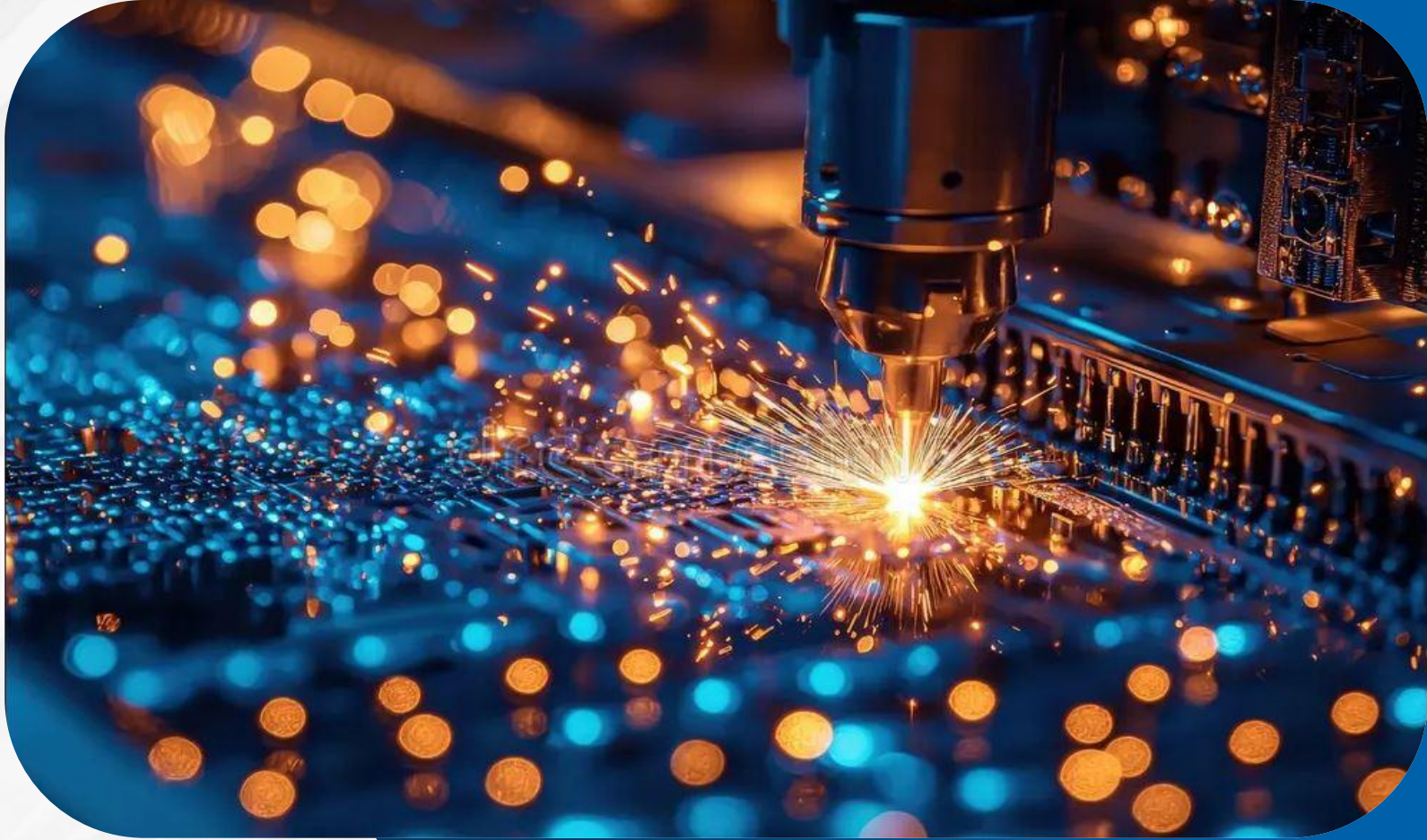


DEPARTMENT OF ELECTRONICS ENGINEERING

INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES) DHANBAD



SPQR
MONTHLY e-NEWSLETTER

JULY 2025
7th EDITION

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FROM THE HOD'S DESK



Dear Readers,

We are here to update you about the overall progress and a few milestones achieved by the Department of Electronics Engineering in July 2025.

