Additive Manufacturing*, 1-12, 2026.
- Sala Kasturi, Aman Gupta and Shi-Hoon Choi, Unraveling microstructural heterogeneity in intermediate and severely deformed V2Ni alloy: Correlating shear, kink, micro and macrobands, *Materials Characterization*, 116414, 2026.
- Moon, Hyeokgyun, Ritesh Prakash, Moe Moe Than, Bukuk Oh, Gyoujin Cho and Jinkee Lee, Numerical and experimental analysis of thermal design of a drying chamber for roll-to-roll (R2R) printing devices, *Flexible and Printed Electronics*, 2026.
- Das, Rajasree, Sagnik Das, Jayanta Mukhopadhyay, Pavan K. Gupta, Shubhi Gupta, and Goutam K. Gupta. "Ni-Doped CeO₂ as Ceramic Catalyst for Gamhar Sawdust Pyrolysis: Product Distribution and Enriched Bio-Oil Production." *Journal of the American Ceramic Society* 109, no. 5 (2026): e70801.
- Mohammed-Aslam, M. A., Bala, R., Rizvi, S. S., Prusty, P., & Khan, S. (2026). Geochemical modeling, hydrogeochemistry and appraisal of groundwater quality of Mangura Nala watershed using statistical tools and geographic information system. *Discover Geoscience*, 4(1), 158.

- Pal, S., Bhaumik, A. K., Tikadar, S., Mahato, S. K., & Pal, A. (2026). Coprolites and Neodiapsida remains from the Early Triassic Panchet Formation, India. *Historical Biology*, 1-27.
- Sarkar, K., Rahman, T., Shyam Raj, B., & Singh, T. N. (2026). Lithological control on machine learningbased prediction of rock strength parameters using P-wave velocity: Kripamoy Sarkar et al. *Journal of Earth System Science*, 135(3), 161.
- Siddiqui, M. S., Pradhan, S. P., Bhapkar, P. V., Hazra, B., & Vishal, V. (2026). Influence of CO₂ Saturation on the Mechanical Behavior of Quartz and Clay-Rich Sandstone and Their Thermal Responses under Inert and Oxidic Conditions. *Energy & Fuels*, 40(16), 8956-8979.
- Singh, A. K., Pandey, B., Hazra, B., & Singh, P. K. (2026). Sunflower structure of pyrite in Lignite of Western Kachchh, Gujarat (India): Insights on its origin and mechanism. *International Journal of Coal Science & Technology*, 13(1), 38.
- Vishal, V., Chandra, D., Mahanta, B., Koperna, G., GD, V., Hazra, B., ... & Singh, T. N. (2026). An atlas of geological carbon sequestration potential in CBM-rich coalfields of India. *International Journal of Greenhouse Gas Control*, 155, 104700.
- Rupam Ghosh, K. K. Bhanja and N. Patra, *Mutation-Driven Remodeling of the LRRK2 Kinase Free-Energy Landscape and Its Consequences for Conformational Transitions and Inhibitor Binding Affinity*, *Journal of Chemical Information and Modeling*, 66 (1), 554, Jan 2026.
- Subhasis Sahoo, Amit Kumar, Kiran Negi, S. K. Mahapatra and S. K. Sahu, *Synergistically Crosslinked Alginate-CMC Hydrogel Reinforced with Natural Fibre for Enhanced Mechanical and Antibacterial Activity*, *European Polymer Journal*, Article 114759, 2026.
- Kiran Negi, S. Patra, G. Chakraborty, M. Dhoundiyal, S. K. Bhutia and S. K. Sahu, *NIR Light Activated Polyphenol Driven Carrier-Free Self-Assembled Nanoparticles for Synergistic Chemo-PDT-PTT*, *Langmuir*, 42 (21), 14978, 2026.
- T. Natarajan M., D. S. Teja, Sk S. Akhter, P. Bhardwaj, P. Kumar, B. S. Mallik and S. K. Padhi, *Electrocatalytic Ammonia Oxidation Mediated by a Cu(II) Complex: A Hydrazine Pathway to Hydrogen Generation*, *Dalton Transactions*, 55 (18), 7111, 2026.
- A. Jha, S. K. S. Venkatesh, A. Singh and N. R. Lakkaniga, *Synergistic Combinations for Improved Therapeutic Outcomes in Triple Negative Breast Cancer*, *Cell Biology International*, 50 (4), e7015, 2026.
- A. Singh and N. R. Lakkaniga, *Molecular Carcinogenesis*, *Molecular Carcinogenesis*, DOI: 10.1002/mc.70132, 2026.
- S. Debnath, M. Ray and S. Maity, *Photochemical Switchable Access to Spiro- γ -lactams and Spiro- γ -lactones from Olefins via a N to O Atom Swap*, *Organic Letters*, 28 (22), 6968, 2026.
- Chakraborty, D. Basu, G. Chakraborty, N. Patra and H. P. Nayek, *Element-Ligand Cooperativity of Hypervalent Organotin(IV) Compounds in Hydroboration Reaction of Carbonyl Compounds*, *Inorganic Chemistry*, 65, 11628, 2026.
- Aditya Tripathi, Sarita Yadav, Madhulika Gupta and B. K. Mishra, *Contending Ions and*

- Preferential Removal Pathways: Deciphering Electrochemical Mechanisms in Flow Electrodes of FCDI for Cr(VI), Pb(II), and Cu(II) Removal, *Electrochimica Acta*, Vol. 573, 149415, June 2026.
- Debashis Sarkar, Nidhi Sehwat, Sarita Yadav, Sushree Palatsingh, P. Lama, Madhulika Gupta and R. K. Metre, Electrocatalytic Water Oxidation by a Heterogenized Co(III)–Aminophenol Complex: Structure–Activity Relationship and DFT Mechanistic Insight, *Chem. Asian J.*, Vol. 21, June 2026.
 - Shatarupa Bhattacharya, Motiur Rahaman, Shreya Suman, Deepak Kumar Rout, Sanchita Mondal, Shashank Purwar, Bhavna Dhingra, Praphulla Chandra Shukla, Gayatri Mukherjee, Madhulika Gupta, Debashree Guha, Mrinal Kanti Bhattacharyya, Tuphan Kanti Dolai, Nishant Chakravorty and Budhaditya Mukherjee, HLA Polymorphisms Shape Divergent Outcomes of *Toxoplasma* and *Plasmodium* Infection in Eastern Indian HbE/ β -Thalassemia Cohort, *Nature Communications Biology*, Vol. 9, 690, May 2026.
 - R. Singh, A. Joshi, T. Kundu, M. Gupta and M. Patel, *Cellulose*, DOI: 10.1007/s10570-026-07106-z, 2026.
 - U. Dey, A. Ghosh, N. Das, A. Singh and S. K. Sahu, *Dalton Transactions*, 55 (22), 8489, 2026.
 - Monisha Jayaprakasan, Anirban Kr. Chakrabarty, Srikant Kumar, Rajiva Kumar Rai, Naga Rajiv Lakkaniga and Sunil Kumar Dubey, *The Vitamin B12 Paradox: Microbial Abundance, Human Deficiency, and Food-Based Nutritional Solutions*, ACS Nutrition Science, Published online June 2, 2026. <https://doi.org/10.1021/acsnutrsci.6c00009>.
 - Rakhi Senapati, S. Srikanan, Debasish Paul, Subhas Ghosal, Soumit Chatterjee and Dipankar Sukul, *Corrosion Inhibition of Mild Steel in Acid Pickling Solution Using Benzothiazole Derivatives: Effect of Substituents*, *Inorganic Chemistry Communications*, Article 117162, Jul 2026.
 - Sunidhi Raj and Niladri Patra. Integrated first-principles, SCAPS-1D, and a ML framework for numerical modelling and performance optimization of BaXS₃ (X = Zr, Hf)-based perovskite solar cells. *Phys. Chem. Chem. Phys.*, 2026. DOI: 10.1039/d6cp01150k.
 - Rajesh Ghosh, Kousik K. Bhanja and Niladri Patra. Mutation-Driven Remodeling of the LRRK2 Kinase Free-Energy Landscape and Its Consequences for Conformational Transitions and Inhibitor Binding Affinity. *J. Chem. Inf. Model.* 2026, 66, 10, 5897–5910.
 - Deepankumar S, Rengaraj R, Pranesh R, P Mishra, and Arup K. Pal, A 3D Chaotic Map-based Novel Intra and Inter-level Bit Plane Image Content Encryption, *Journal of Information Security and Applications*, Vol. 98, 104389, May 2026.
 - Hybrid shaped Darrieus and Multi-Staged Modified Savonius Turbines Under Controlled Flow Parameters: A Novel Experimental Study,” *Flow Measurement and Instrumentation*, May 2026.
 - Prof. K. C. Jana A. K. Soni, **K. C. Jana**, D. K. Gupta, “Intelligent Level-Shifted PWM Controlled PV-Fed Multilevel Inverter with Advanced Partial Shading Detection and GMPP Tracking Capability,” *IEEE Journal of Emerging and Selected Topics in Industrial Electronics*, **2026**, DOI:10.1109/JESTIE.2026.3708688. [Accepted]
 - Subhadeep Banerjee, Ritwick Mondal, Shramana Deb, Gourav Shome, Sharanya Chakraborty, Chinmay Saha, Alak Pandit, Gargi Sen, Sreela Bhattacharya, Purbita Sen, Nitai P. Bhattacharya, Jayanta Roy, Anjan Chowdhury, Julián Benito-León, Integrated molecular and clinical profiling of primary mitochondrial oxidative phosphorylation disorders in an Indian cohort: Insights from genetics, neuroimaging, and machine learning, *Mitochondrion*, Vol. 89, 102150, Jul 2026.
 - Ul Hoque, A. Samanta, S. Pramanik, S. R. Chowdhury, R. Lo, S. Maity. “Title of the Publication,” *Nature Communications*, 15, 5739, 2024.
 - Devesh Kumar, Ram Babu Gupta, Tanmay Dutta, Comparative assessment of direct and indirect liquid cooling strategies for 48V lithium-ion battery packs under extreme operating conditions, *Energy*, 356, 141285, 2026, <https://doi.org/10.1016/j.energy.2026.141285>
 - Effects of compressibility and orientation on the flow-induced pitching oscillation of an elliptic cylinder, Sawant Omkar Deepak; Swagata Bhaumik, *Physics of Fluids* 38, 056114 (2026) <https://doi.org/10.1063/5.0323893>.
 - Suparno Bhattacharyya, A 99-Line FEM Code for Simulating a Moving Point Heat Source Over a Domain, *Computer Applications in Engineering*

