

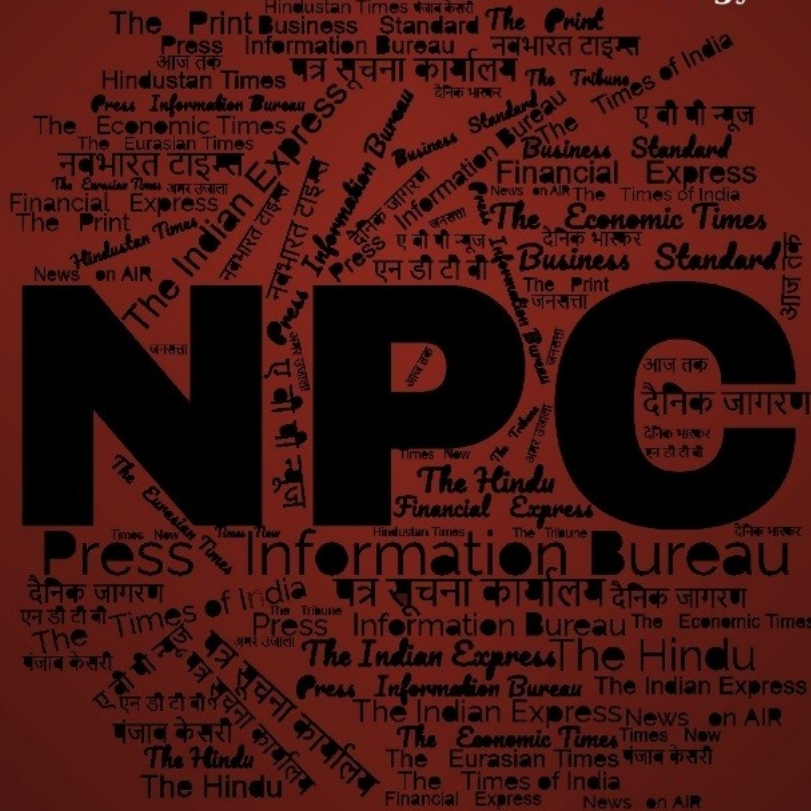
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# समाचार पत्रों से चयनित अंश Newspapers Clippings

डीआरडीओ समुदाय को डीआरडीओ प्रौद्योगिकियों, रक्षा प्रौद्योगिकियों, रक्षा नीतियों, अंतर्राष्ट्रीय संबंधों और विज्ञान एवं प्रौद्योगिकी की नूतन जानकारी से अवगत कराने हेतु दैनिक सेवा

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*Thu, 22 Aug 2024*

## **Meghalaya: NEHU hosts outreach programme on DRDO funding opportunities, drawing regional participation**

The Research and Development Cell of North-Eastern Hill University (NEHU), Shillong, in collaboration with the Institute of Nuclear Medicine and Allied Sciences (INMAS), Delhi hosted a one-day outreach programme on funding opportunities provided by the Life Sciences Research Group (LSRB) under the Specialist Panel on Soldier Health and Drug Development (SHDD) of the Defence Research and Development Organization (DRDO).

The event, held on August 22, drew significant participation from across the region, marking a pivotal moment in advancing collaborative research and development.

The inaugural session of the program was honored by the presence of distinguished guests, including Prof. P.S. Shukla, Vice-Chancellor of NEHU, who served as the chief guest, and Dr. Sudhir Chandna, Director of INMAS Delhi, who was the guest of honour.

The event also featured attendees such as Prof. S.R. Joshi, Director of the R&D Cell at NEHU, Dr. Gaurav Mittal, Secretary of LSRB, Dr. Pooja Srivastava, Member Secretary of SHDD-LSRB, and prominent scientists from INMAS Delhi, including Dr. Himanshu Ojha, Dr. Vinod Kaushik, Dr. Pradeep Goswami, Dr. Sudip R. Nayak, and Dr. Suchi Bhagi.

