INDIAN NATIONAL ACADEMY OF ENGINEERING

E-Newsletter

Vol. XVII, Issue 3, August 2026

INAE VISION 2020-2025

INAE VISION

To be the premier Engineering Academy of the World providing timely inputs to the national and international policy makers, and to extend appropriate assistance in developing engineered solutions for the challenging problems facing contemporary societies and the humanity as a whole.

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INAE Mission

To serve professionals in building and institutionalizing engineering and technological excellence in education, research and industry in India and support advancement of engineering profession globally

Technology Roadmap

We are living in exciting times. We will have to contend with the profound transformation of our society and our industry, because of two revolutions in the making – namely, the digital revolution and the impending transition to fossil fuel free energy globally.

The digital revolution is rapidly transforming the very nature of industrial enterprise today. Many disruptive transformations are maturing rapidly because of the advent of cloud computing and internet of things (IoT) and due to major advances and breakthroughs being made on several fronts such as artificial intelligence (AI) including machine learning (ML) and big data analytics, robotics, autonomy, drones, 3D printing, advance sensors and 5G technologies.

Another revolution in the making is the exciting possibility of fossil fuel-free generation of electricity in the coming decade. The availability of electricity based on renewable sources such as sun, wind and biomass, will cause a major disruption as well as an opportunity for creating a cleaner world, since use of fossil fuels (coal, oil or natural gas) currently, creates deleterious environmental consequences which need urgent attention.

While both these revolutions will cause major disruptions in how we live and work, the transition to the new world in the making is contingent upon the availability of new sources of critical raw materials.

Both digital hardware and generation of electricity from renewables (including the technological challenges associated with energy storage) require a host of new metals and materials for which the new value chains (also the appropriate global supply chains) will have to be established. Innovative processes for extraction of minerals and metals as well as recycling, which are more energy efficient and environment-friendly will have to be developed to produce these critical elements.

To facilitate this global transition, we need to create human resources with high level of domain expertise in different facets of engineering as well as the much needed engineering skill sets needed to deal with the problems of scalability, uncertainty, reliability, complexity, system engineering, ability to deal with variability and yet manufacture products and create solutions of uniform and reproducible quality, capability to design, develop and optimize engineering systems for a given set of inputs and for a desirable set of assured outputs of consistent quality.

Our engineering education has to be appropriately re-engineered so as to equip our future leaders with not only the domain expertise but also the skillsets to innovate continuously and consistently in the face of constant change and dynamic transformations. The human ingenuity and the preparing the well-trained minds, will be critical ingredients in responding to the challenges ahead.

It in this context, INAE has come up with the following areas for our focused attention in the next five years. We believe that these efforts will assist us in facilitating the smooth transition to the new world in the making.

1. **Accelerated Discovery, Development and Deployment of Novel Materials, particularly for strategic sectors like Defense, Atomic Energy and Space.**

We have an urgent need of materials (metals, alloys as well as composites) development for the following sectors – auto sector (both electric vehicles as well as IC engines based vehicles), aerospace, ultra-supercritical power plants, nuclear power plants, renewable energy sector (novel PV materials, rare earth magnets, battery materials for both large scale energy storage as well as for electric vehicles and other electronic appliances, thermoelectric materials for converting low temperature heat into electricity), novel sensors for healthcare industry, materials for the defense applications and space applications, to name a few.

These materials will have to engineered for India-specific applications. That means one must consider during the process of design & development itself, the kind of natural resources we have and the kind of supply chains we will be able to establish to source the starting raw materials, considering the complex geo-political scenario and vulnerabilities associated with dependence on raw materials from abroad.

The other important consideration is the speed of development. In order to remain globally competitive in this domain, we must leverage the state of the art digital platforms (equipped with advance modeling, simulation, data analytics and knowledge engineering tools) for accelerating the development cycle from conception to deployment in actual applications as well as the entire life cycle (cradle to cradle or cradle to grave in some cases), that is, even for the structural health monitoring of the structures where these materials will be deployed.

Another important consideration is the environmental impact of these materials, that is, we must undertake a life cycle analysis, both with respect to the environmental footprint as well as the energy efficiency (actual consumption as compared to the thermodynamic energy needed to accomplish the particular task), for every developmental effort.

It is now well established that integrated computational materials engineering (ICME) approach can help accelerate the materials development cycle.

INAE will work towards coming up with a national strategy to establish and institutionalize the ICME based approach for all material development efforts. The digital platform, thus created, must be equipped with knowledge engineering capabilities so that it can not only act as a knowledge repository of all past efforts made thus far but also continues to update the knowledge going forward.

2. **Strategies for Energy Transition to Fossil Fuels free Renewable Energy Sources**

It is inevitable that India, like several other nations of the world, will move away from fossil fuels as a source of energy. While we have made some headway in developing renewable energy sources like solar and wind, the necessary infrastructure to support the energy transition does not exist at the present time.

INAE plans to create an interdisciplinary expert group to study the whole energy transition comprehensively and holistically, keeping in mind the challenges inherent in such a massive transformation.

INAE will focus on the following important sectors which will be disrupted in the immediate future and/or the areas of concern which we require a strategy for, urgently to facilitate the transition

- Large scale energy storage solutions - Solutions other than Lithium Ion Batteries which do not seem to be appropriate for a country like India for a variety of reasons including the fact that we do not have the basic raw materials - Liquid Metal Flow batteries (for example, Vanadium Flow Batteries) is another attractive option which must be explored.
- Electricity Grid Infrastructure - current grid will not be able to cater to intermittent and distributed electricity inputs; the concept of smart grids which is adequately robust to cater to both supply side challenges (renewable energy sources) as well as demand management (dynamic pricing to take care of its peak loads).
- Transportation (electric mobility, both for people as well as for goods).
- Mining, Mineral Processing and Extractive Metallurgy Industry (which currently depends totally on fossil fuels not only as a source of heat but also as a reductant to convert metal oxides to metals).
- Recycling of waste by-products including municipal waste, tailings and smelter slags including steel slag, red mud and spent pot lining, electronic waste and hospital waste.
- Supply chains for raw materials needed for the transition - sourcing strategies from other geographies, urban mining, deep sea mining and space mining.
- Finding alternative technology options for the manufacture of steel and cement to reduce the environmental foot-print - currently these two materials which will continue to remain the backbone of the Indian economy for the foreseeable future and the consumption is likely to increase by an order of magnitude in the coming decade.
- Waste-water treatment and recycling.
- Water purification technologies including desalination

3. Excellence in Engineering Education

Several groups including other academies globally, are working on the new curricula for engineering education so that our young emerging leaders are adequately equipped with necessary engineering skill sets to face the challenges in the coming decades.

Various deliberations within India as well as abroad have emphasised the need of providing hands-on design experience, problem solving skills and exposure to the systems engineering concepts, tools and technologies to the engineering students. The curricula also need to be updated with the advancements in digital technologies.

All engineers must be familiar with the sustainability paradigm and must be able to do life cycle analysis for every engineering product. They must be equipped with knowledge and the experience with various digital platforms and modelling tools such as computational materials engineering (all the way from atomistic scale to macroscopic scale), computational fluid dynamics, structural analysis tools, life cycle analysis modelling tools, engineering scale up, robust design methodologies to take care of uncertainty and complexity, machine learning and data analytics tools and algorithms, multi-objective and multi-variate optimization tools and technologies.

It is important that the professional ethics is part of the engineering course curricula. A multi-disciplinary systems perspective to all engineers will certainly broaden their horizons – much needed to face the emerging world scenario. Good communication skills and ability to work in teams, are also prerequisites for engineers to succeed in the real life.

All engineers must possess basic IT skillsets and it is a given since digital technologies are transforming every aspect of our lives.

A multidisciplinary INAE Expert Group will critically examine the current status of engineering education, identify gap areas and strive to fill those gaps with appropriate action plans

4. World Class Infrastructure

INAE will come up with an action plan in consultation with all stake- holders to upgrade our national infrastructure within next few years. This will include

- Requirements, technology options and the investments needed to create a few smart cities in the country - including mobility, healthcare facilities, e-governance, access to affordable housing, utilities (electricity and water), waste collection, processing and recycle, education, communication, maintenance of infrastructural facilities, disaster management infrastructure including extreme events (for example, excessive rain and floods) etc.
- Requirements, technology options and the investments needed to create a rural infrastructure so that they can enjoy access to certain basic amenities where they are located - digital connectivity for example can provide them with access to healthcare, online education, information dissemination, financial inclusion, logistics warehousing and agriculture and farm productivity with engineering focus etc.

5. Cyber-physical Systems

Globally innovations are taking place at the interface of digital technologies and domain expertise. For example, manufacturing is being transformed as a consequence of the following - robotics and automation, Internet of Things (IoT), cloud computing, 3D printing, AI, machine learning and data analytics (Digital Twins), structural health monitoring of built structures and engineered products, drones, autonomy, data analytics based predictive asset maintenance systems, blockchain technology to facilitate complete traceability of the products, digital platforms for integrated design, development, deployment and monitoring of materials and products and knowledge engineering platforms for capturing, retaining and context sensitive retrieval of knowledge to solve challenging problems.

Similarly leveraging the advanced digital technologies, the infrastructure available in a given locality or a city can be upgraded for easy accessibility – for example, healthcare facilities, e-governance, utilities (electricity and water)

It is now possible to make most of healthcare facilities available to the citizens at their place ofresidence (particularly important for senior citizens living alone) through the intervention of digital connectivity, sensors and IoT solutions. Provision of healthcare and affordable Medicare facilities through technological interventions is a key focus area.

INAE will select certain areas for focussed attention during the next five years and develop strategies to create infrastructure to facilitate digital transformation for achieving a set of desirable objectives for example, higher productivity, higher efficiency, better quality of life and better quality of products, reduced cost of services, higher safety of workers, etc.

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ACADEMY ACTIVITIES

Academy News (Covering period from April 1, 2026 to July 31, 2026)

Events/Programs conducted by INAE from April to July 2026

40th INAE Foundation Day Function at R&I Park, IIT Delhi on April 18, 2026 (Saturday)

The Indian National Academy of Engineering (INAE) was founded on 20th April, 1987 to promote excellence in Engineering and Technology (E&T) in the country. INAE celebrates this landmark as its Foundation Day, each year, as a landmark day to rededicate itself to the professed goals with an aim to promote excellence in Engineering and Technology (E&T) in the country. On the occasion of 40th Foundation Day, the Indian National Academy of Engineering (INAE) reaffirmed its commitment to advancing the engineering profession in India. The celebrations, held on 18 April 2026 at the R&I Park, Indian Institute of Technology, Delhi, began with a traditional inauguration by the INAE leadership. Mr. JD Patil, President INAE, during his Presidential Address highlighted the invaluable contributions of INAE Fellows, Young Associates, and members in shaping the engineering landscape of the nation.

A highlight of the event was a thought-provoking panel discussion on "Engineering India's Multi-Modal Future: Synergizing High-Speed Rail, Space Infrastructure, and Industrial Logistics for a Viksit Bharat." Brief Introduction was given by the Program Moderator, Prof. Indranil Manna, Former President, INAE who steered the discussion with expert Panellists in following areas:

- High Speed Rail by Mr. K Senthilnathan, Executive Vice President and Head Technical Services, Heavy Civil Infra IC, L&T
- Space Infrastructure by Smt. Nigar Shaji, Outstanding Scientist (Retd.), URSC, ISRO and
- Manufacturing and Logistics by Prof. Prem Vrat, FNAE, Chairperson, Board of Governors, IIT(ISM) Dhanbad and Pro Chancellor, The NorthCap University).

The event was graced by the esteemed Chief Guest, Dr. Ajai Chowdhry, FNAE, Co-founder of HCL and Chairman, EPIC Foundation, whose insightful address on India's technological challenges and pathways forward, sparked a lively discussion. INAE affirmed its intent to develop a suggested roadmap with recommendations for addressing these critical issues.

A special felicitation ceremony honoured Fellows elected in 1987—the Academy's founding year:

- Prof. Prem Krishna, former Professor & Head, Civil Engineering, IIT Roorkee.
- Prof. S. C. Dutta Roy, former Professor, Electrical Engineering, IIT Delhi.
- Mr. Paritosh C. Tyagi, former Chairman, Central Pollution Control Board

Their enduring contributions to engineering and to the Academy continue to inspire future generations.

The event witnessed the presence of several distinguished Fellows, including Dr. Sanak Mishra and Prof Indranil Manna, former Presidents of INAE, Vice Presidents Prof. Santanu Chaudhury, Prof. Sanjay Mittal, Prof. Sivaji Chakravorti, Dr. S. Somanath, Mr. Pradeep Chaturvedi, and Mr. T. Suvarna Raju, along with Young Associates, members, invitees, researchers, and students.