- Education*, 34, e70226, 2026, <https://doi.org/10.1002/cae.70226>.
- Bhattacharya, S. K., N. Das, S. K. Pal, U. Low, and S. Srinivas. 2026. "Comprehensive Gravity, Magnetic and Radiometric Analysis of the Eastern Ghat Mobile Belt–Cuddapah Basin Collision Zone: New Insights on Concealed Structures, Felsic Magmatism and Tectonic Dynamics." *Geological Journal* 1–28. <https://doi.org/10.1002/gj.70296>.
 - Emmanuel Seraphimu Mrema, Amit Bera, Sanjit Kumar Pal, Feasibility of artificial recharge sites in the Makutupora Basin, Tanzania: A geospatial approach towards sustainable water management in a semi-arid region, *Journal of African Earth Sciences*, Volume 242, 2026, 106242 ISSN 1464-343X, <https://doi.org/10.1016/j.jafrearsci.2026.106242>.
 - Ujjal Senapati, Amit Bera, Litan Dutta, Sanjit Kumar Pal, Tapan Kumar Das, Leveraging machine learning for the optimal selection of surface rainwater harvesting sites in semi-arid regions for sustainable water resource management, *Physics and Chemistry of the Earth, Parts A/B/C*, Volume 144, Part 1, 2026, 104490, ISSN 1474-7065, <https://doi.org/10.1016/j.pce.2026.104490>.
 - Amit Bera, Litan Dutta, Rajwardhan Kumar, Swarnali Barua, Kumar Suman Sourav, Sanjit Kumar Pal, A holistic approach to basin-scale groundwater security assessment using SWAT, machine learning, and deep learning in semi-arid regions, *Journal of Water Process Engineering*, Volume 85, 2026, 109794, ISSN 2214-7144, <https://doi.org/10.1016/j.jwpe.2026.109794>.
 - Hembram, S., Verma, K.S., Datta Gupta, S. *et al.* Geomechanical characterization of reservoir and caprock integrity for CO₂ sequestration assessment in the Jaisalmer Basin, India. *J Earth Syst Sci* **135**, 104 (2026). <https://doi.org/10.1007/s12040-026-02797-1>
 - Neelima Singh, Mohit Agarwal, Deepa Negi, Numerical simulation of lead-free RbGeBr₃ based perovskite solar cell, *Materials Letters*, Volume 408, 2026, 140109, ISSN 0167-577X, <https://doi.org/10.1016/j.matlet.2026.140109>.
 - Agarwal, M., Mehta, V. & Yadav, A. Particle swarm optimization based improved UNet for indoor scene segmentation. *Cluster Comput* **29**, 287 (2026). <https://doi.org/10.1007/s10586-025-05899-5>
 - Agarwal, M.K.; Ogra, A. An Approach Using the Analytical Hierarchy Process for Assessing Child-Friendly Environment in Planned Neighbourhood Parks. *Societies* 2026, 16, 126. <https://doi.org/10.3390/soc16040126>
 - Tirtharaj Barman, Arpan Das and Swarandeeep Sahoo* Role of partial stable stratification on the onset of rotating magnetoconvection with a uniform horizontal field Tirtharaj Barman et al 2026 *Phys. Scr.* 101 165003 doi.10.1088/1402-4896/ae5ce3
 - S. Mandal, Silo Discharge of Nonspherical Grains: From Spheroids to Faceted, *Industrial & Engineering Chemistry Research*, Vol. 65, 9731–9737, May 2026.
 - S. K. Singh, V. Tyagi and A. Santra, Rigidity transition in polydisperse shear-thickening suspensions, *Physical Review Fluids*, Vol. 11, 054307, May 2026.
 - K. Agrawal and V. Santhanam, Durable Platinum Thin Film on Silver Leaf, Formed by Self-Terminating Electrodeposition, *Electroanalysis*, Vol. 38, e70135, Apr 2026.
 - S. Yasmin and B. Chandra, Drag reduction in the flow of dilute polymer solutions through a rectangular microchannel, *Physics of Fluids*, Vol. 38, Feb 2026.
 - S. Singh, A. Kumar, P. K. Singh, S. Narayanan and S. K. Bhaumik Thickness profile measurements of acoustic induced maneuvering of thin film evaporation, *Heat Transfer Engineering*, Vol. 47, 382–397, Apr–May 2026.
 - B. Dey, I. Pal, K. K. Saha, S. Majumdar, M. Parveen, A. Das, S. K. Yatirajula, et al., Self-Healing Antibacterial Metallo supramolecular Soft-Networks: Comparative Studies on Mechanical Flexibility and Semiconducting Device Applications, *Inorganic Chemistry*, 2026.
 - S. Ghosh, I. Pal, A. Dey, S. K. Yatirajula, P. P. Ray and B. Dey, Rheoreversible metallosupramolecular soft-nanostructure of Cd(II) for fabricating a thin-film-based semiconducting device, *New Journal of Chemistry*, Vol. 50, 1503–1515, Feb 2026.
 - S. Kamaliny, P. P. Singh and S. Sengupta, Study on carbon deposition and detection on Ni/Ce_{0.5}Zr_{0.5}O₂ catalyst during dry reforming of methane (DRM) for syngas production and possible catalyst regeneration techniques, *International Journal of Hydrogen Energy*, Vol.

236,155049,2026.

- S. Das, R. Aggrawal, V. Yadav, K. Anupam and S. Dutta, Hydrogen production strategies in pulp and papermaking environment—A review on processes, challenges and economics, *Applied Energy*, Vol. 413, 127746, 2026.
- A. Raheem, R. Kumar, H. Znad and E. Ahmad, Silver-Modified TiO_2/NiAl Layered Double Hydroxide Photocatalyst for Enhanced Photocatalytic Water Splitting, *ChemCatChem*, Vol. 18, e70757, May 2026.
- K. A. Ahmad, A. Kumar, H. Znad and E. Ahmad, Kinetic and thermodynamic insights into butyl levulinate production using tungsten-substituted heteropolyacid catalysts, *Fuel*, Vol. 407, 137477, 2026.
- S. K. Pandit and A. Kumar, Efficacy and Barrier Integrity of Superhydrophobic Cellulosic Paperboard for Hygroscopic Food and Liquid Encapsulation, *Cellulose*, 1–19, 2026.
- C. J. Lad, B. Prasad, T. K. Mondal, S. S. Gupta, S. K. Das and A. Samanta, Hydrogen Production From the Scrap Aluminum Beverage Can Chips and Valorization of Byproduct Residue for CO_2 Capture, *Journal of Energy Resources Technology*, Part B: Subsurface Energy and Carbon Capture, Vol. 2, 011012, Feb 2026.
- B. Prasad and A. Samanta, Postcombustion CO_2 Capture in a Radial-Flow Adsorber Using Amine-Functionalized γ -Alumina from the Aluminum-Hydrolysis Byproduct, *Industrial & Engineering Chemistry Research*, 2026.
- L. Pal, P. Sahu, P. Paluri and D. C. Panigrahi, Influence of physical and chemical properties on the thermal behaviour of coal: A comparative study and regression-based assessment of two Indian underground mines.

Published Patent

- Raj Kumar Dishwar, Khushi Rathore, Vaibhav Pal Patent Application No. 202531023488. Published April 03, 2026.
- Partha Sarathi Paul, Paul Prasanna Kumar S., Debashis Chatterjee, Chethan S. Patent Application No. 202531023486. Published April 03, 2026.
- Anup Krishna Prasad, Atul Kumar Varma, Bhabesh Chandra Sarkar, Shailayee Mukherjee, Bitan Purkait, Sandhya Sonker, Rachna Rakesh, Tathastu Das, Ayesha Nayak, Arya Vinod Patent Application No. 202631040739. Published April 10, 2026.
- Anup Krishna Prasad, Rachna Rakesh, Bitan Purkait, Shailayee Mukherjee, Arya Vinod, Tathastu Das, Ayesha Nayak, Kumari Preety, Akella Satya Venkatesh, Bhabesh Chandra Sarkar, Atul Kumar Varma Patent Application No. 202631040763. Published April 10, 2026.
- Swarandeep Sahoo, Susil Kumar Nayak, Tapomay Shee, Raut Hirenabhai Ramesh Bhai, Syed Aifan Ali, Ayush Kumar, Manish Kumar, Suraj Kumar Patent Application No. 202631009199. Published April 10, 2026.
- Rajen Dasgupta, Vivek Kumar, Satwik Mohan Patent Application No. 202531021958. Published April 17, 2026.
- Anup Krishna Prasad, Atul Kumar Varma, Bhabesh Chandra Sarkar, Arya Vinod, Sandhya Sonker, Sameeksha Mishra, Anubhav Shukla Patent Application No. 202631046027. Published April 24, 2026.
- Sushrut Das, Aditi Rani Patent Application No. 202631057038. Published May 22, 2026.
- Aditya Kumar, Dibya Ranjan Rout, Debasish Mahato, Sapan Kumar Pandit, Rose Rani, Ishaan Goel, Tarun Rana. Patent Application No. 202631062260. Published May 29, 2026.
- Niranjana Kumar, Sanjoy Kumar Ghoshal, Ajit Kumar, Anubhav Kumar Sharma Patent Application No. 202631064840. Published June 05, 2026.
- Somnath Yadav, Arup Bairagi, Rajib Bera, Rintu Sk. Patent Application No. 202531043581. Published June 12, 2026.
- Alakesh Kalita. Patent Application No. 202531029706. Published June 12, 2026.

