

Science Diplomacy Alert

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

Science Diplomacy and Understanding the Effects of Nuclear War

Focus



Amid growing hostilities between nuclear-armed states, scientists from all over the globe have called for an improved understanding on the effects of nuclear war. Anupama Vijayakumar writes on the recent UNGA First Committee Resolution on “Nuclear War Effects and Scientific Research”.

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SCIENCE POLICY & DIPLOMACY

International S&T Cooperation



[India Gets Re-Elected As President Of Indian Solar Alliance Till 2026](#)

India would be President during the 2024-2026 time period and France was re-elected as Vice President. The ISA assembly also chose eight Vice Presidents for its Standing Committee, with two hailing from each of the four ISA regions.

[Agreement on Operationalization of Global Mechanism for Digital Genetic Information Benefit Sharing](#)

State-parties at the 16th session of UN Biodiversity Summit in Cali, Colombia arrived at an Agreement to operationalise a new global mechanism to share benefits from digital genetic information.

[ISRO to Help Mexico Build its Earth Observation Satellites](#)

India has offered to support Mexico in building earth observation satellites, strengthening the space collaboration between the two countries.

[India Becomes Member of Square Kilometre Array](#)

India enters as a council member of the global efforts aiming to build the world's most sensitive radio-telescope to explore the universe.

Emerging Tech & Governance



[DeepMind's AI Model AlphaFold3 is Open-source](#)

Google DeepMind model AlphaFold 3 is now open source. Scientists can download the software code and use the artificial intelligence (AI) tool for non-commercial applications.

[Japan to Invest \\$65 Bn in Semiconductors and AI](#)

The Japanese Government will provide \$65 billion through fiscal 2030 to boost semiconductor and artificial intelligence industries.

[South Korean Researchers Develop 8-Photon Qubit Chip](#)

Researchers have successfully developed an integrated quantum circuit chip using photons (light particles). With this system, they can explore various

quantum phenomena.

[SurePath AI Raises \\$5.2 M to Advance Generative AI Governance Platform](#)

The Generative AI governance startup has raised \$5.2 million in funding to accelerate growth and enhance its platform for securely governing generative AI adoption in enterprises.

Events & Meetings



T20 Summit Held in Rio de Janeiro

Leaders of national and international think tanks, members of academia, representatives of the public and private sectors, and civil society discussed public policy recommendations during the T20 Summit held during 11-12 November 2024.

UN Climate Change Conference

World leaders and delegates from 200 countries gathered for the annual Conference of Parties to discuss progress on tackling climate change and global warming in Baku, Azerbaijan during 11-22 November 2024.

Taiwan and Philippines Convene S&T Meeting

The ninth Taiwan-Philippines Pre-Joint Science and Technology Commission Meeting took place on November 8 in Taipei City to review the results of bilateral cooperation on a wide range of projects.

INDIAN SCIENCE NEWS

New Nanomaterial Coating Developed to Increase Efficiency of Fertilizers

The coating made of nanoclay-reinforced binary carbohydrates can reduce the recommended fertilizer dose, thereby limiting their interaction with the rhizosphere soil, water and microbes, and maintain enhanced crop production.

IISc Discovers Enzyme that Can Breakdown ‘Biofilms’ of Bacteria

Researchers have uncovered the potential in the digestive enzymes of cows to break down the “biofilms” of certain types of bacteria, which can limit the action of drugs.

India’s First Analog Space Mission to Plan Lunar Mission Experiments Started

ISRO has started the country’s first analog space mission at Leh in Ladakh. The Space Agency will simulate life in an interplanet habitat, which will be significant as India plans to send a human on the moon in near future.

Eco-friendly Packaging Foam Created

A bio-derived foam has been created which could offer a sustainable alternative to plastic materials used in Fast-Moving Consumer Goods that could transform the packaging industry, while addressing critical environmental concerns.

IIT Kanpur and Zynetic Sign MoY for Advanced EV Charging Solutions

IIT Kanpur and Zynetic will cooperate in research, academic exchange and consultancy to tackle pressing challenges in EV charging technology, and focus on critical areas such as power electronics, embedded systems and integration of AI and ML for predictive maintenance.

