

If you can't see this message, [view it in your browser.](#)

SCIENCE DIPLOMACY NEWS ALERT | 16-31 AUGUST 2022| ISSUE 92

[www.fisd.in](http://www.fisd.in)

## NEWS ALERT

*Forum for Indian Science Diplomacy*

RIS Science Diplomacy News Alert is your fortnightly update on Indian and global developments in scientific research, technological advancements, science diplomacy, policy and governance. The archives of this news alert are available at <http://fisd.in>. Please email your valuable feedback and comments to [science.diplomacy@ris.org.in](mailto:science.diplomacy@ris.org.in)

## CONTENTS

### GLOBAL

[Chip-free, Wireless Electronic 'Skin'](#)

[Simple Method Destroys Dangerous Chemicals in Water](#)

[Novel Concept for Low-Cost Batteries](#)

[Antiviral Tecovirimat May Treat Monkeypox](#)

[New Heat-tolerant, High-Capacity Capacitor](#)

[Light-Activated Hemithioindigo Molecules Target Antibiotic Resistance](#)

[Webb Telescope Detects Carbon Dioxide in Exoplanet](#)

[New Nanophotonic Coating Could Aid Counter-surveillance Efforts](#)

### COVID-19 (WORLD)

[New Generation of Coronavirus Vaccine](#)

[Durable Coating Kills COVID Virus and Other Germs](#)

### COVID-19 (INDIA)

[NIV Calls for Booster Dose and Continuation of Non-Pharmaceutical Interventions](#)

[Novovax's Shows High Levels of Protection Against Infection](#)

### INDIA– SCIENCE & TECHNOLOGY

[India's Indigenously Developed Hydrogen Fuel Cell Bus](#)

[NCL Sets up Pilot Plant with Capability to Manufacture Bisphenol-A](#)

[Anti-Pollution Helmet for Bikers](#)

[Newly Identified Gene to Treat Fungal Infection in Immuno-Compromised Patients](#)

[IIT Guwahati Develops Biodegradable Edible Coatings to Extend Shelf Life](#)

### IN BRIEF

[New Gene Therapy Shows Promise for Treating Eye Condition](#)  
[Artificial Intelligence to Detect Parkinson's](#)  
[Silicon Image Sensor that Computes](#)  
[Polypill Reduces Cardiovascular Mortality](#)

## **RESOURCES AND EVENTS**

[Landmark Climate Bill Adopted in US](#)  
[India Pitches for Special WTO Meet to Expand Scope of Covid IP Waiver](#)

## **SCIENCE POLICY AND DIPLOMACY**

[UN Session on High Seas Treaty Ends Without Agreement](#)  
[NPT Review Conference Ends Without Consensus](#)

## **GLOBAL**

### **Chip-free, Wireless Electronic 'Skin'**

MIT engineers have devised a new kind of wearable sensor that communicates wirelessly without requiring onboard chips or batteries. The team's sensor design is a form of electronic skin, made of ultrathin, high-quality film of gallium nitride, a material that is known for its piezoelectric properties. The researchers found they could harness gallium nitride's two-way piezoelectric properties and use the material simultaneously for both sensing and wireless communication. The team showed that the device was sensitive enough to vibrate in response to a person's heartbeat, as well as the salt in their sweat, and that the material's vibrations generated an electrical signal that could be read by a nearby receiver. In this way, the device was able to wirelessly transmit sensing information, without the need for a chip or battery. The device was able to sense and wirelessly transmit changes in the surface acoustic waves of the gallium nitride on skin related to their heart rate and could also be adapted to sense and wireless transmit changing sodium levels.