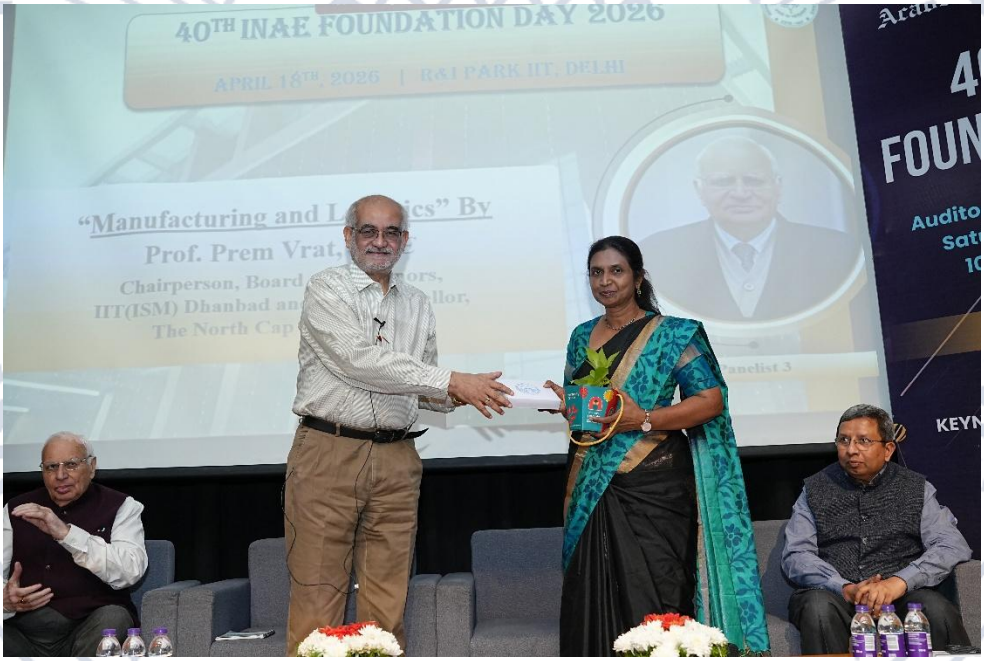
Pictorial Delight of the Foundation Day Celebrations 2026:

Backdrop of INAE Foundation Day 2026 Celebrations

Lighting of the lamp by Former INAE Presidents - Dr Sanak Mishra & Prof Indranil Manna

Mr JD Patil, President, INAE Delivering Presidential Address Online

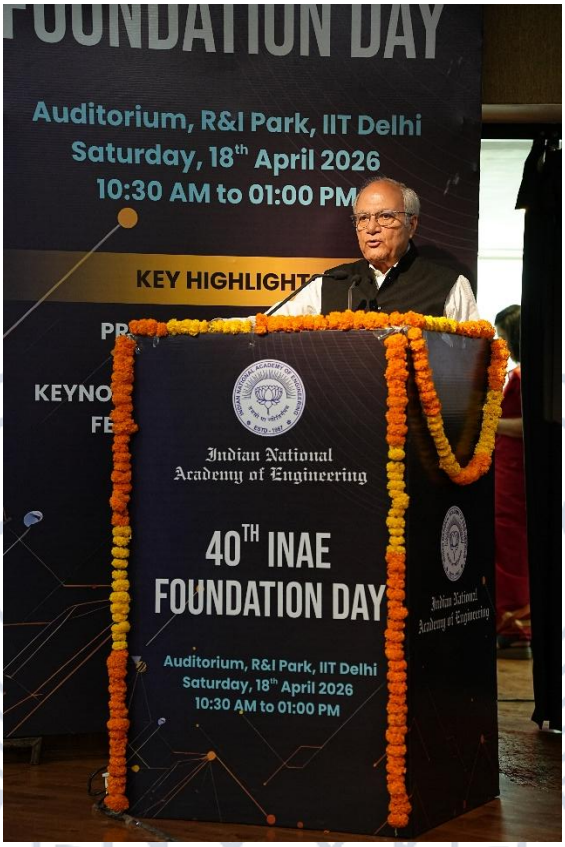
Panel Discussion in Progress. (L to R)- Prof Prem Vrat, FNAE; Prof Indranil Manna, Former President, INAE; Smt Nigar Shaji and Mr. K Senthilnathan



Felicitation of Panellist- Smt. Nigar Shaji by Prof Indranil Manna

Felicitation of Panellist- Mr. K Senthilnathan by Prof Indranil Manna

Felicitation of Panellist- Prof Prem Vrat, FNAE by Prof Indranil Manna



Address by Chief Guest - Dr Ajai Chowdhry, FNAE

Felicitation of Chief Guest - Dr Ajai Chowdhry, FNAE by Prof Santanu Chaudhury, Vice President, INAE

Introduction by Prof Sivaji Chakravorti, Vice President, INAE during Felicitation Session

Felicitation of Prof Prem Krishna, former Vice President, INAE (centre) by Dr Ajai Chowdhry, FNAE (left) and Prof Santanu Chaudhury, Vice President, INAE (Right)

Felicitation of Prof SC Dutta Roy, FNAE by Prof Sivaji Chakravorti and Prof Santanu Chaudhury, Vice Presidents of INAE and Dr Ajai Chowdhry, FNAE (extreme right)

Felicitation of Mr. Paritosh C. Tyagi, FNAE by Prof Sivaji Chakravorti and Prof Santanu Chaudhury, Vice Presidents of INAE and Dr Ajai Chowdhry, FNAE (extreme right)

Group Photographs of Dignitaries during Foundation Day 2026 Celebrations

National Technology Day Celebrations 2026 by INAE

INAE celebrated National Technology Day 2026 by organizing a Distinguished Lecture by Dr Anil Kakodkar, FNAE, Former President, INAE; Chancellor, Homi Bhabha National Institute; Chairman, Rajiv Gandhi Science & Technology Commission, Govt. of Maharashtra; Formerly Director, BARC, Mumbai; Formerly Chairman, Atomic Energy Commission and Secretary, Department of Atomic Energy, Mumbai on "Thorium for India's Energy Independence" on May 15, 2026 (online). Mr JD Patil, President, INAE delivered the Welcome Address and introduced the distinguished speaker and highlighted his key contributions in the India's advancement on nuclear energy as well as the advancement of thorium utilization for India's energy independence. He also pioneered the design of the advanced heavy water reactor which will power the whole country for decades. Dr Anil Kakodkar in his lecture mentioned that the country has have plenty of thorium and only modest quantities of Uranium which is the basis of our three-stage program. He opined that transition from uranium to thorium is a priority. A number of new developments beyond PFBR would be necessary for the growth of Thorium irradiated platforms. These include a set of reactor and nuclear fuel cycle technologies based on mixed oxide, metallic and Thorium fuels. Start of Thorium utilization at scale is thus three to four decades away. He mentioned the benefits of deployment of thorium and the technological advancements required for the same. In his closing statement he mentioned that "energy security is about eliminating vulnerabilities in meeting our energy needs. Realizing energy independence should be the end objective. Collaboration designed to be a win-win situation for the participating parties should be preferred over mere vendor buyer relationship". The Distinguished Lecture was attended by over 225 delegates online and closed with deep gratitude for the esteemed Speaker on behalf of INAE and the event was an astounding success.

INAE Technology Conclave 2026 held on 11–12 July 2026 at Siksha 'O' Anusandhan (SOA) University, Bhubaneswar

Introduction

The Indian National Academy of Engineering (INAE), in collaboration with Siksha 'O' Anusandhan (SOA) University, successfully organised the INAE Technology Conclave 2026 on July 11–12, 2026 at the SOA University campus in Bhubaneswar. The two-day INAE member centric event, the conclave brought together Fellows and Members of INAE, distinguished academicians, industry leaders, researchers, policy makers, innovators, entrepreneurs and young engineers to deliberate on emerging technologies, engineering innovation and national technological priorities.

Designed as a INAE membership centric event with a multidisciplinary platform for knowledge sharing and collaboration, the conclave featured distinguished plenary lectures, thematic panel discussions, technical presentations, innovation showcases, networking opportunities and cultural events. A significant feature of this year's conclave was the introduction of dedicated sessions for the presentation of extended abstracts by INAE Members and the wider engineering community, along with a special Start-up Showcase and Innovation Track that highlighted engineering entrepreneurship and technology commercialisation. The conclave also focused on a dedicated session of felicitation of newly selected members of INAE. These additions substantially broadened participation and strengthened the conclave's role as a platform connecting research, innovation and industry.

Inaugural Session

The conclave commenced with a formal inaugural ceremony attended by eminent personalities from academia and industry. The programme began with the ceremonial lighting of the lamp and rendition of the National Anthem.

The delegates were welcomed by Prof. Pradipta Kumar Nanda, Vice Chancellor, SOA University. The inaugural session also featured addresses by Prof. Damodar Acharya, Chairman, International Advisory Board, SOA University and Chairman, INAE Bhubaneswar Chapter; Prof. Indranil Manna, Former President, INAE and Vice Chancellor, BIT Mesra; and Shri Manoranjan Ram, Senior Vice President, Danieli India.

Delivering the Presidential Address, Mr. J. D. Patil, President, INAE, highlighted the Academy's commitment to fostering engineering excellence, interdisciplinary collaboration and innovation-driven national development. The inaugural keynote address was delivered by Dr. Ashok Kumar Panda, Chairman and Managing Director, SAIL, who emphasised the pivotal role of engineering and technology in strengthening India's industrial competitiveness and achieving sustainable growth.

The inaugural session concluded with the felicitation of guests and a vote of thanks proposed by Prof. S. R. Samantaray, Dean (PG & Research Programmes), IIT Bhubaneswar and Secretary, INAE Bhubaneswar Chapter.

Technical Sessions

The technical programme was structured around four thematic sessions spread over the two days of the conclave, bringing together eminent experts from academia, industry and government to deliberate on technologies of strategic importance to the nation. Through distinguished plenary lectures and thought-provoking panel discussions, the sessions provided participants with valuable insights into emerging engineering trends, technological innovations and national priorities while promoting interdisciplinary dialogue and industry-academia collaboration.

The technical deliberations commenced with an online plenary lecture on "Nuclear Energy with Distributed Small and Medium Size Reactors" by Mr. Bhuban Chandra Pathak, Chairman and Managing

Director, Nuclear Power Corporation of India Limited (NPCIL), who highlighted the transformative role of Small Modular Reactors in meeting India's future energy security requirements. This was followed by a plenary lecture on "Coal Gasification, Fertilizers and Coal-based Chemicals" delivered by Prof. G. D. Yadav, FNAE, Bhatnagar Fellow (CSIR), Emeritus Professor of Eminence and Former Vice Chancellor, Institute of Chemical Technology, Mumbai. He presented the latest developments in coal gasification technologies and their potential for enhancing resource utilisation and promoting sustainable industrial growth.

A special session on engineering entrepreneurship featured Mr. Jayant S. Karve, Director and CEO, RCupe Lifesciences Pvt. Ltd., Bengaluru, recipient of the INAE Young Innovator and Entrepreneur Award, who shared his entrepreneurial journey and demonstrated how innovative engineering solutions can be successfully translated into commercially viable technologies.

The second technical session commenced with an online plenary lecture on "Next Generation Communications" by Prof. U.B. Desai, FNAE, Chancellor, Anurag University and Founding Director, IIT Hyderabad, who discussed emerging communication technologies and their implications for India's digital future. This was followed by an engaging panel discussion on Transportation and Logistics, organised and moderated by Prof. Manoj Kumar Tiwari, FNAE, Director, IIM Mumbai. The distinguished panellists included Prof. Gita Krishnan, Department of Civil Engineering, IIT Madras; Prof. Debjit Roy, Centre for Transportation and Logistics, IIM Ahmedabad; Shri Pushkar Singh, Founder and CEO, LetsTransport, Bengaluru; and Mr. Rajiv Agrawal, Former CEO, Essar Ports. The panel deliberated on multimodal transportation systems, intelligent logistics, digital supply chains and technological interventions required to improve efficiency and sustainability in India's logistics sector.

The third technical session began with a plenary lecture on "Semiconductor Technologies" by Prof. Shanthi Pavan, FNAE, NT Alexander Institute Chair Professor, IIT Madras, who provided an overview of the rapidly evolving semiconductor ecosystem and India's opportunities in chip design and manufacturing. The session also included an insightful panel discussion on Healthcare Technologies, organised and moderated by Prof. Suman Chakraborty, FNAE, Director, IIT Kharagpur. The distinguished panellists comprised Dr. Dilip Kumar Chekuri, CEO, AIC-AMTZ Medi Valley; Dr. Shesheer Kumar, Huwel Life Sciences; Dr. Ashok Choudhury, Institute of Liver and Biliary Sciences (ILBS), New Delhi; and Dr. Suchitra Markan, Scientist F, Indian Council of Medical Research (ICMR), New Delhi. The panel explored technological innovations in medical devices, diagnostics, healthcare delivery systems and translational research aimed at improving healthcare outcomes.

Participants also benefited from a special address by Prof. A.B. Pandit, FNAE, Vice Chancellor, Institute of Chemical Technology, Mumbai, who shared his perspectives on the evolving landscape of chemical engineering in India and how it has started impacting lives even more. He gave reference of an article co-authored with Prof MM Sharma, which formed the basis of his distinguished talk.

The final technical session featured a plenary lecture on "Critical Minerals and Rare Earths" by Dr. Rabi Narayan Patra, Former Chairman and Managing Director, Indian Rare Earths Limited (IREL), who discussed the strategic importance of critical minerals in supporting India's clean energy transition, advanced manufacturing and national security. This was followed by a panel discussion on "Reduction and Diversification of Energy Inputs in Energy Intensive Industries", organised and moderated by Mr. Sashi Sekhar Mohanty, Former Director, SAIL and Essar Steel. The panellists included Mr. Biwaranjan Pallai, Executive Director (Works), Rourkela Steel Plant, SAIL; Mr. Bibhu Mishra, Advisor, Hindalco Industries; Shri Naveen Ahlawat, President and Head – Sustainability & Decarbonisation, Jindal Steel Ltd.; and Mr. V. Upadhyay, Head, Vedanta Aluminium, Jharsuguda. The discussion focused on industrial decarbonisation, energy efficiency, adoption of cleaner technologies and diversification of energy sources to improve sustainability and competitiveness in energy-intensive industries.

Collectively, the plenary lectures and panel discussions reflected the multidisciplinary character of the Technology Conclave and provided participants with valuable perspectives on frontier technologies, engineering innovation and industrial transformation. The quality of the deliberations, coupled with the active participation of experts from academia, industry and government, significantly enriched the technical content of the conclave and reinforced its objective of promoting engineering excellence and collaborative solutions to address India's technological priorities.

Distinguished Addresses

The conclave also featured two distinguished pre-dinner lectures delivered virtually by eminent national leaders. Prof. Abhay Karandikar, FNAE, Member, NITI Aayog, Government of India, shared his perspectives online on India's evolving technology landscape and the importance of engineering-led innovation in achieving national development goals as well as progress being made by ANRF in the Research, Development and Innovation (RDI) Fund, which aligns ANRF to support startups and industry investments in deep tech and scalable real-world solutions.

This was followed by an online address from Dr. Binay Kumar Das, FNAE, Director General, Electronics and Communication Systems, DRDO, who highlighted strategic technologies and the growing importance of indigenous research and technological capability in national security.
Both lectures were widely appreciated by the participants.

Extended Abstract Presentation Sessions

One of the defining features of the INAE Technology Conclave 2026 was the introduction of Extended Abstract Presentation Sessions, providing a dedicated platform for INAE Members and engineers from academia, industry and research organisations to present their recent research and technological innovations.

Parallel technical sessions were organised throughout the two-day conclave covering a broad spectrum of engineering disciplines, including Civil Engineering, Chemical Engineering, Mechanical Engineering, Electrical Engineering, Electronics and Communication Engineering, Computer Science and Information Technology.

