চি এছ আই আৰ-উত্তৰ পূৱ বিজ্ঞান আৰু প্ৰযুক্তিবিদ্যা প্ৰতিষ্ঠান, যোৰহাটঃ অসম
सीएसआईआर-उत्तर पूर्व विज्ञान तथा प्रौद्योगिकी संस्थान, जोरहाटः असम
CSIR-North East Institute of Science and Technology, Jorhat: Assam

INFOWATCH

An In-house Monthly Communication (May, 2026)

CSIR-NEIST Research Article Highlights Sustainable Utilization of Northeast India's Graphite Resources

A new research article published by CSIR-NEIST highlighted the vast potential of natural graphite resources of Northeast India for the development of advanced carbon-based nanomaterials and sustainable waste valorization. The article, titled "Exploration of Natural Graphite Resources of Northeast India: Fixed Carbon Enrichment and Conversion to Advanced Carbonaceous Nanomaterial and Prospects for Sustainable Waste Valorization", has been published in the journal ACS Sustainable Resource Management. The study focuses on graphite deposits found in Arunachal Pradesh, which holds nearly 36 percent of the country's total graphite resources. Researchers reported that the graphite obtained from these deposits is initially low in carbon content and contains several mineral impurities such as iron, aluminium, magnesium and calcium. Using acid leaching techniques, the scientists significantly improved the purity of the graphite and increased the fixed carbon content to above 95 percent. The enriched graphite was subsequently transformed into advanced carbon-based nanomaterials, including graphene oxide, reduced graphene oxide and mesoporous silica.

The research also demonstrated the recovery and utilization of byproducts generated during the purification process. Silica recovered from the leachate was successfully converted into mesoporous silica, a high-value material with diverse industrial applications.

CSIR-NEIST Researchers Develop Genotype-Specific Transformation Protocol for Indica Rice

CSIR-NEIST published a significant research study on genotype-specific optimization of in vitro regeneration and Agrobacterium-mediated transformation in indica rice using the 35S:RUBY and CRISPR/LbCas12a system.

The research, published in the journal Planta (2026, Volume 263:137), focused on developing an efficient transformation system for important indica rice cultivars including Ranjit, Mahsuri, and Kon Joha. The study aimed to support functional genomics research and genetic improvement in rice. The researchers established a robust protocol for callus induction, regeneration, and *Agrobacterium*-mediated transformation using immature rice embryos. Transformation efficiencies of 5.6 percent in Ranjit, 7.5 percent in Mahsuri, and 15.33 percent in Kon Joha were achieved using the LbCas12a system. The study also demonstrated the effectiveness of the RUBY visual reporter system for early and non-destructive identification of transformed rice tissues. Transformed calli and regenerated plants exhibited a distinct visible red coloration without affecting normal plant growth and development. Molecular screening further confirmed successful transformation in the regenerated rice plants. According to the researchers, the developed protocol provides a strong foundation for future genome editing and crop improvement programmes in rice. The findings are expected to contribute towards the development of climate-resilient rice varieties and support sustainable agricultural production and food security.

CSIR-NEIST Demonstrates Innovative Thermal Conversion Technology for Sustainable Energy Solutions

During the demonstration of the device

On 30 May 2026, CSIR-NEIST organized a Demonstration and Interaction Programme on the Combined Gasification and Forced Draft Thermal Conversion Device, an innovative technology developed by CSIR-NEIST scientist Dr Biswajit Gogoi and the team. The programme brought together researchers, entrepreneurs, industry

representatives, and other stakeholders to witness the live demonstration of the technology and engage in discussions on its practical applications.

Welcoming the participants, Dr V M Tiwari, Director, CSIR-NEIST, emphasized the importance of developing sustainable, energy-efficient, and environmentally responsible technologies to address the growing challenges of energy security, waste management, and climate change. Dr Tiwari highlighted CSIR-NEIST's commitment to translating scientific research into technologies that can benefit society and support sustainable development.

During the demonstration, participants observed the functioning of the thermal conversion device, which integrates gasification and forced-draft combustion technologies to efficiently utilize a variety of solid fuels, including biomass residues, agro-waste, etc. The technology is designed to achieve cleaner and more efficient thermal energy generation while reducing fuel consumption and harmful emissions.

