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Legacy that inspires the future

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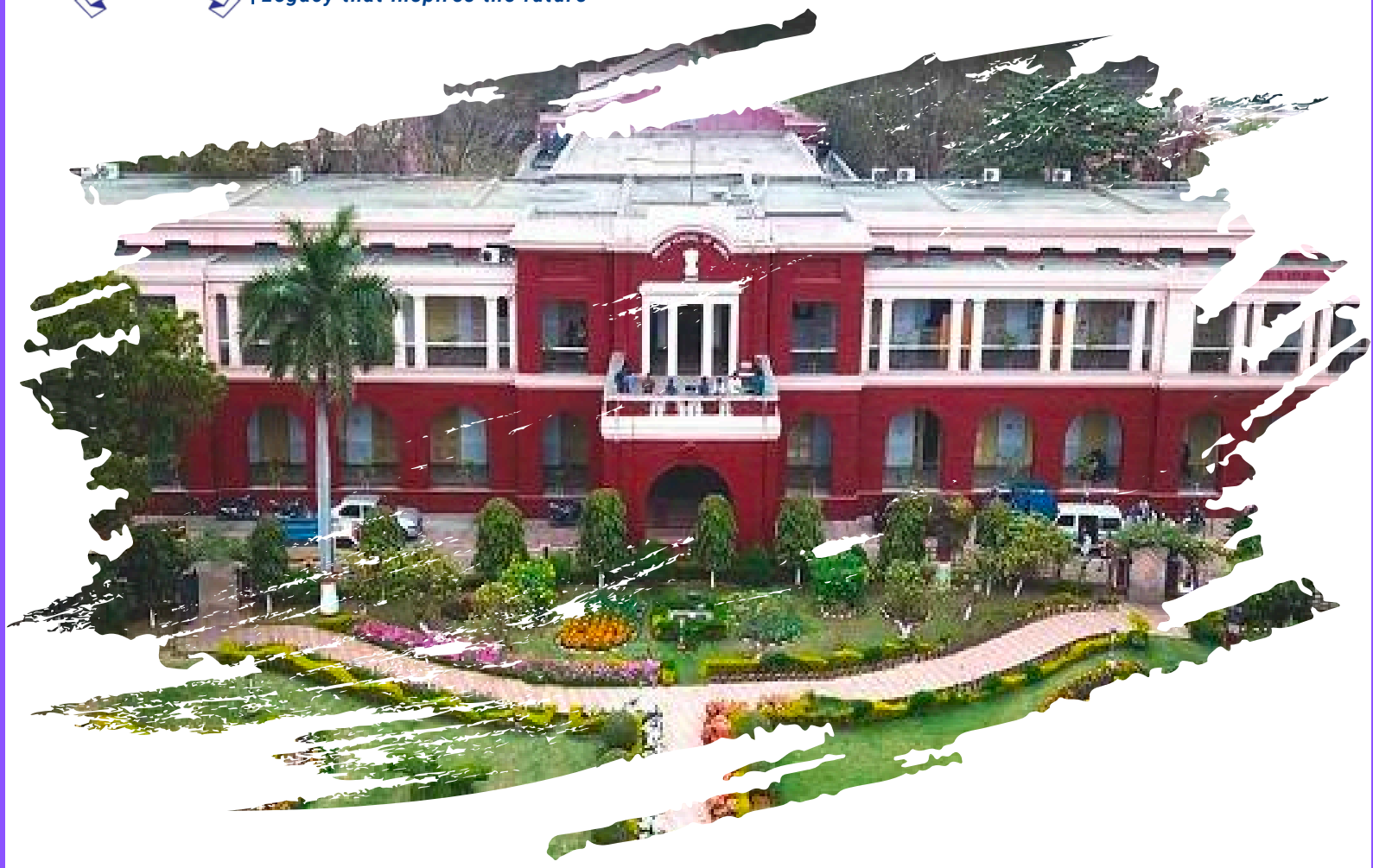
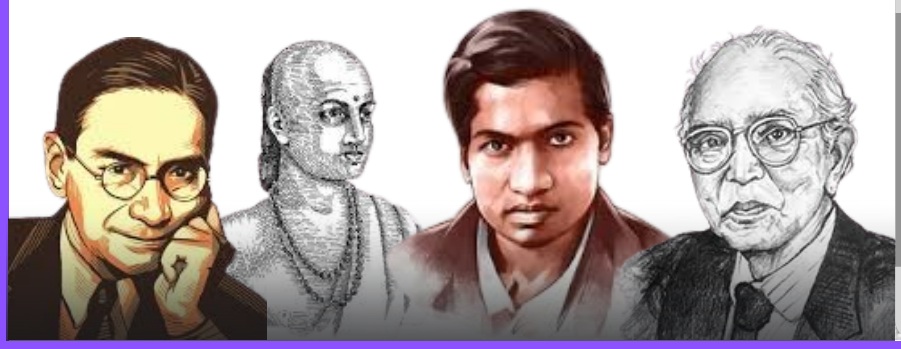
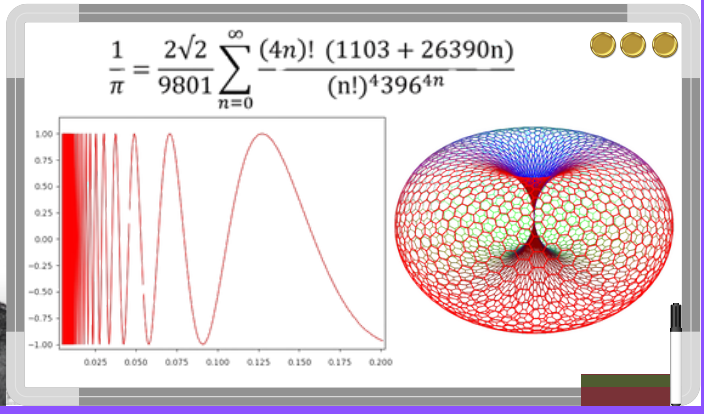


