

Science Diplomacy Alert

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

Note to the Reader

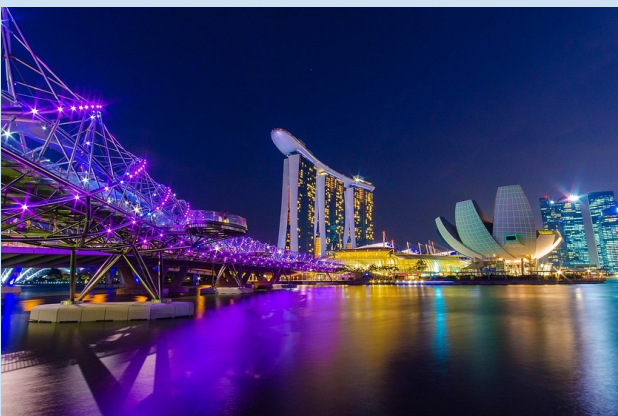
We are glad to present the 150th issue of Science Diplomacy Alert! This milestone is a testament to the unwavering vision and passion of Ambassador Bhaskar Balakrishnan, whose dedication to science diplomacy has guided this publication. Through 150 issues, the newsletter has grown into a trusted source of news, insights, and resources for a diverse range of stakeholders, including policy-makers, researchers, and students. Over the years, Science Diplomacy Alert has consistently delivered timely updates on global science policy developments, emerging trends, and significant diplomatic initiatives.

As we mark this significant achievement, we extend our heartfelt gratitude to our readers and contributors for their continuous support. Looking ahead, the team is planning to explore new and innovative ways to engage with our audience, while ensuring that Science Diplomacy Alert remains as a key contribution to science diplomacy discourse and practice. Looking forward to many more issues filled with insightful and impactful content. As ever your suggestions and ideas to make the Alert more relevant and better are welcomed.

*Warm Regards,
Team FISD*

Focus

India-Singapore S&T Cooperation: The Way Forward



The diplomatic relations between India and Singapore have indeed evolved into a multi-faceted partnership, especially in the realms of science, technology, and innovation. Singapore remains a crucial pillar of India's Act East Policy and vision of the Indo-Pacific. Initially centered around trade, the collaboration has diversified over the decades to include areas like higher education and research, space collaboration and clean energy. The future prospects for India-Singapore cooperation include continued collaboration in renewable energy, sustainable development, AI governance, and the semiconductor sector. Sneha Sinha writes.

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International S&T Cooperation



New Treaty between Russia and Iran to Expand Cooperation on Space

Russia and Iran have signed the treaty on comprehensive strategic partnership which reads “contracting parties shall expand interaction, exchange of views and experience in the sphere of research and space exploration for peaceful purposes”.

India and EU set a Framework for Stronger Partnership

India would work together with the European Union to reduce its dependence on non-market economies and develop cutting-edge technologies, secure critical raw material supply, and build resilient supply chains. Both sides also agreed to fast-track talks on the free trade agreement (FTA).

Sweden Joins Square Kilometer Array

Sweden signed the convention for membership in the SKAO, the organisation behind groundbreaking telescopes in Australia and South Africa, which once completed, will be the most powerful in the world.

AnemiaPhone Transferred to ICMR

Cornell University developed an accurate, quick and affordable technology to assess iron deficiency, which has been transferred to the Indian Council of Medical Research (ICMR) for integration into its programmes for anaemia, women’s health, and maternal and child health throughout the country.

India-Singapore to Work for Development of Semiconductor Ecosystem

Acknowledging that India and Singapore's priorities are similar, and given that Singapore has some experience in the field, the two are working together to develop the manufacturing of semiconductors and building a semiconductor ecosystem in India.