In this month, our department successfully organized a comprehensive five-day Drone Bootcamp at Deepatoli Army Cantonment, Ranchi, Jharkhand. The event witnessed enthusiastic participation from approximately 125 personnel representing various regiments of the Indian Army. Subsequently, another specialized bootcamp titled "Electronics for Unmanned Aerial Systems (UAS), Sensors, and Communication" was conducted at the Indian Institute of Information Technology (IIIT) Manipur, Mantripukhri, Imphal. This program attracted distinguished participants from both defense and academic sectors, focusing on advanced technologies in UAV systems.

Prof. Rajeev Kumar Ranjan was invited as the Chief Guest for the Online Faculty Development Programme (FDP) on "VLSI Devices, Circuit Design & Semiconductor Materials". Meanwhile a research paper was published by Prof. Jeevesh Kumar in IEEE Journal of the Electron Devices Society. Additionally, Prof. Sanjeev Kumar Raghuwanshi has been conferred with the distinguished grade of Senior Member by SPIE. Finally, I am excited to update you that a Global Initiative of Academic Networks (GIAN) Programme is scheduled to be held from November 3 to 7, 2025. We look forward to enthusiastic participation in this upcoming academic event. And there is couple of opportunities in our department under MeitY funded Project.

Please find the Newsletter for detailed updates and give your valuable feedback to fertilize us to be bigger and better.

Wish you all the best!

A handwritten signature in black ink, appearing to read 'Ravi Kumar Gangwar'.

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



BOOTCAMP ON ELECTRONICS FOR UNMANNED AERIAL SYSTEMS, SENSORS AND COMMUNICATION

The Department of Electronics Engineering, IIT (ISM) Dhanbad, successfully organized a five-day Drone Bootcamp in July 2025, at Deepatoli Army Cantonment, Ranchi, Jharkhand. The bootcamp was conducted under the MeitY-sponsored project titled “Capacity Building for Human Resource Development in Unmanned Aircraft Systems (Drone and Related Technologies)”. Aimed at equipping Indian Army personnel with practical and theoretical knowledge of drone technologies, the program was coordinated and managed by Colonel Samarth and Major Ajay Bhardwaj, whose proactive support ensured smooth and effective execution of the event. The sessions were conducted by Prof. Ravi Kumar Gangwar and his expert team from the Drone Electronics Laboratory at IIT (ISM) Dhanbad.

The bootcamp witnessed active participation from nearly 125 army personnel belonging to various regiments. The training was designed to offer a well-rounded understanding of drone systems through both classroom instruction and hands-on sessions. Participants were introduced to critical concepts including UAV fundamentals, aerodynamics, onboard sensors, GPS modules, antenna design, UAV communication systems, image processing, artificial intelligence (AI), machine learning (ML), control systems, and embedded electronics. A major highlight of the program was the successful assembly, configuration, and flight testing of 18 drones comprising 7 hexacopters and 11 quadcopters, entirely by the participating personnel under expert supervision.

The bootcamp concluded with a ceremony graced by Brigadier Jha, who appreciated the collaborative effort and emphasized the strategic importance of such training programs for the armed forces. The engagement provided the IIT (ISM) team with a unique opportunity to interact closely with defence personnel, understand their operational requirements and offer real-time technical solutions to several practical challenges encountered during the bootcamp. Overall, the program served not only as a platform for skill development but also as a meaningful step toward strengthening academia-defence collaboration in the area of unmanned aerial technologies.





BOOTCAMP ON ELECTRONICS FOR UNMANNED AERIAL SYSTEMS, SENSORS AND COMMUNICATION

The Department of Electronics Engineering, IIT (ISM) Dhanbad, successfully organized a five-day Drone Bootcamp on “Electronics for Unmanned Aerial Systems (UAS), Sensors, and Communication” at the Indian Institute of Information Technology (IIIT) Manipur, Mantripukhri, in July 2025. The bootcamp was conducted under the MeitY-funded national initiative titled “Capacity Building for Human Resource Development in Unmanned Aircraft Systems (Drone and Related Technologies)”, with the goal of enhancing skill development and technical exposure in the rapidly evolving domain of drone technologies. Hosted at the IIIT Manipur campus, the program was designed and delivered by a team of experts from IIT (ISM) Dhanbad to train participants from defence and academic sectors in advanced UAV systems.

