



Science Diplomacy Alert

A Fortnightly newsletter on S&T, Science Policy and Diplomacy

Focus

Leveraging Science Diplomacy for Inclusive AI Governance: Bridging the Global Divide



Science diplomacy and initiatives like the India AI Impact Summit can help Global South countries harmonise regulatory frameworks, participate effectively in multilateral discussions, and foster collaborative approaches to AI development. It not only enables access to advanced technologies but also enhances their role in shaping global norms around AI ethics, safety, and fairness, ensuring that technological benefits are distributed equitably. Furthermore, it can facilitate South–South cooperation, enabling nations to share best practices, build capacity collectively. Sneha Sinha writes.

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SCIENCE POLICY & DIPLOMACY

International S&T Cooperation



India Concludes Strategic Cyber Exercise with Central Asian Nations to Boost Regional Cyber

India, along with five Central Asian countries, successfully concluded a three-day Strategic Cyber Exercise aimed at strengthening collective cyber-defence capabilities. The exercise focused on cyber-threat hunting, incident response management, and improving coordination among national CERTs and security agencies.

India Deepens S&T Ties with Ecuador, Bolivia & Cuba

During his visit (4-10 Nov 2025), Hon'ble MoS Shri Pabitra Margherita emphasized science and technology cooperation with Ecuador, Bolivia, and Cuba, highlighting areas like digital technology, AI, innovation, and building capacity through ITEC training slots. In Cuba, discussions also covered health and pharmaceuticals, early-warning systems, and strengthening digital public infrastructure, reflecting India's commitment to shared development and South-South cooperation.

Kazakhstan to Focus on Building Prowess in AI Through Global Collaboration

Kazakhstan has tripled its spending on education and science to push artificial intelligence as a top national priority, aiming to modernize its economy and build a fully digital state. The country plans to attract more foreign students, expand academic partnerships with top global universities, and integrate AI education and research to become a leading academic hub in Central Asia.

India and Botswana Strengthen Health-Tech and Pharmaceutical Cooperation

India and Botswana signed agreements to enhance cooperation in pharmaceuticals, digital health, and medical technology. The partnership focuses on providing affordable Indian medicines, including antiretroviral drugs, to improve Botswana's healthcare access and

address shortages in essential medications. Additionally, both countries aim to strengthen digital health infrastructure, enabling telemedicine and remote care through improved connectivity and technology sharing.

India & Luxembourg Agree to Deepen Cooperation in Space, Quantum & AI Innovation

India's Science & Technology Minister Dr Jitendra Singh Luxembourg's Ambassador discussed scaling up collaboration in space start-ups, quantum technologies, artificial intelligence, and cybersecurity. The two countries plan to connect India's booming private space ecosystem with Luxembourg's advanced space finance and research infrastructure, fostering joint R&D and market access.

India & UK Launch Joint Science & Technology Partnership Dashboard

The Indian Principal Scientific Adviser Prof. Ajay Kumar Sood and the UK's National Technology Adviser Dr. David Warren Smith unveiled a pilot IN-UK Science & Technology Partnership Dashboard. The tool maps 143 bilateral projects (since 2018), tracking funding, partners, and alignment with UN-SDGs and India-UK strategic goals. It aims to inform decision-makers by providing real-time insights into joint research, innovation, and impact.

Emerging Tech & Governance



India AI Governance Guidelines Unveiled

The Ministry of Electronics & IT unveiled India's first AI governance guidelines to ensure safe, ethical, and inclusive AI development. Key features include seven guiding principles, stakeholder-specific recommendations, and innovation sandboxes to balance experimentation with risk mitigation. The move aligns with India's push for responsible AI ahead of the India-AI Impact Summit 2026.

TECH5 and AJARI Join Forces to Embed Conversational AI in Digital Public Infrastructure

TECH5 has partnered with AJARI to integrate its multilingual AI agent, NISA, into TECH5's T5-OmniTrust platform, enhancing digital identity wallets with voice-based conversational capabilities. This collaboration aims to simplify user interactions across key DPI (Digital Public Infrastructure) use cases such as e-KYC, access to government and financial services, and digital document signing by allowing citizens to communicate with an AI assistant via voice. The move is expected to make digital identity systems more intuitive, inclusive, and human-centric, especially for government-facing citizen services.

India's First Silicon Carbide Semiconductor Plant to Be Built in Odisha

SiCSem has broken ground in Bhubaneswar for a ₹2,000 crore end-to-end Silicon Carbide (SiC) semiconductor plant, the first of its kind in India with support from the India Semiconductor Mission. The facility is expected to process 60,000 SiC wafers annually and package about 9.6 crore units by 2027-28, significantly boosting Odisha's semiconductor ecosystem.

IBM Advances Quantum Computing with Nighthawk and Loon Processors

IBM unveiled two new quantum processors: Nighthawk, a 120-qubit chip optimized for denser connectivity, and Loon, a 112-qubit testbed designed for fault-tolerant quantum computing. Nighthawk can currently handle circuits of up to 5,000 two-qubit gates, with future revisions expected to scale to 15,000, while IBM is transitioning to 300 mm wafer fabrication to increase chip complexity and production efficiency. The company aims to achieve quantum advantage by 2026 and full logical qubit error correction by 2029, marking a significant step toward scalable, practical quantum computers.

Events & Meetings



Emerging Science, Technology and Innovation Conclave 2025

The Hon'ble Prime Minister of India inaugurated the ESTIC 2015 at the Bharat Mandapam in New Delhi. The Prime Minister announced the launch of the Research, Development and Innovation Scheme, with an allocation of ₹1 lakh crore. He emphasized that efforts are being made to promote research and development in the private sector as well.