The presentations showcased cutting-edge research, novel engineering solutions, applied technologies and industrial case studies addressing contemporary engineering challenges. The sessions facilitated meaningful interaction between presenters and experts, encouraging technical discussions, constructive feedback and opportunities for future collaboration.

The enthusiastic participation in these sessions demonstrated the growing research capability within the engineering community and reflected the Academy's commitment to providing a national platform for dissemination of high-quality engineering research. The Extended Abstract Sessions substantially enhanced the academic content of the conclave while creating opportunities for members, researchers and practicing engineers to engage with Fellows of the Academy.

Start-up Showcase and Innovation Track

Another major highlight of the conclave was the Start-up Showcase and Innovation Track, which underscored INAE's commitment to promoting innovation-driven entrepreneurship and facilitating the translation of engineering research into commercially viable technologies.

In addition, a dedicated Start-up Display was organised throughout the conclave, providing technology start-ups with an opportunity to exhibit their products, prototypes and innovative solutions before an audience comprising industry leaders, researchers, investors and policy makers.

The Innovation Track stimulated productive interactions between innovators, researchers and industry representatives, highlighting the importance of engineering entrepreneurship in addressing societal challenges, creating high-value enterprises and contributing to the vision of an innovation-led economy. The sessions also inspired young engineers to pursue entrepreneurial ventures and demonstrated the increasing contribution of technology start-ups to India's engineering ecosystem.
The Startup Showcase Pavilion was inaugurated by Dr. Ashok Panda, Chairman & Managing Director, Steel Authority of India Limited (SAIL), in the esteemed presence of Dr. Pradipta Kumar Nanda, Vice Chancellor, SOA Deemed to be University; Prof. Damodar Acharya, Former Chairman, AICTE & Former Director, IIT Kharagpur; Prof. Manas Kumar Mallick, Director, ITER & Director, AIC-SOA Foundation; Dr. B.K. Sahu, Senior Regional Manager & Head, NRDC Outreach Office; Dr. Ashok Kumar Choudhury, Additional Professor, ILBS; Dr. Pravakar Sahoo, Programme Director, Atal Innovation Mission, NITI Aayog; Mr. Rashmi Ranjan Mohapatra, CEO, World Skill Center, Government of Odisha; Prof. A.B. Pandit, Vice Chancellor, ICT Mumbai; Prof. Ravindra V. Adivarekar, Director, ICT Bhubaneswar; Mrs. Lopa Mishra Jana, CEO, AIC-SOA Foundation; Prof. Indranil Manna, Former President, INAE & Vice Chancellor, BIT Mesra; and Mr. J.D. Patil, President, INAE & Member of the Board of IN-SPACe.

A significant highlight of the inaugural session was the signing of two memorandum of Understanding (MoUs). AIC-SOA Foundation signed a MoU with the World Skill Center, Bhubaneswar, to collaborate on skill development, entrepreneurship promotion, innovation and industry-oriented capacity building. Another MoU was signed between AIC-SOA Foundation and ICT Mumbai to foster joint initiatives in research, innovation, technology commercialization, startup incubation, entrepreneurship development and academic collaboration.

The conclave featured two highly engaging workshops designed to strengthen entrepreneurial capabilities:

• Lean Canvas – Build a One-Page Business Model, led by Dr. Shreeram Iyer, Partner, Vera Business Consulting LLP, equipped participants with practical tools to build sustainable and scalable business models.

• Modern Sales – How the Fundamentals Have Changed & How to Navigate the Change, conducted by Mr. Rajesh Gopinath, Founding Partner, CenterStandView Consulting LLP, provided valuable insights into customer acquisition, sales strategy, market positioning and business growth in today's dynamic marketplace.

Around 40 technology startups from Odisha showcased cutting-edge solutions across Artificial Intelligence, Healthcare, Robotics, Agriculture, Clean Technology, Advanced Manufacturing and Digital Technologies. The exhibition attracted significant appreciation from dignitaries, investors, industry experts and delegates, highlighting the remarkable quality of innovation emerging from the region.

The Startup Pitching & Demonstration Session provided startup founders with a platform to showcase their innovative solutions before an esteemed jury comprising experts from academia, industry, and the startup ecosystem. The session featured technologies with strong commercial potential and the ability to create meaningful societal impact. Following the evaluations, FxUAV Technologies Private Limited, Vayuraksha Kinetics Private Limited, and Team IRA emerged as the winners in this segment.

Recognition of New INAE Members
An important feature of the conclave was the felicitation of newly inducted Individual Members of INAE. The ceremony recognised the expanding community of engineering professionals associated with the Academy and reaffirmed INAE's commitment to nurturing emerging engineering talent and strengthening professional engagement across academia, industry and research institutions.

Networking and Cultural Programme
The conclave also provided several opportunities for informal interaction and professional networking through tea breaks, working lunches and an evening cultural programme followed by dinner. These interactions enabled participants from diverse disciplines and organisations to exchange ideas, explore collaborative opportunities and strengthen professional relationships beyond the formal technical sessions.

Valedictory Session
The conclave concluded with a valedictory session addressed by distinguished dignitaries including Prof. Santanu Choudhury, Vice President, INAE as the Chief Guest; Prof. Damodar Acharya; Prof. S. R. Samantaray; Dr. Ramanuj Narayan, Director, CSIR-IMMT, Bhubaneswar. A formal vote of thanks was presented by Lt. Col. Shobhit Rai (Retd.), Deputy Executive Director, INAE acknowledging the role of Chief Patrons, Patrons, various organizing Committees, student volunteers at SOA University and partner institutes as well as sponsors of the event as well as distinguished speakers and delegates.

The speakers appreciated the quality of the technical deliberations, the active participation of delegates and the successful introduction of the Extended Abstract Presentation Sessions and the Start-up Showcase. The top three winners of the best start up were announced namely FxUAV Technology Pvt Ltd, Vayuraksha Kinetics Pvt Ltd and IRA, as well as best paper in each of the six engineering disciplines were also announced which were Mr Neeraj Kumar from DRDO in Civil Engineering, Dr Rudranarayan Pradhan from Odisha Institute of Technology & Research, in electrical engineering, Ms Amrita Bose from IIT Kharagpur in CS &IT, Er Indranil Aich from Aich Appraisers Auctioneers & Valuers in Mechanical engineering, Prof Gargi Das of IIT Kharagpur in Chemical engineering and Prof S Indu in Electronics & Communications of DTU, New Delhi and felicitated. They emphasised the need for continued collaboration among academia, industry, government and entrepreneurs to accelerate engineering innovation for national development.

Conclusion
The INAE Technology Conclave 2026 successfully achieved its objective of creating a vibrant multidisciplinary platform for discussions on emerging technologies, engineering research, innovation and entrepreneurship. Through its carefully curated programme of distinguished plenary lectures, thematic panel discussions and interactive networking opportunities, the conclave promoted meaningful dialogue among researchers, industry leaders and policy makers.

The introduction of the Extended Abstract Presentation Sessions significantly broadened technical participation by providing engineers and researchers with an opportunity to present their work before an eminent audience, while the Start-up Showcase and Innovation Track effectively highlighted the growing importance of engineering entrepreneurship and technology commercialisation in India's innovation ecosystem.

Overall, the conclave reinforced the Indian National Academy of Engineering's role in promoting engineering excellence, encouraging interdisciplinary collaboration, nurturing innovation and supporting India's aspiration to emerge as a global technology leader as well as providing a platform to INAE members to be engaged with the activities of the Academy. The enthusiastic participation of delegates and the high quality of technical discussions underscored the growing relevance of the Technology Conclave as one of INAE's flagship annual programmes for advancing engineering knowledge and innovation.

Pictorial Delight of Technology Conclave 2026

Prof. Indranil Manna, Former President, INAE Delivering Address

Prof. Damodar Acharya, FNAE, Chairman, International Advisory Board, SOA University and Chairman, INAE Bhubaneswar Chapter Delivering Address

Prof AB Pandit, FNAE, Vice Chancellor, Institute of Chemical Technology, Mumbai Delivering Address

Mr J.D. Patil, President, INAE Delivering Address in Inaugural Session

Dignitaries on Dais in Panel Discussion

Prof Indranil Manna, former President, INAE Felicitating Prof Suman Chakraborty, FNAE, Director, IIT Kharagpur

Group Photograph of Panellists with Prof Indranil Manna, Former President, INAE (third from left)

Felicitation of Prof A.B. Pandit, Former Vice President, INAE

Group Photograph of Dignitaries with Prof Damodar Acharya (Centre)

Inauguration of Poster Session

Inauguration Session of the Startup Showcase

Group Photograph During Session on Felicitation of Individual Members

Valedictory Session

Dignitaries on Dais in Valedictory Session

Delegates Visit to the Startup Booths & Interaction with Startups

Workshop on Lean Canvas – Build a One-Page Business Model Conducted by Dr. Shreeram Iyer, Partner at Vera Business Consulting, Ex-CEO, T-Hub

Workshop on "Modern Sales – How the Fundamentals Have Changed & How to Navigate the Change" by Mr. Rajesh Gopinath, Founding Partner, CentreStandView

MOU Signing

Startup Pitching Session

Centre for Engineering Education Excellence (CEEE) Program

The Centre for Engineering Education Excellence (CEEE) Programme**,** a flagship initiative of the Indian National Academy of Engineering (INAE)**,** supported by the Infosys Foundation and the All India Council for Technical Education (AICTE)**,** continued its mission during 2026–27 to strengthen the quality of engineering education in India through structured mentoring, faculty development and knowledge sharing. The program brings together distinguished faculty members and domain experts from premier Indian Institutes of Technology (IITs), to equip engineering faculty with contemporary subject knowledge, innovative teaching methodologies and effective pedagogical practices. Through this

collaborative framework, the program seeks to bridge the gap between academic learning and the evolving requirements of industry while contributing to the development of skilled, industry-ready engineering graduates.

A major milestone during the reporting period was the successful implementation and widespread acceptance of the CEEE Automation Portal, which has significantly enhanced the efficiency, transparency and scalability of programme administration. The portal has been adopted across all participating CEEE Centres as the primary digital platform for managing programme activities. It facilitates end-to-end automation of key operational processes, including participant registration, course scheduling, mentor and faculty management, attendance monitoring, dissemination of course materials, submission of assignments and feedback, certificate generation, and preparation of programme reports. The portal has substantially reduced manual administrative effort, improved the accuracy and consistency of programme data, enabled real-time monitoring of programme progress, and strengthened coordination among INAE, participating IITs and affiliated institutions. Its successful deployment marks an important step towards the digital transformation of the CEEE Program and establishes a robust foundation for efficient programme management and evidence-based decision-making.

During 2026–27, the program was conducted through nine CEEE Centres located at IIT Kharagpur, IIT Bombay, IIT Madras, IIT Kanpur, IIT Delhi, IIT Guwahati, IIT Gandhinagar, IIT Hyderabad and IIT Indore**.** The programme covered a broad spectrum of engineering disciplines, including Computer Science and Information Technology (including Data Science); Artificial Intelligence, Data Science and Machine Learning; Electrical, Electronics and Instrumentation Engineering; Mechanical, Aerospace and Energy Engineering; Materials, Chemical and Biomedical Engineering; and Civil and Environmental Engineering**.**

By mid-July 2026**,** the offline mentoring of 29 courses has been successfully completed in accordance with the approved schedule. The overall programme has continued to provide a highly enriching and professionally rewarding learning experience for participating faculty members. Through direct interaction with eminent academicians, experienced mentors and subject experts from premier institutions, participants have strengthened their disciplinary knowledge while gaining exposure to contemporary teaching-learning methodologies and best pedagogical practices. The combination of expert-led technical sessions, structured mentoring, collaborative learning and peer interaction has encouraged participants to reflect upon and enhance their classroom practices. The hybrid design of the programme, integrating in-person engagement with online academic interactions, has further ensured sustained learning beyond the classroom and facilitated the continued exchange of knowledge among faculty members.

The CEEE Automation Portal has complemented these academic initiatives by providing a unified digital ecosystem for programme management. The availability of real-time participant data, automated workflow management, centralized documentation and analytical reporting has improved institutional coordination and enabled timely monitoring of programme outcomes. The portal has also contributed to greater transparency, accountability and standardization in programme implementation across all participating centres, thereby strengthening the overall governance framework of the CEEE Programme.

As the 2026–27 CEEE Program progresses with online mentoring scheduled across various CEEE Centres, the initiative continues to reaffirm INAE's commitment to advancing excellence in engineering education through capacity building, academic mentoring and institutional collaboration. The successful integration of the CEEE Automation Portal with program operations further demonstrates the Academy's commitment to leveraging digital technologies for effective programme delivery and continuous improvement. Together, these initiatives are expected to make a sustained contribution towards enhancing faculty competencies, promoting innovative pedagogy and strengthening the quality of engineering education across the country.

CEEE Program: Way Forward Meet on 19th April 2026

The CEEE Program: Way Forward Meet was organized on 19th April 2026, wherein significant gathering of academic mentors and coordinators from nine IITs at IIT Delhi deliberated to chart the roadmap for the CEEE Programme for 2026–27 and focused on strengthening collaboration, enhancing programme delivery, and aligning with emerging priorities in engineering education.

A key highlight of the event was the felicitation of the Centre and Domain Coordinators of the CEEE Programme 2025–26, in recognition of their dedication and contributions over the past year. MoUs were also exchanged with IIT Hyderabad, IIT Guwahati, IIT Gandhinagar, and IIT Indore, marking their inclusion as new centres for the CEEE Programme 2026–27.

The inaugural session featured address by Mr JD Patil, FNAE, President INAE, followed by an eminent panel of thought leaders:

- Prof. Indranil Manna – Immediate Former President, INAE & National Coordinator, CEEE Program
- Prof. TG Sitharam, FNAE –Former Chairman, AICTE
- Prof. Santanu Chaudhury, FNAE – Vice-President, INAE and Chairman, Selection and Evaluation Committee, CEEE
- Prof. BS Murty, FNAE – Director, IIT Hyderabad

Their perspectives set the tone for meaningful dialogue and forward-looking deliberations. The discussions reaffirmed a collective commitment to advancing excellence in engineering education and further strengthening the impact of the CEEE Programme in the coming year.