Dr. Sudhir Chandna emphasised the critical role of INMAS and DRDO in the development of processes, products, technology, and devices essential for soldier welfare and national security, acknowledging the challenges faced during times of crisis, such as the Covid-19 pandemic, and urged scientists and faculty to propose innovative research projects with strong hypotheses and potential for practical outcomes.

Prof. PS Shukla praised the significant contributions of DRDO and reaffirmed NEHU's commitment to supporting initiatives that benefit society and the nation. He offered robust support from the university to further collaborative efforts and program execution.

The programme also witnessed an engaging session of interactive discussions between DRDO scientists and the attendees, which included over 130 faculty members and scientists from medical institutions, universities, ICAR, research institutions, and colleges across Northeast.

The outreach programme underscored the collective effort to enhance research capabilities and strengthen the ties between academic institutions and defense research organisations.

<https://www.indiatodayne.in/meghalaya/story/meghalaya-nehu-hosts-outreach-programme-on-drdo-funding-opportunities-drawing-regional-participation-1077208-2024-08-22>

## DECCAN Chronicle

Thu, 22 Aug 2024

### **BITS Pilani Appoints Dr G. Satheesh Reddy as Senior Professor**

Birla Institute of Technology and Science (BITS) Pilani, Hyderabad, on Thursday, announced the appointment of Dr G. Satheesh Reddy, the former chairman of the Defence Research and Development Organisation (DRDO), as a distinguished senior professor in the department of electrical and Electronics engineering. Dr Reddy's career is marked by nearly four decades of pioneering contributions to India's defence technology. In a statement, Dr Reddy said: "After nearly 39 years at DRDO, continuing my research in an academic setting is a natural step. The establishment of the Centre for Research Excellence in National Security (CRENS) at BITS is particularly compelling." He added that he looked forward to contributing to this centre and collaborating with industry, security agencies, and start-ups to drive innovation.

<https://www.deccanchronicle.com/southern-states/tehrangana/bits-pilani-appoints-dr-g-satheesh-reddy-as-senior-professor-1818306>



Thu, 22 Aug 2024

### **बेकार हो जाएंगी चीन-PAK की मिसाइलें... भारत बना रहा ऐसा हथियार**

भारतीय रक्षा अनुसंधान एवं विकास संगठन (DRDO) ने भारतीय नौसेना के लिए नई मिसाइल बना रहा है. यह लंबी दूरी की सतह से हवा में मार करने वाली मिसाइल होगी. कहा जा रहा है कि इसकी रेंज 250 km होगी. यह किसी भी तरह के एंटी-शिप मिसाइल को मार गिराएगी. चाहे उसकी गति 8600 किलोमीटर प्रतिघंटा से ज्यादा क्यों न हो.

यह मिसाइल इंडियन नेवी को हवाई सुरक्षा कवच देगी. ताकि पाकिस्तान या चीन की मिसाइलें किसी भी तरह से भारतीय नौसेना के युद्धपोतों, पनडुब्बियों और एयरक्राफ्ट कैरियर पर हमला न कर सकें. इस मिसाइल को Project Kusha के तहत बनाया जा रहा है. यह लंबी दूरी की सतह से हवा में मार करने वाली LRSAM सिस्टम जैसी होगी.

प्रोजेक्ट कुश में तीन लंबी दूरी की एयर डिफेंस मिसाइलें मौजूद हैं. 150 km, 250 से 300 km और 400 किलोमीटर. सपोर्ट के लिए साथ में रूस से मिली S-400 एयर डिफेंस सिस्टम भी है. लेकिन डीआरडीओ लगातार ऐसे हथियार बनाने में लगा है, जो देश को दुश्मन की परमाणु बैलिस्टिक मिसाइल से भी बचा सके.

क्यों बनाई जा रही है ये मिसाइल?

इस समय पूरी दुनिया में एंटी-शिप बैलिस्टिक मिसाइल (ASBMs) बहुत तेजी से बन रही हैं. इनसे सिर्फ नौसैनिक टारगेट ही हिट नहीं होते बल्कि सतह या हवा में भी निशाना लगाया जा सकता है. इनकी स्पीड बहुत ज्यादा होती है. इन्हें रोकना मुश्किल होता है. साथ ही इनसे होने वाली तबाही बहुत ही ज्यादा नुकसान करती हैं.