A total of 135 participants took part in the bootcamp, including 40 personnel from the Assam Rifles and Indian Army. The training offered a comprehensive blend of theoretical sessions and practical demonstrations, covering key areas such as UAV architecture, sensor integration, real-time signal interfacing, embedded electronics, control algorithms and secure communication protocols for tactical operations. Participants also gained hands-on experience in drone assembly, navigation systems, GPS-denied environment control strategies and UAV simulations.

The technical sessions were conducted by a team of faculty and research experts from the Department of Electronics Engineering, IIT (ISM) Dhanbad. Prof. Ravi Kumar Gangwar, Prof. Jeevesh Kumar, Dr. Varun Chaudhary, Dr. Kundan Kumar Suman, and Mr. Aks Raj, who shared deep insights into drone design, embedded systems and AI-driven control mechanisms.

The valedictory ceremony was graced by distinguished dignitaries including Brigadier Neeraj Sharma, Deputy IGAR South; Brigadier Robeen Chatterjee, DIG 26 Sector Assam Rifles; Colonel Amit Mane, 21 Assam Rifles; and Prof. Krishnan Baskar, Director of IIIT Manipur. The event featured a live demonstration of drones assembled and flight-tested by the participants during the bootcamp. This collaborative initiative reflected the commitment of both IIT (ISM) Dhanbad and IIIT Manipur toward strengthening indigenous drone technologies and fostering defense-academia partnerships aligned with the vision of an Atmanirbhar Bharat.



Prof. Rajeev Kumar Ranjan from the Department of Electronics Engineering, IIT (ISM) Dhanbad, was invited as the Chief Guest and delivered an expert lecture at the Online Faculty Development Programme (FDP) on “*VLSI Devices, Circuit Design & Semiconductor Materials*”. The FDP was organized by the Electronics & ICT Academy, IIT Roorkee, in association with Motilal Nehru National Institute of Technology (MNNIT), Allahabad, and sponsored by the Ministry of Electronics and Information Technology (MeitY), Government of India.

The FDP, held in online mode, was hosted by NIT Allahabad, drawing participation from faculty members and researchers across the country. The program aimed to enhance knowledge in emerging domains of VLSI and semiconductor device modeling, circuit design, and nanoelectronics.

Prof. Rajeev Ranjan delivered a compelling lecture on “Memristor Emulator and Its Application”, offering deep insights into the working principles of memristive systems, emulator circuit design, and their promising applications in neuromorphic computing and advanced electronics. The session was highly appreciated for its technical depth and relevance to ongoing research trends.

His contribution added significant value to the FDP, bridging theoretical concepts with hands-on circuit design perspectives, and inspiring participants to explore cutting-edge technologies in semiconductor device research.

