

Leveraging India's STEM Diaspora

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India's STEM diaspora engagement implemented by DST, DBT, SERB and CSIR is driven by this multi-scheme ecosystem which combines collaboration, circulation and selective return. There is a need for a mission-driven national framework and strategy for STEM diaspora engagement and a need for leveraging their strength for India's scientific priorities and capacity building. Sneha Sinha writes.

Today, for knowledge economies, access to skilled and talented individuals have become increasingly important and has emerged as a key driver of innovation, growth and future prosperity. Global competition, therefore, has increased to attract a skilled workforce. Several countries have adopted immigration programmes and policies that favour import of skilled foreign workforce. In several OECD countries, health systems significantly rely on internationally trained medical professionals. India tops as the country of origin of international students moving to the United States, United Kingdom and Canada. India has a significant proportion of the STEM diaspora in global innovation hubs with a large share of Indian-origin STEM professionals in the United States, Europe and other advanced innovation ecosystems across academia, research institutions, industry labs and R&D, several present at leadership positions as well as in high-value sectors including deep-tech, advanced engineering, etc. India's STEM diaspora is the bridge that connects it to the world, building linkages to the global systems, strengthening international cooperation, supporting S&T partnerships as well as furthering S&T capacity building.

Migration of skilled workers, often viewed as a loss for developing countries. However, lately, there has been a shift from the focus on "brain-drain" to leveraging diaspora as a development resource, aiming to mobilise talent for national development. Increasingly, countries are actively designing policies and institutions to engage with their diaspora. India's approach to engaging its STEM diaspora has evolved significantly in the last two decades. The focus on "brain drain" has moved towards global collaboration, knowledge networks and circulation. During the last 20 years, there are several initiatives that have been taken to engage with the diaspora. They include engagement platforms like *Pravasi Bharatiya Divas* and *Regional Pravasi Bharatiya Divas*. Particularly for the science and technology specific diaspora, some schemes implemented by several ministries include VAIshwik BHArtiya Vaigyanik (VAIBHAV) Fellowship, Visiting Advanced Joint Research (VAJRA), Ramanujan Fellowship, Ramalingaswami Re-entry Fellowship, Collaborative Projects with Scientists and Technologists of Indian Origin

(CP-STIO), Senior Research Associateship/Scientists Pool Scheme. There are several projects, fellowships granted through these schemes by the Department of Science and Technology, Science and Engineering Research Board, Department of Biotechnology, Council for Scientific and Industrial Research. These have helped build linkages with Indian-origin scientists abroad, some have also been absorbed in the India ecosystem with regular faculty positions. Additionally, the Pravasi Bharatiya Academic and Scientific Sampark (PRABHASS) is national digital portal that serves as a networking platform which aims to connect with global Indian S&T community, encouraging them to strengthen the Indian innovation system and solve challenges faced by India.

India's STEM diaspora engagement implemented by DST, DBT, SERB and CSIR is driven by this multi-scheme ecosystem which combines collaboration, circulation and selective return. There is a need for a mission-driven national framework and strategy for STEM diaspora engagement and a need for leveraging their strength for India's scientific priorities and capacity building in areas such as artificial intelligence, semiconductors, biotechnology, clean energy, etc. Equally significant is to move from scheme-based, short-term engagement to strengthening absorptive capacity and research infrastructure of Indian institutions to effectively utilise diaspora expertise. Additionally, there is a need for integration of diaspora in the industry and innovation ecosystem, including startups and deep-tech sectors.

SCIENCE POLICY & DIPLOMACY

International S&T Cooperation

[Vietnam Moves to Implement Science and Technology Pact with France](#)

Vietnam has issued a plan to carry out its cooperation agreement with France on science and technology. The initiative focuses on strengthening joint research, innovation, and expert exchanges. It aims to deepen bilateral ties while boosting technological development and knowledge sharing between the two countries.

[South Korea and Poland Upgrade Bilateral Ties](#)

Poland and South Korea have elevated their relationship to a strategic partnership with a strong focus on defence cooperation and advanced technologies. The agreement includes collaboration in arms production, technology transfer, and strengthening broader security and innovation ties.

[DST-TDB Partners with Scharge Pvt Ltd for Advanced EV Charging Innovation under India-UK R&D Programme](#)

DST-TDB has signed an agreement with Scharge Pvt Ltd for the project "Powering EV Charging Innovation," supported under the India-UK Collaborative R&D Programme for

Industrial Sustainability. The initiative focuses on developing next-generation EV charging systems for commercial fleets and depot operations. The project integrates smart charge controllers with automated cable management technology to improve efficiency, safety, and usability in EV charging infrastructure. It aims to strengthen India's indigenous capabilities in electric mobility and support scalable, future-ready charging ecosystems.

Emerging Tech & Governance

[IndiaAI and CDSCO Launch Health Innovation Acceleration Hackathon](#)

IndiaAI, under the Ministry of Electronics and IT, in collaboration with CDSCO, launched a Health Innovation Acceleration Hackathon to develop AI-based solutions for regulatory workflows. The initiative aims to build tools for data anonymisation, document summarisation, and faster drug regulatory approvals through advanced AI integration.

