



## COVER STORY

In the second quarter of 2024, IIT Gandhinagar (IITGN) conducted initiatives to instil and augment its culture of research and entrepreneurship. The 14th edition of the **Summer Research Internship Programme (SRIP)** was launched on May 5, 2024. The eight-week flagship programme saw the participation of over 170 students from prestigious institutes nationwide. During the programme, almost 130 research projects were carried out under the mentorship of IITGN faculty members. The interns concluded the programme by presenting their work at a poster competition on July 9, 2024. Two projects, one related to the study of breast cancer drugs and another related to machine learning for identifying pollution sources, were bestowed with the IITGN's Bhalodia-Khetan Summer Research Excellence Awards (SREA).



In parallel, IITGN hosted the fifth edition of **Invention Factory® India**. The six-week summer programme involves participation from students of various IITs and NITs in teams of two. Each team ideates a potential invention, prototypes it, pitches it to a jury of experts, and finally files a patent. The inventions typically address significant societal and consumer needs. This year, the programme was held from May 27 - July 5 at IITGN, June 3 - July 12 at IIT Bombay, and June 3 - July 14 at IIT Jammu. The teams competed for the title of "Best Invention," with the first prize bagged by two teams- Nageshwar Kumar and Chaitanya Tandon for developing a 'Tactile Glove for Bidirectional Communication with Deafblind', and Kritika Patidar and Stavan Mehta for inventing a 'Tooth Extraction Facilitator'.

## PROJECT FUNDING

PI/Mentor	Discipline	Project Title	Agency Name
Karla Patricia Mercado-Shekhar	Biological Sciences and Engineering	Development of an indigenous imaging-based intraoperative probe for brain tumour delineation	Department of Biotechnology
Vimal Mishra	Civil Engineering	Major Research and Development Programme MRDP in Hydro Climate Extremes	Department of Science & Technology - Climate, Energy and Sustainable Technology (DST - CEST)
Dhiraj Devidas Bhatia	Biological Sciences and Engineering	DST - National Postdoctoral Fellowship in Nano Science and Technology	DST - Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR)
Dhiraj Devidas Bhatia	Biological Sciences and Engineering	GSBTM Summer research internship	Gujarat State Biotechnology Mission (GSBTM)
Atul Bhargav	Mechanical Engineering	Feasibility study of emergency cooling in an air-cooled datacenter using PCM (phase change material) thermal module	Indian National Academy of Engineering
Mayank Singh	Computer Science & Engineering	AI-powered Sustainable Cities	Ministry of Education
Saumyakanti Khatua	Chemistry	Green Hydrogen for a Sustainable Society	Distinguished International Associate - Royal Academy of Engineering (DIA-RAE)
Dhiraj Devidas Bhatia	Biological Sciences and Engineering	In vivo targeted, in situ, multiplexed, high-throughput biological-mapping and delivery with DNA nanotechnology	Science & Engineering Research Board - Core Research Grant (SERB - CRG)
Superb Kumar Misra	Materials Engineering	Developing a reusable, multifunctional Metal Organic Framework based prototype from metal scrap for heavy/noble metal detection, removal and recovery	Science & Engineering Research Board - Core Research Grant (SERB - CRG)
Jayaprakash K R	Mechanical Engineering	Acoustics of Chiral Auxetic Metamaterials	Science & Engineering Research Board - Core Research Grant (SERB - CRG)
Uddipta Ghosh	Mechanical Engineering	Dynamics of active compound drops: Theory and numerics	Science & Engineering Research Board - Core Research Grant (SERB - CRG)
Venkata Madhukanth Vadali	Mechanical Engineering	Tendon-driven Variable Stiffness Soft Robotic Gripper	Science & Engineering Research Board - Core Research Grant (SERB - CRG)