Events:

CSIR-NEIST celebrates National Intellectual Property Festival 2026

On 08 May 2026, CSIR-NEIST organized the National Intellectual Property Festival 2026 at the Dr J N Baruah Auditorium under the theme "IP and Sports: Ready, Set, Innovate" which is the theme for this year's World IP Day set by the World Intellectual Property Organization. The event was graced by Guest of Honour Dr Nishad A Deshpande, Scientist, F, CSIR-URDIP, Pune; wherein scientists, officials, research scholars and participants from local institutes attended.

Dr V M Tiwari delivering welcome address

Delivering the welcome address, Dr V M Tiwari, Director, CSIR-NEIST, emphasized the growing relevance of intellectual property awareness in research, innovation and emerging sectors, including sports technology and related industries. Dr Tiwari stated that creativity exists in every field and is protected through various intellectual property portfolios. He stressed that a proper understanding of intellectual property rights can help innovators create meaningful impact and safeguard their contributions.

Dr Nishad A Deshpande delivering his lecture on the occasion

In his Lecture, Dr Nishad A Deshpande discussed the role of intellectual property in encouraging innovation and creative works. Referring to the World Intellectual Property Organization's theme "IP and Sports," Dr Deshpande explained how intellectual property drives innovation, technology development, branding and fan engagement in the sports sector. He highlighted some IP backed innovation such as smart fabrics, better/safer equipments, aesthetic apparels, brand names, team logos, etc. which encourages research and investments in sports industry. that patents and copyright protection encourage research He further explained the key IP tools behind sports industry such as patents, copyright, trademarks and designs. Dr Deshpande further elaborated that intellectual property represents creations of the human intellect in diverse forms ranging from art to algorithms. He also discussed the various types of IP and mentioned some govt. initiatives taken up in India with the aim to encourage IP protection in sports related technologies.

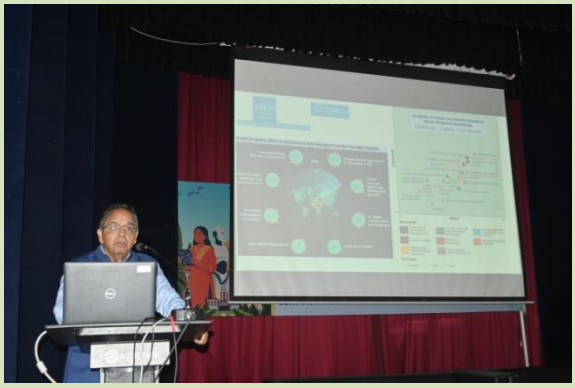
The event concluded with a Vote of Thanks delivered by Dr Rituparna Duarah, followed by the National Song and National Anthem.

It may be worthwhile to mention that under the banner of National IP Festival 2026, CSIR-NEIST also organized an outreach programme to promote IP awareness among students and faculty. Under this initiative, Ms.I. Ilika Zhimo, Scientist E, delievered a talk on Intellectual Property Rights at N N Saikia College, Titabor on 07 May, 2026.

National Technology Day 2026 Celebrated at CSIR-NEIST

CSIR–NEIST celebrated National Technology Day 2026 On 11 May 2026 under the theme “Responsible Innovation for Inclusive Growth.” The event was graced by Dr S Chandarshekhar, Former Secretary, DST, Government of India as Chief Guest while Prof Narinder K Mehra, Hon’ble Emeritus Scientist, ICMR; was present as Guest of Honour. Dr Virendra M Tiwari, Director, CSIR-NEIST, presided over the event and welcomed the distinguished guests and participants.

In his address, Dr Virendra M Tiwari highlighted the contributions of the invited dignitaries to the nation, particularly during the pandemic period. He emphasized the significance of National Technology Day and reflected on the peaceful utilisation of nuclear energy following the successful nuclear tests carried out in Pokhran, Rajasthan .



Prof Narinder K Mehra delivering his presentation

Dr Tiwari also highlighted the crucial role of science, technology, and innovation in building a sustainable and inclusive future for society and the nation development. Dr Tiwari also emphasized the need for responsible innovation to ensure inclusive growth and sustainable development.

Dr V M Tiwari delivering welcome address

Prof Narinder K Mehra spoke on the interconnection between climate change and antimicrobial resistance (AMR), stressing the urgent need for effective remedies to tackle these global challenges. He highlighted the growing risk of cancer caused by air pollution and antimicrobial resistance and discussed the increasing presence of AMR in the food chain, leading to drug resistant infections. Prof Mehra also pointed out that Type 2 diabetes could be linked to environmental factors, including the air people breathe. He also stressed the importance of sustainable development strategies and India’s preparedness in addressing these issues.

