

SPARK

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DEPARTMENT OF ELECTRONICS ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY
(INDIAN SCHOOL OF MINES), DHANBAD





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HOD'S ADDRESS



Dear Readers,

It brings me immense pride to share some of our department's standout achievements and upcoming initiatives. Our community continues to push the boundaries of research, demonstrating excellence both in scholarly publications and on prestigious national platforms.

Our faculty members continue to make significant strides, contributing to the academic ecosystem through high-impact research and expert dialogues:

The month began with welcoming our new faculty member Dr. Dheeraj Bharti to the department.

Our department successfully concluded 12-day Refresher Course on "Advanced Optical Communication for 6G and Beyond".

Prof. Ravi Kumar Gangwar represented IIT (ISM) Dhanbad during a one-month research visit to the Nagoya Institute of Technology (NITECH), Nagoya, Japan.

Additionally, I would like to highlight the commendable work of Prof. R.K. Gangwar for their recent valuable publication in distinguished journals, which have significantly advanced knowledge in their respective areas.

Looking Ahead, in line with our commitment to national-level faculty development, our department will host an upcoming Two-Week Offline Refresher Course on "Device-Circuit Co-Design: From Emerging Materials to Intelligent Systems." Organized under the aegis of the Malaviya Mission Teacher's Training Programme (MMTTC) a premier UGC initiative, this program will take place from August 10–23, 2026.

Wish you all the best!

Subindu Kumar

*Prof. Subindu Kumar
HoD, Department of Electronics Engineering,
IIT(ISM) Dhanbad*

REFRESHER COURSE

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.



EXCHANGING IDEAS AND INNOVATIONS

FACULTY RESEARCH VISIT TO NAGOYA INSTITUTE OF TECHNOLOGY, JAPAN UNDER THE JST LOTUS SCHEME

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.

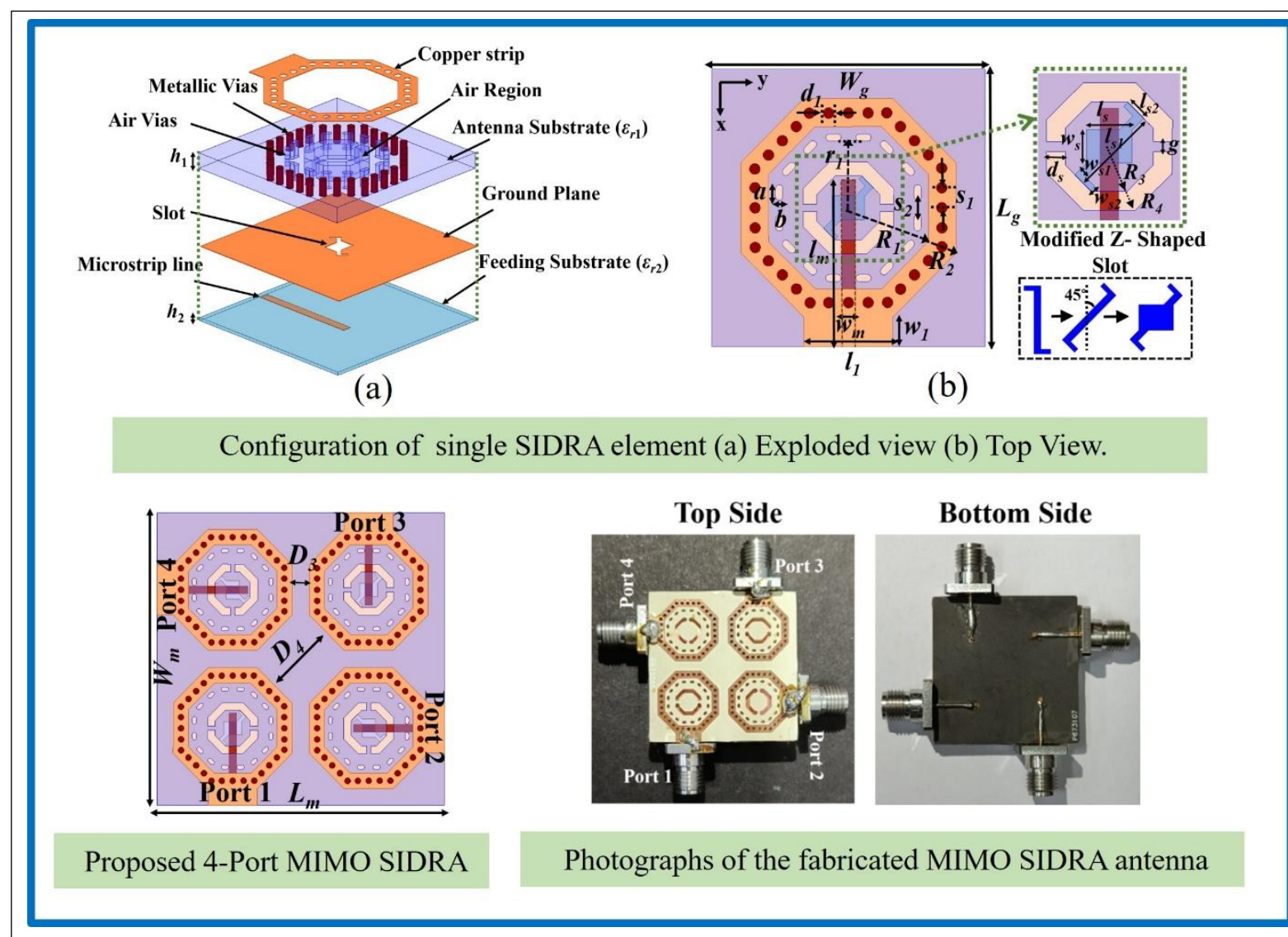
Additionally, Mr. Ashok Kumar Sahu, a Ph.D. scholar under Prof. Gangwar's supervision, is also undertaking a research visit to NITECH under the JST LOTUS Scheme, actively contributing to collaborative research activities.