On the occasion, a Report for CEEE 2024-26 was formally released which can be viewed through the Dropbox link which is given below:

https://www.dropbox.com/scl/fi/2rzudspmvtg6s8ub06kgx/CEEE-2024-2026-Complete-Report-A4.pdf?rlkey=0ig8u7g1mn91vex8c8qwk56ko&st=p1bt4muf&dl=0

The selected photographs & other relevant details of the CEEE Program held on 19th April 2026 can be viewed through the Dropbox link which is given below.

https://www.dropbox.com/scl/fo/7wm7maky514h23uyff1wy/AMpiOqzcSS-48YsBGR5olOg?rlkey=eqfbbwyybrmsw1mb9jqydpreu&st=ulbdfuyk&dl=0

In addition, please also find appended an updated Flyer of the CEEE Program for 2026-27 which can be viewed by ***Clicking here.***

Local Chapter Activities and Webinar Series held during April to July 2026

The following Webinars/activities/meetings/Technical Lectures were conducted during April to July 2026 by INAE Local Chapters.

INAE Mumbai Chapter

Webinar on "Changing Roles of Materials in Advanced Nuclear Technologies in India" held on June 5, 2026

INAE Mumbai Chapter organized a Webinar on "Changing Roles of Materials in Advanced Nuclear Technologies in India", by Dr. Raghvendra Tewari, Former Director, Materials Group, Bhabha Atomic Research Centre, at Anusakthinagar on 5th June 2026 from 1800-19:00 hours in hybrid mode.
The programme started with welcoming the speaker and distinguished audience by Dr. Gopika Vinod, Secretary, INAE Mumbai Chapter. Sh A. K. Balasubrahmanian, Chair INAE Mumbai Chapter & Chairman AERB gave opening remarks, highlighting rapid commercialization of new technologies for the processing and fabrications of metals or alloys. Dr. Poulami Chakraborty introduced the speaker.

The lecture on "Changing Roles of Materials in Advanced Nuclear Technologies in India" began with a historical overview of the inception of India's nuclear energy programme under the visionary leadership of Dr. Homi J. Bhabha. The speaker described the establishment of key institutions such as Indian Rare Earths Limited (IREL), highlighting the acquisition of monazite-bearing coastal sands and the development of indigenous capabilities for the extraction and processing of strategic nuclear materials. The lecture traced the evolution of materials research in India, emphasizing its pivotal role in achieving self-reliance across the nuclear fuel cycle and reactor technologies.

The technical session highlighted the development of zirconium alloys for fuel cladding/pressure tube in pressurized heavy water reactors, bainitic and advanced steels for reactor structural components, nickel-based alloys for high-temperature molten salt reactors, silicon carbide and SiC-based composites for accident-tolerant fuel systems and advanced reactor applications, and rare-earth materials for strategic nuclear technologies. Recent advances in uranium extraction and processing technologies were also discussed, illustrating the importance of indigenous materials and process development throughout the nuclear fuel cycle. The speaker further emphasized the role of advanced alloy design, corrosion-resistant materials, radiation-tolerant materials, and modern characterization techniques in enhancing the safety, efficiency, and longevity of present and future nuclear systems. The lecture effectively demonstrated how sustained advances in materials science continue to underpin India's progress in advanced heavy water reactors, gas cooled reactors, molten salt reactors, including various non-nuclear technologies and societal applications, while reinforcing the nation's commitment to technological self-reliance.

The talk was attended by a large number of officers from DAE fraternity, as well as many online participants from diverse background. Dr. Umasankari Kannan, FNAE attended in person and various INAE Fellows viz Mr. Sanatkumar, FNAE and Dr. G. K. Dey, FNAE joined online. There was online participation of around 20 persons. Dr. R. B. Grover summarised the importance of topic and appreciated the spectrum of topics covered by speaker. The talk was followed by interactive session with audience and responding to all the queries raised in the chatroom. Meeting concluded with vote of thanks proposed by Prof. Santanu Bandopadhyay, Treasurer, INAE Mumbai Chapter.

Photographs from the event are given below

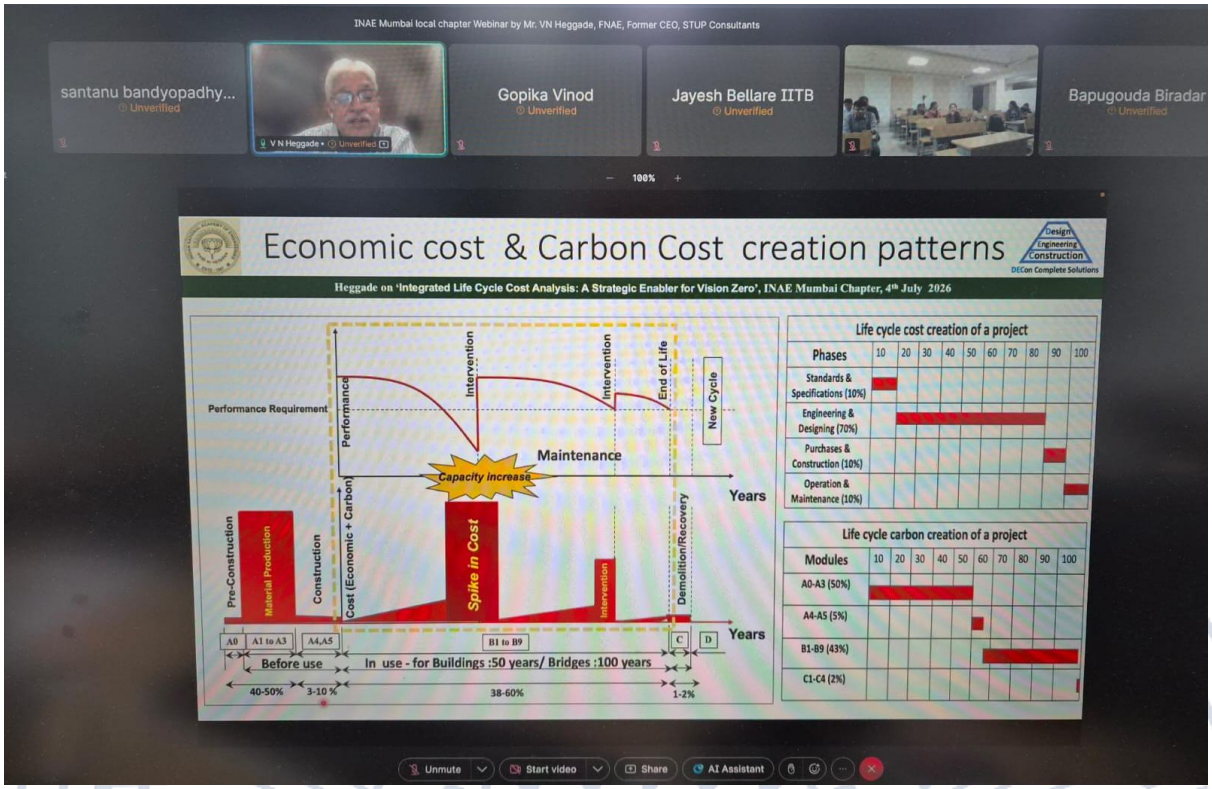
Webinar on "Integrated Life-Cycle Cost Analysis: A Strategic Enabler for Vision Zero India", held on July 4, 2026

INAE Mumbai Chapter organized a Webinar on "Integrated Life-Cycle Cost Analysis: A Strategic Enabler for Vision Zero India", by Mr. V.N. Heggade, Former Chief Executive Officer (CEO) of STUP Consultants & former Executive Director of Gammon, at DESE Seminar Room, 2nd floor, DESE Building, IIT Bombay campus in hybrid mode on July 4th, 2026, from 4.00 pm onwards. The program started with welcoming the speaker and distinguished audience by Dr. Gopika Vinod, Secretary, INAE Mumbai Chapter. Prof. Jayesh Bellare, Chair INAE Mumbai Chapter gave opening remarks, highlighting importance of sustainability and need for Net zero. Dr. Poulami Chakraborty and Dr Gopika Vinod introduced the speaker.

Talk presented the framework of integrated life cycle cost model, which includes economic cost and carbon costs. Quantitative model was proposed incorporating green procurement policies, Private Public Partnership model, sustainable financing aspects long with performance benchmarking, case studies. Talk also covered mitigation strategies for reducing carbon footprints, design efficiency strategies for concrete structures, policy frameworks.

The talk was attended by a large number of faculty from civil engineering fraternity along with many online participants from diverse background. Several INAE Fellows- Dr. R. B. Grover, FNAE; Dr. Umasankari Kannan, FNAE; Mr. Sanatkumar, FNAE; Dr. R. K. Singh, FNAE and Dr. B. K. Dutta, FNAE joined online. There was online participation of around 30 persons. The talk was followed by interactive session with audience and responding to all the queries raised in the chatroom. Meeting concluded with vote of thanks proposed by Prof. Santanu Bandopadhyay, Treasurer, INAE Mumbai Chapter.

Photographs from the event are given below



INAE Bhubaneswar Chapter

(i) The 77th lecture of the INAE Distinguished Lecture Series was organized by INAE Bhubaneswar Chapter, jointly with SOA University, CSIR-IMMT Bhubaneswar, IIT Bhubaneswar, NISER Bhubaneswar and IEEE Bhubaneswar Sub-section and delivered by Prof. Tapan K Gandhi, Head of Centre for Biomedical Engineering, IIT Delhi and AIIMS New Delhi on "AI-Driven Visual Neuroscience for Early Diagnosis and Adaptive Rehabilitation & Management of Visual Disorders" on April 11, 2026 at Convention Center, Ground Floor, Campus-2, .Ghatikia, Bhubaneswar (in Physical Mode).

Key Points: Principles of computational visual neuroscience, with a focus on object perception and recognition, and their application in developing tools for the early diagnosis of visual disorders to help alleviate blindness. The talk highlighted AI-enabled diagnostic systems for the early detection of visual impairments, along with adaptive, personalized rehabilitation strategies grounded in neuroplasticity and digital therapeutics. By integrating computational models, clinical insights, and scalable technologies, this work aims to deliver accessible and cost-effective vision care solutions, particularly for resource-constrained settings, ultimately improving functional vision, enhancing quality of life, and contributing to blindness alleviation in India.

Bio -Data: Dr Tapan K Gandhi is Head of Centre for Biomedical Engineering, IIT Delhi and AIIMS New Delhi. He is Professor in the Dept. of Electrical Engineering, Cadence Chair Professor of AI and Automation, Associate Faculty in School of AI, IIT Delhi. Dr Gandhi has done his PhD in Biomedical Engineering, followed by 3 years as Postdoctoral Associate at MIT, USA. He is awarded the first INSPIRE Faculty in India in the engineering & technology category of the Department of Science & Technology, Govt. of India. His research expertise spans from Innovation in Healthcare Technology, Digital Health, Brain imaging, Cognitive Computing, Artificial intelligence to Responsible Gaming. He has published papers in top ranking journals like Nature, Science, PNAS, Current Biology, PloS Biology, IEEE Transactions. He has more than 300 publications in international journals and conference proceedings. His research work is not only published in top-notch journals but also appeared in many popular presses

including TIME magazine, the Boston Globe, the New York Times, MIT News, Harvard News, Wall Street Journal and also in the SCIENCE Magazine. Dr Gandhi's work was selected as cover page in SCIENCE Magazine in 2015. Dr Gandhi's lab is involved in various Govt. funded, international projects, and Industry consultancy. He is mentoring a few Startups. He is serving as expert member (Task Force) in various research and strategic committees in Govt. of India including expert member under the National One Health Mission (The apex body in India) to formulate Technology enhanced integrated surveillance and outbreak investigation.

Dr Gandhi holds the prestigious Abdul Kalam Technology Innovation National Fellowship. He is elected Fellow of National Academy of Engineering (FNAE), Elected Fellow of National Academy of Sciences, India (FNASc.) and also elected Fellow of International Artificial Intelligence Industry Alliance (AIIA). Dr Gandhi holds Adjunct Professorship in the Dept. of Electronics, IIT(ISM) Dhanbad and also is appointed as Honorary Advisor to Armed Forces Centre for Computational Medicine, (AFMC), Pune, India.

No. of Participants: 400
E-mail : Tapan.Kumar.Gandhi@ee.iitd.ac.in

(ii) The 78th lecture of the INAE Distinguished Lecture Series was organized by INAE Bhubaneswar Chapter, jointly with SOA University, CSIR-IMMT Bhubaneswar, IIT Bhubaneswar, NISER Bhubaneswar and IEEE Bhubaneswar Sub-section and delivered by Prof. Santanu Chaudhury, Professor & Dean, School of Advanced Computing, Ashoka University ON "Causal AI : Emerging Perspectives and Applications" on April 11, 2026 between 4.30 PM to 6.00 PM at Convention Center, Ground Floor, Campus-2, Ghatikia, Bhubaneswar (in Physical Mode)

Key Points: Artificial intelligence systems have achieved remarkable success in pattern recognition and prediction, yet most modern AI models primarily learn correlations rather than true cause–effect relationships. Causal AI seeks to address this limitation by integrating principles from causal inference, statistics, and machine learning to enable systems that can reason about interventions, counterfactuals, and decision-making under uncertainty. This talk provided a review of causal AI. It illustrated use of Causal AI in Computer Vision problems.

Bio-Data: Prof Santanu Chaudhury did his B.Tech (1984) in Electronics and Electrical Communication Engg and Ph.D (1989) in Computer Science and Engg. from I.I.T, Kharagpur. Presently, he is Dean and Professor in the School of Advanced Computing at Ashoka University. He retired from the position of Professor in the department of Electrical Engineering., IIT Delhi on January 31st, 2026. He had been Director, IIT Jodhpur and Director CSIR-Central Electronics Research Institute. He was also Dean, Undergraduate Studies at IIT Delhi. He held several Chair Professor positions at IIT Delhi.

He was awarded INSA Medal for Young Scientists in 1993. He is a Fellow of Indian National Academy of Engineering (INAE), The National Academy of Sciences (NASI) and International Association of Pattern Recognition (IAPR). He is also a recipient of Distinguished Alumni Award of IIT Kharagpur. He has over 350 publications in reputed Journals and conferences and 15 patents with technologies commercialised by global industries. His areas of interests are Computer Vision, Artificial Intelligence, Digital Heritage, AR-VR &Multi-sensory media.