Granted Patent

- Sagar Pal, Kalipada Manna, Shaon Dey, Arpita Roy. Patent Application No. 202531019066. Granted April 17, 2026.
- Kaushik Mazumdar, Chumki Das. Patent Application No. 202431097530. Granted April 24, 2026.
- Anil Kumar Nirala, Atul Kumar. Patent Application No. 202331034539. Granted April 24, 2026.
- Vikas Mahto, Barasha Deka, Rohit Sharma. Patent Application No. 202231073800. Granted April 28, 2026.
- Alok Kumar Das, Kumar Ujjwal, Mukul Anand, Robin Singh. Patent Application No. 202431067209. Granted May 11, 2026.
- Kesavan Ravi, Chaitanya Gullipalli. Patent Application No. 202531022622. Granted May 12, 2026.
- Amitesh Kumar, J. Thangaraj, Vishnu Priye, Abhinav Gautam. Patent Application No. 202131058195. Granted May 19, 2026.
- Sandipan Das, A. K. Samanta, Soumyajit Sengupta. Patent Application No. 202331078073. Granted May 27, 2026.
- S. R. Samadder, Rima Kumari. Patent Application No. 202431072102. Granted June 03, 2026.
- Rabindra Nath Hota, Nitish Kumar Sah, Nandan Kumar Jha, Vikram. Patent Application No. 202431104915. Granted June 05, 2026.
- Sumanta Kumar Padhi, Parthasarathi Das, Tanumay Roy, Thillai Natarajan M, Subhas Jana. Patent Application No. 202531111630. Granted June 08, 2026.
- Somnath Chattopadhyaya, Nishant. Patent Application No. 202531014718. Granted June 11, 2026.
- Alok Sinha, Dharmendra Singh Ken. Patent Application No. 202531020216. Granted June 22, 2026.
- Alakesh Kalita. Patent Application No. 202431081152. Granted June 24, 2026.
- Vivek Bajpai, Madhav Raturi, Prince Anand. Patent Application No. 202531036943. Granted June 25, 2026.
- R. N. Hota, Nandan Kumar Jha, Vikram. Patent Application No. 202431002352. Granted June 29, 2026.
- Ejaz Ahmad, Suman Dutta, Afaq Ahmad Khan, Akash Rajpoot, Shivshankar Prasad. Patent Application No. 202531097101. Granted June 30, 2026.

Major Instrumental Facilities Created

• Soldering and De-soldering setup



- **Time domain Electromagnetic (TDEM)/ Transient Electromagnetic (TEM) Instrument**
Time-Domain Electromagnetic (TDEM) or Transient Electromagnetic (TEM) methods in India are advanced, non-invasive geophysical techniques used extensively by national agencies like the Central Ground Water Board (CGWB) and commercial contractors for pan-India groundwater mapping, mineral prospecting, and crustal-scale subsurface image.



• Res 2DINV and Res 3DINV Professional software

Professional EM Software — Process, invert, and interpret EM & ERT data using the Aarhus GeoSoftware suite. Advanced inversion for TEM, FEM, AEM, and resistivity surveys. Geoscience Software. Informed Subsurface Data. Earth-Modelling Software. Subsurface Technology. Geoscience Intelligence.

- An experimental facility with a low-speed open-circuit wind tunnel for the UG teaching lab was installed in the **Department of Mechanical Engineering**.

Individual Faculty Achievements

- **Prof. Dheeraj Kumar**, Department of Mining Engineering, is serving as the Project Adviser for the R&D project titled "*Pilot Scale Paste Backfilling to Evaluate the Effectiveness of Paste Fill Technology in Conventional Bord and Pillar Coal Mining Working Using LHD/S DL.*" The project is led by **Prof. Santosh Kumar Behera (Principal Investigator)**, with **Prof. Arka Jyoti Das**, **Prof. D. P. Mishra**, and **Prof. B. S. Choudhary** as **Co-Principal Investigators**. Sponsored by Coal India Limited (Central Mine Planning & Design Institute Limited), the project has received a sanctioned share of ₹16.05 lakh for IIT (ISM) Dhanbad.
- **Prof. Ashok Kumar (Principal Investigator) and Prof. Santosh Kumar Behera (Co-Principal Investigator)**, Department of Mining Engineering, have been awarded an R&D project titled "*Assessment of Stand-up Time of Freshly Exposed Unsupported Overlying Strata for Safe Working with Continuous Miner Technology in Indian Coalfields*" under the Advanced Research Grant (ARG) Programme of the Anusandhan National Research Foundation (ANRF). The project was sanctioned on 23 May 2026 with a total approved cost of ₹62.88 lakh.
- **Prof. Ajeet Yadav (Principal Investigator)**, Department of Mining Engineering, has been awarded a prestigious Research & Development (R&D) project titled "*A Numerical Modelling-Based Approach for Rational Estimation of Abutment Angle under Deep Cover in Indian Geo-Mining Conditions*" under the Anusandhan National Research Foundation (ANRF), New Delhi. The project has received a total approved funding of ₹56.60 lakh and aims to develop a numerical modelling-based framework for the rational estimation of abutment angles under deep cover, thereby contributing to safer and more efficient mining practices in Indian geo-mining conditions.
- **Prof. Arup K. Pal** and his team received Best Paper Award for a research paper titled "*AGRT-Net: A Hybrid Attention-Guided Region Transformer for Osteoporosis Classification from Indian Femur Radiographs*" presented at International Conference on Complex System Modelling and Artificial Intelligence (CSMAI 2026) during May 21-22, 2026. The conference venue was Aleksandër Moisiu University, Durrës, Albania.
- **Prof. Umakanta Tripathy** was granted a patent for a real-time, chemical-free optical method to study protein aggregation, and delivered an invited talk on the role of biophysics and nonlinear optics in early disease detection ("Parkinson's Disease: Possible Impact and Solutions") at IIT (ISM) Dhanbad.
- **Dr. Samapika Mallik** received the Women Researcher Award at the 3rd International Conference and Award Ceremony for Women Researchers (IACWR 2026).
- **Prof. Ram Bilash Choudhary** completed the Nurturing Future Leadership Program (NFLP, Batch 8) under the Malaviya Mission Teacher Training Programme, held at the Department of Management Studies, IIT Madras (18-22 May 2026).
- **Prof. Sumit Kumar** received external funding for the CMB-Bharat initiative and represented the department at the inauguration of the Manekshaw Centre, IIIT Delhi.
- **Prof. Ajay Mandal** has been officially awarded the title of chartered Chemist (CChem) from the Royal Society of Chemistry. Prof. Ajay Mandal is top 5% global scientist as per SciRank
- Palavalasa Vishnu Teja (M.Tech Scholar of **Prof. Tarun Naiya**): 1st position in the Society of Petroleum Engineers (SPE) South Asia Student paper contest 2026 (Master's division), and will be participating in the SPE Annual Technical Conference and Exhibition (ATCE) 2026, 21st October to 23rd October 2026, Houston, Texas, USA.
- **Prof. Ajoy Kumar Bhaumik** has been selected as a National Post-Doctoral Fellowship (NPDF) Expert Core Committee Member under ANRF, DST for the tenure May 2026 to May 2028.
- **Prof. Ajoy Kumar Bhaumik** delivered a keynote lecture on the topic "*Foraminifera: How are they useful for hydrocarbon exploration?*" in the 30th Indian Colloquium on Micropaleontology and Stratigraphy (ICMS) organised at IIT Bhubaneswar on 10.06.2026.
- **Prof. Ajoy Kumar Bhaumik** has been recognised as an External Expert for the procurement of a Field Emission Scanning Electron Microscope (FESEM) in the Department of Metallurgical and Materials



- **Prof. Ajoy Kumar Bhaumik and Prof. Udit Bansal** served as Reviewers for the evaluation of ongoing Prime Minister's Research Fellowship (PMRF) candidates for the June 2026 evaluation session.
- **Prof. Deepak Kumar Jha** has been appointed as an *Associate Editor of Geoarchaeology (Wiley & Sons)*, recognizing his expertise and contributions to the fields of geoarchaeology and Earth sciences.
- **Prof. Kripamoy Sarkar** has been honoured with the *Editor of Distinction Award 2026 by the Journal of Earth System Science (Springer Nature)* in recognition of his outstanding editorial contributions.
- **Prof. Pintu Prusty** has been honoured with the *Editor of Distinction Award 2026 by the Scientific Reports (Springer Nature)* in recognition of his outstanding editorial contributions.
- **Prof. Rahul Kumar Kaushal** has been selected for the prestigious ANRF Ramanujan Fellowship 2026, awarded by the ANRF, Government of India, in recognition of his outstanding research excellence and potential.
- **Prof. Deepak Kumar Jha and Prof. Pintu Prusty** have jointly installed a rain gauge system at the Department of Applied Geology to monitor and understand the long-term variability of monsoonal rainfall and its influence on the local hydrological cycle.