PUBLICATIONS

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. DOI: [10.1109/JIOT.2026.3696922](https://doi.org/10.1109/JIOT.2026.3696922)

This work presents a low-profile, wideband circularly polarized PCB-compatible MIMO substrate-integrated dielectric resonator antenna (SIDRA) for mm-wave 5G IoT applications. The proposed two-layer SIW-based structure employs metallic vias, capsule-shaped air holes, and a modified 45° inclined Z-shaped slot to achieve enhanced gain, wide overlapping impedance and axial-ratio bandwidth (20.93-27.7 GHz), and high port isolation (>22.6 dB). The integrated SIW cavity effectively suppresses mutual coupling while improving the antenna gain, making the design suitable for compact MIMO systems. Furthermore, link budget analysis validates its communication range, demonstrating its suitability for reliable 5G IoT connectivity. The proposed compact and planar DRA structure demonstrates significant potential for seamless integration with mm-wave transceiver modules in IoT applications.



DR. DHEERAJ BHARTI

Assistant Professor

We are delighted to welcome Dr. Dheeraj Bharti as the newest member of our faculty at IIT (ISM) Dhanbad. He brings with him a remarkable academic background and innovative global research experience that will significantly enrich our institution.

🎓 **Academic & Professional Journey** Dr. Bharti's impressive academic and research journey includes some of the leading institutions worldwide: Postdoctoral Researcher: Embrapa Digital Agriculture (Campinas, Brazil), where he designed field-deployable robotic perception systems for precision agriculture. Joint M.Tech.-Ph.D. in Electrical Engineering, Indian Institute of Technology, Kanpur, specializing in computer vision, deep learning, and uncertainty-aware perception. B.Tech.: Electronics and Communication Engineering, Maulana Azad National Institute of Technology (MANIT), Bhopal.

🧠 **Research Frontier & Expertise** Dr. Bharti is positioned at the exciting intersection of Computer Vision, Robotic Perception, Signal Processing, Sensor Fusion, and Embedded AI. His postdoctoral work in Brazil pushed the limits of agritech, integrating cameras, GNSS, inertial sensors, and multi-object tracking for 3D orchard reconstruction and vision-based crop-yield estimation. At IIT (ISM) Dhanbad, he will focus on developing robust, georeferenced perception systems aimed at overcoming unstructured, real-world environments. His main application areas include: 🤖 Agricultural Robotics & Autonomous Navigation ⚒ Mining & Industrial Inspection, Aerial Systems & Infrastructure Monitoring 📡 Autonomous Navigation; Remote Sensing We are incredibly enthusiastic about the energy, expertise, and global perspective

Dr. Bharti brings to our students and research community. Feel free to drop a comment below to welcome him to the IIT (ISM) family, or connect with him to explore potential collaborations in robotics and AI!