चीन के पास DF-21D जैसी एंटी-शिप बैलिस्टिक मिसाइल हैं. इसे कैरियर किलर भी बोलते हैं. यानी पूरे एयरक्राफ्ट कैरियर को डुबो सकते हैं. ईरान और अमेरिका भी ऐसे हथियार बना चुके हैं. अमेरिका की SM-6 ऐसी ही मिसाइल है. इसलिए डीआरडीओ ने इंडियन नेवी के लिए ऐसी मिसाइल बनाने का फैसला किया.

क्या खास होगा इस मिसाइल में...

यह मिसाइल किसी भी तरह की एंटी-शिप बैलिस्टिक मिसाइल को इंटरसेप्ट करेगी. चाहे उसमें पारंपरिक हथियार लगा हो या फिर परमाणु हथियार. इसमें ड्यूल कैपिबिलिटी होगी, यानी ये किसी भी तरह के विमान या बैलिस्टिक मिसाइल को निशाना बना पाएगी. इससे जमीन, जहाज, एयरक्राफ्ट कैरियर ... सभी जगह कवच बन जाएगा.

<https://www.aajtak.in/defence-news/story/drdo-is-developing-new-long-range-anti-ship-missile-interceptor-for-indian-navy-under-project-kusha-2018404-2024-08-22>

## Defence News

## Defence Strategic: National/International



Fri, 23 Aug 2024

### **US, India sign pact for reciprocal priority support to promote national defence**

The United States (US) and India have signed an agreement to provide reciprocal priority support for goods and services to promote national defence and to enable the two countries to acquire the

industrial resources they need from one another to resolve unanticipated supply chain disruptions to meet national security needs.

Vic Ramdass, the American principal deputy assistant secretary of defence for industrial base policy, and Indian defence ministry's additional secretary and director general (acquisitions) Samir Kumar Sinha signed the non-binding Security of Supply Arrangement (SOSA) on Thursday.

India is the 18th SOSA partner of the US after Australia, Canada, Denmark, Estonia, Finland, Israel, Italy, Japan, Latvia, Lithuania, the Netherlands, Norway, the Republic of Korea, Singapore, Spain, Sweden, and the United Kingdom.

Ramdass called the arrangement a pivotal moment in the US– India Major Defense Partner relationship and added it will be a key factor in strengthening the US –India Defense Technology and Trade Initiative (DTTI). He said he looked forward to hosting the next DTTI meeting this fall to deepen cooperation between defence industrial bases and pursue bilateral co-development, co-production, and co-sustainment initiatives.

In 2023, the two countries concluded a new road map for future defence industrial cooperation with the goal of fast-tracking technology cooperation and co-production in critical areas in a renewed push for deepening collaboration. The areas included air combat and land mobility systems, intelligence, surveillance, and reconnaissance, munitions, and the undersea domain.

SOSA comes five years after India and the US signed the Industrial Security Agreement to shore up defence cooperation. It allows the US government and American original equipment manufacturers to share classified information with private Indian defence firms.

The US and India committed under SOSA to support one another's priority delivery requests for the procurement of critical national defense resources. Washington will provide India assurances under the US Defense Priorities and Allocations System (DPAS), with program determinations by the US Department of Defense (DoD) and rating authorization by the Department of Commerce (DOC).

India will establish a government-industry Code of Conduct with its industrial base, where Indian firms will voluntarily agree to make every reasonable effort to provide the US priority support.

“With an expanding global supply chain for DOD, SOSAs are an important mechanism for DoD to strengthen interoperability with US defense trade partners. The Arrangements institute working groups, establish communication mechanisms, streamline DoD processes, and proactively act to allay anticipated supply chain issues in peacetime, emergency, and armed conflict. They are also a useful tool in developing investment strategies to ensure redundancy and security,” DoD said in a statement.