GANANAM

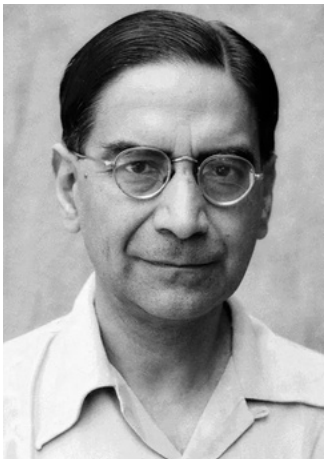
A Monthly Newsletter of

Department of Mathematics and Computing





NATIONAL STATISTICS DAY CELEBRATION



The Department of Mathematics and Computing at IIT (ISM) Dhanbad proudly celebrated National Statistics Day on June 29, 2025, commemorating the birth anniversary of **Prof. Prasanta Chandra Mahalanobis**, the Father of Indian Statistics. He is best remembered for the **Mahalanobis distance**, a statistical measure, and for being one of the members of the first Planning Commission of free India. He made pioneering studies in anthropometry in India. He founded the Indian Statistical Institute, and contributed to the design of large-scale sample surveys.

The event was graced by **Prof. Dheeraj Kumar**, Deputy Director of IIT (ISM) Dhanbad, as the Chief Guest. Distinguished talks were delivered by eminent statisticians: **Prof. Ashis Chakraborty**, retired Professor from the Indian Statistical Institute, Kolkata, who spoke on "Some Recent Developments in Software Reliability," and **Prof. Debasis Kundu,** Professor at IIT Kanpur, who presented his insights on "Robust Parameter Estimation of Newton's Rings."

FAREWELL TO PROF. SHISHIR GUPTA

After decades of distinguished service to the academic and research community, Prof. Shishir Gupta retired on 30 June 2025 from the Department of Mathematics and Computing, IIT (ISM) Dhanbad.

His contributions in the fields of theoretical seismology, numerical methods, solid mechanics have shaped the academic growth of numerous students and researchers. His mentorship, leadership, and dedication will remain a lasting legacy.

We wish him a fulfilling and enriching post-retirement life.

PUBLICATIONS

- Murshid AK, M., **Sahu, S.A.**, Mondal, S. and Das, S., (2025). Green's function approach for wave propagation due to a point source in piezoelectric fiber-reinforced composite with complex fluid loading. ZAMM- Journal of Applied Mathematics and Mechanics. DOI: 10.1002/zamm.70130. [SCI/Q1/IF:3.2]
- Roshni N., Prabhugari S., Soni R., Manish Reddy A. S., Soni A., Dave J. and **Ojha T.**, (2025) SDN Security Enhancement through Machine Learning based Packet Detection and Rate-Limiting, IEEE INDISCON, NIT Rourkela.

ALUMNI ENGAGEMENT HIGHLIGHT

The Department of Mathematics & Computing, IIT (ISM) Dhanbad was honored to host **Prof. Aritra Dutta**, alumnus of the **M.Sc. (Mathematics and Computing) 2006–08 batch**, for a thought-provoking seminar on "Connecting the Dots and Reading Between the Lines", June 17, 2025. Prof. Dutta is currently an Assistant Professor at the University of Central Florida, Orlando.

Prof. Dutta discussed a series of open problems spanning distributed computing, continuous optimization, self-supervised video understanding, and numerical linear algebra. His interdisciplinary insights, drawing from statistics, mathematics, and computer science, inspired engaging discussions and sparked new ideas among students and faculty alike.

We thank Prof. Dutta for returning to his alma mater and sharing his expertise with our academic community!

OTHER RESPONSIBILITY

- **Prof. G. K. Vishwakarma** joined as an Associate Editor of "Journal of Statistical Computation and Simulation". It is a prestigious journal in the field of probability & statistics and indexed in SCIE with Q2 CiteScore. It focuses on publishing research in advanced statistical techniques. JSCS is a journal of Taylor & Francis Group and has more than 53 years of publishing history with 95 volumes.