Welcome



CONTACT

Department of Electronics Engineering, Room No. 206/A, 2nd Floor, Academic Complex IIT (Indian School of Mines) Dhanbad, Jharkhand, India, 826004.

E-mail: dheerajbharti@iitism.ac.in

MEDIA CORNER

आईआईटी में 12 दिवसीय रिफ्रेशर कोर्स संपन्न 6जी व एडवांस्ड ऑप्टिकल कम्युनिकेशन की नई तकनीकों की दी गई जानकारी



एजुकेशनरिपोर्टर | धनबाद

आईआईटी आईएसएम में चल रहा 12 दिवसीय रिफ्रेशर कोर्स शुक्रवार को संपन्न हुआ। इस दौरान हर दिन 6जी और एडवांस्ड ऑप्टिकल कम्युनिकेशन पर गहन चर्चा हुई। संस्थान के इलेक्ट्रॉनिक्स इंजीनियरिंग विभाग के इस कोर्स में कुल 48 विशेषज्ञ व्याख्यान हुए। कोर्स को-ऑर्डिनेटर प्रो. अमीतेश कुमार और को-ऑर्डिनेटर प्रो. गोविंद मुर्मू ने प्रतिभागियों को संबोधित किया। समारोह में दूरसंचार विभाग (भारत सरकार), विभिन्न आईआईटी, एनआईटी, आईआईएससी, सीएसआईआर

प्रयोगशालाओं सहित देश के अन्य प्रमुख शिक्षण व शोध संस्थानों के विशेषज्ञों ने अपने विचार साझा किए। बताया कि व्याख्यानों का मुख्य फोकस क्वांटम टेक्नोलॉजी पर रहा। एडवांस्ड ऑप्टिकल कम्युनिकेशन, 6जी टेक्नोलॉजी, क्वांटम फोटोनिक्स, फोटोनिक् इंटीग्रेटेड सर्किट्स, ऑप्टिकल सेंसिंग और फोटोनिक् व माइक्रोवेव डिवाइसेज जैसे उभरते क्षेत्रों पर भी विस्तार से चर्चा की गई। प्रतिभागियों को अत्याधुनिक शोध और भविष्य की तकनीकों की बेहतर समझ मिली। मौके पर विभागाध्यक्ष प्रो. रवि कुमार गंगवार, प्रो. विनीत राय सहित अन्य मौजूद थे।

The 12-day Refresher Course on "Advanced Optical Communication for 6G and Beyond", organised by the Department of Electronics Engineering, IIT (ISM) Dhanbad.

आईआईटी आईएसएम में 6जी पर रिफ्रेशर कोर्स संपन्न

द्वितीय संवाददाता धनबाद

आईआईटी आईएसएम धनबाद के लेक्ट्रॉनिक्स इंजीनियरिंग विभाग की ओर से आयोजित 'एडवांस्ड ऑप्टिकल कम्युनिकेशन फॉर 6जी एंड बियॉन्ड' विषय पर 12 दिवसीय रिफ्रेशर कोर्स का शुक्रवार को समापन हुआ। इलेक्ट्रॉनिक्स इंजीनियरिंग विभागाध्यक्ष प्रो रवि कुमार गंगवार, भौतिकी विभागाध्यक्ष प्रो विनीत राय मौजूद रहे। कोर्स को-ऑर्डिनेटर प्रो अमितेश कुमार ने बताया कि 12 दिनों के दौरान कुल 48 विशेषज्ञ व्याख्यान आयोजित किये गये। इनमें दूरसंचार विभाग (भारत सरकार), विभिन्न आईआईटी, आईआईएससी, एनआईटी, सीएसआईआर



समापन समारोह में शामिल अधिकारी व विद्यार्थी।

प्रयोगशालाओं और देश के प्रमुख शिक्षण एवं शोध संस्थानों के विशेषज्ञों ने भाग लेकर नवीनतम तकनीकों पर अपने विचार साझा किये। उन्होंने बताया कि व्याख्यानों का मुख्य फोकस क्वांटम टेक्नोलॉजी रहा। इसके अलावा 6जी, एडवांस्ड ऑप्टिकल कम्युनिकेशन, क्वांटम फोटोनिक्स, फोटोनिक्