Delivering his presentation, Dr Chandarshekhar spoke on improving human health and environmental sustainability. He observed that rapid industrialisation over the past 150 years had significantly impacted the planet in the name of development. He elaborated on issues related to DNA and genomic damage and recommended books such as “We Are Eating Earth” to create greater public awareness about environmental degradation.

Dr S Chandarshekhar delivering his presentation

Dr Chandarshekhar also highlighted the contributions of the CSIR towards national development through research and innovation. He spoke about challenges posed by diseases such as tuberculosis and the importance of scientific interventions in healthcare. He further discussed the origins of medicines, and also stressed the importance of adopting green ammonia & renewable energy sources to protect the environment.

On the occasion, two MoUs were signed between CSIR-NEIST and Birangana Sati Sadhani Rajyik Vishwavidyalaya and Assam Down Town University respectively.

The event concluded with a Vote of Thanks delivered by Dr P Yuvraj. A tree plantation initiative was also undertaken on the institute campus following the event.

67th Research Council Meeting of CSIR-NEIST Reviews Scientific Progress and Future Research Initiatives

The 67th Research Council Meeting of CSIR-NEIST was held from 28-30 May 2026 to review the institute's recent scientific achievements and discuss its future research roadmap.

Addressing the meeting, Dr V M Tiwari, Director, CSIR-NEIST, highlighted the Institute's major research and development accomplishments over the preceding six months. Scientists and project leaders from various divisions presented significant research outcomes, ongoing projects, and emerging areas of scientific investigation.

The Research Council reviewed the Institute's performance across diverse research domains and appreciated its progress in generating high-impact scientific publications, securing patents, and advancing technology development. The Council also emphasized the importance of strengthening technology transfer activities to ensure wider societal and industrial impact of research outcomes.

NEIST-NEXUS Lecture Series 2026

The NEIST-NEXUS Weekly Lecture Series 2026 at CSIR-NEIST continued in May 2026 with lectures that highlighted emerging developments in health sciences, microbiome research, and modern drug discovery. The sessions showcased how interdisciplinary approaches are advancing our understanding of human health and accelerating biomedical innovation.

Dr Romi Wahengbam

On 8 May 2026, Dr Romi Wahengbam, Scientist D delivered a lecture on *"Gut Microbiome and Impact of Fermented Foods on Cardiometabolic Health."* The presentation emphasized the crucial role of the human gut microbiome in maintaining cardiometabolic health and overall well-being. Dr Wahengbam discussed how dietary habits, particularly the consumption of traditional fermented foods, influence gut microbial composition and promote the production of beneficial metabolites such as short-chain fatty acids (SCFAs). A major focus of the talk was on *hawaiijar*, a traditional fermented soybean product from Northeast India, and its potential to improve gut health, strengthen gut barrier integrity, restore microbial balance, and reduce the risk of atherosclerosis. The lecture highlighted the growing importance of microbiome-based nutritional strategies for disease prevention and health promotion.

Dr Selvaraman Nagamani

On 15 May 2026, Dr Selvaraman Nagamani, Scientist D presented *"The Experiment–Computation Nexus in Modern Drug Discovery."* The talk explored the integration of experimental biology with advanced computational techniques to enhance drug discovery and lead optimization. Dr Nagamani demonstrated how molecular modeling and well-tempered metadynamics can provide detailed mechanistic insights into DNA lesion recognition and repair processes. The lecture also highlighted the application of computer-aided drug design (CADD) and machine learning approaches in optimizing biologically active compounds with improved therapeutic potential. In addition, the use of graph neural network (GNN)-based frameworks for analyzing and compressing large-scale molecular dynamics simulation data was discussed, illustrating the transformative role of artificial intelligence and computational tools in modern pharmaceutical research.

Dr Pravin G Ingole

On 22 May 2026, Dr Pravin G Ingole, Scientist-E, hosted a lecture titled *"Advanced Polymeric Membranes for Sustainable Separation Technologies."* Dr Ingole highlighted recent advances in polymeric thin film nanocomposite and mixed matrix membranes, focusing on their enhanced efficiency in separation processes. The incorporation of functional materials such as metal organic frameworks (MOFs), graphene oxide, MXenes, and inorganic nanoparticles was discussed as an effective strategy to improve membrane performance, including permeability, selectivity, and resistance to fouling. The talk showcased the versatility of these membrane systems across a range of applications, including gas separation, dye and salt fractionation, pharmaceutical contaminant removal, and industrial wastewater treatment. Particular emphasis was placed on

sustainable fabrication approaches that utilize biopolymers and environmentally friendly materials, aligning membrane technology with the principles of green chemistry and sustainable development. Dr Ingole further highlighted the broader significance of membrane based separation processes in resource recovery, wastewater remediation, and carbon capture technologies. The lecture underscored how innovative membrane engineering can contribute to cleaner industrial practices and support global efforts toward environmental sustainability.