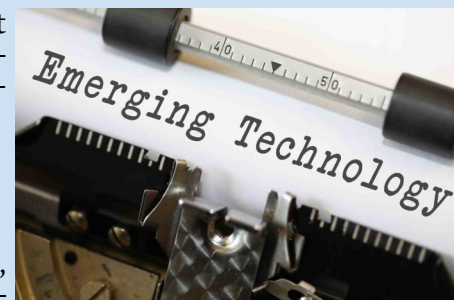
Russia’s AI-Powered ‘Interceptor Drone’

Russia has developed a pre-production model of the Sokol interceptor drone, equipped with artificial intelligence. This highlights growing reliance on AI-driven drones in modern warfare.

e& and IBM Plan for Industry AI Platform

Announced during the World Economic Forum 2025 in Davos, etisalat and (e&), UAE based telecommunication company has collaborated with IBM to deploy a pioneering, end-to-end, multi-model AI and Generative AI governance solution.

Emerging Tech & Governance



Events & Meetings

World Economic Forum Annual Meeting Held in Davos

With the theme ‘Collaboration for the Intelligent Age’, WEF saw participation of more than 50 heads of state and government. Conversation on AI focused on application, investment and development. Tangible examples of progress on manufacturing, decarbonization, climate action, and health were highlighted, with continued commitment to gender parity.



MeitY-UNESCO Hold Stakeholder Consultation on AI Readiness Assessment Methodology

MeitY, UNESCO, with implementation partner, Ikigai Law held a stakeholder consultation in Bangalore, India to gather insights for an India-specific AI policy report. This is the second in a series of five consultations aiming to foster responsible AI adoption in India.

Dialogue on Health Diplomacy in the Global South Held in Gandhinagar

Shri Bhupendra Patel, Chief Minister of Gujarat, emphasised India's commitment to global health security and solidarity, especially through initiatives like vaccine diplomacy during the COVID-19 pandemic. The platform was an opportunity to showcase India's innovative solutions and strengthen collaboration with Global South nations.

INDIAN SCIENCE NEWS

ISRO Completes its 100th Launch with NVS-02 Satellite

ISRO's 100th mission takes flight with NVS-02, revolutionizing India's regional navigation. With precise GPS, disaster resilience, and strategic defense applications, this satellite strengthens India's regional navigation system, NavIC system, which serves India and its surrounding region with precise Position, Velocity, and Timing (PVT) information.

Cabinet Approves 'National Critical Minerals Mission'

The National Critical Mineral Mission (NCMM) with an expenditure of Rs.16,300 crore and expected investment of Rs.18,000 crore by PSUs, etc. will encompass all stages of the value chain and intensify the exploration of critical minerals. It aims to also create a fast track regulatory approval process for critical mineral mining projects.

Confined Electrons for Improved Optoelectronic Materials, Sensors & Nano-catalysts

Study by Jawaharlal Nehru Centre for Advanced Scientific Research on electron confinement-induced plasmonic breakdown in metals opens new avenues and can help design more efficient nanoelectronic devices and optoelectronic materials with enhanced precision, sensors that operate at atomic and molecular levels as well as efficient nano catalysts.

ICMR and CDSCO Develop Test to Identify Pathogens and AMR Susceptibility

The Indian Council of Medical Research (ICMR) and Central Drugs Standard Control Organisation (CDSCO) have developed a test for identifying antimicrobial pathogens and susceptibility to antimicrobial resistance among patients, to help innovators and testing laboratories in performing rapid diagnostic tests.

IIT-D to Launch Co-innovation Centres in Deep Tech, AI and Robotics

I-Hub Foundation for Cobotics (IHFC), Technology Innovation Hub of the Indian Institute of Technology Delhi (IIT-D) is collaborating with ten prestigious institutes in India to establish Co-Innovation Centres (CiC). The vision is to drive innovation among India's young minds. They aim to promote research and development of indigenous deep-tech products.

JNCASR Develops Device that Senses Strain

Scientists from Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru have developed a device that senses strain, mimics pain perception and adapts its electrical response accordingly. The device paves the way for future smart wearable systems that can help doctors detect stress.