- **Prof. Nitai Pal** received Senior (Individual) Membership of *Indian National Academy of Engineering (INAE)* w.e.f. 15th May 2026.
- **Prof. Somnath Chattopadhyaya**, Professor and Head of the Department of Mechanical Engineering, IIT (ISM) Dhanbad, delivered an invited expert talk on "*How to Improve QS Ranking*" at IEST Shibpur on 21 May 2026. Held at the Alumni Seminar Hall, the session highlighted key strategies for strengthening institutional visibility, academic reputation, research impact, and global engagement. The programme was organised by the Office of the Dean (Students' Welfare), IEST Shibpur.
- Dodda, S., Roy, A., **Bhattacharyya, Suparno**, "Time-Series Transformer Models for Predicting Transient Greenhouse Gas Emissions," SPE Annual Technical Conference and Exhibition (ATCE), October 21-23, 2026, Houston, Texas, USA. (to be presented)
- **Prof. Niptika Jana, Assistant Professor** has visited the Chiba, Japan during 23.05.2026 to 31.05.2026 to attend, convene and oral presentation at the PpGU-AGU join scientific meeting.
- **Prof. Saurabh Datta Gupta, Associate Professor** has visited the UiT the Arctic University of Norway during 12.06.2026 to 20.06.2026 to participate in the highly multidisciplinary international training and mobility project SEER funded by HKDIR at UiT the Arctic University of Norway.
- The team, consisting of Pareekshit Hegde, Padmini Pujapanda, Karthik H S, Gokul K, and Sachin Dhakad from the departments of Applied Geophysics and Petroleum Engineering, secured second place at the Imperial Barrel Award (IBA) 2026 Asia Pacific Regional Competition for a detailed study on deepwater hydrocarbon systems in the Gulf of America. They were mentored by **Prof. Saurabh Datta Gupta**, Associate Professor from the Department of Applied Geophysics. The Imperial Barrel Award, organized by the American Association of Petroleum Geologists, is regarded as the premier global competition that tests students on real-world petroleum exploration challenges.

Major Research Output

- During the period April–June 2026, the **Department of Mining Engineering** achieved significant research advances in mine safety, blasting engineering, and spontaneous combustion risk assessment through high-impact publications. A major outcome was the development of an oxygen-flux-controlled framework for understanding the thermal stability and escalation of low-temperature coal oxidation, providing a more reliable scientific basis for assessing and mitigating spontaneous combustion hazards in coal mines. In the area of blasting engineering, the department introduced an improved pre-blast ground vibration prediction methodology by integrating rock acoustic impedance and wave attenuation parameters calibrated using in-situ field measurements, leading to more accurate vibration forecasts and enhanced environmental safety in surface mining operations. Complementing this work, a comparative evaluation of empirical and regression-based blast vibration prediction models established the strengths and limitations of existing approaches under Indian coal mining conditions, offering practical guidance for selecting appropriate predictive models. Collectively, these studies strengthen the department's contribution to safer, more sustainable, and scientifically informed mining practices, while demonstrating research excellence through publications in reputed international and national journals.
- **Department of Computer Science and Engineering**
 - **Prof. Arup K. Pal (Co-PI)** got an external R&D project titled "*Design and Development of AI-Integrated Sensors for Continuous Monitoring of Ocean Environment and Microplastic Pollution to Enhance Seaweed and Fishery Production*" sanctioned from Ministry of Science & Technology. The sanctioned amount is INR 76,92,069.
 - **Prof. Pranay Kumar Saha (Co-PI)** got an external R&D project titled "*DARSI: Demand-Aware Rooftop Solar Mapping and Installation Optimization with Limited Satellite Data and Model Debiasing*" sanctioned from ANRF under ARG scheme. The sanctioned amount is INR 95,03,040.
 - **Prof. Jaishree Mayank (Co-PI)**, got an external R&D project titled "*SANCHARI: An Efficient Generic Software Tool for the Synthesis and Validation of Cost-Effective Time-Sensitive Networks*" sanctioned from ANRF under ARG scheme. The sanctioned amount is INR 1,59,14,000..
- A study from **Prof. Anjan Chowdhury and his collaborators**, recently published in *Mitochondrion*, presents the first comprehensive characterization of primary mitochondrial disorders from Eastern India, describing the distinct clinical, biochemical, neuroimaging, electrophysiological, and molecular profiles of MELAS, CPEO, LHON, and Leigh syndrome. It established syndrome-specific genotype-phenotype correlations and demonstrated that interpretable machine-learning models, particularly decision tree and random forest algorithms, can accurately identify clinically relevant discriminative features for syndromic classification. The findings support a practical, transparent, and cost-effective diagnostic framework that integrates clinical assessment, targeted molecular testing, and machine learning to facilitate earlier diagnosis and optimized genetic evaluation in resource-limited healthcare settings.
- A notable research thrust from the **Department of Physics** this quarter has been the development of chemical-free, real-time optical methods for probing protein aggregation and amyloid toxicity. The group of Prof. Umakanta Tripathy demonstrated a technique based on the self-focusing and self-defocusing (third-order nonlinear-optical) response of a sample to monitor protein aggregation and to identify the toxic oligomeric species that emerge at its onset — work that was both granted a patent and published in the Journal of Physics: Photonics. Because the method is entirely label-free and requires no complex sample preparation, it offers a simple and sensitive route to early detection of disease markers relevant to neurodegenerative disorders.
- **Department of Fuel, Minerals and Metallurgical Engineering (FMME)** made significant research contributions in advanced materials, mineral processing, sustainable energy, and critical minerals. Faculty members published high-quality research in internationally reputed journals on topics including waste valorization, biofuels production, additive manufacturing,

microstructural characterization of advanced alloys, and thermal design for printed electronics. The department also received a patent on an innovative cold spray aluminium coating deposition method for enhanced wear resistance, demonstrating its commitment to translational research and industrial innovation. Research outcomes were further recognized through international accolades, including the Best Paper Award at the Rapid.Tech 3D Additive Manufacturing Conference, Germany. These achievements reflect the department's growing impact in addressing challenges related to advanced manufacturing, sustainable fuel processing, and industrial innovation.

- **Department of Chemistry and Chemical Biology:** Faculty members and researchers of the department made significant contributions across diverse areas of chemical, biological, computational, and materials sciences through publications in leading international journals, including *Nature Communications Biology*, *Journal of Chemical Information and Modeling*, *Langmuir*, *Organic Letters*, *Dalton Transactions*, *Electrochimica Acta*, *European Polymer Journal*, *Inorganic Chemistry*, and *ACS Nutrition Science*. Their research advanced fundamental understanding and technological innovation in computational drug discovery through molecular dynamics simulations of disease-associated kinases; sustainable polymeric hydrogels and natural fibre-reinforced biomaterials; multifunctional nanomedicines for synergistic chemo-photodynamic-photothermal cancer therapy; electrocatalytic ammonia oxidation and water oxidation for clean hydrogen generation; organometallic catalysis and photochemical synthesis of complex molecular architectures; electrochemical water purification technologies for toxic heavy-metal removal; corrosion inhibition strategies for industrial applications; host genetic determinants of infectious diseases; nutritional science addressing global vitamin B12 deficiency; and novel cellulose-based functional materials. Collectively, these high-impact publications demonstrate the department's interdisciplinary research excellence and its commitment to addressing pressing challenges in healthcare, sustainable energy, environmental remediation, advanced materials, and molecular sciences through innovative fundamental and translational research.

- **Department of Electrical Engineering:** Multi-phase buck converters (MPBC) have applications in server power supply, telecom power supply, and electric vehicle (EV) battery charging. In practical implementations, phase current imbalance may occur due to variations in current sensor gain caused by aging and tolerance mismatch. To address this, an automatic gain correction (AGC) algorithm has been proposed which utilizes synchronous multi-sampling of the decreasing phase currents. The present work is focused on implementation of AGC feature with digital peak current mode control (DPCMC) of MPBC with phase-shift operation for EV battery charging. Phase-shift operation helps to reduce the output current ripple. In this work, DPCMC algorithm has been programmed using comparator subsystem (CMPSS) and ePWM modules of TMS320F28379D. The implementation of AGC does not require any extra hardware and uses the ADCs multiplexed with CMPSS unit for multiple sampling. The acquired samples are subsequently used for the AGC algorithm. Further, the charger is configured for constant-current (CC) and constant voltage (CV) modes of operation. In MPBC, simultaneous conduction of multiple switches can lead to higher input current. To prevent this, the rate of rise in reference current is limited by incorporating a simple saturation block in the outer voltage PI controller. Simulation and experimental verification have been carried out to validate the interleaved operation of MPBC and effectiveness of AGC method.
- **Department of Mechanical Engineering:** A research study conducted by Prof. Antarip Poddar finds that higher hematocrit (Hct) levels shorten recirculation zones behind stenoses, stabilize vortices, and increase wall shear stress (WSS), raising the risk of plaque rupture in diabetes but reducing oscillatory shear index (OSI).
- **Department of Applied Geophysics:** Prof. Mohit Agrawal delivered an oral presentation titled "Lithospheric Seismic Structure of Northeastern India Using Ambient Noise Tomography and Receiver Functions" at the International conference *Himalayan Horizons: Tectonics, Sustainability, and Resilience from the 1905 Kangra Earthquake to Today (HTSR-2026)*, conducted from 4–7 April 2026, hosted by the Central University of Himachal Pradesh (CUHP). During the presentation, he highlighted the research carried out by his PhD student, Dr. Dhiraj Kumar Singh.

Women Faculty Achievers

- **Prof. Udita Bansal** served as a Member of Yuva Sangam Phase VI, held at IIT (ISM), Dhanbad from 12-20 June 2026. Yuva Sangam, a flagship youth exchange programme of the Ministry of Education, Government of India under the Ek Bharat Shreshtha Bharat (EBSB) initiative, aims to foster national integration by enabling young participants to experience the diverse culture, heritage, and developmental achievements of paired states across India.