<https://www.hindustantimes.com/india-news/us-india-sign-pact-for-reciprocal-priority-support-to-promote-national-defence-101724385346557.html>

## **India, US military-to-military relationship strong: Pentagon**

The military-to-military relationship between India and the United States is strong, the Pentagon said Thursday on the eve of the meeting between Defence Minister Rajnath Singh and Defense Secretary Austin Lloyd.

Rajnath Singh arrived in Washington Thursday morning as part of a four-day visit to further boost the comprehensive global strategic partnership between the two countries. He is scheduled to meet Austin at the Pentagon on Friday.

"The mil-to-mil relationships between the United States and India are strong," Pentagon Deputy Press Secretary Sabrina Singh told reporters at a news conference here.

"You've seen that cooperation deepen, and not just from a DOD perspective, but from an administration perspective. Our close coordination and working together remains strong. The (Defense) secretary when he visited India, you know, announced some of those deliverables," Sabrina Singh said in response to a question.

"I'm not going to go through all of what he announced then, but it remains strong," she said.

<https://economictimes.indiatimes.com/news/defence/india-us-military-to-military-relationship-strong-pentagon/articleshow/112725048.cms>

## **PM Modi's Ukraine visit likely to explore deeper ties in defence manufacturing**

The symbolism and balancing act aside, Prime Minister Narendra Modi's visit to Ukraine, the first by an Indian Prime Minister, will focus on cooperation in defence, with India operating a large inventory of military equipment of both Russian and Ukrainian origin.

In the three years since the war in Ukraine, India has seen supplies and spares held up for some time and has attempted to diversify and reduce dependence by turning to domestic companies as well as seeking alternate vendor base in other countries.

The situation has improved since and spares, components and supplies have started coming, though not to the pre-war levels, according to official sources. Both Russia and Ukraine have assured that they would ensure timely deliveries though it is not up to the earlier schedules yet, the sources said.

Sources said Ukraine has several cutting-edge systems and technologies many of which are battle-tested. It has expressed interest in forming joint ventures with Indian companies.

The war in Ukraine in February 2022 impacted all three services of the Indian military that have huge inventories both from Russia and Ukraine. Immediately after the war began, the Indian Army terminated several contracts related to air defence, armour and artillery as it faced escalation in prices from other countries since spares and supplies became scarce and were diverted, shooting up prices, officials said. Further, quality claim resolutions became very time consuming.

The Army turned to indigenous defence manufacturers for smaller components and sub-assemblies. This was also done by the Navy and Indian Air Force (IAF).

“The Army has reached out to domestic vendors, tried to minimise imports of spares, assemblies and so on to the extent possible and diversified the vendor base where domestic options were not available to about 7-8 countries notably Poland, Estonia, Bulgaria, Czech Republic among others,” a source said.

The indigenous push was particularly in small components and ammunitions, officials said. With Russia, there has been an added element of payments as Russia was shunted out of the global SWIFT system and the rupee-rouble trade couldn't cater to large payments.

The impact of such tensions is not entirely new as in the past, tensions between Russia and Ukraine had considerably delayed the modernisation of the IAF's AN-32 transport fleet. Ukraine upgraded over 100 AN-32 transport aircraft of the IAF under a deal finalised in 2009. While upgrade of 45 AN-32s in Ukraine was completed in 2015, remaining aircraft were to be upgraded by IAF Base Repair Depot, Kanpur which got considerably delayed.

For the Indian Navy, probably the impact is as acute, if not more, as over 30 frontline warships are powered by engines from Zorya Nashproekt of Ukraine. Indian Navy drew a roadmap to achieve a certain level of servicing locally in the next few years.

In addition, Zorya is tying up with an Indian company to carry out certain level of engine maintenance reducing the need to ship engines to Ukraine, sources stated. Defence trade between India and Ukraine continued till just before 2022. For instance, after the Balakot air strike in 2019, IAF made emergency procurement of R-27 air to air missiles for its SU-30MKI fighters.

At Aero India in February 2021, Ukraine signed four agreements worth \$70 million which includes sale of new weapons as well as maintenance and upgrades of existing ones in service with the Indian military, as reported by The Hindu earlier.