On 27 May 2026, Dr Leon Raj J, Scientist-E, delivered a lecture titled *"Structural Evaluation of Reinforced Concrete and Industrial Structures: Field Investigations and Case Studies."*

Dr Leon Raj J

Drawing from field investigations and real world case studies, Dr Leon Raj discussed the methodologies used to evaluate reinforced concrete structures in both public and industrial settings. The lecture highlighted the role of non destructive and semi destructive testing techniques in determining the condition of ageing infrastructure without causing significant damage to the structures. A notable case study presented during the session involved the assessment of a substation plinth beam at Silapathar, Assam. Through this example, different concrete strength evaluation methods were compared, revealing the challenges associated with accurately estimating in situ concrete strength. The discussion also addressed the limitations of commonly used rebound hammer tests and cube strength correlations when applied to existing structures under field conditions.

Emphasizing the importance of structural health monitoring, Dr Leon Raj emphasized how systematic evaluation helps guide maintenance planning, retrofitting strategies, and repair interventions. Such assessments play a crucial role in ensuring the safe and reliable operation of infrastructure throughout its service life.

CSIR-NEIST in Print Media

Experts stress sustainable innovation, environmental protection and healthcare research

CSIR-NEIST celebrates National Technology Day

HT Correspondent

JORHAT, May 11: CSIR–North East Institute of Science and Technology (CSIR-NEIST) celebrated National Technology Day 2026 with great enthusiasm and academic spirit under the theme, 'Responsible Innovation for Inclusive Growth'.

In his Technology Day lecture, Dr S Chandarshekhar, former Secretary, DST, GoI and Chief Scientific Adviser, PI Industries, spoke extensively on human health, environmental sustainability and the long-term consequences of unchecked industrialisation. He observed that rapid industrial growth over the past one and a half centuries has exerted immense pressure on the planet in the name of development. Elaborating on issues related to DNA and genomic damage, he called for greater public awareness regarding environmental degradation and recommended thought-provoking literature such as We Are Eating Earth.

Dr Chandarshekhar, who was the chief guest on the occasion, also highlighted the remarkable contributions of the Council of Scientific and Industrial Research towards national development through pioneering research and innovation. He further spoke on the scientific challenges posed by diseases such as tuberculosis and underscored the importance of research-driven healthcare interventions. Emphasising sustainable solutions, he advocated the adoption of green ammonia and renewable energy sources as essential steps towards environmental protection and ecological balance.

Addressing the gathering as guest of honour, Professor Narinder K Mehra, Emeritus Scientist, ICMR, delivered an insightful talk on the growing interrelationship between climate change and antimicrobial resistance (AMR). He expressed deep concern over the increasing health risks arising from environmental degradation, particularly the rise in cancer and drug-resistant infections linked to air pollution and antimicrobial resistance. He also discussed the alarming presence of AMR within the food chain and its implications for public health. Highlighting the possible environmental links to Type 2 diabetes, Professor Mehra stressed the urgent need for sustainable development strategies and proactive preparedness to address emerging global health challenges.

Earlier, in his welcome address, Director of CSIR-NEIST, Dr Virendra Tiwari, highlighted the immense contributions of the invited dignitaries towards national development, particularly during the challenging pandemic years. Reflecting on the significance of National Technology Day, he recalled the historic Pokhran nuclear mission and underscored the importance of the peaceful application of nuclear energy for national progress. He further emphasised the pivotal role of science, technology and innovation in building a resilient, sustainable and inclusive society.

On the occasion, Memoranda of Understanding (MoUs) were signed between CSIR–NEIST and Birangana Sati Sadhani Rajyik Vishwavidyalaya, Golaghat, as well as with Assam Down Town University, Guwahati, marking an important step towards strengthening academic and research collaborations.

The programme concluded with a vote of thanks by Dr P Yuvraj, Principal Scientist, CSIR-NEIST. The programme was conducted by Dr Monti Gogoi, TA, CSIR-NEIST. A tree plantation drive was also carried out within the institute campus, symbolising the collective commitment towards environmental sustainability and a greener future.