[AI-Designed Proteins Act as Molecular Sensors](#)

Researchers at Queensland University of Technology and collaborators have used AI to design proteins that switch on only when they bind to specific molecules. The work demonstrates programmable protein-based sensors that can work in cells or produce electrical signals. These engineered proteins act as molecular switches linked to measurable outputs like light or electrical signals, opening up applications in diagnostics, environmental sensing, and biotechnology.

[Quantum-Informed AI Improves Turbulence Forecasting with Lower Memory Use](#)

Researchers at University College London developed a hybrid AI model that uses quantum-computed patterns to improve long-term predictions of turbulent fluid systems. The approach, published in *Science Advances*, is more stable over time and requires significantly less memory than conventional methods. A 20-qubit quantum computer is used to extract key statistical features from complex data, which are then fed into a classical AI model. This improves efficiency and may support applications in climate and fluid dynamics modelling.

[AI Identifies Early Risk Patterns of Melanoma](#)

The University of Gothenburg study shows that AI can use routine healthcare registry data to detect early patterns of melanoma risk. The model identified high-risk groups with up to a 33 per cent chance of developing melanoma within five years using population-wide data analysis.

Events & Meetings

[One Health Summit 2026 Highlights Global Health Coordination](#)

The One Health Summit 2026, held in Lyon from 5–7 April, brought together global leaders and experts to advance the “One Health” approach linking human, animal, and environmental health. Aligned with World Health Day, the summit focused on coordinated action against shared threats like pandemics, antimicrobial resistance, and food system risks, emphasizing science-based cooperation and stronger global health systems.

[ISRO Hosts SMOPS-2026 in Bengaluru on Smart and Sustainable Space Mission Operations](#)

Jointly organised by Indian Space Research Organisation, Astronautical Society of India, and the International Academy of Astronautics, the International Conference on Spacecraft Mission Operations (SMOPS-2026) was held during 8–10 April 2026 in Bengaluru. The event focused on next-generation mission operations, including AI-driven space systems, robotics, satellite constellations, and human spaceflight missions. The conference brought together global space agencies, industry experts, and academia to discuss future challenges in space operations such as space traffic management, deep space exploration, and autonomous mission control systems.

[Sādhana Saptah 2026](#)

Sādhana Saptah 2026 was held during 2–8 April 2026 as a nationwide capacity-building initiative under Mission Karmayogi, led by the Department of Personnel and Training along with the Capacity Building Commission and Karmayogi Bharat. It brings together Central Ministries, States, and training institutions to promote competency-based, citizen-centric governance. The initiative focuses on technology, tradition, and measurable outcomes, aiming to strengthen skills in civil services through digital learning (iGOT platform), AI tools, and collaborative training to support the vision of Viksit Bharat 2047.

INDIAN SCIENCE NEWS

[Self-healing Property Discovered in Organic Crystals to Enable Smart Materials Development](#)

Indian researchers have discovered a unique self-healing property in layer-structured organic crystals that works without any external stimulus. The finding can help develop advanced smart materials capable of repairing damage within milliseconds, opening new possibilities for resilient technological applications.

[NITI Aayog Releases Reports to Improve Ease of Doing Research and Development in India](#)

NITI Aayog released two reports on 9 April 2026 in New Delhi titled “Ease of Doing R&D in India,” aimed at strengthening the country’s research and innovation ecosystem. The reports are based on extensive consultations with scientists, institutions, and stakeholders across India. The findings highlight key challenges in funding, regulatory systems, and institutional processes, and

recommend reforms to create a more flexible, trust-based, and innovation-friendly R&D environment to support India's science and technology growth.

[DST-TDB Supports Commercialization of Bio-Waste Derived Hard Carbon for Sodium-Ion Batteries](#)

DST-TDB has supported Indigenous Energy Storage Technologies Pvt. Ltd., Roorkee, to commercialize bio-waste and agricultural waste-derived hard carbon for sodium-ion batteries. The initiative focuses on developing sustainable and cost-effective anode materials for next-generation energy storage systems. The project promotes a circular economy approach by converting agricultural residues into advanced battery materials, reducing dependence on lithium imports and strengthening India's indigenous energy storage capabilities.

[DRDO-IISc Inaugurate National Facility for Advanced Compo-Rheo Die Casting](#)

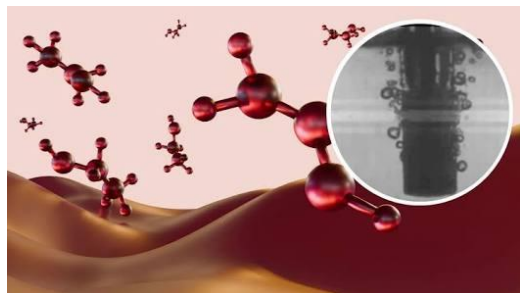
The facility focuses on developing advanced nano-metal matrix composites using innovative die-casting technology. The initiative aims to strengthen indigenous capabilities in high-performance materials and supports applications in power electronics and other civil technologies through collaboration between defence research, academia, and industry.