Africa Tech Festival 2025 Focuses on Responsible, Inclusive AI for the Continent

At the 28th Africa Tech Festival in Cape Town, government leaders, global tech firms, and startups pledged to build Africa's digital future around ethical AI governance, inclusive access, and social impact. Stakeholders emphasized the need for affordable connectivity, strong digital infrastructure, and digital literacy as foundations for responsible innovation. In a landmark move, Cassava Technologies announced it has become Africa's first NVIDIA Cloud Partner, aiming to power homegrown AI development across the continent.

Third India–France AI Policy Roundtable Held at IISc

Key themes included responsible AI development, inclusive access to AI compute capacity, and co-development of industrial partnerships in emerging technologies. The discussions will feed into the AI Impact Summit 2026 and the India–France Year of Innovation 2026, reinforcing a shared vision for equitable and human-centric AI.

INDIAN SCIENCE NEWS

NHA, DHR & ICMR Renew MoU to Strengthen Evidence-Based Healthcare through Advanced Health Technology Assessment

The renewed MoU will apply Health Technology Assessment (HTA) to digital health innovations including AI-based diagnostics, telemedicine, and electronic health records, ensuring cost-effectiveness, clinical efficacy, and equity in healthcare interventions.

IISc Develops “Liquid Marble” Spray to Make Pesticides Stick Better on Leaves

Researchers at IISc have created a clever technique using liquid marbles, droplets coated with biodegradable hydrophobic particles like zein to prevent pesticide sprays from bouncing off waxy leaf surfaces. This method could cut waste (nearly 50 per cent of pesticide loss) and reduce environmental contamination, though scaling and cost reduction remain challenges.

ISRO Launches India's Heaviest Communication Satellite CMS-03 Using LVM3-M5 Rocket

India successfully launched CMS-03, its heaviest communication satellite at 4,410 kg, from Sriharikota using the LVM3-M5 rocket. The satellite will strengthen naval communications and provide multi-band services over India and surrounding oceans, marking a major milestone in India's heavy-lift space capability.

ADVANCES IN S&T

NUS MIT Study Identifies New Targets for a Tuberculosis Vaccine

The problem: Tuberculosis (TB), caused by *Mycobacterium tuberculosis*, remains a major global health threat. The current BCG vaccine provides limited

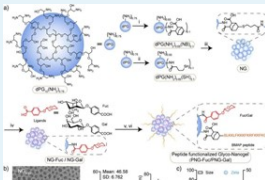


protection in adults, and TB infections continue to cause high mortality worldwide.

The Method: MIT researchers screened over 4,000 M. tuberculosis proteins to identify those that strongly activate helper T cells. They pinpointed immunogenic peptides, including EsxB and EsxG proteins, and used them to design mRNA vaccine candidates targeting broader immune responses.

Future Prospects: These findings could lead to next-generation TB vaccines offering better protection than BCG, potentially improving global TB control. The approach may also guide rapid development of vaccines against other difficult-to-target pathogens.

Heteromultivalent Nanogel Breakthrough Destroys Drug-Resistant Bacteria in Hours



The Problem: Antibiotic resistance is a growing global health crisis, with pathogens like *Pseudomonas aeruginosa* and MRSA forming biofilms and evading traditional treatments. Existing antibacterial strategies often struggle to kill these drug-resistant bacteria quickly and selectively without damaging healthy cells.

The Method: Researchers at Swansea University developed a heteromultivalent nanogel composed of cross-linked polymers functionalised with sugar residues (galactose and fucose) and antimicrobial peptides. The sugar molecules bind specifically to lectin proteins on the bacterial surface, allowing targeted delivery. Once in place, the antimicrobial peptides disrupt the bacterial membrane, killing the cells rapidly. In lab tests, over 99.99% of free-floating *P. aeruginosa* were killed, and more than 99.9% of biofilm-embedded bacteria were inactivated within 12 hours. The nanogel also showed strong efficacy against *E. coli* and MRSA.

Future Prospects: This nanogel technology represents a promising new class of antibacterial therapy that could tackle persistent, multidrug-resistant infections, especially those involving biofilms. Its modular design (using sugars + peptides) suggests it could be adapted to target other pathogens, potentially leading to tailored, highly effective antimicrobial treatments in the future.

INSIGHTS & RESOURCES

Global Carbon Budget 2025

The Global Carbon Budget 2025 was launched today at COP30, the United Nations Climate Change Conference in Belém, Brazil. It is the 20th edition of the annual update that started in 2006. Key highlights of the Report include:

- Fossil-fuel CO₂ emissions are projected to rise ~1.1 per cent in 2025, reaching a record high.
- The report estimates fossil CO₂ emissions at 38.1 billion tonnes in 2025.
- Emissions from all fossil sources (coal, oil, gas) are rising — coal +0.8 per cent, oil +1.0 per cent, natural gas +1.3 per cent.
- CO₂ emissions from land-use change (deforestation etc.) are expected to fall to ~4.1 billion tonnes in 2025.
- Total anthropogenic CO₂ emissions (fossil + land use) are projected to be slightly lower than 2024.
- The remaining carbon budget for limiting warming to 1.5°C is extremely small: ~170 billion tonnes of CO₂, which at current emissions would be used up in ~4 years.

- Land and ocean carbon “sinks” are weakening: about 8 per cent of the increase in atmospheric CO₂ since 1960 is attributed to climate-driven reductions in sink strength.
- CO₂ concentration in the atmosphere is projected to reach ~425.7 ppm in 2025 (~52 per cent above pre-industrial levels).
- Some regional emission trends: China +0.4 per cent, India +1.4 per cent, USA +1.9 per cent, EU +0.4 per cent, Japan –2.2 per cent.

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