‘Significant’ Results from Payload Onboard Maiden Solar Mission Aditya-L1

Indian Institute of Astrophysics (IIA) Bengaluru have reported “first significant” results from the Visible Emission Line Coronagraph (VELC) payload onboard the ADITYA-L1. It helped them to precisely estimate the onset time of a coronal mass ejection (CME) that erupted from the Sun on July 16.

IIT Mandi Develops Method to Monitor Ageing Bridges Using Traffic Data

This approach develops a digital model of the bridges. The real-time data, combined with traffic patterns from the digital model, allows experts to track how traffic affects the bridge over time.

Science Diplomacy and Understanding the Effects of Nuclear War

Anupama Vijayakumar,
Consultant, RIS

Among existential threats such as climate change and pandemics, the prospect of the breakout of a nuclear war has been of particular concern amid the evolving geopolitical scenario. Consequently, understanding the effects of nuclear war on health and environment in particular and the future of humanity in general continues to be an important concern for science diplomacy in the 21st Century. Amid growing hostilities between nuclear-armed states, scientists from all over the globe have called for an improved understanding on the effects of nuclear war. In recent times, this momentum has translated to the UN General Assembly's First Committee on Disarmament and International Security voting for the establishment of an expert panel to broaden the understanding on the subject.

The [resolution](#) titled "Nuclear War Effects and Scientific Research", was sponsored by Ireland and New Zealand. This is the second effort of its kind to draw upon scientific expertise to enhance humanity's understanding on the effects of nuclear war. A 1985 UNGA resolution had called on the UN Secretary-General to conduct a study on the physical and environmental effects of nuclear war. The report that resulted out of this was published in 1988 and significantly helped broaden the understanding on the climactic effects of nuclear war including nuclear winter, "a prolonged cooling effect on the earth". The new resolution calls for the establishment of an independent panel to review existing body of knowledge as well as commission new studies to provide a comprehensive assessment on the poten-

tial effects of nuclear war. More specifically, the panel would [exam-](#)
[ine](#):

"the physical effects and societal consequences of a nuclear war on a local, regional and planetary scale, including, inter alia, the climatic, environmental and radiological effects, and their impacts on public health, global socioeconomic systems, agriculture and ecosystems, in the days, weeks and decades following a nuclear war".

144 UN member-states including several members of the North Atlantic Treaty Organization voted in favour of the resolution. While China remained the sole *de jure* nuclear weapon state to vote in favour, others including the United States, Russia, France and the United Kingdom abstained.

As such the practice of science diplomacy in the post-World War II era have drawn substance from negotiations pertaining to nuclear arms control and non-proliferation. In a way, nuclear diplomacy is a classic case in point to understand [science in diplomacy](#), which focuses on informing and supporting diplomatic processes through lending scientific expertise. Whether it be with respect to nuclear test bans or fissile material cutoff, as well as key matters pertaining to nuclear safety and security, policy has been heavily influenced by science.

Nuclear weapons have only been used twice in history. It was during the final phase of the World War II

that the USA dropped atomic bombs in the Japanese cities of Hiroshima and Nagasaki on 6 August and 9 August 1945 respectively. The two events demonstrated to the world the massive amount of death and destruction that the atomic bomb could unleash. Moreover, the effects of the atomic bomb continues through Japan's post-World War II generations which continue to suffer from severe health impacts.

While a broad consensus exists that the future use of nuclear weapons should be avoided at all costs, fears are rife that geopolitical competition might prompt nuclear-armed states to resort to using them. Although the existing knowledge on the detrimental impacts of nuclear weapons stands on scientific expertise, an enhanced and comprehensive understanding as mandated by the recent resolution would help improve awareness on these effects to the current generations. This would also help bring together and review the vast wealth of existing knowledge on the subject to be compiled in a comprehensive manner. Modern day climactic and scientific modelling tools may also be employed to gain a clearer picture on how such an event could impact a heavily interconnected world. This shall hopefully carry forward in the coming decades to realise a nuclear weapon free world.

World's First Wooden Satellite, LignoSat, Reaches ISS for Key Orbital Test

Experiment: The Japanese satellite, created by Kyoto University and Sumitomo Forestry, uses magnolia wood as its main structural material. It measures 4 inches.