### **Simple Method Destroys Dangerous Chemicals in Water**

Chemists at UCLA and Northwestern University have developed a simple way to break down almost a dozen types of these nearly indestructible persistent chemicals in water at relatively low temperatures with no harmful byproducts. They show that in water heated to just 80 to 120 degrees C, common, inexpensive solvents and reagents like dimethyl sulfoxide, also known as DMSO, and sodium hydroxide, severed molecular bonds in Per- and polyfluoroalkyl substances (PFAS) that are among the strongest known and initiated a chemical reaction that gradually nibbled away at the molecule until it was gone. The simple technology, the comparatively low temperatures and the lack of harmful byproducts mean there is no limit to how much water can be processed at once. The technology could eventually make it easier for water treatment plants to remove PFAS from drinking water. Over the past 70 years, PFAS have contaminated virtually every drop of water on the planet, and can accumulate in the tissues of people and animals over time and cause harm. Certain cancers and thyroid diseases, for example, are associated with PFAS.

### **Novel Concept for Low-Cost Batteries**

Researchers at MIT and elsewhere have developed a new kind of battery, made entirely

from abundant and inexpensive materials, that could help economical, large-scale backup systems to power large wind installations and solar power systems, beyond lithium-ion batteries. The new battery architecture uses aluminum and sulfur as its two electrode materials, with a molten salt electrolyte in between. In their experiments, the team showed that the battery cells could endure hundreds of cycles at exceptionally high charging rates, with a projected cost per cell of about one-sixth that of comparable lithium-ion cells. The new battery formulation would be ideal for installations of about the size needed to power a single home or small to medium business, producing on the order of a few tens of kilowatt-hours of storage capacity.

### **[Antiviral Tecovirimat May Treat Monkeypox](#)**

A UC Davis Medical Center's health study finds that the antiviral tecovirimat appears to be safe and effective for the treatment of monkeypox symptoms and skin lesions. Tecovirimat (TPOXX) is an FDA-approved antiviral drug for the treatment of smallpox. It limits viral spread in the body by inhibiting the work of the protein involved in the release of the enveloped virus. Recently, the Centers for Disease Control and Prevention (CDC) allowed physicians to prescribe tecovirimat on a compassionate use basis to treat adults and children with orthopoxvirus infections, including monkeypox. The study is one of the earliest studies to assess and report the outcomes of treating patients with monkeypox with this antiviral. The antiviral drug approved for smallpox treatment appeared to be safe and effective in 25 patients with monkeypox (MPX). The study was small and did not include a control group. So, assessing antiviral efficacy in terms of symptom duration and severity was limited. Also, the time from symptom onset to starting the antiviral therapy varied among the patients. The researchers called for large-scale studies to explore antiviral efficacy dosing and adverse events.

### **[New Heat-tolerant, High-capacity Capacitor](#)**

Researchers at Osaka Metropolitan University have developed a solid electrolyte that is highly deformable, allowing it to have a large contact area with an electrode, which was developed to be used for an oxide-based all-solid-state capacitor. They fabricated a composite using the same highly deformable solid electrolyte and carbon, then used it to construct both electrodes for a bulk-type all-solid-state capacitor. This capacitor is capable of high current densities and high-capacity charging and discharging at temperatures of 200-300°C, creating the world's first bulk-type all-solid-state capacitors. The researchers expect that their capacitor will be used to improve technology for high-temperature environments, which could not be developed previously due to these technical limitations.

### **[Light-Activated Hemithioindigo Molecules Target Antibiotic Resistance](#)**

Rice University scientists led a team developing light-activated hemithioindigo (HTI) molecules that destroy Gram-positive bacteria and the biofilms they form. The molecules do so by enhancing the local generation of reactive oxygen species (ROS) that chemically attack and destroy drug-resistant cells. The new molecules differ from, and are complementary to, others created at Rice that are also activated by light but drill into cell membranes to kill them. The HTI-based molecular machines consist of two halves: a thioindigo unit linked to a carbocycle via a central carbon double bond. When triggered by

visible light, the molecule undergoes a conformational change that results in either a drill-like 360-degree motion or a shift between two conformations, like an "on/off" switch, depending on the molecular design. In the process, activated HTIs react with the cell and molecular oxygen, transferring electrons to produce ROS that batter the target cells. An important advantage of these molecules is that they have a narrow spectrum of activity and selectively kill a specific group of bacteria, Gram-positive bacteria. Therefore, they are less likely to cause the side effects seen with broad-spectrum antibiotics that indiscriminately kill both 'bad' and 'good' bacteria, and they are also less likely to lead to resistance because only one group of bacteria is affected.