इंटीग्रेटेड सर्किट्स, ऑप्टिकल सेंसिंग तथा फोटोनिक् और माइक्रोवेव डिवाइसेज जैसे उभरते क्षेत्रों पर विस्तार से चर्चा हुई। देश के विभिन्न राज्यों से आये 62 फैकल्टी सदस्यों ने इसमें भाग लिया। को-ऑर्डिनेटर प्रो गोविंद मुर्मू ने सभी विशेषज्ञों, आयोजन समिति और प्रतिभागियों के प्रति आभार व्यक्त किया।



UPCOMING EVENT

**IIT(ISM)
DHANBAD**

**MALAVIYA MISSION
TEACHER'S
TRAINING PROGRAMME**
MMTTC – UGC INITIATIVE

OFFLINE REFRESHER COURSE

DEVICE-CIRCUIT CO-DESIGN
From Emerging Materials to Intelligent Systems
Two-week Offline Faculty Development / Refresher Course

**AUG
10-23
2026**

**Host Institute**
Indian Institute of Technology
(ISM) Dhanbad

**Venue**
Malaviya Mission Teacher Training Centre,
IIT (ISM) Dhanbad

**Registration Free**

**Application deadline: 31 July 2026**

**COURSE FOCUS**
A cross-layer journey from emerging materials and nanoscale device physics to reliable circuit and intelligent system design.

**Emerging devices** –
2D and carbon nanomaterial FETs

**Compact modelling** –
SPICE-ready device parameters

**Circuit reliability** – variability, leakage,
electro-thermal effects

**Intelligent systems** – low-power IoT
and system implications

**PARTICIPANTS WILL LEARN TO**

**Develop device-aware circuit designs**

**Analyze cross-layer interactions
from materials to systems**

**Integrate reliability-conscious strategies
into advanced electronic systems**

**72
contact
hours**

**48+24
lecture +
hands-on**

**CAS /
UGC
recognized**

**MCQ
assessment**

**Certificate
on successful
completion**

**HANDS-ON EXPOSURE**

**SPICE
simulations**

**MATLAB-based
modelling**

**TCAD
demonstrations**

**Project work
and activities**

**ELIGIBILITY**
Faculty members of universities and colleges under UGC
Section 2(f). For Refresher Course admission, FIP participation
is a prerequisite and a one-year gap after FIP is required.

**RESOURCE PERSONS & EXPERT POOL**
Eminent experts from IIT Roorkee, IIT Kharagpur, IIT BHU, IIT Ropar, IIT Patna, IIT Madras,
IIT Kanpur, IIT Guwahati, IIT Indore, IIT Delhi, IIT Gandhinagar, IIITDM Kancheepuram,
IISc Bangalore, CSIR-CGCRI, Synopsys, ISRO/SCL and IIT (ISM) Dhanbad.

**APPLY ONLINE**
Register at mmc.ugc.ac.in, select Refresher Course,
choose Indian School of Mines (Jharkhand)
(10/08/2026–23/08/2026), upload approved NOC,
and submit.

**Scan to Register**

**COURSE COORDINATORS**

Prof. Manodipan Sahoo
manodipan@iitism.ac.in | +91-9523625566

Prof. Rajeev Kumar Ranjan
rajeev@iitism.ac.in | +91-9471191517

**www.iitism.ac.in**

The Indian Institute of Technology (ISM) Dhanbad, under the aegis of the Malaviya Mission Teacher's Training Programme (MMTTC – a UGC Initiative), is organizing a two-week offline Faculty Development / Refresher Course titled "Device-Circuit Co-Design: From Emerging Materials to Intelligent Systems." Scheduled from August 10–23, 2026, at the IIT (ISM) Dhanbad campus, this course offers a comprehensive cross-layer journey from emerging materials and nanoscale device physics to reliable circuit and intelligent system design.

Key Highlights of the Program:

- **Immersive Curriculum:** 72 contact hours consisting of 48 hours of lectures and 24 hours of interactive hands-on sessions.
- **Practical Exposure:** Deep-dive training into SPICE simulations, MATLAB-based modelling, TCAD demonstrations, and collaborative project work.
- **Expert Pool:** Lectures and mentorship from eminent industry and academic experts hailing from premier IITs, IISc Bangalore, CSIR-CGCRI, ISRO/SCL, and Synopsys.
- **Recognition:** CAS / UGC recognized program with an MCQ assessment and certification upon successful completion.