[Prototype Fast Breeder Reactor at Kalpakkam Achieves First Criticality](#)

India's 500 MWe Prototype Fast Breeder Reactor (PFBR) at Kalpakkam, Tamil Nadu, achieved first criticality on 6 April 2026, marking a major milestone in the country's nuclear energy programme. This strengthens India's three-stage nuclear power programme and advances long-term clean energy goals by improving fuel efficiency and enabling future use of thorium-based reactors.

ADVANCES IN S&T

[VO-Based Catalysts Offers New Path for Efficient Hydrocarbon-to-Hydrogen Conversion](#)



The Problem: Methane is abundant but difficult to utilize directly because it is highly stable. Converting it into more useful products like propane and hydrogen would improve its value for energy storage, transport, and clean fuel applications. Propane is widely used in heating and cooking, while hydrogen is a promising clean energy carrier for fuel cells. However, current industrial methods for methane conversion are energy-intensive and generate significant CO₂

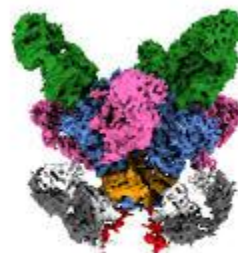
emissions. Photocatalysis offers a cleaner alternative, but its efficiency is often limited because light-generated charges in most materials recombine before they can drive chemical reactions.

The Method: Researchers from Université de Lille–CNRS, Sorbonne Université, and collaborating French institutes used vanadium dioxide (VO₂), a material that undergoes a phase transition at about 68 °C, switching between insulating and metallic states. At this temperature, VO₂ naturally forms mixed domains that create internal junctions, which help separate photo-generated charges and reduce recombination. These built-in junctions improve photocatalytic performance, enabling more efficient conversion of methane into hydrogen and light hydrocarbons, particularly propane. Experiments with thin VO₂ films on sapphire substrates showed the best results, and applying an electric field further enhanced efficiency by improving charge transport and reducing losses.

Future Prospects: This approach could be expanded to produce other valuable hydrocarbons such as butane and ethylene, along with improved hydrogen production. The concept of using phase-changing materials like VO₂ may also inspire new photocatalysts that naturally form efficient charge-separating structures. Future research will focus on improving efficiency, selectivity, and energy performance, including combining thermal and electrical control. This could help move methane conversion closer to its theoretical energy limits and offer a lower-emission alternative to current industrial processes.

[Nanodiscs Capture HIV and Ebola Proteins in Native-Like Membranes for Vaccine Design](#)

The Problem: Viruses like HIV and Ebola have surface proteins embedded in lipid membranes that are crucial for infection. However, in laboratory studies these proteins are often stripped of their membrane environment, making them behave differently from how they do on real viruses. This limits scientists' ability to understand how antibodies recognize and neutralize them, slowing vaccine development.



The Method: Researchers at Scripps Research Institute, in collaboration with IAVI and other institutes, developed a nanodisc-based platform that embeds viral surface proteins into lipid nanodiscs. These structures mimic the virus's natural membrane, preserving the proteins in a lifelike state for study. The system enables detailed antibody-binding studies, immune-cell sorting, and high-resolution structural imaging of proteins from viruses such as HIV and Ebola.

Future Prospects: This platform could significantly accelerate vaccine design by providing more realistic models of viral proteins and immune interactions. It may help identify broadly neutralizing antibodies and guide next-generation vaccines for difficult viruses like HIV, Ebola, influenza, and SARS-CoV-2, while also speeding up preclinical testing of vaccine candidates.

INSIGHTS & RESOURCES

[International Energy Agency Published State of Energy Policy 2026](#)

The State of Energy Policy 2026 by the International Energy Agency reviews how governments are responding to ongoing energy shocks, supply chain disruptions, and rising geopolitical tensions. It explains why energy has become a central issue of economic and national security, and how policy is evolving to balance affordability, resilience, and the transition to cleaner energy systems. Key highlights include

- Energy security has become a top policy priority amid crises including COVID-19 disruptions, the Russia–Ukraine war, extreme weather, and Middle East instability.
- Emergency oil and gas measures are now widely adopted, with coordinated reserve releases and expanded storage policies across many countries.
- Governments have significantly diversified energy sources and strengthened efficiency standards since the 1970s, improving resilience.
- Critical minerals and clean energy supply chains are increasingly concentrated, prompting new trade restrictions and industrial policies.
- Global government energy spending has doubled since 2019, reaching about USD 405 billion annually in 2025.
- Only a minority of affordability support measures target vulnerable households, raising concerns about efficiency of spending.
- Regulatory rollbacks in 2025 slowed energy efficiency improvements and carbon pricing expansion in several regions.
- Progress on emissions reduction is uneven, with many new climate pledges implying slower declines in energy-related emissions through 2035.