<https://www.thehindu.com/news/national/defence-cooperation-in-focus-as-pm-modi-visits-ukraine/article68556041.ece>



*Fri, 23 Aug 2024*

## **India and Poland Forge Strategic Partnership: Boosting Defence, Security, and Trade**

At the invitation of Prime Minister Donald Tusk of Poland, India's Prime Minister Narendra Modi made an official visit to Poland from August 21-22, 2024. This historic event marked the first visit by an Indian Prime Minister to Poland in 45 years and coincided with the 70th anniversary of diplomatic relations between the two countries. The highlight of this visit was the decision by both nations to elevate their bilateral relations to the status of a "Strategic Partnership," reflecting their mutual commitment to strengthening cooperation in key areas such as defence, security, and trade.

### **Strengthening the Foundation of India-Poland Relations**

During their extensive discussions, Prime Ministers Modi and Tusk reaffirmed the importance of shared democratic values and a rules-based international order as cornerstones of their partnership. Recognizing the significance of their long-standing ties, both leaders agreed to deepen bilateral, regional, and international cooperation to create a more stable, prosperous, and sustainable world.

This new Strategic Partnership between India and Poland is a significant milestone, aiming to unlock the full potential of their relationship. A Joint Statement and an Action Plan for the years 2024-2028 were finalized, setting the stage for enhanced collaboration across various sectors.

### **Enhancing Defence and Security Cooperation**

Defence and security cooperation were pivotal in the discussions between the two leaders. Both sides acknowledged the necessity of deepening their collaboration in these areas, especially in light of the evolving global security environment. The Joint Working Group for Defence Cooperation will be fully utilized to explore opportunities for joint initiatives and defense industry partnerships.

Prime Minister Modi emphasized India's role as a significant defense partner, highlighting the country's capabilities in manufacturing and technology. Poland, poised to assume the Presidency of the European Union Council next year, recognized the importance of strengthening its defense ties with India, particularly in the context of broader India-EU relations.

### **Expanding Trade and Economic Ties**

Economic cooperation emerged as another key focus during the visit. India, now the world's fifth-largest economy, and Poland, the sixth-largest economy within the European Union, acknowledged the vast potential for trade and investment between the two nations. The leaders agreed to fully utilize the Joint Commission for Economic Cooperation to explore new areas of collaboration, balance bilateral trade, and expand their trade basket.

Tanmaya Lal, Secretary (West) in India's Ministry of External Affairs, emphasized the importance of this visit in providing a strong impetus for the India-Poland partnership. "Poland is a very important partner for India in this region," Lal stated, highlighting the ongoing negotiations for an India-EU Free Trade Agreement (FTA) and the establishment of the Trade and Technology Council between India and the EU.

### **Cooperation in Technology, Energy, and Connectivity**

Recognizing the critical role of digitalization in economic and social development, both sides agreed to bolster bilateral cooperation in technology and cybersecurity. The leaders underscored the importance of connectivity between the two countries, welcoming the commencement of direct flight connections and advocating for further expansion to new destinations.

The Action Plan also highlighted cooperation in energy, climate action, and infrastructure development. Both nations recognized the challenges posed by climate change and agreed on the importance of joint efforts in climate initiatives. India encouraged Poland to consider joining the International Solar Alliance (ISA) and the Coalition for Disaster Resilient Infrastructure (CDRI).

### **Multilateral Cooperation and Global Peace**

In addition to bilateral cooperation, according to the joint statement issued at the end of the visit the two leaders emphasized the need for enhanced collaboration at multilateral forums. They reaffirmed their commitment to a rules-based international order, global peace, and security, especially in the context of ongoing conflicts such as the war in Ukraine.

Both leaders expressed deep concern over the humanitarian crisis in Ukraine and called for a comprehensive, just, and lasting peace in accordance with international law and the principles of the UN Charter. They also reiterated their stance against the use of nuclear weapons and stressed the importance of respecting sovereignty and territorial integrity.