No. of Participants: 420
You tube Link: https://www.youtube.com/live/sjJ9tXUVeWw?si=Q0Q6xu4CYjjdZ2aI

INAE Kharagpur Chapter

INAE Kharagpur Chapter formally launched its Lecture Series by Eminent Researchers on June 1, 2026, at the S. N. Bose Auditorium, IIT Kharagpur. The inaugural event was conducted in physical mode and witnessed enthusiastic participation from faculty members, researchers and students. The inaugural lecture was delivered by Prof. Sushmita Mitra, Professor and Former Head of the Machine Intelligence Unit, Indian Statistical Institute (ISI), Kolkata, on the topic "Harnessing Artificial Intelligence for Healthcare". In her insightful presentation, Prof. Mitra highlighted the transformative role of Artificial Intelligence (AI) in modern healthcare, emphasizing the use of machine learning and deep learning techniques for disease diagnosis, medical image analysis, survival prediction, and clinical decision support. The inaugural lecture was followed by a special session on the "INAE Individual Membership Program", presided over by Dr. Tinku Acharya, Founder and CEO of Videonetics Technology Private Limited. Dr. Acharya provided valuable insights into the objectives of INAE, the significance of individual membership, and the nomination process.

The program along with the two lectures are available on the following Google Drive link

https://drive.google.com/drive/folders/12D1u8lan7exbbXR4gbPcQ4svne9VPJEy?usp=sharing

INAE Hyderabad Chapter

One- Day Seminar on "Quantum Sensors for Defence Applications" on July 16, 2026

DRDO in association with Sensors Research Society and INAE Hyderabad Chapter organized one day Seminar on "Quantum Sensors for Defence Applications" on Thursday, 16th July 2026 from 1130 hrs. (IST) onwards at DRDL Seminar Hall, Kanchanbagh, Hyderabad in hybrid mode. Dr. V K Saraswat, FNAE, Former Member, Niti Aayog, Former Secretary DD R&D, DG DRDO and SA to RM was the Chief Guest at the said event who delivered the Plenary Address, besides addresses, delivered by various other eminent speakers. The Welcome Address was delivered by Dr. Jaganath Nayak, FNAE DS & DG (MSS) followed by a briefing on "Ongoing QT initiatives through DIACOEs & Opportunities" by Dr. N. Ranjana, OS, Director, DFTM, DRDO HQs. The next feature was Addressed by Directors - RCI, DRDL, ASL, DSP, DLRL & CHESS. The Plenary Address by Dr. V K Saraswat, FNAE was an important feature of the program and captivated the august audience. The post lunch session commenced with talk on "Overview of Quantum Technologies" by Dr. Sardar Santu, Director, DYSL-QT followed by lectures on "Rydberg Atom based Sensing and its Defence Applications" by Prof. Ashok Mohapatra, NISER, Bhubaneshwar; "Quantum Clocks" by Prof. Subhadeep De, IUCAA, Pune and "Magnetic Field based Navigation" by Shri. Mallikarjuna Sarma, Founder, QuBeats. The seminar ended with the Closing Remarks by Director, DRDL and Director, DFTM. The seminar had good participation and was well appreciated by the august audience.

INAE Bangalore Chapter

This year, Prof. Roddam Narasimha Memorial Lecture was delivered **by** Prof. O N Ramesh, Indian Institute of Science Bangalore at 11:30 AM on 20th July 2026 (Monday) at SR Valluri Auditorium, NAL, Bangalore to be held in a hybrid mode. The title of the lecture was **"**Transition, Turbulence and All That.....". The speaker highlighted that late Prof Roddam Narasimha, FNAE had made lasting contributions to a wide range of problems in fluid mechanics and aerodynamics. The talk focussed on one particular thread through his work on transition and turbulence. Beginning with turbulent spots and transition, the speaker discussed intermittency, concentrated breakdown, bursting and episodic descriptions of turbulence and explored some of the connection between them. The underlying theme is a simple one: that turbulence may often be understood by focusing on significant events rather than on average quantities alone. The lecture was not intended as a historical reviewe as opined by the speaker but rather a personal perspective on a set of ideas that continue to be relevant to current turbulence research.

About the Speaker:

Prof. O N Ramesh obtained his B.Sc. (Physics) from Loyola College, University of Madras, and his M.E. (Mechanical Engineering) and Ph.D. (Aerospace Engineering) from the Indian Institute of Science, Bengaluru. Following Postdoctoral research at the Engineering Department, University of Cambridge, UK, he joined the Department of Aerospace Engineering at IISc, where he has been on the faculty since 2000. His research interests include laminar-turbulent transition, turbulence, separated flows, and turbomachinery aerodynamics.

INAE Forums

The following are the updates on activities carried out by INAE Forums during the period April to July 2026.

INAE Forum on Civil Infrastructure

The INAE Forum on Civil Infrastructure, chaired by Prof Prem Krishna, former Vice President, INAE consisting of domain experts is presently undertaking a study on issues related to civil infrastructure in India and to deliberate on the preparation of a comprehensive report. Meetings were held to review the progress of the study which were attended by members of the Forum along with invited experts, and detailed discussions were held on the structure and content of the proposed report. Emphasis was placed on integrating technical aspects with broader considerations relating to policy, regulatory frameworks, and societal engagement in infrastructure development. In order to enrich the report with relevant and updated information, members were requested to interact with institutions and experts working in related fields. Inputs were sought from organizations dealing with buildings, transportation, sustainability, and construction technologies. Discussions were also held on establishing relationships between projected material requirements, costs, and the associated carbon footprint of infrastructure development, particularly in cement, steel, and other construction materials, as well as the need to consider emerging sustainability concerns such as embodied carbon and environmental impact. The Forum emphasized that the scale and unique context of the Indian infrastructure scenario must be carefully taken into account.

The recommendations emerging from the study are expected to be prioritized, with those considered most critical for implementation in the next five to ten years receiving the highest priority. The Forum considered the possibility of preparing case studies related to infrastructure projects, such as buildings and bridges, which could illustrate practical approaches to reducing carbon footprints and improving sustainability in the built environment. The report is under preparation and shall be finalized shortly. The Forum is nearing completion of its report and held rigorous deliberations with experts on April 10, 2026; June 10, 2026, July 10-11, 2026 and July 31, 2026 to finalize the report on “Sustainability of Civil Infrastructure. During the meetings it was reported that a good number of Case Studies have been received and their finalisation is in progress. The members were briefed regarding the status of the INAE – CAETS linkage concerning the ongoing study on sustainability. It was brought out by him that a brief presentation was made about this study at CAETS 2025 Annual Meeting in September 2025 and a brief updated version will be expected to be presented at CAETS 2026, again in September 2026. The said report by the Forum is in advanced stage of finalization.

New Proposals for Forums

During the Governing Council meeting on March 21, 2026 the concept of INAE Forums was reviewed. The genesis of this initiative is certain INAE Forums had earlier brought out pertinent reports including technology roadmaps on topical issues however, most had completed/exceeded their tenure and therefore, proposals for new Forums are being invited with slightly revised guidelines and format as approved by the Governing Council during the meeting. The objective of the forums is development of a policy document on selected engineering theme or domain to help the country (government, funding agencies, educational institutions, research organizations, industry and users) formulate a policy,

strategy and roadmap for immediate or distant future. Proposals for constituting of INAE Forums on topics of engineering and technological interest to society were invited on the revised guidelines and format by the last date of July 15, 2026. The proposals received are being selected and approved during the forthcoming Governing Council Meeting on September 9, 2026. Besides the above, the two newly constituted Forums on Nuclear Energy and Critical Minerals have commenced the tasks accordingly.

INAE Schemes

Mentoring of Engineering Students by INAE Fellows/Young Associates

Meritorious 3rd / 4th year B.E./ B.Tech/ B.Sc (Engg.) students from engineering colleges/ institutions recognized by AICTE/Ministry of Education (MoE) securing minimum first-class marks or equivalent CGPA only are eligible for mentoring. Applications for the year 2026–27 under the scheme "Mentoring of Engineering Students by INAE Fellows/Young Associates" were invited during February 5, 2026. The last date for receipt of nominations was extended to May 3, 2026. A total of 56 nominations were received and were approved by 159th Governing Council meeting held on 30th June 2026 (List enclosed as Annexure I can be viewed by clicking here….).

INAE Chair Professorships and Distinguished Professorship Technologists

The applications for the year 2026–27 under the INAE Chair Professorships and INAE Distinguished Professorship for Technologists schemes were invited on 4 June 2026. The last date for receipt of applications/nominations is September 30, 2026. Further details can be viewed on INAE website www.inae.in at the links https://www.inae.in/research-innovation/inae-chair-professorship/ and https://www.inae.in/research-innovation/inae-distinguished-professors-technologists/

International Affairs

CAETS Energy Community

The CAETS Energy Community is undertaking a global study titled "Towards Reliable Low-Carbon Energy for All: Assessment of Risks and Opportunities," co-chaired by Dr. Ajay Mathur, FNAE and Mr. Pradeep Chaturvedi, Vice President, INAE. The study aims to assess pathways for achieving reliable, affordable, and sustainable low-carbon energy while examining the associated risks and opportunities across different regions.

The CAETS Energy Community Meeting held on 27 April 2026 deliberated on the draft concept note, focusing on the scope, objectives, and broad framework of the proposed study. Following the meeting, the concept note was finalized and circulated to CAETS Member Academies and domain experts for comments and inputs. Subsequently, a meeting of the key members of the CAETS Energy Community was held on 12 June 2026, during which the inputs received were reviewed and the methodology, operational framework, and broad outline of the report were finalized, including the reporting structure, expected deliverables, and mechanisms for collaboration among participating academies.

The interim draft of the study will be presented during the CAETS 2026 Annual Meeting in Munich, Germany, with the final report scheduled for release at the CAETS 2027 Annual Meeting in Rotterdam, Netherlands.

CAETS Engineering Education Working Group (EEWG)

The CAETS Engineering Education Working Group (EEWG), co-chaired by Prof. Indranil Manna, Immediate Former President, INAE and Prof. Ed Lazowska, serves as a platform for member academies to exchange perspectives, identify emerging challenges, and develop recommendations for strengthening engineering education in response to evolving technological and societal needs. Building upon discussions held during previous Working Group meetings and the CAETS 2025 Annual Meeting in Brisbane, the EEWG reviewed a preliminary compilation document capturing the key observations and recommendations that have emerged from its deliberations on engineering education.

During the 12th online meeting held on 2 May 2026, members discussed the structure and content of the compilation, emphasizing the need to enrich the document with relevant statistical information, comparative perspectives, and illustrative examples from different countries while acknowledging the challenges of obtaining comparable international data. The Working Group also reviewed the AI White Paper prepared under its auspices and deliberated on emerging developments in artificial intelligence, including their implications for engineering education and the importance of ethical considerations in the adoption of AI technologies.

Based on the discussions and inputs received from members, the compilation document and the AI White Paper are being further refined. Members have been invited to provide additional comments and country-specific inputs to strengthen the publications. The Working Group also deliberated on its future course of action, including mechanisms for sustaining collaboration among member academies and continuing engineering education initiatives within the CAETS framework.

Visit to INAE Office

Prof. Gareth H McKinley, School of Engineering Professor of Teaching Innovation' Dept. Mechanical Engineering, MIT, Cambridge, USA who was elected as a Foreign Fellow of INAE during the year 2025 visited INAE Office, New Delhi on May 21, 2026 and signed the Fellowship Register in presence of Mr Pradeep Chaturvedi, Vice President, INAE; Prof YM Joshi, FNAE, Professor, IIT Kanpur and Prof Abhijit R. Abhyankar, FNAE, Professor, IIT Delhi.

Prof Gareth H McKinley signing the Fellowship Register

Presentation of Fellowship Certificate by Mr Pradeep Chayurvedi, Vice President, INAE to Prof Gareth H McKinley

(Left to Right) Prof YM Joshi, FNAE; Mr Pradeep Chaturvedi, Vice President, INAE; Prof Gareth H McKinley; Prof Abhijit R. Abhyankar, FNAE and Lt Col Shobhit Rai (Retd) Deputy Executive Director, INAE

INAE Awards

INAE Young Engineer Award 2026

Nominations had been invited for the INAE Young Engineer Award 2026 in January 2026 (which had been reinstated last year) with the last date of application as March 2026 which was extended to April 15, 2026 as per practice each year. All INAE Young Awardees shall become INAE Young Associates on conferment of the award. This year also, like last year there was a phenomenal response to the call for nominations for INAE Young Engineer Award 2026 with receipt of 226 valid nominations as against 223 in the year 2025 and 110 in the year 2024. On similar lines as last year, a three-stage selection process was followed. During the first stage, the screening was carried out by the Sectional Committee Members online followed by the second stage wherein the Sectional Committees during their first meetings held from 15th to 29th May 2026 shortlisted 58 nominees for making presentations before the Selection Committee for INAE Young Engineer Award 2026 in the third stage, during meetings held on June 22nd to 24th, 2026 and recommended 30 nominees which were approved by the Governing Council. The names of nominees selected for conferment of INAE Young Engineer Award 2026 have since been uploaded on INAE website and can be viewed at the link https://www.inae.in/inae-young-engineer-award/

INAE Young Innovator & Entrepreneur Award 2026

The INAE young Innovator & Entrepreneur Award is instituted to encourage and recognize innovation and entrepreneurship among Young Engineers. The nominations for INAE Young Innovator & Entrepreneur Award for the year 2026 were invited during February 5, 2026. The extended last date for seeking nominations was May 15, 2026. The selection process for the subject award is carried out in two stages. In the first stage, the nominations received are scrutinized and shortlisted through evaluation and award of marks on the basis of the approved selection criteria. In the second stage, the shortlisted candidates are invited to make presentations on their work before the Selection Committee for detailed assessment and final recommendation.

A total of 34 valid nominations were received. All eligible nominations were subsequently forwarded to the esteemed members of the Selection Committee for detailed evaluation. Each nomination was assessed in accordance with the prescribed evaluation criteria and awarded a score out of a maximum of 15 marks. Based on the evaluation scores received, the Selection Committee, at its meeting held on 9 June 2026, shortlisted eleven (11) nominees for the next stage of the selection process. The shortlisted nominees were invited to make presentations on their work before the Selection Committee on 2 July 2026 and 3 July 2026. The presentations were evaluated in accordance with the criteria specified therein. Based on the comprehensive evaluation of the nominations and the presentations made by the shortlisted nominees, the Selection Committee finalized its recommendations. The names of the selected nominees will be placed before the INAE Governing Council for its consideration, approval, and subsequent conferment of the INAE Young Innovator & Entrepreneur Award 2026.