- **Prof. Jaishree Mayank (Co-PI)** got an external R&D project titled "SANCHARI: An Efficient Generic Software Tool for the Synthesis and Validation of Cost-Effective Time-Sensitive Networks" sanctioned from ANRF under ARG scheme. The sanctioned amount is INR 1,59,14,000.
- **Dr. Sowmiya Chawla**, Associate Professor, Department of Civil Engineering, IIT (ISM) Dhanbad, was invited as an Expert Speaker by Tata Steel Limited, West Bokaro Division, to deliver a technical lecture at the workshop titled "Haul Road Design and Slope Stability: Navigating Challenges and the Way Forward," held on 30 June 2026 at Tata Steel's West Bokaro facility. The invitation was extended in recognition of her expertise in transportation geotechnics and sustainable mine infrastructure engineering. During the workshop, Dr. Chawla delivered an expert lecture on "Next-Generation Haul Roads in Surface Mines: Sustainable Design and Ground Improvement Solutions for Heavy-Haul Operations." The lecture highlighted emerging approaches for improving the performance, safety, and sustainability of haul roads in surface mining, fostering meaningful discussions between academia and industry on addressing contemporary challenges in mining infrastructure. The session brought together industry professionals, mining engineers, and

researchers to discuss challenges in haul road design, slope stability, and sustainable mining infrastructure, fostering meaningful academia-industry interactions. The invitation reflects the national recognition of Dr. Chawla's expertise in geotechnical and transportation engineering and highlights IIT (ISM) Dhanbad's growing contribution to industry-oriented research and sustainable infrastructure development.



- **Prof. Manisha Verma** received ANRF ECRG Grant for the project "AI-Driven Multimodal Material Understanding Systems for Accurate and Scalable Waste Segregation in Indian Context"
- **The women faculty members of the FMME Department** made significant contributions to research, academic excellence, and scientific outreach. Prof. Shubhi Gupta published a high-quality research article in the Journal of the American Ceramic Society on the use of Ni-doped CeO_2 ceramic catalysts for Gamhar sawdust pyrolysis, demonstrating enhanced bio-oil production and product distribution, thereby contributing to sustainable biomass conversion and renewable energy research. **Prof. Kasturi Sala** published a high-impact research article in Materials Characterization on the microstructural heterogeneity of severely deformed V_2Ni alloys, advancing the understanding of deformation mechanisms in advanced materials. In addition, **Prof. Aarti Kumari** delivered an invited lecture at the National Seminar on Emerging Trends in Rare Earth and Critical Mineral Extraction and Processing at BIT Sindri, highlighting sustainable strategies for the extraction, processing, and recycling of rare earth elements and critical minerals to support clean energy technologies and national resource security.

MoU Signed

1. IIT(ISM) Dhanbad has signed a MoU with Kaynes Semicon Private Limited, Ahmedabad, Gujarat to Facilitate joint research, testing, and analysis using advanced research facilities, conduct faculty industry training exchanges. The MoU was signed on 06.04.2026 and its validity is 05.04.2028 and the Co-ordinator of this MoU is Dean (R&D)
2. IIT(ISM) Dhanbad has signed a MoU with Simon India Limited, Delhi for Co-development and co-deployment of green technologies (e.g., green hydrogen, green ammonia, CCUS, circular economy solutions, energy efficiency, sustainable aviation fuel, biomass to value-added chemicals, and low-carbon industrial processes), waste utilization, rare earth recovery, fertilizers new grades, derivatives of chemicals, etc. The MoU was signed on 06.04.2026 and its validity is 05.04.2031 and the Co-ordinator of this MoU is Prof. Ejaz Ahmad
3. IIT(ISM) Dhanbad has signed a MoU with Tech Bond Global LLC (TBG), Heath, USA to foster academic and industrial research in the areas of polymer bonding, polymer processing and improvement in dissimilar material interface integrity through the TBG-CoE. The MoU was signed on 06.04.2026 and its validity is 05.04.2031 and the Co-ordinators of this MoU are Prof. A.R. Dixit and Prof. Sarthak S. Singh.
4. IIT(ISM) Dhanbad has signed a MoU with Hycon Laboratories Private Limited, Hyderabad for enhancement of various activities such as, Training activities for students, Faculty development programs to enhance the skills, Placements for IIT (ISM) Dhanbad eligible students, Knowledge sharing sessions from both the Parties, Internship for students. The MoU was signed on 06.04.2026 and its validity is 05.04.2031 and the Co-ordinator of this MoU is Prof. Sumanta Kumar Sahu.
5. Wadhvani Innovation Network Centre of Excellence (WIN CoE), IIT(ISM) Dhanbad has signed a MoU with Technology Innovation in Exploration & Mining Foundation (TEXMiN) for Collaboration for Translational Research, Technology Development and Capacity Building in Mining and Mineral Exploration. The MoU was Signed on 08.05.2026 and its validity is 07.05.2031 and the Co-ordinator of this MoU is Coordinator & Head of WIN CoE.
6. IIT(ISM) Dhanbad has signed a MoU with Assam Skill University, Mangaldoi, Darrang, Assam for Fostering collaboration in the areas of education, research and innovation. The MoU was signed on 11.05.2026 and its validity is 10.05.2031 and the Co-ordinator of this MoU is Prof. Avanish Kumar.

International Visits

- **Prof. D. P. Mishra**, Associate Professor of the Department of Mining Engineering, visited Poznan University of Technology (PUT), Poland, from 8 – 12 June 2026 under the Erasmus+ Faculty Mobility Programme. During the visit, Prof. Mishra delivered lectures to undergraduate and postgraduate students of the Faculty of Environmental Engineering and Energy and interacted with faculty members to explore opportunities for collaborative research, academic exchange, and future institutional cooperation.
- **Prof. Ashok Kumar**, Assistant Professor of the Department of Mining Engineering represented IIT (ISM) Dhanbad at the 60th US Rock Mechanics/ Geomechanics Symposium (ARMA 2026), held in Tucson, Arizona, USA, from 21–24 June 2026. Supported by the Anusandhan National Research Foundation (ANRF) under the International Travel Support (ITS) Scheme, he presented a research paper and poster, and engaged with leading mining professionals on contemporary challenges and emerging solutions in underground coal mining.
- **Prof Shuvashere Mondal** visited Department of Statistics, Operational Research and Numerical Analysis, National University of Distance Education, Madrid for research collaboration and delivered a talk during 8-9th April, 2026
- **Prof ShuvashereMondal** presented a paper in the 12th International Conference on Advances in Statistics, Barcelona, Spain during 10-12th April, 2026.
- **Prof. A. K. Das** attended the 10th World Congress on Particle Technology (WCPT10), Japan on 13th May 2026. He delivered the 'Rising Star' lecture at the conference on "Scalable Simulation of Aggregation Processes Using Coarse-Grained DEM-PBM Coupling".
- **Mr. Sudhanshu Arya** (research scholar, group of **Prof. Bobby Antony**) participated in the Joint ICTP-IAEA School on Atomic and Molecular Processes in Plasmas at the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy (4–8 May 2026).
- **Prof. Ravi Kumar Gangwar**, Department of Electronics Engineering, represented IIT (ISM) Dhanbad during a one-month research visit to the Nagoya Institute of Technology (NITECH), Nagoya, Japan, under the Japan Science and Technology (JST) LOTUS Scheme. During the visit, Prof. Gangwar delivered an invited lecture on his research to postgraduate and Ph.D. students in the Department of Electronics and Mechanical Engineering at NITECH. He also interacted with faculty members, research scholars, and postgraduate students to explore opportunities for collaborative research and academic exchange between IIT (ISM) and NITECH.

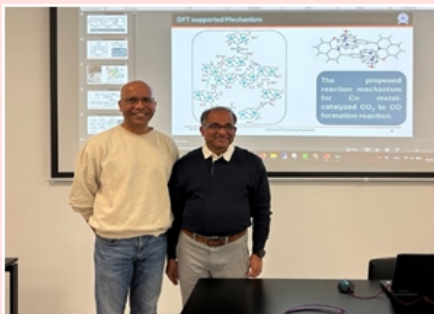
The discussions primarily focused on MIMO and millimeter-wave antenna technologies for advanced wireless communication systems, facilitating knowledge exchange and strengthening the foundation for long-term collaborative research between the two institutions. As part of the visit, Prof. Gangwar held fruitful discussions with Prof. Kunio Sakakibara, Prof. Yuji Tanaka, and Prof. Yoshiki Sugimoto, further reinforcing the academic and research partnership. He also participated in the Technical Committee on Antennas and Propagation (AP) at Nagasaki University and attended EXPO COMM Wireless Japan × Wireless Technology Park 2026 in Tokyo under the same program. Additionally, Mr. Ashok Kumar Sahu, a Ph.D. scholar under Prof. Gangwar's supervision, is also undertaking a research visit to NITECH under the JST LOTUS Scheme, actively contributing to collaborative research activities.



- **Prof. Udita Bansal** attended and delivered an oral presentation on "Mineralogical and Geochemical Characterization of Cretaceous Green Silicates of the Mahadek Formation, Shillong Shelf" at JpGU-AGU Joint Meeting 2026 in Chiba, Japan from 24th to 29th May 2026.
- **Prof. Deepak Kumar Jha** participated in the International Continental Scientific Drilling Program (ICDP) Early Career Researcher Workshop, "The Next Generation," held in Chiba, Japan, from 21-23 May 2026. The visit, including travel and accommodation, was fully supported by ICDP and the GFZ Helmholtz Centre for Geosciences, Germany.