India-Singapore S&T Cooperation: The Way Forward

Sneha Sinha
Consultant, RIS

This year marks the 60th anniversary of diplomatic relations between India and Singapore which began with [India's recognition of Singapore](#), barely three days after Singapore gained Independence in 1965. The bilateral relations between the two countries are characterised by political, defence, economic, cultural, educational and people-to-people contacts. Singapore is a key pillar of India's Act East Policy and the vision of the Indo-Pacific. The bilateral relations have deepened and also diversified. India-Singapore bilateral relations were elevated to a strategic partnership in 2015, and a comprehensive strategic partnership in 2024. Initially, collaboration remained limited to trade and related sectors. However, by 1995, an Agreement on S&T was signed. A decade later, India-Singapore Comprehensive Economic Cooperation Agreement (CECA) further emphasised on S&T cooperation for closer collaboration and harnessing of R&D capabilities and commercialisation of technologies between the two countries. Some [areas identified](#) include marine and agricultural biotechnology, space research, advanced materials and information technology. In 2015, India and Singapore sought to further [cooperation in S&T, R&D and Innovation](#) through joint endeavours. Focus areas for [India-Singapore agreements](#) in 2018 were higher education, research, artificial intelligence, innovation, machine learning, cognitive computing and big data analytics to improve healthcare, cybersecurity, automation, mobility, smart energy systems and e-governance, cyber security, urban planning, etc. These agreements between institutions also fostered academic and research exchanges and joint research initiatives.

Space has been one of the key sectors of [India Singapore S&T cooperation](#). During 2011-2023, Indian Space Research Organisation has launched 18 Singapore satellites. In 2023, Singapore joined India's global initiatives towards clean energy like the International Solar Alliance and Global Biofuel Alliance. Last year, Singapore co-hosted the inaugural ASEAN – India Women Scientists Conclave. The [8th Roundtable of ASEAN-India Network of Think Tanks](#) was held in November 2024 in Singapore. More than 25 prominent Think Tanks and policy research organisations from ASEAN and India discussed strengthening of the ASEAN-India Comprehensive Strategic Partnership focusing on both existing and new areas of collaboration including digital connectivity, green energy transition, etc.

The September 2024 [Joint Statement](#) between the two countries has more areas of potential cooperation. These include sustainability with potential to cooperate in areas of green hydrogen and green ammonia and efforts towards sustainable development. India and Singapore held an e-workshop in the green economy in September 2024. The second area of cooperation was in the field of digital technologies with common interests in data, AI and cyber security. A MoU on Cooperation in Digital Technologies was signed and both countries also decided to explore cooperation in the areas of critical and emerging technologies. Both sides also decided to set up a Cyber Policy Dialogue, and the inaugural dialogue was held in Singapore in October 2024. In healthcare and medicine, cooperation in medical education, research, Human Resource development and healthcare were identified as areas of potential collaboration. India and Singapore held an e-workshop in the area of digital health and medical technologies in July 2024. Both Prime Ministers agreed that advanced manufacturing, particularly in developing resilient semiconductor supply chains, can be a new pillar of bilateral cooperation, and welcomed the signing of the MoU on India-Singapore Semiconductor Ecosystem Partnership. At the G20 Summit in Brazil in November 2024, Singapore also supported the Indian initiative of the Declaration on Digital Public Infrastructure, AI and Data for Governance.

Singapore has a robust S&T ecosystem and focuses on emerging technologies, sustainability and smart city initiatives. Given, India's initiatives in renewable energy (like the International Solar Alliance, National Hydrogen Mission), and S&T missions (like India's National Supercomputing Mission, National Biopharma Mission, and Clean Energy Mission, AI Mission), and greater emphasis on space, biotechnology and digital and AI with vibrant research ecosystem. India-Singapore S&T cooperation is poised to grow further in future. Joint statements clearly identify areas of potential collaboration, which include emerging technologies, renewable energy solutions, biomedical R&D, space technologies, etc.

Both countries can together contribute towards global efforts for an inclusive and responsible AI governance. India-Singapore cooperation in the semiconductor sector will be significant in shaping the semiconductor ecosystem in India and boost innovation.

Additionally, it will diversify the global semiconductor supply chain and enhance resilience. Given both countries' shared commitment towards sustainability, cooperation in renewable energy solutions - especially in solar, wind and green hydrogen as well as sustainable infrastructure, and water and waste management would serve as a model for collaboration in the region and globally towards sustainable development. S&T collaboration between the two countries is mutually beneficial, and will also contribute towards finding S&T solutions for the sustainable future of the region and the world.