### [Webb Telescope Detects Carbon Dioxide in Exoplanet](#)

For the first time, astronomers have found unambiguous evidence of carbon dioxide in the atmosphere of an exoplanet (a planet outside our solar system). The discovery demonstrates the power of the James Webb Space Telescope (JWST) to deliver unprecedented observations of exoplanet atmospheres. Carbon dioxide is an important component of the atmospheres of planets in our solar system, found on rocky planets like Mars and Venus as well as gas giants like Jupiter and Saturn. For exoplanet researchers, it is important both as a gas they are likely to be able to detect on small rocky planets and as an indicator of the overall abundance of heavy elements in the atmospheres of giant planets. Carbon dioxide is actually a very sensitive measuring stick for heavy elements in giant planet atmospheres. This detection will serve as a useful benchmark of what we can do to detect carbon dioxide on terrestrial planets going forward. In addition to carbon dioxide, the researchers detected another interesting feature in the spectrum of WASP-39b that they have not yet identified.

### [New Nanophotonic Coating Could Aid Counter-surveillance Efforts](#)

Researchers at the University of Illinois Urbana-Champaign have recently devised a visibly transparent infrared reflective coating. Designed with a nano-mesh structure, their new coating sufficiently transmitted visible light -- including sunlight -- and reflected body thermal radiation like conventional metal-based textiles. In addition, by combining their nano-pore structure with a photothermal material, the researchers were able to confine both sunlight and thermal energy from the body inside the textile. This technology could be used in counter-surveillance military applications - specifically, to provide camouflage under the scrutiny of thermal imaging cameras. Their tests of the thermal camouflage effect, at temperatures ranging from 34° to 250°C were so promising that it could successfully be used for both daytime and nighttime cloaking.

## **COVID-19**

### **COVID-19 (WORLD)**

#### [New Generation of Coronavirus Vaccine](#)

Researchers at Karolinska Institutet in Sweden are developing a coronavirus vaccine designed to be less sensitive to mutations and equipped for future strains. The vaccine showed promising results in mice. The researchers are developing a vaccine containing more

parts of the virus, including ones that do not mutate at the same rate as the spike protein. The vaccine is a DNA vaccine, which enables the cells to produce the proteins that the DNA sequences contain instructions for. In this case, it concerns DNA for parts of the spike protein from three different coronavirus variants and DNA for another two virus proteins, called M and N, where mutations are less common. The vaccine protects mice against serious infection from the beta variant of SARS-CoV-2, a variant that can evade the immune response, and activates immune cells (T cells) that recognise the coronavirus found in bats.

### **Durable Coating Kills COVID Virus and Other Germs**

A team of University of Michigan engineers and immunologists have developed a durable coating that can quickly kill bacteria and viruses and keep on killing them for months at a time. It proved deadly to SARS-CoV-2 (the virus that causes COVID-19), E. coli, MRSA and a variety of other pathogens. It kills 99.9 percent of microbes even after months of repeated cleaning, abrasion and other punishment on real-world surfaces like keyboards, cell phone screens and chicken-slawed cutting boards. The coating could be a game changer in traditionally germ-laden public spaces like airports and hospitals. The coating, which is clear and can be brushed or sprayed on, gets its durability and germ-killing power by combining tried-and-true ingredients in a new way. It uses antimicrobial molecules derived from tea tree oil and cinnamon oil, both used for centuries as safe and effective germ killers that work in under two minutes. The coating's durability comes from polyurethane, a tough, varnish-like sealer that's commonly used on surfaces like floors and furniture. The results of the study's durability tests suggest that the coating could keep killing germs for six months or longer before its oil begins to evaporate and reduce its disinfectant power. However, it can be recharged by wiping it with fresh oil; the new oil is reabsorbed by the surface, starting the cycle again.

