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Newsletter of the Department of Mechanical Engineering (Jan-March 2025, Vol-1)

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current topics >>>

Women faculty achievers

Prof. A. 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.

Prof. Aditi Sengupta



She has also contributed a book chapter, details are as follows: Sengupta, A. (2025). "Compressible enstrophy transport for flow in a low-pressure turbine with unsteady wakes impinging at the inflow," In: Zeidan, D., Hidalgo, A., Zhang, L.T., Goncalves Da Silva, E. (eds) Computational Fluid Dynamics: Novel Numerical and Computational Approaches. Infosys Science Foundation Series. Springer, Singapore. https://doi.org/10.1007/978-981-97-8152-2_3

Editorial team:

Prof. Shibayan Sarkar

Prof. Omkar Mypati

Creating Curb Appeal

International Visits in the Department

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, Professor, 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 part of Centenary lecture series in the institute.



Individual faculty achievements

Prof. Prasanta Mahato

Prof. Prashanta Kr. 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

Prof. Subhankar Sen delivered an invited talk offline on 22/1/2025 on the topic Prediction of second critical Reynolds number of symmetric 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' on 28/2/2025 at the twelve-day multidisciplinary online refresher course under the aegis of Malaviya Teacher Training Programme (MMTP) 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' on 18/3/2025 at the refresher course on Heat and Mass Transfer - Basic and Advanced organized by the Malaviya Mission Teachers Training Center, IIITDM Kancheepuram during 10th March-22th March, 2025.

Prof Nirmal Kumar Singh

Prof Nirmal Kumar Singh presented paper on 'Investigation of residual stress along the build direction of selective Laser melted Inconel 718 sample' in the International Conference on Sustainable Technologies, Energies and Materials (STEM-25) in Bangkok, Thailand during 19-21 February 2025.



Prof Nirmal Kumar Singh presented paper on 28 March 2025 at 5 pm on 'Additive manufacturing in solar cell fabrication-Review' in International Conference on Advances in Energy, Environment for Sustainable Development (AEESD-2025) organized by Dept. of Chemistry, Institute of Technical Education and Research, Siksha 'O' Anusandhan, Deemed to be a University, Bhubaneswar, India and in collaboration with Doon University, Uttarakhand, India and CSIR-IMMT, Bhubaneswar, Odisha, India during 28-29 March 2025.

Prof. Singh also chaired a Session on 29.03.2025 from 10 am to 12:30 pm and expressed my view in valedictory function at 6:45 pm on 29 March 2025.

Patents

- Suraj Prasad, Deepak Kumar Mandal, S. Narayanan, System and Method For Enhancing Evaporation Rate of Multicomponent Drops By Acoustic Streaming (Granted patent 557965).
- Dr. Ujjal Sur, Dr. RudraSankar Dhar, Dr. Manoj Kumar Dutta, Pallav Dutta, Dr. Payal Bhardwaj, Dr. Vivekanand Shukla, Dr. Gaurav Jain, Sayak Sarkar, Dr. Jayanta Das, Dr. Manujakshi Byalal Chindappa, Dr. Shashidhar Tumkur Malleshappa, Prashanth Kumar Shagya Parashivamurthy, Rajeev Bilagi, Sushma Tarikere Manjunath, Wall-Mounted Compact Electric Vehicle Charging Unit (UK Patent Grant no. 6431507)



Publications

- Kartika Chandra Tripathy, Ajay 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, Performance evaluation of modified hydrokinetic turbines in pipe flow with velocity correction technique, Renewable Energy, ELSEVIER, 242, 122485, 2025
- Aadil Kureshee, S. Narayanan, Deepak Kumar Mandal, Acoustic-induced flow on the evaporation dynamics of twin drops, International Journal of Multiphase Flow, 183, 105070, 1-10, 2025
- Suraj Prasad, Subhramanian Narayanan, Deepak Kumar Mandal, Bicomponent Drop's Evaporation: Effect of Acoustics and Hot Surrounding, Heat Transfer Engineering, Volume 46, Issue 6, 2025
- A. Gond, A. Sengupta, Data-driven optimal design of premixed hydrogen-air combustion in a microcombustor. AI Thermal Fluids, 1:100007, 2025.