Sudipta Sarkar	Physics	From Bulk to Brane: Holographic Understanding of Black Hole Physics	Science & Engineering Research Board - Core Research Grant (SERB - CRG)
Dhiraj Devidas Bhatia	Biological Sciences and Engineering	Design, characterization and biological assessment of DNA based Nano gels for targeted delivery in Glioblastoma treatment	Science & Engineering Research Board - National Post Doctoral Fellowship (SERB - NPDF)
Arpan Bhattacharyya	Physics	Black holes in astrophysical environment: observational signatures in gravitational waves	Science & Engineering Research Board - National Post Doctoral Fellowship (SERB - NPDF)
Sudhanshu Sharma	Chemistry	Development and Optimization of Polymer/Graphene based Device Grade Nanocomposite Separator Membrane for Li-S Batteries	Science & Engineering Research Board - National Post Doctoral Fellowship (SERB - NPDF)
Amit Arora	Materials Engineering	Development of sustainable machining process for difficult-to-cut materials using hybrid nanofluids and ultrasonic-assisted machining using textured tools	Science & Engineering Research Board - Teachers Associateship for Research Excellence (SERB - TARE)
Pranab Kumar Mohapatra	Civil Engineering	CFD analysis of Chitravathi Hydro Power Project	Adani Renewable Energy Forty Two Ltd.
Shailesh R Gandhi	Civil Engineering	Geotechnical Consultancy	Anandjiwala Technical Consultancy
Sameer Patel	Civil Engineering	Study to identify the sources, prevention, and control of odour in the effluent treatment plant.	Ashima Ltd.
Ravi Ayyagari	Mechanical Engineering	Frequency Dependent Damping Studies	Cavi Elettrici e Affini Torino (CEAT)
Dhiman Basu	Civil Engineering	Structural Audit of "Aaykar Bhawan" at Ashram Road, Ahmedabad: Part-1	Central Public Works Department (CPWD)
Vimal Mishra	Civil Engineering	Disaster Resilience Management through Climate Risk-informed Programming with Systemic Change	CSR Trust for SDGs in India
Gaurav Srivastava	Civil Engineering	Proof-checking of design of platform boundary wall at Gokulpuri Metro Statio	Delhi Metro Rail Corporation
Manish Kumar	Civil Engineering	Development of site-specific response spectra and compatible ground motions for the analysis of the NH-5 balance cantilever bridge between Shakral village and Dhalli section, and five NH(O) arch major bridges between Padhar and Bijni section.	Gawar Construction Limited
Vikrant Jain	Earth Sciences	Assessment of mineral tonnage using measurement of specific gravity / bulk density	Gujarat Mineral Research & Development Society
Sameer Patel	Civil Engineering	Proofing of EIA report and studying the e-waste and Cu-scrap status in India	Hindalco Industries Limited
Nipun Batra	Computer Science & Engineering	Smart Metering & Energy Solutions with Data Analytics & EaaS (Energy as a Service)	Jio Platforms Ltd.
Venkata Madhukanth Vadali	Mechanical Engineering	Feasibility Study of Using Laser in Coloration and Engraving of Watch Dials, Watch Hands, and Watch Bracelets	Kamla Dials and Devices Limited
Amit Arora	Materials Engineering	Metallurgical Consulting for Development and Benchmarking of Ferro-Silicon Alloys	Kastwel Foundries
Amit Arora	Materials Engineering	Identification of the source of corrosion in carbon steel pipes and mitigation methods	Larsen & Toubro Ltd. (Energy)
Gaurav Srivastava	Civil Engineering	Manning and operation of housekeeping, horticulture, security, dining, maintenance, etc. for Prerna School Campus, Vadnagar, Mehsana.	Navodaya Vidyalaya Samiti
Sriharitha Rowthu	Materials Engineering	Milk and milk-fat repellent HDPE bottles	Prompt Innovations Pvt. Ltd.
Sudhanshu Sharma	Chemistry	Impedance analysis for concrete sample of RIL	Reliance Corporate Park
Sushobhan Sen	Chemistry	Verification of certain bituminous concrete mix designs	RKC Infrabuilt Pvt. Ltd.
Jayaprakash K R	Mechanical Engineering	Design, Analysis and Testing of Vibration Absorber for a Deep Hole Boring Tool	Tools and Appliances Corporation

## AWARDS AND FELLOWSHIPS



**Prof Karla P Mercado-Shekhar**, Assistant Professor, Biological Engineering, was named as a **Scholar** by the **IEEE Ultrasonics, Ferroelectrics, and Frequency Control (UFFC) Society** for representing Ultrasonics.