### **COVID-19 (INDIA)**

#### **NIV Calls for Booster Dose and Continuation of Non-Pharmaceuticals Interventions**

Scientists at the Indian Council of Medical Research-National Institute of Virology (ICMR-NIV) have presented four cases where patients had breakthrough infection from the Kappa or Delta variant, and several months later were reinfected with Omicron variants, after receiving two doses of vaccine. The recurrence of SARS-CoV-2 virus infection has been reported to vary between 2.3 per cent and 21.4 per cent. In cases of reinfection, the disease severity was found to decrease or remain unchanged at 97.3 per cent. The situation has become even more complicated due to the appearance of the Omicron variant with increased transmissibility and immune escape potential. The variant has now evolved into 283 sub-lineages including the most predominant BA.1.1, BA.2, BA.4 and BA.5. This emphasises the need for the booster vaccination dose. Apparently, the known immune escape of Omicron and its sub-lineage could also be the reason for the reinfection amongst these breakthrough cases. Irrespective of the immune status with vaccination or the natural infections, many breakthrough infections and re-infections have been observed across the globe. Considering this along with booster dose vaccination, the continuation of non-pharmaceutical interventions i.e. use of mask, hand hygiene and physical distancing would be the good strategy to curb the spread of infection.

### **Novavax's Shows High Levels of Protection Against Infection**

US biotechnology major Novavax whose vaccine is being manufactured by Pune-based Serum Institute of India (SII) said that two large phase-3 trials of its COVID-19 vaccine have shown high levels of protection against mild, moderate, and severe infection. SII and Novavax are the key partners in the development and manufacturing of the Novavax vaccine, marketed by Novavax as Nuvaxovid™ and by SII as Covovax™, from its facility in Pune. Data shows that the prototype current strain vaccine induces broad recognition of new variants, especially with boosting. The vaccine has been authorised for use as a booster in several countries, including Japan and Australia. He also said that an application has been submitted to the US FDA for Emergency Use Authorisation for the COVID-19 vaccine as a booster in adults.

## **INDIA-SCIENCE & TECHNOLOGY**

### **India's Indigenously Developed Hydrogen Fuel Cell Bus**

Union Minister of State, Dr Jitendra Singh launched India's first truly indigenously developed Hydrogen Fuel Cell Bus developed by KPIT-CSIR in Pune. The bus which has zero emissions, is the most environmentally friendly mode of transportation. The high efficiency of fuel cell vehicles and the high energy density of hydrogen ensures that the operational costs in rupees per kilometre for fuel cell trucks and buses are lower than diesel powered vehicles and this can bring freight revolution in India.

### **NCL Sets up Pilot Plant with Capability to Manufacture Bisphenol-A**

The CSIR-National Chemical Laboratory (NCL) in Pune has successfully demonstrated the operations of a pilot plant capable of manufacturing Bisphenol-A, a key raw material with high demand for manufacturing engineering plastics globally. The facility was inaugurated by Dr Jitendra Singh, minister of state for science and technology. India imports about 135 thousand tonnes of Bisphenol-A annually. The material has wide-scale applications as coating material for food and beverage cans in the packaging industry, in electronics and automobile components, and for the overall manufacture of engineering plastics. The process developed by NCL enables recycling of all unreacted and leftover phenol involved in the chemical process, resulting in savings in the overall cost of production of the final product.