INAE Innovative Student Projects Award 2026

Indian National Academy of Engineering (INAE) instituted this award to recognize innovative and creative projects undertaken by engineering students at the Bachelor's and Master's levels, as well as theses of research scholars at the Doctoral level. The award aims to encourage young talent by providing early recognition and national-level visibility for outstanding engineering innovations and research contributions. Following its temporary suspension during 2022–23, the award has been reinstated in 2025–26. Accordingly, nominations have been invited for eligible projects and theses completed during the academic years 2022–23, 2023–24, 2024–25, and 2025–26, thereby ensuring that deserving work undertaken during the intervening period receives due consideration. The call for nominations for the INAE Innovative Student Projects Award 2026 was announced on 14 April 2026, and the last date for receipt of nominations was 31 July 2026.

INAE Publications

Transactions of Indian National Academy of Engineering – An International Journal of Engineering and Technology"

INAE is currently publishing a Journal named "Transactions of Indian National Academy of Engineering – International Journal of Engineering and Technology" published by M/s Springer which was earlier named INAE Letters. Transactions of INAE - Volume 11, Issue 2 June 2026 was published through Springer Publishers during the period April to July 2026. Further details are on Springer website at the link https://link.springer.com/journal/41403

INAE Membership

The INAE Individual Membership category was established to broaden the Academy's engagement with the engineering community by recognizing accomplished professionals from industry, R&D, academia, engineering services, entrepreneurship, and government/private organizations. Through a structured and approved selection process, Individual Membership is conferred on mid-career and senior engineering professionals who demonstrate significant potential and are on the path to achieving the distinction of INAE Fellowship. The Membership category is subscription-based and operates on an annual renewal cycle.

The need for focused and innovative strategies to substantially expand the membership base has been undertaken and following action are noteworthy:

- I**NAE Technology Conclave 2026**: The Technology Conclave 2026 was conducted at SOA University, Bhubaneswar (11–12 July 2026), for enhancing awareness of INAE and attracting new members.
- **Enhanced Fellow Engagement:** Fellows are encouraged to recommend at least **five distinguished engineering professionals** each for Individual Membership and to actively facilitate Institutional and Corporate Memberships to strengthen INAE's national engineering network.
- **Membership Growth and Institutional Support:** INAE acknowledges with gratitude the generous support received from leading corporates and institutions, including HAL, Infosys Foundation, and several premier academic and research organizations. These partnerships reflect strong confidence in INAE's mission and contribute significantly to its long-term financial sustainability.

  The Academy currently comprises:
  - **38 Institutional Members** (30 Diamond, 2 Ruby, and 6 Coral).
  - **310 Individual Members** (196 Senior Members and 114 Associate Members).

INAE also gratefully acknowledges the generous contribution made by Larsen & Toubro to the INAE Corpus Fund.

Strengthening the INAE Corpus Fund

The INAE has also appealed to the Fellowship to support the Academy's transition towards long-term financial sustainability through voluntary contributions to the INAE Corpus Fund. This phase presents an important opportunity to strengthen INAE's institutional capacity and expand its impact in advancing engineering for national development. Contributions to the Corpus Fund are regarded as a collective responsibility of the Fellowship and a strategic investment in the Academy's future.

In recognition of donors, INAE has a **Wall of Donors** on its website at the link https://www.inae.in/wall-of-donors/

Account Details and QR code:
Account Name: INAE Corpus Fund
Account No.: 41790835603
Bank: Branch – NIHFW, Munirka (earlier old JNU), New Delhi
IFSC: SBIN0001624
Account Type: Savings

Tax Benefits:
Donations qualify for 50% tax deduction under Section 80G (for those under the old tax regime), with receipts and certificates issued within a quarter.

INAE expresses deep gratitude to all supporters and continues to welcome contributions from Fellows, Young Associates, Awardees, and Corporate partners, which are essential to ensuring INAE's long-term self-reliance and mission continuity.

Important Meetings held during April 1, 2026 to July 31, 2026

April 10, 2026	Meeting of INAE Forum on Civil Infrastructure held at New Delhi in hybrid mode
April 18, 2026	Apex Committee Meeting held at New Delhi in hybrid mode
April 19, 2026	Meeting on CEEE Program: Way Forward
April 24, 2026	Meeting of the SC VIII on Publication of Technology Review/ Forecasting/Gap analysis Reports for 2026 held over Webex
April 27, 2026	First Online meeting of CAETS Energy Community
April 30, 2026	Meeting of Conveners with Vice-President (fellowship & Awards), INAE regarding nominations for Fellowship 2026
May 2, 2026	12th Meeting of CAETS Engineering Education Working Group (EEWG) held online
May 15th to June 1st, 2026	First meetings of 10 Sectional Committees to shortlist nominees for Fellowship and Young Engineer Award 2026
June 2, 2026	Online Meeting of PEC domain experts - Green Manufacturing Technologies under India Taiwan Science & Technology Cooperation
June 3, 2026	Online Meeting of PEC domain experts - Artificial Intelligence, IoT, Big Data, Cyber Security under India Taiwan Science & Technology Cooperation
June 4, 2026	Online Meeting of PEC domain experts - Healthcare including Functional genomics, Drug development and biomedical devices, Agricultural Engg. under India Taiwan Science & Technology Cooperation
June 5, 2026	Online Meeting of PEC domain experts - Green Energy Technology, Renewable Energy (Solar and Bio)/ Clean Energy under India Taiwan Science & Technology Cooperation
June 8, 2026	Online Meeting of PEC domain experts - Semiconductor & Communication under India Taiwan Science & Technology Cooperation
June 9, 2026	1st Shortlisting Meeting of INAE Young Innovator & Entrepreneur Award 2026
June 10, 2026	Meeting of INAE Forum on Civil Infrastructure
June 19, 2026	47th Finance Committee Meeting of INAE
June 22, 23 & 24, 2026	Presentations by shortlisted nominees for INAE Young Engineer Award 2026 before Selection Committee
June 30, 2026	159th Governing Council Meeting of INAE held at New Delhi in hybrid mode
July 2, 2026	Second stage Meeting of INAE Young Innovator & Entrepreneur Award 2026
July 10, 2026	Finalization of Report -INAE Forum for Civil infrastructure
July 13 to July 24, 2026	Second meetings of 10 Sectional Committees to recommend nominees for Fellowship
July 31, 2026	Meeting of INAE Forum on Civil Infrastructure
July 31, 2026	CAETS Energy Community Online Meeting

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International/National Conferences in September, October and November 2026

C5G 2026: International Conference on 5G for Sustainable Development online and in-person on 28th to 29th September 2026 at Jaipur, Rajasthan,
https://ic5g.in/

International Conference on Artificial Intelligence and Emerging Applications 2026 (AIEA – 2026) online and in-person on 5th to 6th October 2026 at Ghaziabad, Uttar Pradesh
https://aiea2026.laeconference.com

International Conference on Advanced Design, Materials, and Biomedical Engineering (ICDMB 2026) in-person on 8th to 9th October 2026 at Bhopal, Madhya Pradesh
http://icdmb26.manit.ac.in/

International Conference on Advances in Mechanical Engineering and Nanotechnology ICAMEN 2026 online and in-person on 29th to 31st October 2026 at Jaipur, Rajasthan
https://icamenmanipal.in/

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Honours and Awards

(covering the period April to July 2026)

1	Professor Ganapati D. Yadav, FNAE, Former Vice-Chancellor of the Institute of Chemical Technology (ICT), Mumbai; Bhatnagar Fellow; National Science Chair; Padma Shri awardee, and Chairman of BOG, LITU, Nagpur was selected as the 2026 P.V. Danckwerts Memorial Lecturer. He will deliver his lecture titled "Engineering Science Repurposed: Catalysis, Circularity, Sustainability, and Molecular Pathways to a Net-Negative Future" on November 9, 2026, at the AIChE Annual Meeting in Minneapolis, USA which is widely regarded as one of the highest recognitions in chemical engineering internationally. Further strengthening his global standing, he has been elected International Fellow of the Canadian Academy of Engineering, becoming the first Indian citizen to receive this honour and will be formally inducted at Edmonton, Canada, on June 1, 2026. Further details can be viewed at the link https://share.google/U4J529XAcxJQtUlp9
2	Prof Manindra Agrawal, FNAE, Director, IT Kanpur has been elected a Fellow of the Royal Society, one of the world's most prestigious scientific honours. The recognition places him among an elite group of scientists whose work has shaped modern knowledge, including figures such as Isaac Newton and Albert Einstein. Prof Agrawal received the honour for his pioneering contributions to theoretical computer science, especially the AKS primality test, a breakthrough that changed the way mathematicians think about prime numbers. Further details can be viewed at the link https://timesofindia.indiatimes.com/science/meet-manindra-agrawal-iit-kanpur-director-elected-fellow-of-the-prestigious-royal-society-joining-the-ranks-of-einstein-and-newton/articleshow/131228216.cms
3	Prof Ulrich L. Rohde, a Foreign Fellow of INAE became a member of the team of MIT and an honorary member of the Bavarian Academy of Science and Humanities in Munich where Albert Einstein and Heisenberg were members.
4	Several distinguished Fellows of INAE have been awarded the prestigious National ANRF - J C Bose Grant - 2026 including Prof. Deepankar Choudhury, IIT Bombay; Prof Surjya Kanta Pal, IIT Kharagpur; Prof Sivaji Chakravorti, Vice President, INAE, Jadavpur University; Prof V Ramgopal Rao, Birla Institute of Technology & Science; Prof Hirendra Nath Ghosh, NISER, Bhubaneswar; Prof Samit K Ray, IIT Kharagpur; Prof Bidyadhar Subudhi, NIT Warangal; Prof Suddasatwa Basu, IIT Delhi; Prof T Pradeep, IIT Madras; Prof Jitendra Sangwai, IIT Madras; Prof Kirti Chandra Sahu, IIT Hyderabad; Prof. Sushmita Mitra, ISI Kolkata; Prof Sudip Misra, IIT Kharagpur and Prof Yogesh Singh Chauhan, IIT Kanpur.
5	Prof Gareth H McKinley, a Foreign Fellow of INAE and Paul A. Samuelson Professor of Economics, Emeritus, Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge has been elected Member of The National Academy of Sciences announced in recognition of his distinguished and continuing achievements in original research.
6	Dr Manmath Kumar Badapanda, FNAE, Adjunct Professor, IIT (ISM), Dhanbad and formerly Scientific Officer-H, Raja Ramanna Centre for Advanced Technology, Indore has been awarded the prestigious DAE Raja Ramanna Chair. This distinguished honour recognizes his outstanding contribution & exceptional achievements in the field of advanced power converters, scientific mentorship and nation building.

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NEWS OF FELLOWS

(covering the period April to July 2026)

1	Prof. Umesh V. Waghmare, FNAE, President of Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru, has taken over as Secretary, Department of Science & Technology (DST). Further details can be viewed at the link https://www.biospectrumindia.com/news/66/28068/prof-umesh-v-waghmare-takes-charge-as-new-india-dst-secretary.html
2	Prof Abhay Karandikar, FNAE, Former Secretary DST has been appointed as Full Time member Niti Aayog. Further details can be viewed at the link https://indianexpress.com/article/india/niti-aayog-new-members-aiims-dst-ashok-lahiri-vice-chairperson-10655579/
3	Dr. R. Sundaravadivelu FNAE. Emeritus Professor (Retd), IIT Madras; Chairperson, Bureau of Indian Standards Sectional Committee (CED 47) Ports, Harbours and Offshore Installations & Director, Prof. R. Sundaravadivelu Advisory Services Pvt Ltd has authored a book on "Port and Harbour Structures" published by Taylor & Francis Books.
4	Dr. Jagannath Nayak, FNAE, Director, Former Associate Dean, Electro- Optic Instrument Research Academy (ELOIRA) & Project Director, Fiber Optics Gyro, Centre for High Energy Systems & Science (CHESS), DRDO, Hyderabad has taken over as Director General of Missiles & Strategic Systems (MSS) at the Defence Research and Development Organisation (DRDO). https://hyderabadmail.com/jagannath-nayak-appointed-drdo-director-general-missiles-strategic-systems/
5	Captain Mohan Ram, VSM, IN (Retired) FNAE, Former Consultant, TVS Motor Company Ltd., Hosur (Tamil Nadu), has authored a book "A Builder's Navy- The Long Road to Self-sufficiency in Warship Design" which has been released. The publishers are Sabre & Quill, New Delhi. It is also available from Amazon and Flipkart. The book traces the remarkable growth of the Indian Navy's design capability from a zero base to design of aircraft carriers and nuclear submarines.

