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Science Diplomacy Alert

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

Focus

India-Japan Science and Innovation Partnership: Highlights of Indian PM's Visit

During the visit of the Indian Prime Minister to Japan last week, the newly concluded Memorandum of Cooperation (MoC) between two countries will encourage the flow of investment, technology assistance, including technology transfer and capacity building support for the implementation of projects involving low carbon technologies. It will also develop the domestic ecosystem and partnerships to localise these low carbon technologies and associated high technology interventions related to equipment, machinery, products, systems and infrastructure, paving the way for their large-scale deployment. S. K. Varshney writes.

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SCIENCE POLICY & DIPLOMACY

International S&T Cooperation

South and Southeast Asian Countries Unite to Strengthen Health Research Systems

With representatives from Bhutan, Nepal, Sri Lanka, Timor-Leste, and India the high-level regional dialogue aimed to ensure that health research directly informs policy, addresses regional priorities, and builds sustainable systems for the future.

Japan and South Korea to Establish Consultative Body to Jointly Tackle Societal Challenges

The consultative body would focus on shared social issues facing both countries, including low birthrates, aging populations and disaster safety awareness.

India and Japan Joint Vision for Next Decade

The 10-year strategic prioritization for economic and functional cooperation will focus on economic partnership, economic security, mobility, ecological sustainability, technology and innovation, health, people to people and state-prefecture engagements.

India Bhutan Sign MoU on Technical Cooperation in Agriculture and Allied Sectors

The MoU will serve as a framework for collaboration in various areas outlined in the MoU including agricultural research and innovation, livestock health and production, post-harvest management, value chain development, and the exchange of knowledge, skills, and expertise.

Emerging Tech & Governance

Milestone in India's Semiconductor Journey

India's first end-to-end Semiconductor OSAT Pilot Line Facility of CG Power was launched by the Union Minister of Electronics and Information Technology, Shri Ashwini Vaishnaw at Sanand, Gujarat.

AI to Detect Major Heart Conditions

The British team conducted a study using an AI powered stethoscope which can spot heart failure, heart valve disease and abnormal heart rhythms.

Japan Launches Domestic Quantum Computer at Expo 2025

Researchers at the University of Osaka's Center for Quantum Information and Quantum Biology (QIQB)—in partnership with RIKEN, ULVAC, Fujitsu, and other Japanese companies—have unveiled Japan's first fully domestically produced superconducting quantum computer.

IBM and AMD Partner to Advance Quantum Supercomputing

They announced plans to develop next-generation computing architectures based on the combination of quantum computers and high-performance computing, known as quantum-centric supercomputing.

Events & Meetings

National Space Day Celebrated

The theme for India's National Space Day was 'Aryabhatta to Gaganyaan: Ancient Wisdom to Infinite Possibilities'. The occasion marks the anniversary of Chandrayaan-3's successful landing and aims to inspire youth toward innovation and space research.

Prime Minister's Science, Technology & Innovation Advisory Council Meeting Held

The 28th PM-STIAC meeting proposed a National Plant Health Initiative to strengthen India's agricultural resilience. The initiative will use AI-based surveillance and digital tools to tackle plant health threats from climate change.

TRIPS 2025 Summit Held at IIT Kanpur

Indian Institute of Technology, Kanpur inaugurated the Technology, Research, Innovation, and Policy Summit (TRIPS) 2025 themed 'Bridging Research, Innovation, and Policy for a Sustainable Future', and brought together scientists, policy experts and industry pioneers to shape India's future through collaborative science and innovation-driven policy.

5th India–South Africa Joint Working Group Meeting

The 5th India–South Africa Joint Working Group on Agriculture held on 26 August 2025 highlighted the opportunities to enhance cooperation across agricultural and allied sectors.

INDIAN SCIENCE NEWS

34 Indian Students Leave for Sakura Science Programme

The Sakura Programme 2025, JST has invited students and supervisors from India, alongside participants from six other countries (Egypt, Ghana, Kenya, Nigeria, South Africa and Zambia).

TDB Partners with Primary Healthtech to Develop AI/ML-based IoT Point-of-Care Blood Testing Device

The project will focus on enhancing the current prototype (M1) to perform five tests simultaneously, reducing patient waiting time, and setting up commercial-scale manufacturing.

AGNI-5 Successfully Tested

Intermediate Range Ballistic Missile 'Agni 5' was successfully test-fired from the Integrated Test Range, Chandipur in Odisha on August 20, 2025. The launch validated all operational and technical parameters. It was carried out under the aegis of the Strategic Forces Command.

Gold Nanoclusters Help Early-Detection for Parkinson's Disease

Scientists at the Institute of Nano Science and Technology (INST), Mohali developed ultra-small gold nanoclusters coated with amino acids that selectively bind to normal versus toxic α-synuclein protein forms, enabling early-stage detection of Parkinson's Disease.

India Partners with World Food Programme to Fight Global Hunger

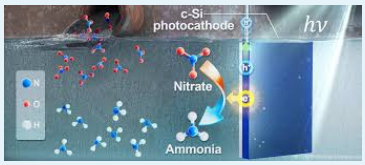
India and the World Food Programme (WFP) signed a Letter of Intent in New Delhi, under which India's Department of Food and Public Distribution will supply fortified rice from its surplus stocks to support food-insecure populations in global crisis zones.