### **Anti-Pollution Helmet for Bikers**

A Delhi-based startup, Shellios Technolabshas developed an anti-pollution helmet which also has a Bluetooth-enabled app that lets the rider know when the helmet requires cleaning. The startup received seed funding from the Department of Science and Technology (DST) and was incubated at Science and Technology Entrepreneur Park (JSSATE-STEP) Noida. They have signed commercialization deals with leading Original Equipment Manufacturers (OEMs) for the helmet. The product, at Technology Readiness Level (TRL) level 9 has been granted utility patent and is now being sold in all parts of the country priced at Rs. 4500/-. The end-users of the product include individual riders all over India and for the next version, Shellios ties up with top tier-2-wheeler OEM for the commercialization of the anti-pollution helmet. The helmet titled PUROS is integrated with air purifying accessories which include the patented innovations of the startup -- a Brushless DC (BLDC) blower fan, High-Efficiency Particulate Air (HEPA) filter membrane, electronic circuit, and microUSB charging port integrated into the helmet. The purifying system set at the back of the helmet picks up all particulate matter coming from outside and cleans the air before it reaches the biker. Following all mandatory standards stipulated by the government, the 1.5 Kg helmet ensures exposure reduction by more than 80 percent as measured using a controlled environment.

### **Newly Identified Gene to Treat Fungal Infection in Immuno-Compromised Patients**

In a collaborative study between at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India and Institut Pasteur, Paris, France, scientists identified a gene called CSA6 which holds the key to prevent fungal infection Candidiasis that often affects intensive-care unit (ICU) patients, cancer patients and patients receiving immunosuppressive therapy. The fungal species residing in mucosal linings of the gastrointestinal and urogenital tract of healthy individuals turns into a pathogen under immuno-compromised conditions breaching the host defense causing superficial as well as life-threatening systemic infection. The study identifies and elucidates the functions of a novel regulator of chromosome stability that is exclusively present in a group of medically relevant human fungal pathogens. Besides, it also provides a systematic scheme for identifying genes whose products may serve as potential therapeutic interventions for fungal infections by posing lesser adverse effects on humans. Hence, small molecule modulators that alter expression levels of the gene called Csa6 offer potential avenues for treatment with no side effects in humans.

### **IIT Guwahati Develops Biodegradable Edible Coatings to Extend Shelf Life**

The Indian Institute of Technology (IIT) Guwahati researchers have developed an edible coating to extend the shelf-life of fruits and vegetables. This coating material which will prevent wastage was tested on vegetables such as potatoes, tomatoes, green chilli and strawberries, Khasi mandarin, apples, pineapples, and kiwifruits. And it was found to keep

these vegetables fresh for nearly two months. The IIT Guwahati team used a mix of a micro-algae extract and polysaccharides to produce protective, edible films for coating on vegetables and fruits. The researchers also tested the biosafety of these coatings by treating BHK-21 cells with these coating materials. Their tests showed that these coating materials were nontoxic and could be safely used as edible food packaging materials. The newly-developed coatings can be mass-produced and are unique. They are very stable to light, heat and temperature up to 40 degrees C, edible and can be safely eaten as part of the product formulation and do not add unfavourable properties to it. They retain the texture, colour, appearance, flavour, nutritional value and microbial safety of the fruit or vegetable that has been coated, thereby enhancing their shelf life to several weeks to months.

## IN BRIEF

### [New Gene Therapy Shows Promise for Treating Eye Condition](#)

Researchers from Trinity College Dublin have developed a new gene therapy approach that shows promise for treating the dry form of Age-Related Macular Degeneration (AMD) -- a progressive eye disease that affects up to 10 per cent of adults over 65 years of age and is a leading cause of severe vision impairment and blindness in this age group. The new gene therapy (ophNdi1) directly targets mitochondrial function in cells that are malfunctioning in AMD. The new gene therapy uses a virus to access the cells that are suffering and deliver the code needed to enable the failing mitochondria to generate extra energy and continue to function in supporting vision.

### [Artificial Intelligence to Detect Parkinson's](#)

Researchers at MIT have developed an artificial intelligence model that can detect Parkinson's just from reading a person's breathing patterns. The tool in question is a neural network, a series of connected algorithms that mimic the way a human brain works, capable of assessing whether someone has Parkinson's from their nocturnal breathing -- i.e., breathing patterns that occur while sleeping. The neural network is also able to discern the severity of someone's Parkinson's disease and track the progression of their disease over time. The researchers demonstrated that the artificial intelligence assessment of Parkinson's can be done every night at home while the person is asleep and without touching their body. Parkinson's is the second-most common neurological disorder, after Alzheimer's disease.