Eligibility: The course is open to faculty members of universities and colleges under UGC Section 2(f). For Refresher Course admission, FIP participation is a prerequisite, along with a mandatory one-year gap post-FIP.

Important Information:

- **Course Dates:** August 10 – 23, 2026
- **Registration Fee:** Free
- **Application Deadline:** July 31, 2026
- **How to Apply:** Register online at mmc.ugc.ac.in, select 'Refresher Course', choose 'Indian School of Mines (Jharkhand)' (10/08/2026–23/08/2026), and upload your approved NOC.

For queries, please contact the Course Coordinators:

- **Prof. Manodipan Sahoo** | manodipan@iitism.ac.in | +91-9523625566
- **Prof. Rajeev Kumar Ranjan** | rajeev@iitism.ac.in | +91-9471191517

Dr. Aman Sikri

Assistant Professor

Research Interest: Reconfigurable Intelligent Surfaces (RISs), Non Orthogonal Multiple Access (NOMA), Free Space Optical (FSO) Communications, Rate Splitting Multiple Access (RSMA).

**Dr. Himanshu Bhusan Mishra**

Associate Professor

Research Interest: Development of Physical Layer Signal Processing for 5G/6G Wireless Technologies (OFDM, Massive MIMO, OTFS, RIS, ISAC etc.), Implementation of Physical layer algorithms on Software Defined Radio (SDR) based point-to-point wireless setup.

**Dr. Debjani Mitra**

Professor

Research Interest: Wireless Communication- 5G technologies, Communication Networks, Machine Learning and Statistical Signal processing.

**Dr. Govind Murmu**

Assistant Professor

Research Interest: Signal Processing and Communication Algorithms, Adaptive Filters, Adaptive Beamforming for 4G/5G, Blind Source Separation (BSS) Algorithms, Adaptive Control.

Dr. Samrat Mukhopadhyay

Assistant Professor

Research Interest: Online Machine Learning, Compressed Sensing, Nonconvex and Stochastic Optimization, Sparse Adaptive Filtering.

**Dr. Subhadeep Mondal**

Assistant Professor

Research Interest: Quantum computing, machine learning, signal processing, and next-generation communication systems, with an emphasis on developing mathematically grounded algorithms that bridge theory and real-world applications

**Dr. Ugrasen Singh**

Assistant Professor

Research Interest: Design and analysis of wireless communication systems. I have been working on Space Modulation Techniques (SMTs), Reconfigurable Intelligent Surface (RIS), Non-Orthogonal Multiple Access (NOMA), Orthogonal Frequency Division Multiplexing (OFDM), Ultra-Reliable and Low-Latency Communication (URLLC), and Physical Layer Security.

**Dr. Preeti Priya**

Assistant Professor

Research Interest: Integrated Communications and Sensing, High Mobility Communications, Leo Satellite Communications, OTFS, OFDM, Beamforming, MIMO, Sparse Signal Processing, Synchronization and Channel Estimation, Nonlinear Data Detection (Particle Filter).

Dr. Nirupama Mandal

Associate Professor

Research Interest: Transducer Design, Controller Design, Instrumentation System Design, Smart Sensing System and Smart Instrumentation.

**Dr. Mrinal Sen**

Associate Professor

Research Interest: Photonic Integrated Circuits, Embedded Systems.

FACULTY PROFILE

Dr. Sushrut Das

Professor

Research Interest: Microwave Passive Networks, Antennas, Wireless Energy Transfer and Energy Harvesting Microwave Filters.**Dr. Ravi Kumar Gangwar**

Professor

Research Interest: Dielectric Resonator Antennas, MIMO Antennas, Bio-electromagnetics And Microwave Measurements.**Dr. Santanu Dwari**

Professor

Research Interest: RF & Microwave Engineering, Antenna.**Dr. Prashant Kumar Varshney**

Assistant Professor

Research Interest: SIW Based Microwave Planar Sensors, Metamaterial Inspired Microwave Sensors for Various Applications.**Dr. Y. M. Asha Latha**

Assistant Professor

Research Interest: RF Power Amplifier Design: Broadband, High Efficiency, Switched Mode PAs, Harmonic Manipulation, Harmonic Injection, Load Modulation, Doherty PA, Chip Design: GaN MMIC Based RF Power Amplifier Design.**Dr. Amitesh Kumar**