- A. Sengupta and A. Guha, A numerical study of design and off-design operations of SHM1 airfoil. Frontiers in Aerospace Engineering, 4:1531916, 2025.
- N K Jha, Vikram, N K Sah and R N Hota, Acoustic attenuation by conical-cavity-backed conical liners with simultaneous bias-grazing flow, Sādhanā, 50:50, 2025.
- K Bharatheedasan, T Maity, LA Kumaraswamidhas, M Durairaj, Enhanced fault diagnosis and remaining useful life prediction of rolling bearings using a hybrid multilayer perceptron and LSTM network model Alexandria Engineering Journal, 115, 355-369, 2025.
- M Prashanth, LA Kumaraswamidhas, R Karunanithi, S Sivasankaran, Interpretation of X-ray peak profile analysis and HRTEM morphology of mechanochemical synthesized Al-Zr-x Vol.% RE (CeO₂ + Y₂O₃) nanocomposites powders: A comparative study, Inorganic Chemistry Communications, 114158, 2025.
- Ghosh, G. K., Panda, S., Kumar, N., Ghosh, S. K., & Kotia, A., Heat Transfer Research, 56. 2025.
- Samala Thirupathi, Amit Rai Dixit, Pratik Kumar Shaw, Suryank Dwivedi, Machine learning-assisted stress and deformation prediction for 316L stainless steel hybrid lattice structures fabricated through laser powder bed fusion, Materials Today Communications, 44, 2025, 112037
- Pandey, S.K., Dixit, A.R. A multistage de-binding approach for material extrusion-based additively manufactured fabricated zirconia ceramics, J. Korean Ceram. Soc. (2025).
- Hemlata Jangid , Nirmal K. Singh and Amlan Kar , Process Parameters and Heat-Treatment Optimization for Improving Microstructural and Mechanical Properties of AA6082-T651 Deposit on EN14B Plate Using Friction Surfacing Technique. Processes (MDPI),13, 367, pp1-21, 2025.

Workshop organised in the Department

Prof. Shibayan Sarkar 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.



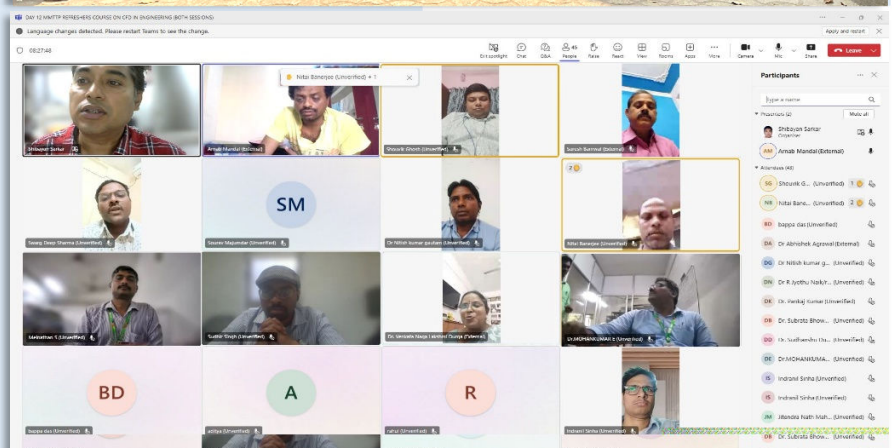
Prof. Mamdud Hossain, Robert Gordon University, Aberdeen, UK, and Prof. Sarkar delivered expert lectures in this program. The whole event was video recorded and will be available on the GIAN website. The program was conducted in the Seminar Hall of the Department of Mechanical Engineering in the presence 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.

Different level students from all parts of India visited the Department of Mechanical Engineering



Online workshop ...

Prof. Subrata Kumar Ghosh and Prof. Shibayan Sarkar organized a Twelve-day Online Refresher Course on "Computational Fluid Dynamics in Engineering" under the funding of MMTP from 28.02.2025 - 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 of lectures.



Twelve day online refresher course under MMTP

Head of the Department

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Prof. Shibayan Sarkar 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.