### [Silicon Image Sensor that Computes](#)

Researchers from Harvard have developed the first in-sensor processor that could be integrated into commercial silicon imaging sensor chips -- known as complementary metal-oxide-semiconductor (CMOS) image sensors -- that are widely used. They developed a silicon photodiode array, electrostatically doped, enabling the sensitivity of individual photodiodes, or pixels, to incoming light to be tuned by voltages. An array that connects multiple voltage-tunable photodiodes together can perform an analog version of multiplication and addition operations central to many image processing pipelines, extracting the relevant visual information as soon as the image is captured. These dynamic photodiodes can concurrently filter images as they are captured, allowing for the first stage of vision processing to be moved from the microprocessor to the sensor itself. The silicon photodiode array can be programmed into different image filters to remove unnecessary



details or noise for various applications.

### **Polypill' Reduces Cardiovascular Mortality**

Spanish researchers have developed a three-drug medication known as a "polypill," which is effective in preventing secondary adverse cardiovascular events in people who have previously had a heart attack, reducing cardiovascular mortality by 33 percent in this patient population. These are findings from the clinical trial SECURE. The results show that the polypill achieves clinically relevant reductions in the recurrent cardiovascular events among people who have recovered from a previous heart attack because of better adherence to this simplified approach, rather than taking them separately. The polypill analysed in the study, Trinomia, contains aspirin (100 mg), the angiotensin-converting enzyme inhibitor ramipril (2.5, 5, or 10 mg), and atorvastatin (20 or 40 mg).

## **RESOURCES & EVENTS**

### **Landmark Climate Bill Adopted in US**

On Tuesday 16 August, US president Joe Biden signed a bill into law that he described as "the most significant legislation in history to tackle the climate crisis". The Inflation Reduction Act contains \$437bn of spending, \$369bn of which will go towards emissions-cutting measures. It was agreed after months of negotiations in Congress. No Republicans supported the bill which brings the US much closer to meeting its international climate targets. The Bill provides an additional \$4bn for western US states that are feeling the effects of droughts. The bill will be paid for by new measures that increase taxes on large corporations and curb tax avoidance, including a 15 percent minimum tax on corporations, expected to raise \$222bn over the next decade. The bill extends wind and solar tax credits by 10 years and extends similar incentives to battery storage and biogas. It also includes new or extended tax credits for nuclear power, clean hydrogen and carbon capture and storage (CCS). The bill contains roughly \$30bn in targeted grant and loan programs for states and electric utilities to accelerate the transition to clean electricity and \$27bn for a "clean energy technology accelerator", to support the deployment of clean technologies, particularly in disadvantaged areas.

### **India Pitches for Special WTO Meet to Expand Scope of Covid IP Waiver**

At a recent meeting of the General Council, India said it is not able to continue discussions at the TRIPS Council due to "hesitation from the institution" and expects things to resume in September after the WTO's summer break. India has pitched for a special meeting of the General Council of the World Trade Organization (WTO), before the one scheduled in December, forextending the scope of the Covid-19 vaccine patent waiver to diagnostics and therapeutics. The 164-member WTO had in its 12th ministerial conference in June decided to expand the intellectual property rights waiver to therapeutics and diagnostics within six months, which would end in December.

## **SCIENCE POLICY AND DIPLOMACY**

### **UN Session on High Seas Treaty Ends Without Agreement**

UN member states ended two weeks of negotiations in New York on 26 Aug without a

treaty to protect biodiversity in the high seas, an agreement that would have addressed growing environmental and economic challenges. After 15 years, including four prior formal preparatory sessions, negotiators have yet to reach a legally binding treaty to address the multitude of issues facing international waters—a zone that encompasses half of the planet. It will now be up to the UN General Assembly to resume the fifth session at a date still to be determined. The session was expected to agree on a final text on "the conservation and sustainable use of marine biodiversity beyond national jurisdiction," or BBNJ for short. One of the most sensitive issues in the text revolved around the sharing of possible profits from the development of genetic resources in international waters, where pharmaceutical, chemical and cosmetic companies hope to find miracle drugs, products or cures. Developing countries do not want to be left out of potential windfall profits drawn from marine resources that belong to all. One of the key pillars of an eventual BBNJ treaty is to allow the creation of marine protected areas, which many nations hope will cover 30 percent of the Earth's ocean by 2030.