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ADVANCES IN S&T

NUS Researchers Developed Novel Method to Enhance the Precision of Cancer Treatment



The problem: One of the key challenges in cancer treatment is delivering drugs specifically to cancer tissues. Existing screening methods assume uniform delivery across all organs, often overlooking the preferences of different cell types within a tumour, from immune to endothelial to cancer cells.

DNA Barcoded Gold Nanoparticles: Researchers used thiol-functionalization to securely anchor the DNA barcodes to the surface of the gold nanoparticles. This ensures the barcodes remain stable, resistant to enzymatic degradation and do not interfere with cellular uptake. Researchers prepared nanoparticles in six different shapes and sizes, where their distribution and uptake across various cell types were monitored. They found that round nanoparticles were excellent in targeting tumours in preclinical models. However, triangular nanoparticles excelled in both in vitro and in vivo tests, resulting in high cellular uptake and strong photothermal properties.

Future Prospects: Designing optimally-shaped nanoparticles for organ-specific targeting enhances the safety and efficacy of nanotherapeutics for cancer treatment — and beyond. The method enhances the precision of cancer treatment.

Stronger Biodegradable Adhesive Polymer Developed

The problem: Adhesives are commonly used in automotives, packaging, electronics, solar cells and construction, among many other areas. Together they make up a roughly \$50 billion industry that supports much of our modern life but also contributes to the mounting issue of plastic waste.

Re-engineered Poly(3-hydroxybutyrate): Colorado State University researchers were able to chemically re-engineer the structure of naturally occurring polymer i.e. poly(3-hydroxybutyrate), or P3HB to deliver stronger adhesion than the common petroleum-derived, nonbiodegradable options when used on various substrates or surfaces such as aluminum, glass and wood. The adhesion strength of the re-engineered P3HB can also be tuned to accommodate different application needs.

Future Prospects: P3HB is biodegradable under a variety of instances, including managed and unmanaged environments. That expands the range of possible options for dealing with the material at the end of its life cycle. The P3HB adhesive can also be recovered, reprocessed and reused.



Survey Shows Public Trust in Science Continues to be High

A global survey of 71,922 people in 68 countries reveals that public trust in scientists is still high. Led by the University of Zurich and ETH Zurich, a team of 241 researchers conducted the first post-pandemic study of trust in science, societal expectations and public views on research priorities. The survey provides global, representative survey data on the populations and regions of the world. It shows

- ◆ “Most people in most countries have a relatively high level of trust in scientists”.
- ◆ People in many countries feel that the priorities of science are not always well aligned with their priorities.
- ◆ Majority of respondents want science to play an active role in society and policy-making. 52 per cent believe that scientists should be more involved in the policy-making process. Only a minority (23 per cent) believe that scientists should not actively advocate for specific policies.
- ◆ Globally, 83 per cent of respondents believe that scientists should communicate with the public about science, providing an impetus for increased science communication efforts.
- ◆ Participants gave high priority to research to improve public health, solve energy problems, and reduce poverty. On the other hand, research to develop defense and military technology was given a lower priority.

Chinese Startup DeepSeek Makes Highly Advanced LLMs

Chinese AI startup DeepSeek “has taken the tech world by storm” with the release of two Large Language Models (LLM) DeepSeek-R1 and Janus-Pro-7B. The DeepSeek-R1, a partly open-source ‘reasoning’ model has the capability to solve some scientific problems at a similar standard to o1, OpenAI’s most advanced LLM, which the company released at the end of 2024. Meanwhile, the capability of Janus-Pro-7B, an text to image generator has been compared to that of OpenAI’s DALL-E and UK-based Stability AI’s Stable Diffusion. DeepSeek has a stated mission to democratise AI at a low cost while prioritising privacy. According to DeepSeek founder Liang Wenfeng, the company consists of a young team consisting of graduates and doctoral students from China’s top universities. Some members of the country’s leadership team are younger than 35 and “are deeply motivated by a drive for self-reliance in innovation.”

We welcome your comments and valuable suggestions. Please write to us for receiving publications, updates and notices regarding seminars, conferences, etc. Contact us at science.diplomacy@ris.org.in.

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