- On June 9, 2026, **Prof. S. K. Padhi** gave an Invited Lecture at Prof. Ally Aukauloo's Group Université Paris-Saclay (FRANCE) on Earth-Abundant Cobalt and Copper Molecular Catalysts for CO₂-to-CO Electrocatalysis from June 6–11.
- Under the bilateral STINT: Mobility Grants for Internationalization: India with Prof. Ebbe Nordlander, **Prof. S. K. Padhi** spent May 17–June 19, 2026, as a visiting professor at LUND University in Sweden. From June 30 to July 30, two doctorate students from his group, Mr. Dev Raj and Ms. Palak Jaiswal, visited the group and carried out cooperative research.
- **Prof. Somnath Chattopadhyay** visited TU Leoben Austria, the youngest member of Indo-European Heritage Network. IIT ISM was instrumental in inducting TU Leoben in the group of the Heritage Network. In 2017 IIT ISM Dhanbad also voted for the inclusion of IIT Delhi in the Heritage Network in the General Assembly meeting for inclusion at University of Lisboa, Lisbon Portugal represented by Dean International Relations Prof. Sanghvi.
- **Participation in IFORS 2026 International Conference, Vienna, Austria**
- **Prof. Rashmi Singh**, Department of Management Studies and Industrial Engineering, represented IIT (ISM) Dhanbad at the 24th Conference of the International Federation of Operational Research Societies (IFORS 2026), held at the University of Vienna, Austria, from 12–17 July 2026. The prestigious global conference, organized under the theme “*Decision Support for a Sustainable World,*” brought together leading researchers, academicians, policymakers, and industry practitioners from across the globe to deliberate on emerging developments in Operations Research (OR), Decision Sciences, Optimization, Artificial Intelligence, Analytics, Sustainability, and Decision Support Systems.

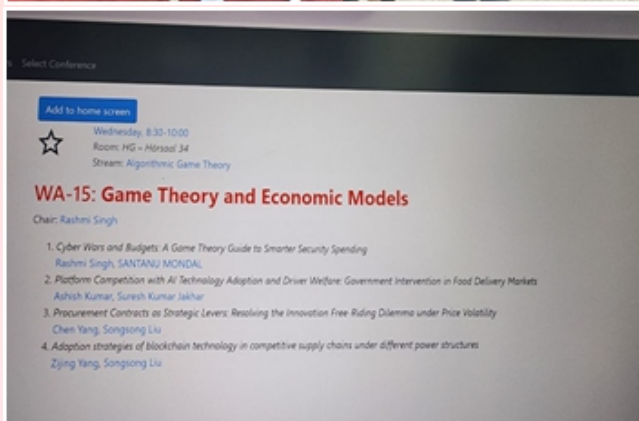


Prof. Rashmi Singh's participation at IFORS 2026 showcased IIT (ISM) Dhanbad's growing global footprint in Operations Research and Analytics. As an active contributor to the international OR community, she presented her research paper titled, “*Cyber Wars and Budgets: A Game Theory Guide to Smarter Security Spending.*” The presented work is an extended version of her recent high-impact publication, co-authored with her Ph.D. scholar Santanu Mondal, titled “*Enhancing Cyber Resilience in Financial Networks: A High Uncertainty Simulation Tool for Probabilistic Risk Assessment and Strategic Resource Allocation,*” published in *Reliability Engineering & System Safety* (Volume 277, 2026, Article No. 112961), a Web of Science (WoS) indexed Q1 journal with an Impact Factor of 11.0. The conference presentation builds upon this internationally recognized research by advancing strategic cybersecurity investment frameworks using game-theoretic modelling and intelligent resource allocation mechanisms for cyber risk management. The study addresses one of the most pressing global challenges of contemporary organizations and financial ecosystems—optimizing cybersecurity budgets under uncertainty to enhance cyber resilience and support sustainable decision-making. The work exemplifies the interdisciplinary application of Operations Research techniques in cybersecurity, simulation modelling, strategic analytics, and decision support systems.

- In recognition of her expertise in game-theoretic modelling and decision analytics, **Prof. Rashmi Singh was invited to serve as the Session Chair for Session WA-15: Game Theory and Economic Models.** In this academic leadership role, she moderated technical discussions among international researchers and facilitated scholarly exchange on emerging applications of game theory, economic modelling, and strategic decision-making frameworks in Operations Research. Her appointment as Session Chair reflects her growing international academic recognition in these specialized domains.
- **Prof. Rashmi Singh** also actively participated in the GLOW (Global Women in Operations Research) Session, an international initiative dedicated to fostering the participation, leadership, and visibility of women scholars and practitioners in Operations Research worldwide. The session provided a valuable platform to engage with distinguished researchers from the global OR community, discuss opportunities for international collaboration, mentorship, and inclusive academic leadership, and contribute to ongoing efforts aimed at strengthening gender diversity within the discipline.
- As part of the official IFORS 2026 conference programme, **Prof. Rashmi Singh** participated in the cultural excursion to **Schloss Hof Palace**, one of Austria's most celebrated Baroque heritage sites.

The excursion offered participants an opportunity to appreciate Austria's rich cultural and historical legacy while fostering informal academic interactions among delegates from diverse countries and disciplines. In addition, she explored the culturally rich and intellectually vibrant city of Vienna, internationally recognized for its contributions to science, arts, architecture, and innovation. Such cultural immersion complements global academic engagement by facilitating cross-cultural understanding and strengthening international scholarly networks.

Glimpse of IFORS 2026 Conference held at Vienna, Austria



Workshops/Conferences/Seminars

Physics-Techne Symposium 2026 — a two-day symposium (14–15 March 2026) at the Central Library, IIT (ISM) Dhanbad, with tracks on Quantum Computing, Electronics and Machine Learning.

- **Popular Talk and Panel Discussion** — Prof. O. S. K. S. Sastri (Central University of Himachal Pradesh) delivered a popular talk, “God is Omnipresent, Omnipotent and Omniscient: Based on Fourier Transform,” followed by a panel discussion “Voices of Research Scholars: Challenges, Choices, Change,” at Raman Hall (16 March 2026).
- **Research Scholars' Conclave 2026** — a one-day conclave (17 March 2026) at Raman Hall, held as part of the month-long National Science Day celebrations.
- **Ph.D. Pre-Submission Seminar** — Mr. Sujeet Kumar (19DR0159) of the Functional Ceramics Laboratory, under the supervision of Prof. P. M. Sarun (13 May 2026).
- **Conference participation (external):** Research scholars from the department presented at the 44th Annual Meeting of the Astronomical Society of India (ASI 2026), IIT Guwahati (15–19 May 2026); attended the 10th International Soft Matter Conference (ISMC 2026), BITS Pilani, Goa (22–29 May 2026); and participated in the Golden Jubilee Meeting of the Indian Society of Atomic & Molecular Physics (ISAMP), IIT Delhi.
- **IInvenTiv 2026 (Annual R&D Fair)** – Prof. Parthasarathi Das (Convenor), Prof. Sagar Pal (Local Organizing Committee, Chairman), and Prof. Madhulika Gupta (core committee member) from dept. of Chemistry and Chemical Biology were engaged in organizing the fourth edition of IInvenTiv 2026, the flagship R&D fair of the Ministry of Education, Government of India, at IIT(ISM) Dhanbad from 6-7th April 2026. The event witnessed the distinguished presence of 17 institutional leaders, including Directors from 14 IITs, along with representatives from IEST, NIT, and CSIR, who shared their insights and perspectives, enriching discussions on research, innovation, and industry collaboration. Jointly organized by IIT (ISM) Dhanbad, IIT Kharagpur, IIT (BHU) Varanasi, IIT Bhubaneswar, and IIT Patna, the two-day event brought together premier academic institutions, innovators, startups, venture capitalists, policymakers, and industry leaders to showcase cutting-edge

innovations and accelerate the journey from research to real-world impact. The event witnessed an engagement from over 500 general visitors and more than 1000 delegates overall. Under the TEXMiN initiative, four MoUs worth ₹10 crore were signed, while five MoUs with IIT (ISM) Dhanbad were valued at approximately ₹15 crore. The startups also received funding support of around ₹16.5 crore, marking the first instance of on-the-spot funding at IInvenTiv. A total of 71 startups participated in structured VC matchmaking sessions, of which 15 were shortlisted for further funding discussions.

- Pre-Inaugural Session of IInvenTiv 2026 | A distinguished Roundtable on Research, Development & Innovation (RDI) to scale strategic sectors, bringing together Directors of 14 IITs & IEST, venture capitalists, and industry leaders to shape the future of innovation-driven India.
- Prof. Sukumar Mishra, Director, IIT (ISM) Dhanbad & Chair, IInvenTiv 2026, extending a warm floral welcome to the Hon'ble Chief Guest, the Governor of Jharkhand, Santosh Kumar Gangwar.



A distinguished gathering at the dais during IInvenTiv 2026, graced by the Hon'ble Chief Guest, the Governor of Jharkhand, Santosh Kumar Gangwar, alongside Directors of 14 IITs & IIST and eminent leaders from academia, industry, healthcare, and innovation ecosystems.



Valedictory Session of IInvenTiv 2026 with the organizing leadership, Prof. Sagar Pal (Chairman, Local Organizing Committee), Prof. Parthasarathi Das (Convenor), Prof. Sukumar Mishra, Director, IIT (ISM) Dhanbad, Prof. Arvind Kumar Mishra, Director, CSIR-CIMFR, Dhanbad, Prof. Dheeraj Kumar, Deputy Director, IIT (ISM), Dhanbad and Prof. Ejaz Ahmad (Organizing Secretary).

- **Prof. Prabal Banerjee** from IIT Ropar has delivered a research talk on Electrochemical Generation of Ketyl Radical Anions, Synthetic Utilization in the Construction of Diverse Cyclic and Acyclic Scaffolds on June 22, 2026.
- **Prof. Niladri Patra** delivered an invited talk on “Unraveling the Biophysical Mechanism of MexAB-OprM Efflux Pump: Insights into OprM Pore Opening and pH-Responsive Dynamics for Drug Expulsion



Modulation.” in Recent Advances in Chemistry on April 15 th , 2026 at the National Institute of Technology Durgapur.