**MEMRISTOR EMULATOR CIRCUIT
AND NEUROMORPHIC APPLICATION**

By
Prof. Rajeev Kumar Ranjan
Department of Electronics Engineering



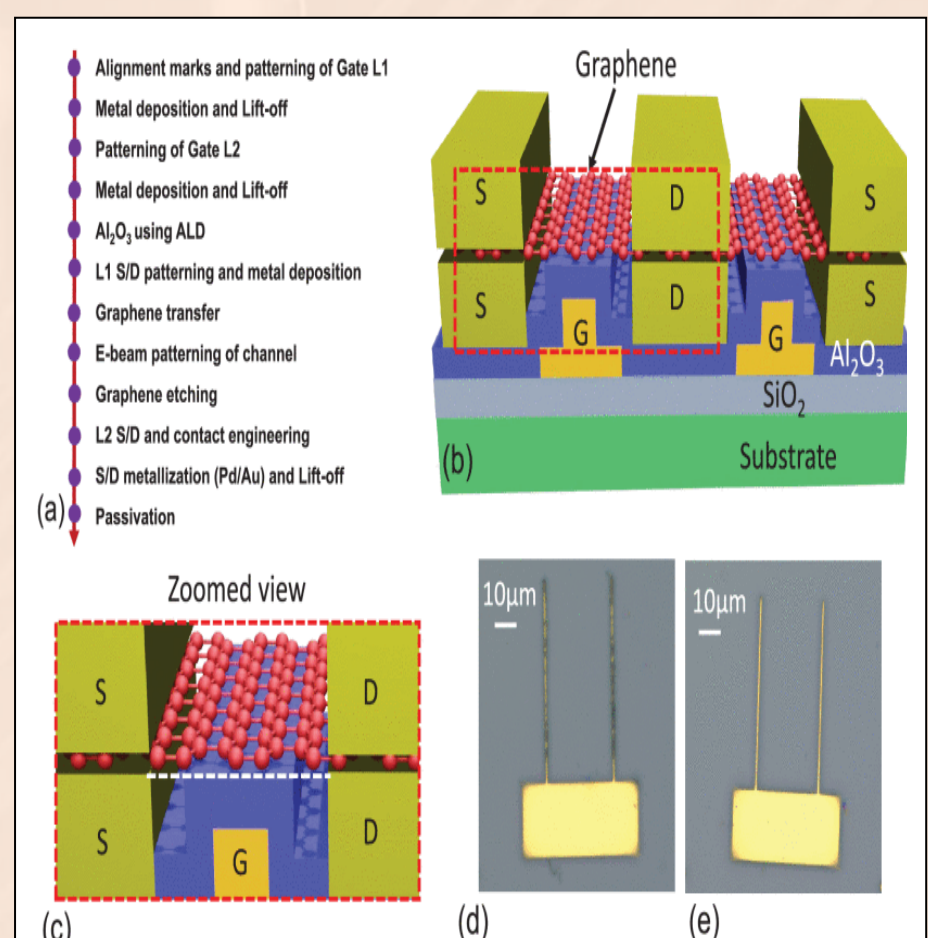
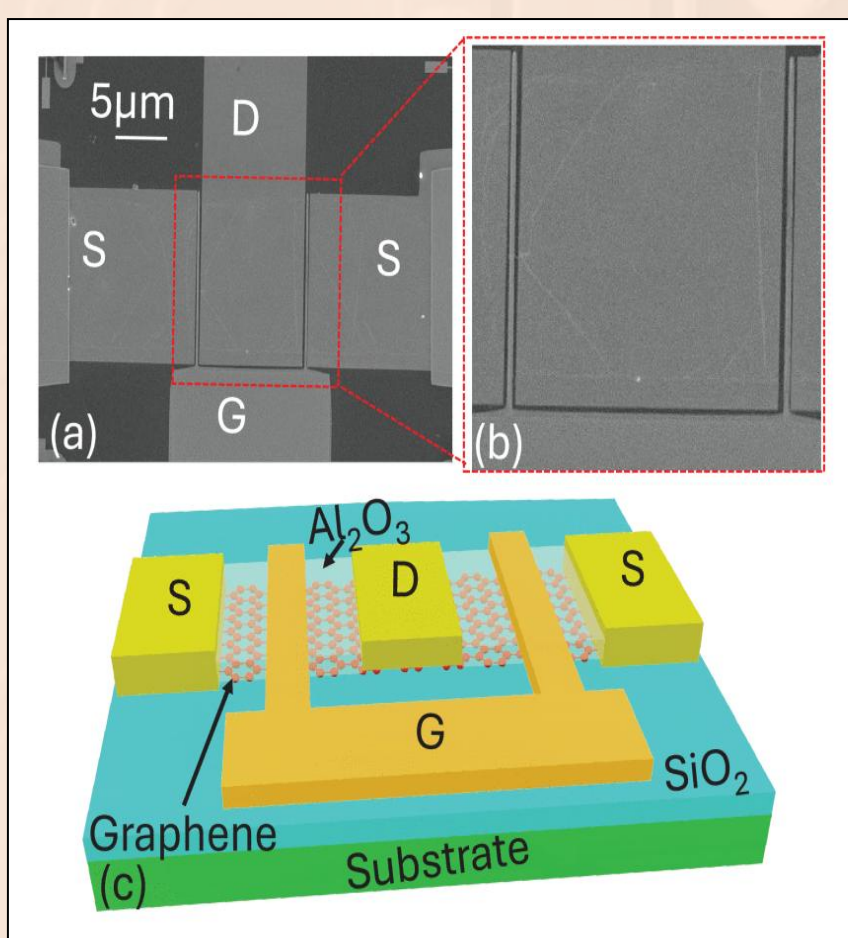
INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES), DHANBAD