### **[NPT Review Conference Ends Without Consensus](#)**

Following four weeks of intense discussions at UN Headquarters in New York, the Tenth Review Conference of the Parties to the NPT ended late on 26 August without an outcome document because Russia objected to text about its control over Ukrainian nuclear facilities. The UN Secretary-General expressed disappointment that countries were unable to reach consensus on a “substantive outcome”, and to strengthen the 52-year-old treaty and advance its goals despite the sincere and meaningful engagement by the parties. The Conference recognized the NPT as the “cornerstone” of the global disarmament and non-proliferation regime, but was unable to address the pressing challenges threatening global collective security. Read the [final text](#) here.

### **RIS course on Science Diplomacy Planned in January 2023**

RIS is planning to organise a course on Science Diplomacy For international participants from partner countries of the ITEC programme of the Ministry of External Affairs, Government of India. This course will be similar to the courses organised in 2017, 2018, 2019, and 2020, and is planned for January 2023, for two weeks duration. Details will be indicated as soon as the course is finalised. The participation is open to science policy makers, diplomats and scientists from ITEC partner countries.

### **[RIS and GSEJ Extend Submission Deadline for Science Diplomacy Review Special Issue](#)**

The Science Diplomacy Review (SDR) is a peer-reviewed and open access journal published by the Forum for Indian Science Diplomacy (FISD) based at Research and Information System for Developing Countries (RIS), an autonomous independent policy research think tank with India's Ministry of External Affairs. SDR's special issue titled '*New Dimensions of Science Diplomacy for the Twenty-First Century*' will be published in collaboration between RIS and the Centre for Global Science and Epistemic Justice (GSEJ) at the University of Kent, UK. We invite contributions that unpack the idea of 'science diplomacy' through examinations on past and emerging experiences. Authors may submit full length research articles (4,000-5,000 words) as well as shorter articles and

commentaries (1,500-3,000 words). Papers that focus on non-state actors and/or from the Global South perspectives, and papers with novel research methods are particularly welcome. The last date for submission of the full paper is 2 September 2022. The details are available at <http://fisd.in>.

We welcome your comments and valuable suggestions. Please write to us for receiving publications, updates and notices regarding seminars, conferences etc.

**NOTE TO OUR READERS AND STAKEHOLDERS:**

The Science Diplomacy Programme at RIS has been sending you the fortnightly issues of Science Diplomacy Alerts regularly. We request your cooperation to review the Alerts and improve its content. For this purpose, please complete the form at <https://forms.gle/o4d869FxaM9t3KNw7>, and submit it. Your support and cooperation are appreciated.

**Research and Information System for Developing Countries**

Core IV B 4th Floor, India Habitat Centre, Lodi Road, New Delhi 110003, India

Tel:-011- 24682176, E-mail: [science.diplomacy@ris.org.in](mailto:science.diplomacy@ris.org.in)

Website: [www.fisd.in](http://www.fisd.in)

***Disclaimer:***

Opinions and recommendations in the report are exclusively of the author(s) and not of any other individual or institution including FIRD. This report has been prepared in good faith on the basis of information available at the date of publication. All interactions and transactions with industry sponsors and their representatives have been transparent and conducted in an open, honest and independent manner as enshrined in FIRD Memorandum of Association. FIRD does not accept any corporate funding that comes with a mandated research area which is not in line with FIRD research agenda. The corporate funding of an FIRD activity does not, in

any way, imply FISS endorsement of the views of the sponsoring organization or its products or policies. FISS does not conduct research that is focused on any specific product or service provided by the corporate sponsor.

To unsubscribe please [click here](#)