University of Kashmir and IISER Pune MoU on Collaborative Research

The MoU under the ANRF-PAIR (Alliance for Research and Innovation- Partnerships for Accelerated Innovation and Research) program aims to strengthen research collaboration, promote innovation, and create opportunities for joint projects, resource sharing, and capacity building.

ADVANCES IN S&T

Solar-Powered System Converts Wastewater Nitrates into Valuable Ammonia

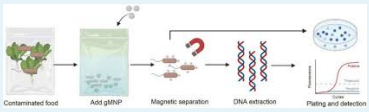


The problem: Nitrates in wastewater are serious environmental pollutants linked to health hazards like methemoglobinemia and gastric cancer. Traditional ammonia production methods, such as the Haber–Bosch process, are energy-intensive and emit significant CO_2, making it imperative to find sustainable alternatives.

The Method: Researchers at UNIST developed a solar-powered photoelectrochemical (PEC) system that converts nitrates directly into ammonia without any external electrical bias. The system uses a silicon-based photocathode coupled with a nickel foil catalyst. Under sunlight, the silicon generates electrons that travel through the nickel catalyst to reduce nitrate to ammonia. A thin layer of nickel hydroxide ($Ni(OH)_2$) forms in-situ on the catalyst, suppressing competing hydrogen evolution and enhancing the selectivity toward ammonia.

Future Prospects: This approach achieves a record-high production rate of 554 μg/cm²·h, a performance more than 50 per cent better than earlier technologies. The system was also

validated on a larger 25 cm^2 scale, demonstrating its practical potential. Researchers aim to scale this PEC system for outdoor, real-world applications. Their vision is to create practical, large-scale devices that can operate under ambient sunlight, directly treating wastewater to generate ammonia—a dual benefit of pollutant remediation and sustainable chemical production.



Rapid Nanoparticle-Based Method Detects Viruses in Food and Water Within Hours

The Problem: Testing for viral or bacterial contamination in food and water currently takes days to a week, leaving people at risk before results are available. This delay is particularly dangerous when monitoring public health threats—like polluted beaches—where exposure may occur before closures are enforced.

The Method: Researchers at Michigan State University have introduced two innovative nanoparticle-based techniques that reduce detection time from days to mere hours:

- Glycan-coated magnetic nanoparticles (gMNPs): These ultrasmall sugar-coated particles cling to viruses or bacteria. Using a simple magnet, contaminants are isolated from the sample for further analysis.
- Gold nanoparticle–based biosensors: After separation, the presence of specific pathogenic genes is revealed using gold nanoparticles that embed into the DNA. A red color indicates detection of the target gene, while a blue shift indicates its absence.

This two-step process—isolation plus detection—delivers results in 2 to 4 hours, compared to the conventional wait of 1 to 2 days. It works with just 1 mL of gMNPs for 1 L of water or 25 g of food. Costs are impressively low: 10–50 cents per test for the magnetic nanoparticle separation and under $2 per test for the gold nanoparticle detection.

Future Prospects: The goal is to bring this technology to resource-limited regions, where medical infrastructure and power may be unreliable. The method's simplicity—needing only a magnet, minimal power, no refrigeration, and easy operation—makes it an ideal candidate for such settings.

INSIGHTS & RESOURCES

WHO and UNICEF Launch Report During World Water Week 2025

The Report titled Progress on Household Drinking Water and Sanitation 2000–2024: special focus on inequalities reveals that, while some progress has been made, major gaps persist. People living in low-income countries, fragile contexts, rural communities, children, and minority ethnic and indigenous groups face the greatest disparities.

- Ten key facts from the report:
  - Despite gains since 2015, 1 in 4 – or 2.1 billion people globally – still lack access to safely managed drinking water, including 106 million who drink directly from untreated surface sources.
  - 3.4 billion people still lack safely managed sanitation, including 354 million who practice open defecation.
  - 1.7 billion people still lack basic hygiene services at home, including 611 million without access to any facilities.

- People in least developed countries are more than twice as likely as people in other countries to lack basic drinking water and sanitation services, and more than three times as likely to lack basic hygiene.
- In fragile contexts, safely managed drinking water coverage is 38 percentage points lower than in other countries, highlighting stark inequalities.
- While there have been improvements for people living in rural areas, they still lag behind. Safely managed drinking water coverage rose from 50 per cent to 60 per cent between 2015 and 2024, and basic hygiene coverage from 52 per cent to 71 per cent. In contrast, drinking water and hygiene coverage in urban areas has stagnated.
- Data from 70 countries show that while most women and adolescent girls have menstrual materials and a private place to change, many lack sufficient materials to change as often as needed.
- Adolescent girls aged 15–19 are less likely than adult women to participate in activities during menstruation, such as school, work and social pastimes.
- In most countries with available data, women and girls are primarily responsible for water collection, with many in sub-Saharan Africa and Central and Southern Asia spending more than 30 minutes per day collecting water.
- As we approach the last five years of the Sustainable Development Goals period, achieving the 2030 targets for ending open defecation and universal access to basic water, sanitation and hygiene services will require acceleration, while universal coverage of safely managed services appears increasingly out of reach.

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