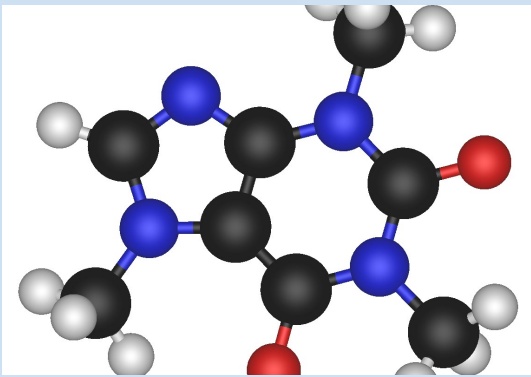
Future Prospects: The use of wood could reduce environmental impact, as traditional aluminum satellites release aluminum oxides upon reentry, potentially affecting Earth's thermal balance and ozone layer. With the growing number of satellites in orbit, the environmental footprint of satellite reentry has become an increasing concern. The wooden satellite is designed to explore sustainable options for space technology.



New Processes for Turning Carbon Dioxide into Ethylene

Experiment: The MIT team focused on the electrochemical conversion of CO₂ to ethylene. The team has developed a new design for the electrodes used in these systems, which increases the efficiency of the conversion process. They ran a test electrode for 75 hours continuously, with little change in performance.

Future Prospects: The approach could also be applied to producing other high-value chemical products as well, including methane, methanol, carbon monoxide, and others. The process can be easily integrated into existing manufacturing processes, even in a large-scale roll-to-roll process.



INSIGHTS & RESOURCES

UN Report Calls for Climate Finance to Aid Developing Countries

The United Nations Conference on Trade and Development (UNCTAD) has published a new report titled 'The New Collective Quantified Goal on Climate Finance'. The report outlines a daunting roadmap for climate finance and calls for developed countries to meet escalating financial commitments to support global climate goals.

The report stresses on key requirements pertaining to climate finance in the current context.

- Developing nations will need around \$1.1 trillion annually in climate financing by 2025, a figure expected to climb to \$1.8 trillion by 2030.
- Effective climate financing must be transparent, adaptable, and easily accessible, focused on expanding fiscal capacity rather than increasing debt burdens.
- Equitable approach—aligning with the principle of Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC)—to ensure fair effort-sharing among developed countries.

Global Renewable Energy Investment to touch USD 3.1 Trillion Mark in 2024

The 3rd edition of the World Solar Report series was released at the 7th Assembly of the International Solar Alliance focusing on global solar growth, investment trends, technological advancements, and Africa's green hydrogen potential. The newly launched 4 reports namely World Solar Market Report, World Investment Report, World Technology Report, and Green Hydrogen Readiness Assessment for African Countries each highlight a crucial area in the global shift towards sustainable energy. The report was released by MNRE Minister and ISA President Pralhad Joshi at the ongoing assembly of the International Solar Alliance held in New Delhi.

- The World Investment Report highlights a global shift toward sustainable energy, with energy investments rising from USD 2.4 trillion in 2018 to USD 3.1 trillion by 2024.
- The World Solar Market Report said that exceptional growth was witnessed in solar, with global capacity soaring from 1.22 GW in 2000 to 1,418.97 GW in 2023. The manufacturing sector is also expected to exceed demand, making solar more affordable. Solar jobs have surged to 7.1 million, and global capacity may reach 7,203 GW by 2030.
- The World Technology Report showcased advancements in solar technology, emphasizing breakthroughs in efficiency, sustainability, and affordability.
- The report on Readiness Assessment of Green Hydrogen African Countries highlighted green hydrogen's potential to decarbonise industries heavily reliant on fossil fuels like steel and fertilizer production.

Rich Nations Provided USD 32.4 Bn in Adaptation Finance in 2022; Large Gap Remains

According to the report submitted by a group of developed countries to the UN Framework Convention on Climate Change (UNFCCC): Developed countries provided USD 32.4 billion in 2022 to help developing countries adapt to climate change, including USD 28.9 billion in public funding. This amount was about 23 per cent higher than in 2021 and 54 per cent higher than in 2019. However, according to a UN report released in November last year, developing countries need USD 215-387 billion every year to protect themselves from the impacts of climate change. USD 11.6 billion of international public finance was provided as grants, USD 17.2 billion was provided as loans, and USD 100 million was provided as equity in 2022. Compared to 2019, grants increased by 63 per cent, and loans rose by 48 per cent. Of the total USD 32.4 billion mobilised in 2022, USD 10.6 billion was given as bilateral aid, while USD 18.3 billion went through multilateral channels, like development banks and climate funds.

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