- **Prof. Niladri Patra** delivered an invited talk on “Biophysical Mechanism of MexABOprM Efflux Pump: Insights into OprM Pore Opening and pH-Responsive Dynamics for Drug Expulsion Modulation.” in Novel Approaches in Antibacterial Discovery, Bangalore, Gates Foundation, on 7-8th May, 2026.
- **Prof. Soumitra Maity** has delivered an invited talk in National Workshop on “Chemistry in Drug Discovery” at IIT Patna during 1- 2nd May 2026.



During this quarter, the Department of Management Studies and Industrial Engineering continued its academic, CSR, and community outreach initiatives. Major activities included the ongoing STEM education programme for underprivileged and Project Affected Person (PAP) students of BCCL areas (sponsored by Bharat Coking Coal Limited), a tribal-women livelihood workshop under the Coal India Limited CSR initiative, school visits under the Ministry of Tribal Affairs-supported Centre of Excellence project for Eklavya Model Residential Schools (EMRS) in Jharkhand, and international academic representation through the participation of Prof. Rashmi Singh in the IFORS 2026 International Conference held in Vienna, Austria. Highlights are summarised below.

1. STEM Education Outreach Programmes under BCCL CSR Initiative (May–July 2026)

The Department of Management Studies and Industrial Engineering, IIT (ISM) Dhanbad, continued implementing the BCCL-sponsored CSR project, “Promoting STEM Education for Underprivileged and Project Affected Person (PAP) Students of BCCL Areas in Dhanbad through Innovative Techniques: A Logical, Digital, and Experimental Approach for Learning,” through a series of outreach programmes during the quarter.

A major highlight was the **One-Day STEM Education Programme** organized on **28th May 2026** at the **Penman Auditorium, IIT (ISM) Dhanbad**, which brought together around **550 students**, principals, and teachers from DPLMA +2 High School Nawagarh, Girls High School

Railway Colony Bhaga, and Bhagirath Brahmachari High School. The programme was graced by **Shri Manoj Kumar Agarwal (CMD, BCCL)**, **Shri Abhishek Jha (District Education Officer, Dhanbad)**, and **Prof. Dheeraj Kumar (Officiating Director, IIT (ISM) Dhanbad)**, along with **Prof. Rashmi Singh** and **Prof. Niladri Das**. It featured an interaction session, an educational campus tour covering the **Geological Museum, Seismological Observatory, ACIC, Robotics Laboratory, Central Library, and Student Activity Centre**, followed by an award distribution and felicitation ceremony for meritorious students. The event also received wide media coverage.

The Department also organized the **fifth STEM Workshop on 9th May 2026 at Girls Highway School, Railway Colony, Bhaga**, benefiting 142 students through pre-assessments, science demonstrations, and hands-on learning activities. This was followed by the **sixth STEM Workshop on 4th July 2026 at G.N.M. +2 School, Katrasgarh**, where 200 students of Classes IX–XII participated in interactive STEM experiments led by Prof. Rashmi Singh and Prof. Niladri Das. Together, these programmes further strengthened the project's objective of promoting experiential STEM education and scientific curiosity among underprivileged and Project Affected Person (PAP) students in the BCCL operational areas of Dhanbad.





2. Village Interaction and Stakeholder Consultation on Millet Cultivation — Salma Gram Panchayat, Bankura, West Bengal (18 June 2026)

Under the CSR initiative supported by **Coal India Limited (CIL)**, the Department organized a Village Interaction and Stakeholder Consultation Programme on 18th June 2026 at Salma Gram Panchayat, Saltora Block, Bankura, West Bengal, as part of the project "**Designing and Delivering Capacity Building Programme for High-Quality Millet Cultivation to Empower Tribal Women Entrepreneurs in West Bengal and Creating Digital Marketing Platform for Effective Delivery.**" The programme engaged Gram Panchayat representatives, Self-Help Groups (SHGs), Farmer Producer Organisations (FPOs) and local farmers to understand the existing agricultural ecosystem, assess village resources and potential beneficiaries, and build a community-driven strategy for millet-based entrepreneurship among tribal women. Discussions focused on sustainable farming practices, value addition, market linkages, and the nutritional and economic benefits of millet cultivation.



3. EMRS School Visits — Salgadih (Tamar, Ranchi) and Kujra (Lohardaga) (9-10 July 2026)

EMRS school visits were conducted from 9-10 July 2026 across EMRS Salgadih, Tamar, Ranchi and EMRS Kujra, Lohardaga in Jharkhand, under the Centre for Excellence, IIT (ISM) Dhanbad, supported by the **Ministry of Tribal Affairs**. Students participated in both theoretical and practical assessments, demonstrating proficiency in computer fundamentals, digital literacy and basic software applications, while hands-on sessions in the school computer labs strengthened their practical skills and confidence. The programme received positive feedback from students and appreciation from school authorities, marking another milestone in promoting digital education and empowering tribal students under the **Basic and Advanced IT and Computer Training programme**.



Using MIDAS GTS NX software has successfully organized by convener Prof. Swapnil Mishra, Assistant Professor, Department of Mining Engineering, IIT (ISM) Dhanbad on 8th and 9th May, 2026. The programme focused on the advanced application of MIDAS GTS NX software for geotechnical analysis and design in mining and civil engineering projects. The event witnessed the participation of approximately 80 attendees, including students, faculty members, researchers, and industry professionals. The programme featured expert lectures, technical discussions, and intensive hands-on training sessions covering contemporary practices in slope engineering, tunnelling, and open-pit mining. The technical sessions were delivered by Mr. Chiranjib Sarkar, Principal Engineer, GEOCONSULT India Pvt. Ltd., and Dr. Siddharth Pathak, Technical Support Engineer, MIDAS, who shared their extensive industry experience and expertise in advanced geotechnical modelling and numerical analysis. Participants gained

practical exposure to advanced numerical modelling techniques and geotechnical analyses using the MIDAS GTS NX platform under their guidance.



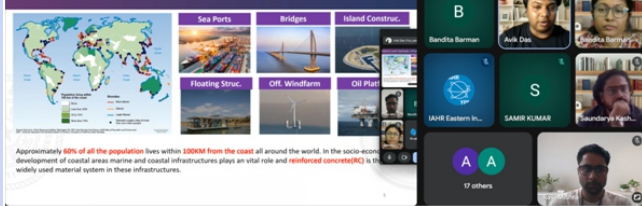
➤ On April 16, the **IAHR Eastern India Young Professionals Network (YPN)**, in association with the Department of Civil Engineering, proudly hosted its sixth lecture series featuring a compelling presentation by Dr. Avik Kumar Das. Joining us online, the Tsinghua University Assistant Professor and head of the Smart Sustainable Coastal Infrastructures Laboratory delivered an insightful talk titled "Bendable Concrete: What, How, and Why for Resilient Hydraulic and Oceanic Infrastructures." It was a privilege to host such a distinguished researcher, whose extensive work and highly cited publications in engineered cementitious composites continue to push the boundaries of modern civil engineering.

The session provided our community with a deep dive into how bendable concrete is emerging as a transformative solution for harsh marine environments. Dr. Das expertly broke down the mechanics of the material, emphasising its unique capabilities, exceptional durability, and crucial role in mitigating the rigorous challenges of coastal and offshore construction. The discussion highlighted the urgent need to integrate resilient, sustainable materials into future infrastructure, and attendees were inspired by advances in concrete technology.

Challenges to Marine and Coastal Infrastructures



Marine and Hydraulic Infrastructures



➤ The Concrete Structures Research Lab (CSRLab)-**Dr Chandrashekhar Lakavath**, Department of Civil Engineering, IIT (ISM) Dhanbad, under the Structural Engineering specialization, successfully organized various insightful invited talks during May-June 2026 focused on sustainable and resilient infrastructure development. The sessions brought together postgraduate and PhD scholars, faculty members, and researchers to engage with emerging global trends in sustainable construction materials, seismic resilience, and innovative structural design practices. The expert speakers shared valuable insights into cutting-edge research initiatives and ongoing infrastructure projects in Europe and Canada, providing participants with international perspectives on engineering challenges and solutions. These academic interactions significantly enriched the research outlook of our scholars by exposing them to recent technological advancements, sustainability-driven design approaches, and future opportunities for collaborative research in the field of structural engineering. The recorded videos of the lectures can be accessed at: <https://www.youtube.com/@csrl.lakavath>

• *The Many Roads Leading to Achieving Sustainability in Concrete Infrastructure*

Concrete Structures Research Lab
Winter | 2026 | Seminar

The many roads that lead to achieving sustainability in concrete infrastructure

Sustainable structures

Prof. Eva Lantsoght
Delft University of Technology, Netherlands

Expertise:
Reinforced Concrete Bridge Assessment
Shear & Sustainability

Talk Overview

- Addressing climate change impacts by making concrete infrastructure resilient to extreme weather events.
- Designing structures that can adapt to evolving environmental and loading conditions.
- Extending the service life of infrastructure to reduce resource consumption and environmental impact.
- Promoting Circular Economy through the reuse of existing structural elements.