### **A New Era in India-Poland Relations**

Prime Minister Modi's visit to Poland has ushered in a new era in India-Poland relations, marked by the elevation of bilateral ties to a Strategic Partnership. This partnership is set to enhance cooperation in defense, security, trade, and beyond, reflecting the shared values and interests of both nations. With the foundation laid during this historic visit, India and Poland are poised to achieve greater collaboration and mutual benefits in the years to come.

<https://www.financialexpress.com/business/defence-india-and-poland-forge-strategic-partnership-boosting-defence-security-and-trade-3590244/>

# Science & Technology News



**Press Information Bureau**  
**Government of India**

**Ministry of Science & Technology**

*Thu, 22 Aug 2024*

## **President of India presents Rashtriya Vigyan Puraskar –2024**

The President of India, Smt. Droupadi Murmu presented the Rashtriya Vigyan Puraskar-2024 at an award ceremony held at Gantantra Mandap, Rashtrapati Bhavan today (August 22, 2024).

In the first edition of the Rashtriya Vigyan Puraskar, 33 awards were presented to distinguished scientists in four categories - Vigyan Ratna, Vigyan Shri, Vigyan Yuva, and Vigyan Team.

The Vigyan Ratna Award, given to the scientists who have made lifetime contributions in any field of Science and Technology, was presented to Prof. Govindarajan Padmanabhan, a pioneer of molecular biology and biotechnology research in India. The Vigyan Shri Awards, given to the scientists who have made distinguished contributions to Science and Technology, were presented to 13 scientists for their path-breaking research in their respective domains. The Vigyan Yuva-SSB award, given to recognize scientists who have exceptionally contributed to any field of science and technology, was given to 18 scientists for their significant contribution in the areas spanning from the study on the warming of the Indian Ocean and its consequences, to the development of indigenous 5G base station and communication and precision tests of quantum mechanics. The Vigyan Team Award, given to a team of 3 or more scientists for making ground-breaking research contributions in any field of science and technology, was given to the team of Chandrayaan-3 for the successful landing of Chandrayaan-3 lander near the south pole of the moon.

The Minister of Science & Technology, Dr. Jitendra Singh thanked Hon'ble President of India Smt. Draupadi Murmu for sparing her valuable time to present the first edition of Rashtriya Vigyan Puraskar-2024, beginning from this year. He said, the awards aim to recognise India's scientific talent and the extraordinary achievements of Indian scientists in Science, Technology and Innovation.

### **Some important recipients of the awards included the following:**

Prof. Govindarajan Padmanabha, NASI Honorary Scientist & Professor, Indian Institute Of Science, Bangalore: Prof. Padmanabhan has been instrumental in creating the Biotechnology Industry Assistance Council, New Delhi that supports 1800 incubatees and generating more than 800 products in the area of Biotechnology. Prof. Padmanabhan elucidated the heme-bio synthetic pathway of plasmodium causing malaria and pioneered several molecular biology / biotech research efforts in the country

Dr Anandharamakrishnan, Director, CSIR - National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram: Dr Anandharamakrishnan has significantly contributed to the field of food processing and has improved the understanding of innovative food processing technologies, nutrient delivery systems, 3-D food printing, food structure & digestion, and their applications towards achieving sustainable food systems

Dr Avesh Kumar Tyagi, Distinguished Scientist & Director, Chemistry Group, Bhabha Atomic Research Centre, Mumbai: Dr. Tyagi is a globally acclaimed scientist and technologist. He has made groundbreaking contributions to the advancement of processes and materials crucial to Indian Atomic Energy Program

Prof. Umesh Varshney, Honorary Professor, Department of Microbiology & Cell Biology, Indian Institute of Science, Bengaluru: Prof. Varshney is an outstanding biologist and his fundamental work is on essential processes of protein synthesis and DNA repair in tubercular bacteria, E. coli and holds promise towards the development of TB vaccines

Prof. Jayant Bhalchandra Udgaonkar, Professor, Indian Institute of Science Education and Research, Pune: Prof. Udgaonkar has made outstanding contributions to the understanding of protein structure and function including protein folding and misfolding in the field of structural biology

Prof. Syed Wajih Ahmad Naqvi, National Science Chair, CSIR-National Botanical Research Institute, Lucknow: Prof. Naqvi is an outstanding Biogeochemical Oceanographer with national and international recognition. His pioneering research work had an enduring disruptive impact in the field of oceanography.