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ENGINEERING AND TECHNOLOGY UPDATES

Civil Engineering

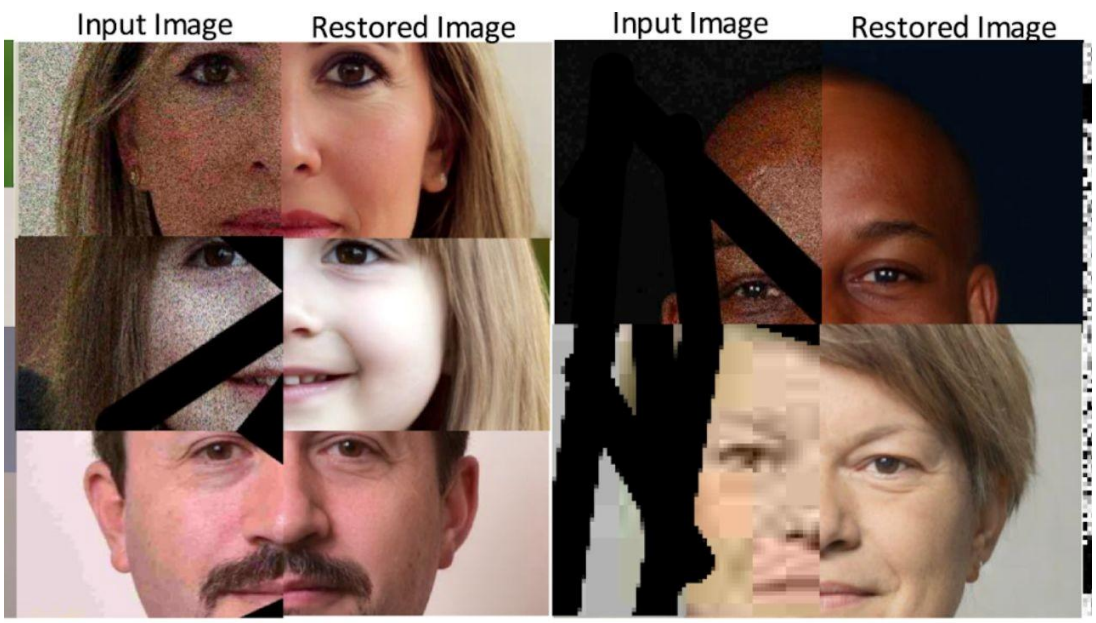
1. Researchers develop battery-free smart sensor for structural health monitoring

Scientists have developed a battery-free smart sensor that generates its own electricity from movement, offering a potential solution to one of the biggest challenges facing connected devices: how to keep billions of sensors powered without constant battery replacement. As sensors become increasingly common in healthcare, manufacturing, transport and smart buildings, keeping them powered remains a major challenge. Batteries must be replaced or recharged, increasing maintenance costs and limiting long-term monitoring, particularly in remote or inaccessible locations. Researchers at Atlantic Technological University (ATU) have created a flexible self-powered sensor that converts everyday mechanical vibrations into electricity while simultaneously monitoring those vibrations in real time. The technology could support the next generation of wearable healthcare devices, structural health monitoring and Internet of Things (IoT) applications without the need for external power supplies. The technology has the potential to make connected devices more practical by reducing the need for regular maintenance. At the centre of the technology is a flexible piezoelectric nanogenerator (PENG). Piezoelectric materials generate electricity when they are bent, pressed or vibrated. The device combines bismuth oxychloride (BiOCl) nanosheets with a flexible polyvinylidene fluoride (PVDF) polymer. Together, these materials enhance the sensor's ability to convert mechanical energy into electrical signals, enabling it to harvest energy and continuously monitor vibrations without an external power source. Health monitoring, home security systems, and supporting independent living will be some of the applications for the sensor. One of the biggest challenges was developing a material that could both harvest energy and remain sensitive enough to detect even small vibrations. To demonstrate the technology, the researchers integrated the sensor into a wireless smart security system. Mounted on a door, it detected mechanical impacts and wirelessly transmitted vibration data without requiring a battery. The future of connected devices depends on sensors that can operate independently for years without battery replacement. The team believes the technology could support the next generation of structural health monitoring, predictive maintenance, wearable healthcare technologies and intelligent IoT systems. Future applications include monitoring heart rate, breathing, movement and rehabilitation, as well as fall detection, smart prosthetics, sports performance monitoring and wearable medical devices. Beyond healthcare, the technology could also help monitor machinery, buildings and other critical infrastructure, reducing maintenance requirements while improving long-term reliability.

Source https://www.atu.ie/news/researchers-develop-battery-free-smart-sensor-for-structural-health-monitoring

Computer Engineering and Information Technology

2. IIT Gandhinagar researchers develop GenR, Brings Old Faces Back to Life



Faded family photographs, blurred faces and damaged archival images could soon get a new lease of life, thanks to an artificial intelligence tool developed by researchers at the Indian Institute of Technology Gandhinagar (IITGN) and IIT BHU.The researchers have developed Generative Latent Inversion for Blind Face Restoration (GenR), an AI-powered framework designed to reconstruct faces from severely degraded images without relying on paired clean-and-damaged training images. The study uses a StyleGAN3-based inversion technique to generate plausible high-quality versions of damaged faces while attempting to preserve their identity and structure. GenR works through three optimisation stages, first identifying global characteristics such as facial structure, identity and pose, before refining features including the eyes, nose and jawline and finally enhancing skin, hair and other textures. Researchers tested the system on denoising, image upsampling, inpainting and deartifacting tasks. The framework reportedly produced a restored image in about 30 seconds for single-degradation tasks. However, the researchers cautioned that extremely damaged images could lead AI to generate realistic details that do not accurately represent the original person. Potential applications include historical photo preservation, digital heritage, forensic analysis, video conferencing and social media. The IITGN team has also worked on Video-ASTAR, a training-free text-to-video approach designed to maintain consistency of objects and their relationships across generated video frames. As World Photography Day highlights the importance of preserving visual memories, the researchers believe AI could play an increasingly important role in protecting old images while also creating visual representations of memories that were never photographed.

Source https://theblunttimes.in/iit-gandhinagar-researchers-develop-genr-brings-old-faces-back-to-life/69999/

Mechanical Engineering

3. Engineering breakthrough: Scientists 3D-print one of the world's hardest metals

Scientists in Japan have found a new way to 3D print one of the hardest materials used in industry, and that too, without destroying the very properties that make it so valuable. Researchers at Hiroshima University have successfully produced tungsten carbide-cobalt (WC-Co), cemented carbide using a laser-based 3D-printing technique. The resulting material had a hardness of more than 1,400 HV, a measure of how strongly a material resists being scratched or indented. That does not make it the world's strongest metal. But it does put the material among the hardest engineering materials commonly used in industry. WC-Co is widely used for cutting tools, drills, machining equipment and construction tools because it can withstand intense wear and repeated use. It combines tungsten carbide, which provides the extreme hardness, with cobalt, which acts as a metallic binder holding the carbide particles together. The problem is that making these components is difficult and expensive. Conventional manufacturing generally involves compressing tungsten carbide and cobalt powders and heating them through a process called sintering. Because tungsten and cobalt are costly, wasting material is a major drawback. This is where 3D printing could make a difference. Instead of shaping a large amount of material and removing what is not needed, additive manufacturing builds an object by depositing material where it is required. The researchers used a process called hot-wire laser irradiation, which combines a laser with preheated filler wire. The key breakthrough was to soften the material rather than fully melt it. Completely melting tungsten carbide can change its internal structure and damage the properties that give it its exceptional hardness. The team tested different ways of directing the laser. One approach produced defects because some tungsten carbide decomposed. Another suppressed that problem but allowed iron from the base material to enter the structure, reducing its hardness. Researchers overcame this by adding a middle layer made from a nickel-based alloy and carefully controlling the temperature. The final material exceeded 1,400 HV without tungsten carbide decomposition or major defects. The achievement could eventually make it easier to manufacture complex carbide components while using less expensive raw material.

Source https://www.indiatoday.in/science/story/japan-3d-print-tungsten-carbide-ultra-hard-material-2963873-2026-08-05

Chemical Engineering

4. **Breakthrough Catalyst for Green Hydrogen Production Unveiled By IIT-Guwahati**

Researchers at the Indian Institute of Technology-Guwahati have developed a low-cost catalyst to produce hydrogen from water, which can help support the country's National Green Hydrogen Mission and accelerate the transition to sustainable energy sources. Hydrogen is considered an important part of the global shift to clean energy. When hydrogen is used to produce energy, it generates only water as a byproduct, unlike petroleum-based fuels that release pollutants. Hydrogen is also used in fuel cells and serves as a raw material in several industrial processes, including the production of fertilisers. Currently, 90-95 per cent of hydrogen is produced from fossil fuels. 'Grey' and 'blue' hydrogen are produced from natural gas, and 'brown' and 'black' hydrogen from coal. Their production releases greenhouse gases, which negates the environmental benefits of using hydrogen. Water is the cleanest source of hydrogen, and producing hydrogen from water through electrolysis requires efficient catalysts, with researchers around the world studying different materials for this purpose. The most effective catalysts currently available are made from rare and expensive noble metals, which limits their large-scale use. To address this, the IIT-Guwahati researchers used a nickel salt, which is inexpensive and widely available, as one of the components of the water-splitting catalyst. However, nickel salt alone is not efficient enough for hydrogen production and it lacks stability. The researchers combined a nickel salt with an anthracene-based organic molecule. Researchers synthesised the coordination polymer (CP) based catalyst where the anthracene units are interlinked via the nickel nodes in a simple process at room temperature, aided by ultrasonic waves. In these materials, metal atoms are connected by organic molecules, forming an extended network. The structure provides a high density of active sites for the hydrogen evolution reaction and allows for efficient electron transport through the material. The results reveal a significant synergic effect in the combination of nickel and the anthracene-based framework, with each component enhancing the performance of the other.The catalyst was also stable during long-term operation. The researchers also found that nearly 88 per cent of the electrical energy was used to split water. Such low wastage is essential to develop practical systems for large-scale hydrogen production. The team carried out chemical analysis and modelling studies to understand why the catalyst performed well, and found that the nickel atoms formed a three-dimensional network with the anthracene moiety, the statement added.

Source https://www.rediff.com/news/report/iit-guwahati-develops-low-cost-catalyst-for-hydrogen-from-water/20260814.htm

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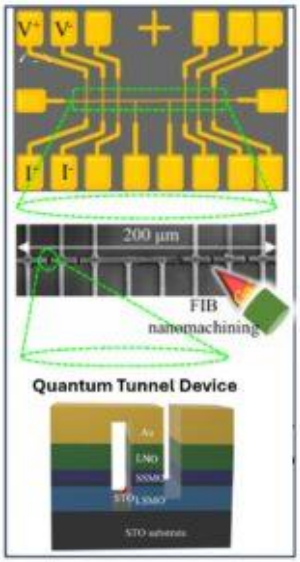
Electrical Engineering

5. Electrically controlled magnetic switching for next-gen cryogenic devices

Researchers at the Indian Institute of Science (IISc) have demonstrated a new way of switching a material between two fundamentally different magnetic states using an electric current. The discovery could pave the way for compact, energy-efficient electronic devices that store information, perform logic operations, and even interface with future quantum computers. Many magnetic memory technologies rely on changing the direction of a material's magnetisation. In this study, however, instead of simply flipping the direction of magnetisation, the team used an electric current to completely transform the material from one magnetic state to another. The researchers studied a complex oxide called $Sm_{1-x}Sr_xMnO_3$ which is known for hosting multiple magnetic states. At low current, the material exists in a ferromagnetic state in which its atomic magnetic moments are largely aligned in the same direction. In this state, electric current flows easily and resistance is low. But when the applied current crossed a critical value, the material abruptly switched to an antiferromagnetic-like state in which neighbouring magnetic moments tend to point in opposite directions. This state has much higher electrical resistance.



Current-controlled orbital reconstruction drives a transition from ferromagnetic to antiferromagnetic order in a complex oxide and associated quantum-tunnel device (Image: Suryakanta Mondal).

The team demonstrated that this electrically-driven transition is reversible and is accompanied by the collapse of long-range ferromagnetic order and a rearrangement of the material's electronic orbitals. This makes the switch different from ordinary heating or conventional current-driven reversal of magnetisation. The researchers then used the material to fabricate nanoscale tunnel devices measuring about 250 by 250 nanometres in size. These miniature devices displayed two stable resistance states, with magnetoresistance exceeding 200%. The switching could be controlled by electric current, temperature, and magnetic field. Because the effect is strongest at low temperatures, the discovery is particularly promising for cryogenic memory and logic circuits that can support quantum computing platforms, which typically operate at extremely low temperatures. The researchers now plan to work on reducing the current and energy required for switching, adapting the device for a wide range of operating temperatures, and integrating these devices into larger cryogenic memory and logic circuits. This could potentially lead to a new generation of low-power electronic and quantum devices.

Source https://www.iisc.ac.in/events/electrically-controlled-magnetic-switching-for-next-gen-cryogenic-devices/

6. India Advances Terahertz Wireless For 6G

Researchers at IIT Madras have demonstrated 6.39 Gbps wireless data transmission using the Bharat 6G THz Testbed, in collaboration with the Society for Applied Microwave Electronics Engineering & Research (SAMEER). Supported by the Telecom Technology Development Fund (TTDF), the work focuses on terahertz communication for future 6G networks. The demonstration is relevant to applications that require high data rates and low latency, including extended reality, advanced robotics, autonomous systems, and highly connected infrastructure. Higher-frequency wireless links could provide access to larger bandwidths, allowing future networks to move more data while supporting communication-intensive applications. The work also provides an indigenous environment for developing and testing high-frequency wireless technologies in India. Such testbeds can help researchers validate communication systems before potential integration into larger networks and contribute to domestic expertise in technologies being considered for future telecom standards. The Bharat 6G THz Testbed operates in the terahertz spectrum, broadly covering frequencies from 300 GHz to 10 THz. These frequencies sit between millimetre-wave and infrared bands and offer access to spectrum that can support wider wireless channels than many existing communication bands. The demonstrated link achieved a data transmission rate of 6.39 Gbps, equivalent to 6.39 billion bits per second. The technology is being evaluated as part of India's broader Bharat 6G programme, which is aimed at developing domestic capabilities for next-generation communication systems. Terahertz communication could complement other 6G technologies by providing high-capacity wireless links for specific use cases where conventional cellular frequencies may not offer sufficient bandwidth. The research therefore contributes to the development and validation of high-frequency wireless technologies that could support future 6G networks.

Source https://www.electronicsforu.com/news/india-advances-terahertz-wireless-for-6g

Aerospace Engineering

7. ISRO fires more powerful version of engine that will launch SSLV to space

ISRO has carried out a static test of the upgraded SS1 booster for the SSLV at Sriharikota. The validated changes are expected to raise payload capacity and support wider industry production. The Indian Space Research Organisation has successfully conducted a ground static test of an upgraded version of the first-stage solid booster used in the Small Satellite Launch Vehicle (SSLV), marking a significant step toward enhancing the rocket's performance and commercial appeal. The test of the improved Solid Stage-1 (SS1) motor was carried out on August 11, 2026, at the static test facility of the Satish Dhawan Space Centre (SDSC) in Sriharikota. According to ISRO, the upgraded booster incorporates several design enhancements aimed at improving performance while making the vehicle easier and more economical to manufacture. The modifications include an enhanced propellant burn rate in two motor segments, an optimised thermal protection system, and process improvements in the nozzle subsystem. Engineers have also reduced the overall mass of the stage, contributing to better efficiency. ISRO said the motor's performance during the test closely matched predicted values, validating the design improvements introduced in the upgraded stage. One of the biggest gains from the upgrade is an increase in the launch vehicle's payload-carrying capability. ISRO estimates that the improved SS1 stage will boost SSLV's payload capacity to Low Earth Orbit (LEO) by approximately 100 kilograms, making the rocket more competitive in the rapidly growing small-satellite launch market.The SSLV was developed by ISRO as a production-friendly, launch-on-demand rocket capable of quick turnaround times. Designed primarily for launching small satellites into orbit, the vehicle has already completed two successful developmental flights. The latest milestone comes as ISRO pushes ahead with plans to transfer SSLV technology to Indian industry. The transfer-of-technology process is already underway, with the goal of enabling large-scale production of the launcher by private companies. With higher payload capability and a manufacturing-friendly design, the upgraded SSLV is expected to strengthen India's position in the global small-satellite launch market while supporting the country's expanding private space ecosystem.