Research

PUBLICATION

Aadil Bashir Dar, Adil Meersha, Amogh K. M, Asif A. Shah, Anand Kumar Rai, Rupali Verma, Utpreksh Patbhaje, Jeevesh Kumar and Mayank Shrivastava, *“Physical Insights Into the Effect of Substrate on Graphene RF Transistor Performance and Demonstration of Novel Inverted T-Gate Architecture”*, IEEE Journal of the Electron Devices Society, 2025, Volume: 13, IEEE, DOI

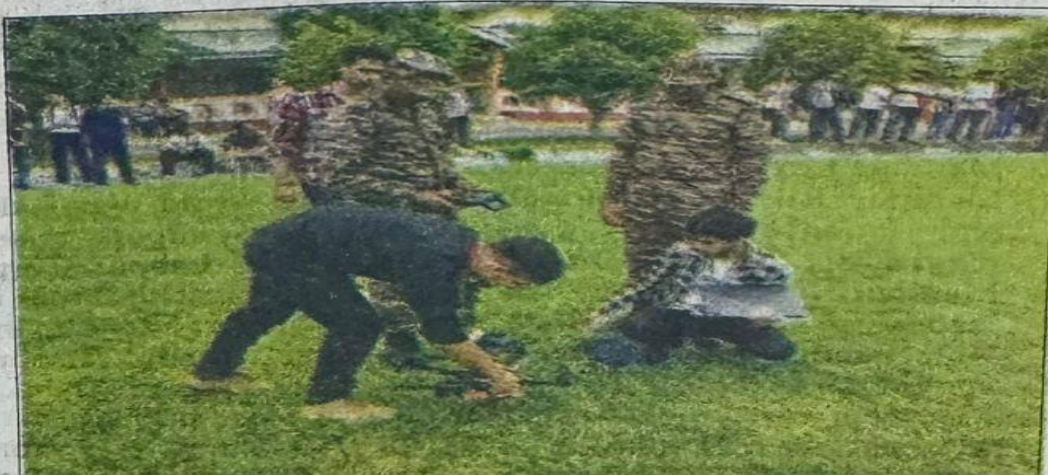
In this work, Graphene has emerged as a promising material for future radio frequency (RF) device applications due to its exceptional carrier mobility, high saturation velocity, and atomically thin structure. These properties enable ultra-fast charge transport and excellent electrostatic control, making graphene an attractive candidate for high-frequency and high-speed applications. However, the technology progress is limited by RF performance-killing agents like contact resistance, substrate parasitics, and material-to-device process flow limitations. This work provides a systematic insight into the performance limiters of graphene FETs on SiO₂ and SiC substrates, grown via chemical vapor deposition (CVD) and epitaxial methods. Notably, the highest extracted cut-off frequency is 55/20 GHz on the SiC/SiO₂ substrate, which reflects the superiority of SiC over SiO₂ as a substrate for graphene RF devices. Additionally, the work discusses DC/RF performance degradation issues due to top gate dielectric deposition and demonstrate a unique “Inverted T-Gate” device architecture to mitigate the same.





IMPHAL, THURSDAY, JULY 24, 2025

Bootcamp on “Electronics for UAS, Sensors and Communication” concludes at IIIT Manipur



By Our Staff Reporter

IMPHAL, Jul 23 : A five-day intensive bootcamp workshop on “Electronics for Unmanned Aerial Systems, Sensors, and Communication” concluded today at the Indian Institute of Information Technology (IIIT) Manipur city campus in Mantripukhri.

The bootcamp was organised by IIIT Manipur in collaboration with the Indian Institute of Technology (ISM) Dhanbad with the aim to significantly enhance capacity in the rapidly evolving field of Unmanned

Aerial Systems (UAS).

As per a release issued by IIIT Manipur, the workshop brought together academic experts and armed forces to bridge the gap between cutting-edge research and practical deployment of drone technologies for defense and surveillance applications.

The workshop was aimed at providing hands-on training and theoretical grounding in the rapidly evolving domain of drone systems, focusing on the integration of sensors, communication modules, and embedded electronics that form

the backbone of modern UAS.

The valedictory function was graced by dignitaries, including Brigadier Neeraj Sharma, Deputy IGAR South; Brigadier Robeen Chatterjee, DIG 26 Sector Assam Rifles; Colonel Amit Mane, 21 Assam Rifles; and Prof Krishnan Baskar, Director, IIIT Manipur.