The Hills Times, 12 May, 2026(Page no. 5)

Societal Activities & Awareness Programmes

CSIR-NEIST organized Swachhata Pakhwada campaign

Dr V M Tiwari (centre), Director, CSIR-NEIST leading the pledge taking ceremony

CSIR-NEIST observed Swachhata Pakhwada campaign during 1-15 May, 2026 with a series of activities aimed at promoting cleanliness, hygiene, and environmental awareness across the institute. The campaign formally commenced with a Swachhata Pledge ceremony held on 4 May, 2026**,** during which the Director, CSIR-NEIST, administered the pledge to staff members and students. As part of the fortnight-long campaign, various activities were organized, including cleanliness drives across the CSIR-NEIST campus with active participation from staff members and students. To encourage awareness and community engagement, theme-based painting, slogan writing, and quiz competitions were also conducted for staff members and students.

The campaign witnessed enthusiastic participation from the CSIR-NEIST fraternity and reinforced the importance of maintaining a clean, healthy, and sustainable workplace and environment.

CSIR-NEIST participates in the "Walk for Tea" event

On 21 May 2026, CSIR-NEIST, led by its Director, Dr Virendra M Tiwari, participated in the "Walk for Tea" at Tocklai Tea Research Institute, Jorhat to commemorate International Tea Day.

Exhibitions Participated

CSIR-NEIST participated in the "National Symposium & Expo on Sustainable Mining and Ecological Restoration" held from 10-12 May 2026, at the Indian Institute of Coal Management, Ranchi, Jharkhand.

Papers Published

In International Peer Reviewed Journals

1. Tonmoi Hazarika, Bharat Kakati, Rimlee Saikia, Manoj Kumar Mahanta, Uma Maheswari Ravichandran: Nitrogen Plasma-Engineered Hydrophilic Surface Functionalization of Polysulfone Ultrafiltration Membranes for Enhanced Functional, Structural, and Filtration Efficiency, *Polymers for Advanced Technologies* 2026; 37:e70622 https://onlinelibrary.wiley.com/doi/10.1002/pat.70622 May-25 3.4 (**IF: 3.4**)

2. Versha Pandey, Ranu Yadav, Sweta Yadav, Anupama Singh, Disha Mishra, Pooja Singh, Binoy K Saikia, Puja Khare: Selectivity of Mineral-enriched Biochars in Growth Promotion of Endophyte in Leaves under as Stress, *Water Air Soil Pollut (2026) Volume 237, article number 859,* https://link.springer.com/article/10.1007/s11270-026-09534-w May-25 3 (**IF: 3**)

3. Shristirupa Borah, Priyanga Manjuri Bhuyan, Rinku Moni Kalita, Barnali Sarma, Swapnali Hazarika, Brajendra K Sharma, Parikshit Gogoi: Dyeing and Functionalizing Mulberry Silk With Phenolic-Amine Conjugates of Catechin and Gallic Acid, *ChemistrySelect 2026; 11:e06494,* https://chemistry-europe.onlinelibrary.wiley.com/doi/full/10.1002/slct.202506494 May-26 2 (**IF: 2**)

4. Anindita Bhuyan, Sakshi Bhatt, Unnati Bora, Lakshi Saikia, and Md Ahmaruzzaman: Development of a magnetically retrievable Ni-doped CuFe2O4/MIL-101(Fe) composite for the photocarboxylation of halobenzene via CO2 utilization, *Journal of Materials Science 2026 Volume 61, pages 17956, 17979 (2026),* https://link.springer.com/article/10.1007/s10853-026-12876-9 May-26 3.9 **(Highest Impact Factor Paper, IF: 3.9)**

5. Anurag Phukan, Maga Nana Kaka, Moushumi Hazarika, Abhishek Borborah, Manash R Das, Chandan Tamuly: Waste-derived chlorogenic-acid Ag nanozyme for nanomolar dopamine sensing in pharmaceutical formulations, *Analytical Methods 2026 2026, 18, 4400-4413,* https://pubs.rsc.org/en/content/articlelanding/2026/ay/d6ay00337k May-26 2.7 (**IF: 2.7**)

Farewell

The following member(s) of the staff have retired from Council's service on superannuation from CSIR-NEIST w. e. f. 31 May, 2026.

1. Mr Atul Chandra Gayan, Lab Assistant, Research Planning & Business Development Division.