Associate Professor

Research Interest: Photonic Integrated Circuits, Fiber Optic Sensors, Microwave Photonics, and Radio-over Fiber Technologies for 5G and Beyond.**Dr. Jaisingh Thangaraj**

Associate Professor

Research Interest: Optical Networks, Wireless Sensor Networks, VANET, Software Defined Networks, Optical Instrumentation.**Dr. Devendra Chack**

Associate Professor

Research Interest: Photonic Integrated Circuits, Advance Optical Communications, Radio-over-Fiber System For 5G/6G.**Dr. Jitendra Kumar**

Professor

Research Interest: Nano-optoelectronics, Nanoelectronics.**Dr. Mukul Kumar Das**

Professor

Research Interest: Modeling and Design of Semiconductor Devices for VLSI and Opto-electronic Applications, Growth of Semiconductor Interface and Band-gap Engineered Thin Film Transistor and Solar Cell by using PVD Technique, Design and Development of Integrated Modules for Photonic QKD Network Development of Quantum Fiber Optic Network.

FACULTY PROFILE

Dr. Naresh Sharma

Assistant Professor

Research Interest: Integrated Photonics, Programmable Photonics, Free Space Optics, Photonic Crystals Applications.



Dr. Sanjeev Kumar Raghuwanshi

Professor

Research Interest: Numerical Method of Optical Waveguides, Optical Sensor, Microwave Photonics, Optical Fiber Communication.



Dr. Swati Rajput

Assistant Professor

Research Interest: Silicon Photonics for Next Generation Optical Communication, Nano photonics, Semiconductor Optoelectronics.



Dr. Jeevesh Kumar

Assistant Professor

Research Interest: 2D Materials, Emerging Electronic Devices, Atomistic Simulation, Device Fabrication, material & Device characterizations.



Dr. Shalu Rani

Assistant Professor

Research Interest: Energy Storage Devices for Wearable Electronics Including Advanced Flexible Supercapacitors/Micro-supercapacitors.



Dr. Subindu Kumar

Professor

Research Interest: III-V Semiconductor Nano-structures, Nano-scaled MOS Devices and Circuits, On-Chip Interconnects.

Dr. Rajeev Kumar Ranjan

Associate Professor

Research Interest: VLSI Design, Mem-element (Memristor, Memcapacitor, And Meminductor) Design.



Dr. Manodipan Sahoo

Associate Professor

Research Interest: 2D Materials-based Devices and Circuits, Nanomaterials based Sensors, Heterogeneous 3D ICs, Neuromorphic Circuits.



Dr. Rahul Bhattacharya

Assistant Professor

Research Interest: Modelling Of Analog and Mixed-signal Circuits, Fault Modeling and Testing of VLSI Circuits, FPGA-based Design.



Dr. Kaushik Mazumdar

Associate Professor

Research Interest: VLSI Design, Electronic Low Dimensional Systems, Analysis and Design of MOSFET & Nano-Devices.



Nanoelectronics and VLSI



OPPORTUNITY

In the Department of Electronics Engineering at IIT (ISM) Dhanbad, applications are being accepted for both full-time and part-time Ph.D. programs.

Application form, Guidelines, Terms & Conditions for full-time are available at IIT(ISM) Dhanbad website.

https://admissions.iitism.ac.in/phd/index.php/admission/add_phd/home

ENGINEERING PROFESSIONALS APPLY

The Department of Electronics Engineering at IIT (ISM) Dhanbad is seeking highly motivated research personnel for multiple ongoing projects in cutting-edge domains such as 6G Communication, VLSI Design, MEMS, and Signal Processing. Applications are invited for various positions, including Junior Research Fellows (JRF) and Project Associates

Application form, Guidelines, Terms & Conditions for full-time are available at IIT(ISM) Dhanbad website.

<https://people.iitism.ac.in/~research/Projectopening.php>



Working at the Department of Electronics Engineering offers access to state-of-the-art laboratory facilities, a collaborative research environment, and the opportunity to enroll in a Ph.D. program (subject to departmental norms and performance).

EDITORIAL TEAM

Dr. Jeevesh Kumar, Mr. Vaibhav

[LinkedIn](#) [Website](#)

SPARK 2026.06