PHD AWARDED

Mr. Mohd Sadab (Admission No. 21DR0106) has been awarded the Doctor of Philosophy (Ph.D) under the able supervision of **Prof. Santimoy Kundu**. His doctoral thesis titled "Design and Modeling of Shear Wave Propagation in Piezoelectric Composite Structures" offers a comprehensive mathematical framework to analyze shear wave propagation in layered piezoelectric composites, incorporating microstructural scale effects and thermal field influences. The study introduces temperature-dependent gradient models and sliding interface mechanics to capture the complex wave–structure interaction phenomena with high fidelity. His work delves into nonlocal continuum theories, such as strain gradient and micropolar elasticity, to enhance the physical realism of wave propagation behavior at micro and nano-scales. The research outcomes not only contribute to the theoretical advancement of wave mechanics in smart materials but also have potential implications for the design and optimization of piezotronic devices used in sensing, signal processing, and energy harvesting. The analytical formulations are validated through extensive simulations and parametric studies, demonstrating significant insights into phase velocity modulation, energy attenuation, and interface effects in engineered piezoelectric media.

The scientific contributions of his Ph.D. work are disseminated through several publications in highly reputed *Q1 & Q2 SCIE journals*, reinforcing both the academic depth and practical relevance of his research. He has received postdoctoral offers from multiple top universities in the Top 200 QS World University Rankings. His long-term research vision is to advance the design of *piezoelectric energy-harvesting devices* aimed at sustainable energy storage for future technological applications.

INVITED TALKS

- **Prof. T. Ojha** delivered two expert talks on “Wirelessly Powered Future IoT Networks” and “Resource Management in 6G IoT networks” as part of short-term course “Artificial Intelligence & Internet of Things: The 4th Industrial Revolution” organized by MMTTC, IIT Patna. (4 June 2025)
- **Prof. A. Das** delivered an invited talk on “Applications of Monte Carlo in particulate process modeling”, at the Mizoram University. (10 June 2025)
- **Prof. R. Kaligatla** delivered an invited talk on “Integral Equation Method for Wave Scattering by New-type Breakwaters” at the International Conference on Mathematical Sciences and Engineering (ICMSE-2025), Dept. of Mathematics and Computer Science, Mizoram Central University, Aizawl. (11 June 2025)
- **Prof. S. Laxmi** delivered an invited talk on “Gradient-Based Optimization Techniques for Physics-Driven Neural Systems”, at the Department of Mathematics and Computing, NIT Jalandhar, Summer School on Evolutionary Algorithms and Machine Learning: Theory and Applications, 16-20 June, 2025.
- **Prof. T. Ojha** delivered an invited talk on “Future IoT Networks - Communication, Computation and Energy” as part of FDP on Exploring IoT in the Digital Era: From Smart Devices to Intelligent Systems, organized by IIIT Kottayam with the association of EICT, NIT Warangal. (16 June 2025)
- **Prof. R. Kaligatla** delivered an invited talk on “Integral Equation Method for Wave Scattering by New-type Breakwaters” at FDP on Recent Trends in Differential Equations and Numerical Computing, Dept. of Mathematics, NIT Calicut. (22 June 2025)
- **Prof. G. K. Vishwakarma** delivered an invited talk on “Statistical Models: Theory and Practice” in FDP titled “Advanced Statistical Software, Methodologies, and Data Visualization for Research Excellence" during June 23–27, 2025 at Department of Mathematics and Statistics, Manipal University Jaipur, India.
- **Prof. G. K. Vishwakarma** delivered an invited talk on “Bayesian Statistics–Theory and Modeling” in FDP cum workshop titled "Statistics, Machine Learning, and Optimization" during June 26-30, 2025 (online mode) at IIIT Kottayam, India.
- **Prof. T. Ojha** delivered two invited talks on “Sensing, Actuation, and Microcontroller/SBC” and “Machine Learning on Edge” at Introductory Hands-on Workshop on IoT-AI for Healthcare organized by iHUB Data, IIIT Hyderabad. (23 and 25th June 2025)

INVITED TALKS

- **Prof. M. Verma** delivered an invited talk on "Transfer Learning and Fine-Tuning for Image Classification", at the Department of Computer Science and Engineering, Indian Institute of Information Technology Design and Manufacturing (IIITDM) Kancheepuram. (24 June 2025)
- **Prof. S. Misra** delivered an invited talk on "Some results on Seshadri constants of vector bundles", at the Department of Mathematics, IIT Bombay. (24th June 2025)
- **Prof. A. Das** delivered an invited talk on "Smarter Simulations of Particle Aggregation: Bridging Scales with Population Balance and Discrete Element Methods", at the UPES Dehradun. (26 June 2025)

MATHEMATICS AND COMPUTING NEWS

- **In nature's math, freedoms are fundamental:** Scientists have developed a unified theory for mathematical parameters known as gauge freedoms. Their new formulas will allow researchers to interpret research results much faster and with greater confidence. The development could prove fundamental for future efforts in agriculture, drug discovery, and beyond. [Read More]

- **AI paves the way towards green cement:** AI researchers in Switzerland have found a way to dramatically cut cement s carbon footprint by redesigning its recipe. Their system simulates thousands of ingredient combinations, pinpointing those that keep cement strong while emitting far less CO2 all in seconds.[Read More]

EDITORIAL TEAM

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