**Ahana Ghosh**, PhD Scholar, Humanities and Social Sciences, was selected as the **'Student Ambassador Lead'** by the **Society for Archaeological Sciences (SAS)** for 2024-2025.

**Ashish Tiwari**, PhD Scholar, Electrical Engineering, received the **Fulbright-Nehru Doctoral Research Fellowship**. As part of the fellowship, Ashish will work on his project titled 'Neural Inverse Rendering of Large-Scale Indoor and Outdoor Scenes from Sparse Multi-View Images' at Rice University, Houston, USA.



## CONTINUING EDUCATION PROGRAMME (IITGN-X)

Event/Programme Name	Event Date	Discipline/Centre/Institute and Funding Agency
Workshop: Python Programming & AI applications	April 05, 2024	Organised by the Department of Computer Science and Engineering, IITGN
Workshop: Additive Manufacturing/3D Printing	April 06, 2024	Organised by the Tinkerer's Lab and IITGN's Machine Shop
Workshop: Ethical Conduct of Research on Human Participants	April 13, 2024	Organised by the by IITGN's Institutional Ethics Committee (IEC)
Workshop: Major Research and Development Program (MRDP) on Hydroclimatic extremes	April 15, 2024	Organised by IITGN under the umbrella of the National Mission on Strategic Knowledge for Climate Change (NMSKCC), with funding from the Department of Science and Technology.
Short-term Course: Capacity Building Programme for National Experts involved in greenhouse gas inventory preparation under the enhanced transparency framework of the Paris Agreement	April 21 - May 01, 2024	Organised by the Dr Kiran C Patel Centre for Sustainable Development with funding from the United Nations Development Programme (UNDP) through the Capacity Building Initiative for Transparency project of GEF-UNDP-MoEFCC.
Workshop: Fundamentals and Applications of Imaging Techniques in Archaeology	April 21, 2024	Organised by the Archaeological Sciences Centre with funding from the ASI Archaeology Chair Endowment Fund
Workshop: Basic Electronic Circuits & Arduino workshop	May 04, 2024	Organised by the Department of Physics
Workshop: 3D Scanning	May 11, 2024	Organised by the Maker Bhavan, IITGN
Training Programme: Course for Indian Forest Service (IFS) officers	May 13 - 17, 2024	Organised by the Dr Kiran C Patel Centre for Sustainable Development with funding from the Ministry of Environment, Forest and Climate Change (MoEFCC)
Workshop: Maker's Curiosity: Learning by doing Rapid Prototyping	May 14 - 16, 2024	Organised by the Maker Bhavan, IITGN
Workshop: Get Rolling with Robot Operating System	May 25 - 26, 2024	Organised by the Robotics Lab, IITGN
Short-term Course: CAD/CAM integration with interface CNC machines	May 27 - 31, 2024	Organised by the Department of Mechanical Engineering
Nurturing Future Leadership Programme (NFLP)	June 24 - 28, 2024	Organised by IITGN with funding from the Ministry of Education, GoI
Short-term Course: Fire Forensics	June 24 - 28, 2024	Organised by the Centre for Safety Engineering, IITGN

## PATENTS

Title	Inventor	Status
An Acoustic Feedback Cancellation System For Assistive Listening Device And Method Thereof	George, Nithin; Pradhan, Somanath; Patel, Vinal	<b>Granted</b>
Composite Propellant	Jasuja, Kabeer; Ghoroi, Chinmay; Gunda, Harini	<b>Granted</b>
Styryl N-Oxide Fluorophores for Detection of Fe <sup>2+</sup> And Process For Preparation of Styryl N-oxide Fluorophores	Gundimeda, Venkata Sriram Kanvah; Dubey, Yogesh; Mansuri, Shabnam	<b>Filed</b>
Wearable System For Offering Individualized Gait Rehabilitation	Lahiri, Uttama; Ranjan, Shashi	<b>Filed</b>
Adsorbent And A Process For Recovery Of Rare Earth Elements	Bhadane, Prathmesh; Goyal, Prateek; Mahato, Priya; Misra, Superb	<b>Filed</b>