Event Details:
Date: Friday, 27 March 2026
Time: 6:30 - 7:30 PM (IST)
Venue: Online Mode

Who can attend

- Academia | Industry
- Professionals | Researchers | Students

Scan QR code for Registration

Scan for registration

Dr. Chandrashekhar Lakavath
chandrashkhar@iitism.ac.in
Department of Civil Engineering
IIT (ISM) Dhanbad

• *Advancing the Seismic Performance and Design of GFRP-Reinforced Concrete Structures*

Concrete Structures Research Lab
Winter | 2026 | Seminar

Advancing the Seismic Performance and Design of GFRP-Reinforced Concrete Structures

Dr. Seyed Mohammad Hosseini
McGill University, Canada

Expertise:
FRP Composites
GFRP Reinforcement
Tunnels Segments

Talk Overview

- Corrosion of steel in harsh environments reduces RC durability and seismic safety. GFRP offers a corrosion-resistant solution.
- Limited seismic design guidance has restricted GFRP use in earthquake-resistant structures.
- McGill-led research uses experiments and simulations to study GFRP-RC structures seismic performance.
- Outcomes will deliver design guidelines (CSA S806 & ACI 440.11) for safe GFRP adoption.

Event Details:
Date: Friday, 01 May 2026
Time: 6:30 - 7:30 PM (IST)
Venue: Online Mode

Who can attend

- Academia | Industry
- Professionals | Researchers | Students

Scan QR code for Registration

Scan for registration

Dr. Chandrashekhar Lakavath
chandrashkhar@iitism.ac.in
Department of Civil Engineering
IIT (ISM) Dhanbad

• *Leveraging Structural Optimization for More Efficient, Sustainable and Economical Structures*

Concrete Structures Research Lab
Summer | 2026 | Seminar

Leveraging structural optimization for more efficient, sustainable and economical structures

Dr. Yakov Zelickman
Assistant Research Professor
Department of Civil and Systems Engineering

Expertise:
Solid and fracture mechanics
Non-linear structural analysis
Optimization

Talk Overview

- Structural optimization enables more sustainable & economical structural designs.
- Optimization of slab supports, thickness, & post-tensioning layouts can significantly improve efficiency.
- Case studies demonstrate how optimization challenges traditional design intuition & reveals superior solutions.
- Minor modifications to conventional design approaches can lead to substantial material & cost savings.
- Outcomes highlight the potential of optimization as a practical tool for future structural engineering design.

Event Details:
Date: Friday, 12 June 2026
Time: 6:30 - 7:30 PM (IST)
Venue: Online Mode Only

Who can attend

- Academia | Industry
- Professionals | Researchers | Students

Scan QR code for Registration

Scan for registration

Dr. Chandrashekhar Lakavath
chandrashkhar@iitism.ac.in
Department of Civil Engineering
IIT (ISM) Dhanbad

• *Seismic Performance of Precast Concrete Shear Walls with Conventional Connections*

Concrete Structures Research Lab
Summer | 2026 | Seminar

Seismic Performance of Precast Concrete Shear Walls with Conventional Connections

Prof. Lisa Tobber
University of British Columbia, Okanagan-Canada

Expertise:
Seismic Design
Precast Concrete
Shear Walls
Structural Resilience

Talk Overview

- Learn how precast concrete buildings perform during earthquakes.
- Discover the latest advances in seismic design of precast shear walls.
- Explore findings from large-scale structural testing programs.
- Critical connection details that govern seismic performance.
- Gain insights into resilient, sustainable, rapidly constructed building systems.
- Interact with a leading researcher shaping future seismic design practices in Canada.

Event Details:
Date: Friday, 26 June 2026
Time: 9:00 - 10:00 AM (IST)
Venue: Online Mode

Who can attend

- Academia | Industry
- Professionals | Researchers | Students

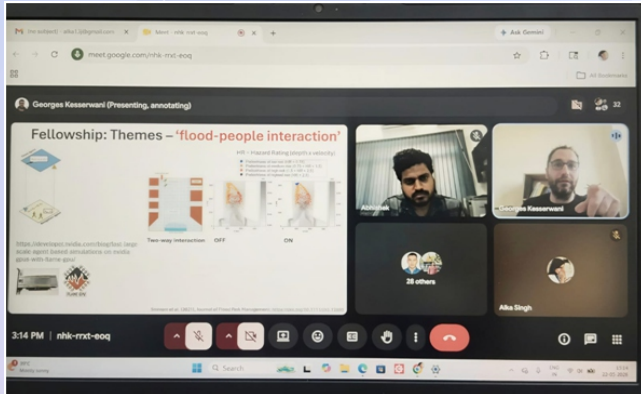
Scan QR code for Registration

Scan for registration

Dr. Chandrashekhar Lakavath
chandrashkhar@iitism.ac.in
Department of Civil Engineering
IIT (ISM) Dhanbad

➤ **Dr. Abhishek Pandey**, Department of Civil Engineering, IIT (ISM) Dhanbad, organized an online expert lecture on 22 May 2026 at 3:00 PM (IST), featuring Prof. Georges Kesserwani, Senior

Lecturer in Water Engineering, School of Mechanical, Aerospace and Civil Engineering, University of Sheffield, UK, as the distinguished speaker. Prof. Kesserwani delivered an insightful lecture on "Computational Methods for Engineering Water: A Focus on Socio-Hydrodynamic Modelling of Flood Risks and on Fast Simulators for Environmental Fluid Mechanics." The lecture highlighted recent advances in computational techniques for water engineering, emphasizing the integration of socio-hydrodynamic modelling to better understand and manage flood risks.



- **A three-day national workshop on Emerging Trends in Microwave Photonics Technology**

A three-day national workshop on Emerging Trends in Microwave Photonics Technology, held from April 15th to 17th, 2026. Sponsored by the Anusandhan National Research Foundation (ANRF), DST Govt. of India and ARUP (New Delhi), the event was conducted in a hybrid mode to facilitate widespread collaboration in radar systems, wireless communication, and signal processing. Under the coordination of Prof. Sanjeev Kumar Raghuwanshi, the program was seamlessly managed by the organizing members, including Tirbhuwan Narayan Yadav, Paritosh Shukla and Ritik Sharma, a dedicated team of Junior Research Fellows (JRFs) and Senior Research Fellows (SRFs). The workshop featured a distinguished lineup of experts from premier institutions such as IISc Bangalore, CSIR- CSIO Chandigarh, CSIR-CGCRI, DRDO and various IITs and NITs. A central pillar of the event was the advanced technical training provided to the scholars. Participants received hands-on experience with Optisystem software for complex optical simulations and engaged in detailed Opto-electronics demonstrations. The curriculum also included specialized sessions on

deposition systems for material fabrication and the characterization of Fiber Bragg Grating (FBG) devices, which are critical components for modern microwave photonics and high-frequency sensing applications. Industry leader Keysight Technologies enhanced the workshop with practical demonstrations, effectively bridging the gap between academic research and industrial requirements. Technical discussions focused on the future of photonic integrated circuits and phased-array radar systems, both of which are essential for the global rollout of 5G/6G infrastructure. Highlighting a commitment to inclusivity, the event saw significant participation from women and researchers from diverse backgrounds. The program concluded with a formal valedictory session where completion certificates were distributed to the participating scholars, marking a significant milestone in India's progress toward technological self-reliance.



- **12-Day Refresher Course on Advanced Optical Communication for 6G and Beyond**

The Department of Electronics Engineering, IIT (ISM) Dhanbad, successfully concluded its 12-day Refresher Course on "**Advanced Optical Communication for 6G and Beyond**" with a valedictory session, marking the successful completion of an intensive academic programme focused on next-generation communication technologies.

The refresher course witnessed enthusiastic participation from **62 faculty members** representing higher educational institutions across India. Over the course of twelve days, participants benefited from **48 expert lectures**

delivered by eminent academicians, researchers, and industry professionals from the **Department of Telecommunications (Government of India), IITs, IISc, NITs, CSIR laboratories**, and several other premier institutions.

The programme provided an in-depth exploration of cutting-edge research and technological advancements in areas such as **Quantum Technology, Advanced Optical Communication, 6G Technologies, Quantum Photonics, Photonic Integrated Circuits, Optical Sensing, and Photonic & Microwave Devices**. Through interactive lectures and expert discussions, participants gained valuable insights into the evolving landscape of optical and photonic communication systems that will shape future wireless and communication networks.

The refresher course served as an excellent platform for knowledge exchange, professional development, and academic networking, fostering collaboration among educators and researchers working in the fields of electronics, photonics, and communication engineering. The successful completion of the programme reflects the Department of Electronics Engineering's continued commitment to promoting advanced learning, research excellence, and capacity building in emerging technologies that are critical for the 6G era and beyond. smooth conduct of the program.



R. Rajwar, O. Bhattacharya and S.R. Samaddar (2026) "Spatial assessment of environmental criticality zones using AHP and geospatial indicators in a rapidly changing landscape: a case study" at SYNERBIO – 2026 Multidisciplinary National Conference, Department of Zoology, BBM KU, DHANBAD, 11th May 2026.

Workshop: Earthquake Information and Awareness Outreach Program Organized by the Observational Seismology Laboratory on 11th April

The Observational Seismology Laboratory of the Department of Applied Geophysics at IIT (ISM) Dhanbad organized an "**Earthquake Information and Awareness Outreach Program**" for the students of Aparna Public School, Dhanbad. The program was conducted to spread awareness about earthquakes and educate students on safety measures to reduce their harmful effects. *Prof. Saumen Maiti, Head of the Department of Applied Geophysics*, warmly welcomed all the participants. Students also explored earthquake-related concepts through informative models and interactive activities arranged by the laboratory team. Research scholars, master's students, and project assistants actively supported the program and guided the students during the activities. An interactive session was held by Prof. Mohit Agrawal where the fundamentals of earthquakes, their causes, and ways to minimize earthquake-related risks were explained. The outreach program was organized under a research project funded by the National Council for Science and Technology Communication (NCSTC), Department of Science and Technology. The successful organization of the event was further supported by Prof. Mohit Agrawal's Lab. Mr. Chandraprakash Bhaskar, Junior Technician of the Seismological Observatory, also contributed to the smooth conduct of the program.