The function was preceded by a demonstration of drones by the participants of the bootcamp.

Altogether, 135 participants, including 40 members from the Assam Rifles and the Indian Army participated actively in the sessions, gaining in-depth knowledge on the fundamentals of drone architecture, real-time sensor interfacing, control algorithms, and secure wireless communication protocols essential for tactical operations.

The sessions were conducted by esteemed experts from IIT (ISM) Dhanbad, including Prof Ravi Kumar Gangwar, Prof Jeevesh Kumar, Dr Varun Choudhary, Dr Kundan Kumar Suman, and Aks Raj.

The resource persons delivered comprehensive lectures and demonstrations covering drone propulsion mechanisms, navigation and control systems, GPS-denied environment challenges, power optimization strategies, and live UAV simulations.

The joint initiative reflected the commitment of IIIT Manipur and IIT (ISM) Dhanbad to strengthen the Nation’s self-reliance in defense technologies under the “Atmanirbhar Bharat” mission.

[Check out for More](#)



Tse/1258-



Prof. Sanjeev Kumar Raghuwanshi, Professor in the Department of Electronics Engineering at the Indian Institute of Technology (Indian School of Mines) Dhanbad, has been elected to the grade of "Senior Member of SPIE."

This distinction from SPIE, the international society for optics and photonics, recognizes his significant professional experience, his active involvement with the optics community and SPIE, and his notable contributions to the field. SPIE Senior Members are honored for their performance and dedication, which sets them apart from their peers.

Professor Raghuwanshi's research interests lie in the analytical and numerical analysis of optical waveguides and devices, with a focus on areas such as optical fiber communication, integrated optics, and optical fiber sensors, and he has a substantial number of peer-reviewed publications and books to his name. His election as a Senior Member of SPIE highlights his standing as a distinguished expert and leader in his field.



GIAN (GLOBAL INITIATIVE OF ACADEMIC NETWORKS) PROGRAMME
03-07 NOVEMBER 2025, IIT (ISM) DHANBAD, INDIA



Gian
 GLOBAL INITIATIVE OF ACADEMIC NETWORKS



Ministry of Education
 Government of India

सत्यमेव जयते

2D Materials for Emerging Electronics

Guest Faculty



Prof. Ariel Ismach,
Dept. of Materials
Science and
Engineering,
Tel Aviv University,
Israel

Host Faculty



Prof. Jeevesh Kumar,
Dept. of Electronics
Engineering,
Indian Institute of
Technology (ISM)
Dhanbad, India

Course Coordinator:
 Prof. Jeevesh Kumar,
 Department of Electronics
 Engineering,
 IIT (ISM) Dhanbad
 Phone: +91 8884742131
 Email: jeevesh@iitism.ac.in

Venue:
 Department of Electronics
 Engineering, IIT(ISM)
 Dhanbad

Register by: 15/10/2025
 Maximum Participants : 50
 (First Come, First Service)



Scan for Registration

ONLINE GOOGLE FORM LINK FOR
 SUBMISSION WITH PAYMENT
 DETAILS IS PROVIDED BELOW

<https://forms.gle/sfvG6rgnQ14h1RrA6>



Applications are invited for the position of Senior Research Fellow position under MeitY Project.

The details are given below:

Position: Senior Research Fellow (SRF)

Number of Position (s): 1

Title of the Project: Capacity building for human resource development in Unmanned Aircraft System (Drone and related Technology)

Principal Investigator: Dr. Ravi Kumar Gangwar (HoD & Professor)

[Advt. Link](#)

[Form Link](#)

Applications are invited for the position of Research Associate-I position under MeitY Project.

The details are given below:

Position: Research Associate-I

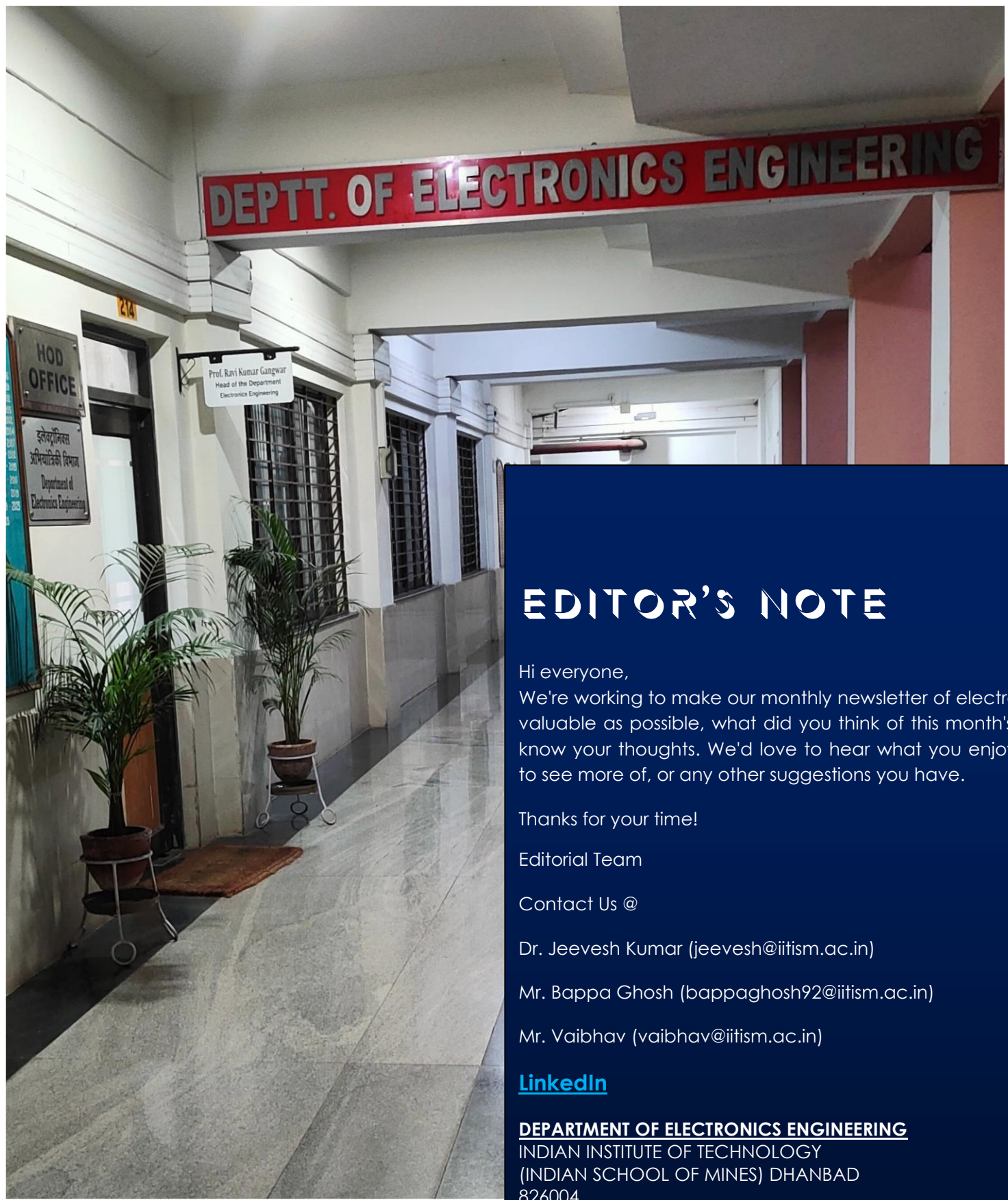
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Principal Investigator: Dr. Ravi Kumar Gangwar (HoD & Professor)

[Advt. Link](#)

[Form Link](#)



EDITOR'S NOTE

Hi everyone,

We're working to make our monthly newsletter of electronics department as valuable as possible, what did you think of this month's issue? Please let us know your thoughts. We'd love to hear what you enjoyed, what you'd like to see more of, or any other suggestions you have.

Thanks for your time!

Editorial Team

Contact Us @

Dr. Jeevesh Kumar (jeevesh@iitism.ac.in)

Mr. Bappa Ghosh (bappaghosh92@iitism.ac.in)

Mr. Vaibhav (vaibhav@iitism.ac.in)

[LinkedIn](#)

DEPARTMENT OF ELECTRONICS ENGINEERING

INDIAN INSTITUTE OF TECHNOLOGY
(INDIAN SCHOOL OF MINES) DHANBAD
826004
JHARKHAND, INDIA
PHONE: +91-326-223 5274