## MoUs

### SAMAGRA SHIKSHA, UTTAR PRADESH

As part of the agreement signed between IITGN and Samagra Shiksha, Uttar Pradesh, the Institute's Centre for Creative Learning will develop a Curiosity Box for PM SHRI schools of Uttar Pradesh that will include STEM toys, models and activities for Science and Maths. The modules will encourage out-of-the-box thinking, build foundational knowledge, and promote innovative and creative learning. Samagra Shiksha will facilitate coordination between CCL and the schools, fund the initiative, and, when needed, oversee feedback, interventions and course corrections.

### THE DESAI FOUNDATION TRUST

An MoU was signed between IITGN and the Desai Foundation Trust (DFT) to establish a long-term partnership through which programmes that uplift the health and livelihood of women, youth & children to serve communities could be conducted. The signatories will collaborate on multiple projects based on need. IITGN's community outreach programmes 'NEEV' and 'NYASA' would be central to implementing the designed programmes at the grassroots level.

### ARTIFICIAL INTELLIGENCE CENTRAL PROJECT MANAGEMENT UNIT (AICPMU), INDIAN INSTITUTE OF TECHNOLOGY JAMMU

IITGN and IITJ's AICPMU signed an agreement to collaborate under the mandate of 'Make AI in India and Make AI Work for India' and promote research and development in the domain of AI. The MoU

includes incubating/promoting individuals/start-ups, entrepreneurs, organisations and corporations individually or in collaboration with faculty and other parties to augment AI-based innovations.

### ADANI DEFENCE SYSTEMS & TECHNOLOGIES LIMITED

An MoU was signed between IITGN and Adani Defence Systems & Technologies Limited for one year to promote collaborations in the design, development, testing, and deployment of defence programmes. Some potential initiatives include creating avenues for joint research projects and internships for students, establishing labs in Artificial Intelligence at the Institute, and conducting tech events, workshops, seminars, short courses, and conferences. Additionally, both parties would aim to foster entrepreneurship activities, engage in prototype development and market translations, carry out production/manufacturing as an Industry Production Partner (IPP) for developed systems/technologies, etc.

### SCHOOL OF SCIENCE AND TECHNOLOGY AT CITY, UNIVERSITY OF LONDON, UNITED KINGDOM

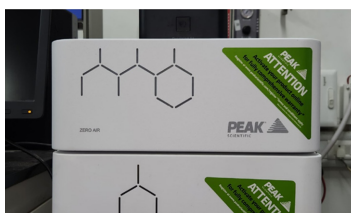
IITGN and the School of Science and Technology at City, University of London signed an MoU to promote cooperation in education and research. The two signatories will facilitate this aim by exploring the development of MSc in Cyber Security and MSc in Financial Technology and Systems degrees, establishing potential research collaboration, and engaging in staff and student mobility opportunities.

## MAJOR FACILITIES

### PRECISION ZERO AIR 1.5 GAS GENERATOR 230V

**Model: SR No. 723040151 by Parshwa Enterprises**

Zero air is clean, dry, hydrocarbon-free, and pollutant-free air used in many laboratories for analytical purposes. Hydrocarbons (mainly methane) present in the air could influence analytical results. Zero Air Generators remove hydrocarbons via oxidative catalysis, ensuring the resultant air contains less than 0.1



parts per million (ppm) of total hydrocarbons. Additionally, other pollutants that could impact analysis, such as humidity, CO<sub>2</sub>, CO, NO<sub>x</sub>, and SO<sub>2</sub>, are also removed with this equipment, leaving pure and dry air that could be used in various applications.

The instrument is installed in the Fuel Cell Lab (AB6, Room 105). For further details, please contact Professor Sudhanshu Sharma ([ssharma@iitgn.ac.in](mailto:ssharma@iitgn.ac.in)).