Source https://www.indiatoday.in/science/story/isro-fires-more-powerful-version-of-engine-that-will-launch-sslv-to-space-2971058-2026-08-14

Mining, Metallurgical and Materials Engineering

8. IIT Delhi Demonstrates Indigenous AI-Enabled Aerostat Surveillance Technology

In a significant step towards strengthening India's indigenous aerospace and surveillance capabilities, IIT Delhi successfully demonstrated an AI-enabled tethered Aerostat surveillance system developed through a unique collaboration between academia, industry, and deep-tech startups. During the technology demonstration, a tactical aerostat balloon of about 24 m3 volume was deployed up to a height of 30 meters, carrying a payload of up to 10 kg for different applications like surveillance, security and remote communications. Aerostats are lighter-than-air platforms that remain airborne for extended durations using helium, carrying cameras and sensors to provide persistent aerial surveillance. Compared with drones, aerostats offer significantly longer endurance, lower operating costs, continuous monitoring, higher payload capacity, and enhanced reliability, making them an ideal solution for border surveillance, disaster management, infrastructure monitoring, environmental observation, traffic management, and emergency response. The breakthrough technology originates from the DRDO Industry Academia-Centre of Excellence (DIA-CoE) funded SITEX-I and SITEX-II research programmes at IIT Delhi. Researchers developed advanced indigenous aerostat hull materials and engineering technologies, reducing dependence on imported strategic materials and establishing a strong foundation for India's lighter-than-air systems. Building upon this research, GB Texcoat Solution Pvt. Ltd., a FITT-IIT Delhi-incubated deep-tech startup, industrialized the technology by developing and fabricating the complete aerostat system using its proprietary high-performance coated textile materials designed for superior helium retention, lightweight construction, durability, and all-weather operation. During the demonstration, the aerostat successfully carried a high-definition surveillance payload, validating the performance of the indigenous platform. Simultaneously, CYRAN AI, an IIT Delhi faculty-led deep-tech startup, deployed advanced Edge AI algorithms to analyse live aerial imagery in real time, enabling intelligent object detection, classification, activity recognition, and automated alerts. Beyond strengthening defence preparedness, indigenous aerostat systems can significantly benefit society through improved disaster response, public safety, critical infrastructure monitoring, agriculture, environmental management, and smart-city applications.

Source https://home.iitd.ac.in/show.php?id=82&in_sections=Research

Energy Engineering

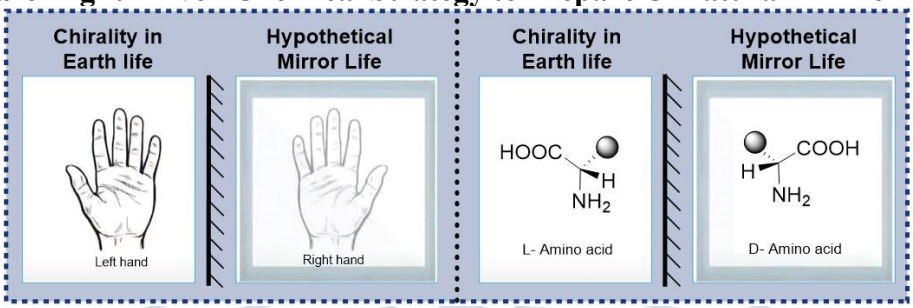
9. P3C is making solar modules from perovskite, a material that could replace silicon

The Gurugram-based company produces perovskite modules on glass and on flexible substrates and has had its cell efficiency certified by the National Institute of Solar Energy. Almost every solar panel in the world is made of silicon, and silicon is close to the limit of what it can do. Perovskite is the material the industry has been watching for a decade: it converts light more efficiently, it can be processed at low temperatures, and it can be laid onto glass or onto a flexible sheet rather than requiring a rigid wafer. The problem has never been efficiency. Perovskite cells have broken record after record in laboratories. The problem is that they degrade, sometimes within months, under heat, moisture and ultraviolet light, which is precisely what a solar panel spends its life in. Almost nobody has moved the technology from a laboratory record to a product that lasts. P3C Technology and Solutions is attempting it. P3C Technology makes two products. MySUN Glass puts perovskite modules on glass, in the way a conventional panel is built. MySUN Flex puts them on flexible substrates, which is where the material's advantage over silicon is clearest, since a bendable panel can go onto surfaces a rigid one cannot. Its certified performance sits at 19.3% cell efficiency, verified by the National Institute of Solar Energy, an autonomous body under the Ministry of New and Renewable Energy. Modules, which are larger and always test lower than individual cells, have been measured at around 15%. Its semi-transparent research cells reach about 20%. Production runs on an assembly line the company says it developed itself, with capacity of around 100 kilowatts of small-format modules and a stated plan to reach one megawatt. In March 2026, it launched P3SKY, a platform for manufacturers to test and validate perovskite modules under real-world conditions before committing to production. The markets the company names are broad: commercial field installations, rooftops, automobiles, space, defence, railways and agriculture. It is also working on perovskite-silicon tandem modules with what it has described as one of India's largest silicon manufacturers, without naming the partner, and on anti-soiling and anti-reflective coatings. The company describes itself as India's first perovskite solar cell manufacturer and targets gigawatt-scale capacity by 2027. Against a current line measured in hundreds of kilowatts, that is a very large step.

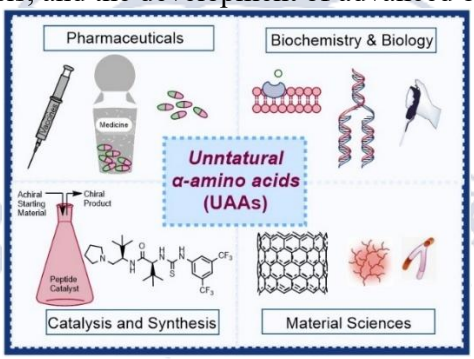
Sourcehttps://yourstory.com/2026/08/p3c-perovskite-solar-modules

Interdisciplinary and Special Engineering Fields and Leadership in Academia, R&D and Industry

10. A New Visible-Light Driven Chemical Strategy to Prepare Unnatural Amino Acids Developed



Like our left and right hands, some molecules are mirror images that can't perfectly overlap; this property is called chirality, or molecular "handedness." Living things frequently recognize and react to the two versions of such molecules (enantiomers) quite differently, even though they have the same atoms arranged in the same way. It is this simple difference that is the essence of life. Nature displays a striking preference for one molecular "hand" or 'enantiomer' over the other. From the DNA that encodes our genetic information to the sugars that power our cells, chirality is everywhere. Nowhere is this more remarkable than in proteins—the tiny molecular machines that carry out almost all the work inside our bodies. Proteins are constructed from small building blocks called amino acids. This is where the chirality in proteins comes from. The fact that nature almost exclusively employs one enantiomer of these amino acids is truly remarkable. However, even a minor modification in molecular handedness can significantly alter the behaviour of a protein and alter its shape. For decades scientists have explored whether nature's limited set of amino acids could be expanded. They aim to create new unnatural amino acid building blocks that can improve protein stability, strength, and functionality. Unnatural amino acids are powerful tools in modern medicine and biotechnology. They enable the creation of biomimetics that mimic natural proteins while offering improved stability, longer activity, and better target selectivity. Several approved drugs, such as bortezomib, octreotide, and baclofen, use modified amino acids to enhance therapeutic effects. Beyond medicine, they help researchers engineer proteins, study biological processes, and design molecules with new functions. They also serve as building blocks in organic synthesis, catalysis, and the development of advanced biomaterials.



Inspired by the need for more efficient ways to access these valuable building blocks, researchers at IIT Delhi developed a new strategy for the precise synthesis of unnatural amino acids and peptides. They have developed a new visible-light driven chemical strategy to prepare unnatural amino acids with precise control of their three-dimensional structure. Light energy and a chiral copper catalyst–ligand system were also utilized by the scientists to control chemical transformations with a high degree of selectivity. The method is based on using simple and readily available natural amino acid building blocks and allows efficient introduction of new chemical groups to generate a diverse set of unnatural amino acids. The major advantage of this approach is that it provides a large repertoire of unnatural amino acids for the design of next-generation biomolecules.

Source https://home.iitd.ac.in/show.php?id=85&in_sections=Research

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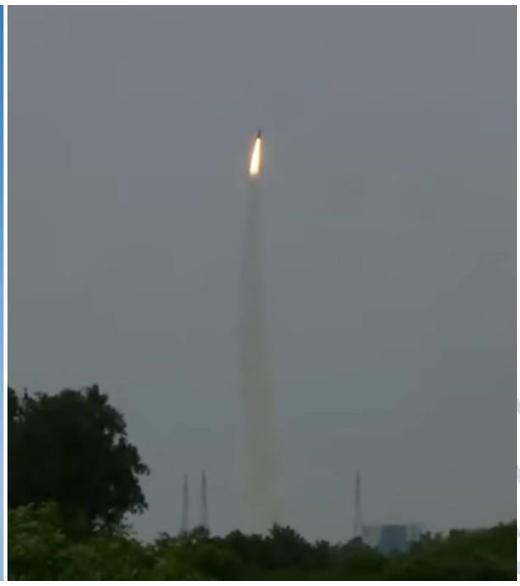
ENGINEERING INNOVATION IN INDIA

1. Vikram-1, country's first private orbital-class rocket, successfully places tech payloads, postcards into orbit



India achieved a major milestone in its space journey on Saturday (July 18, 2026) as Vikram-1, the country's first privately developed orbital rocket, successfully placed multiple technology demonstration payloads and postcards into a low earth orbit. Dubbed 'Mission Aagaman' (meaning arrival), the mission marks India's entry into an elite group of nations with private orbital launch capability, making it only the third country in the world to achieve the feat through a privately developed launch vehicle. Skyroot's Vikram-1, carrying technology demonstration payloads and postcards, lifted off from the Satish Dhawan Space Centre in Sriharikota at the rescheduled time of 12:05 p.m. The launch was witnessed by Skyroot founders Mr Pawan Kumar Chandana and Mr Naga Bharath Daka, both former ISRO scientists, who were present at the agency's Mission Control Center (MCC) along with ISRO Chairman DR V. Narayanan. On its maiden voyage, the four-stage, seven-storey-tall rocket lifted off at 12:05 pm amid cloudy skies from the first launch pad, leaving behind thick clouds of orange smoke. The lift-off marked a new era for the spaceport. With the launch, Skyroot achieved its first successful orbital mission using the Vikram-1 launch vehicle, marking a major step beyond the suborbital flight of Vikram-S in 2022. After its ascent, the rocket deployed its primary payloads one after another into a 450-km low Earth orbit.

Skyroot Aerospace said the engineering data gathered during the test flight will now be studied to verify the rocket's guidance and navigation systems and help improve future commercial satellite missions. The mission also confirmed the performance of the rocket's all-carbon composite structure and 3D-printed engines under actual flight conditions, technologies that the company says are industry-first innovations. Among the payloads carried aboard Vikram-1 was Embrace, a mission by Cosmoserve Space designed to demonstrate robotic arms that could one day be used to remove space debris in orbit. The rocket also deployed Solaras, a compact satellite developed by Grahaa Space to test new capabilities in low Earth orbit (LEO). Skyroot Aerospace's in-house experimental satellite, SCOPE, was also part of the mission. According to the company, the payload was developed to evaluate space technologies that could be used in future missions.

Source https://www.thehindu.com/sci-tech/science/vikram-1-indias-first-privately-developed-orbital-class-rocket-launch-updates/article71237224.ece and https://www.livemint.com/news/india/vikram1-rocket-successfully-places-tech-payloads-postcards-from-astronauts-pm-modi-into-orbit-11784363232667.html

2. IIT-G develops low-cost device to detect toxic metals, bacteria in water

Researchers at IIT Guwahati have developed a portable optical sensing device that can quickly detect toxic metals, fluoride and bacteria in water samples, offering a low-cost tool for on-site water-quality checks in rural areas and places without easy access to laboratories. Named E-Eye, the device has detected arsenic, lead, iron, chromium, fluoride and Escherichia coli bacteria during laboratory tests, the institute said. The estimated cost of the device is about Rs 3,500, with each sample test costing around Rs 2. The device uses a chemical reaction that produces a coloured compound. The intensity of the colour changes according to the concentration of the contaminant. E-Eye analyses the colour through optical sensing, converts the reading into digital data and displays the concentration of the toxicant. According to the researchers, the portable system can be deployed directly at water sources, unlike conventional testing equipment that generally requires samples to be taken to laboratories. It can also wirelessly transmit test results to water-treatment facilities. The team said E-Eye's results were comparable with those obtained through standard UV-Visible and Atomic Absorption spectrophotometers. More than 2,700 samples have been tested using the device, it added. The researchers said the device could support water-quality monitoring under the Centre's Jal Jeevan Mission, which seeks to provide tap water to rural households while ensuring that the water supplied is safe. Apart from drinking water, E-Eye can be used to test environmental and biological samples, vegetables, food products, tea, herbal products, soil and milk, the institute said. It may also help industries monitor liquid effluents containing heavy metals, bacteria and odour-causing compounds. The researchers have set up ENVIONIX Labs Pvt Ltd to commercialise the technology and are exploring an industry partnership for its transfer. They are also working to integrate solar panels and cloud connectivity into the device for remote monitoring and data management.

Source:https://timesofindia.indiatimes.com/india/iit-g-develops-low-cost-device-to-detect-toxic-metals-bacteria-in-water/amp_articleshow/133003468.cms

Note: *Fellows are requested to forward their achievements/achievements of their organziation to be featured under the heading "Engineering Innovation in India".*

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