Prof. Bhim Singh, SERB National Science Chair & Emeritus Professor, Indian Institute of Technology Delhi: Prof. Singh is prolific researcher and technology mentor with good applied and translational research in the field of power electronics that includes power quality and multipulse convertors, solar PV power generation.

Prof. Dr. Sanjay Behari, Director, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram: Prof. Behari is luminary in neurosurgery, epitomised by exemplary service, high quality research and significant advancements in medical technology and infrastructure. He has fostered an environment integrating health sciences with biomedical technology that translates into patents and medical devices as products.

Prof. Adimurthi Adi, Distinguished Visiting Professor, Indian Institute of Technology Kanpur: Prof. Adimurthi has made fundamental contributions in the analysis of partial differential equations and settling many important questions in the field. His research contributions can be classified into Semilinear elliptic PDEs, Functional Inequalities, and Hyperbolic conservation laws.

Prof. Rahul Mukherjee, National Science Chair, Indian National Science Academy, Indian Institute of Management, Kolkata: Prof. Mukherjee has made outstanding contributions and his contributions to mathematical statistics is well recognized. His academic work in statistics encompasses a wide field, which includes Design of Experiments, Bayesian theory, Asymptotic analysis and survey sampling.

Prof. Lakshmanan Muthusamy, Professor of Eminence & DST-SERB National Science Chair, Bharathidasan University, Tiruchirappalli: Prof. Muthusamy is a towering figure in the nonlinear dynamics in the field of physics that includes celestial dynamics in mathematics with interdisciplinary applications in the field of biology, chemistry, economics and sociology.

Prof. Naba Kumar Mondal, INSA Senior Scientist, Saha Institute of Nuclear Physics, Kolkata: Prof. Mondal is a leading experimental Particle Physicist with international acclaim in the field of neutrino physics. He led the conception and design of the detector for the India-based Neutrino Observatory, the INO, useful for young experimentalists working on neutrino physics.

Dr Annapurni Subramaniam, Director, Indian Institute of Astrophysics, Bengaluru: Dr. (Ms.) Subramaniam has made pioneering contributions to physics of single and binary stars, blue stragglers, star clusters, star formation, galactic structure, Magellanic clouds etc. She led the in-orbit calibration and produced impactful scientific results with the UV imaging telescope and also in the Astrosat Mission

Prof. Rohit Srivastava Himanshu Patel, Chair Professor, IIT Bombay: Prof. Srivastava has significantly contributed to point of care medical devices, bio-medical microsystems and nanoengineered biosensors resulting in technology development that includes mobile based urine analysis, diabetes management, noninvasive hemoglobin measurement and lipid analysis systems

Dr Krishna Murthy S L, Senior Scientist, Indian Institute of Rice Research, Hyderabad: Dr Krishna Murthy has developed six salt tolerant varieties of rice and four genetic stocks for salinity and alkalinity tolerance. The extension related work helped cover a significant area with these varieties

Dr Swarup Kumar Parida, Scientist, National Institute of Plant Genome Research (NIPGR), New Delhi: Dr Parida was instrumental in developing various concepts on integrated next-generation molecular breeding and deployed it for efficient genetic dissection of complex stress tolerance, yield and plant architectural traits in order to accelerate crop improvement of rice and chickpea

Prof. Radhakrishnan Mahalakshmi, Professor, Indian Institute of Science Education and Research (IISER), Bhopal: Prof. (Ms.) Mahalakshmi brings fundamental insights to mitochondrial membrane protein biophysics, in health and diseases in the country. The work has implications for peptide-based therapeutics for disease alleviation

Prof. Aravind Penmatsa, Assistant Professor, Indian Institute of Science, Bengaluru: Prof. Penmatsa has provided novel structural insights to neurotransmitter uptake in the field of pharmacology. His work has revealed mechanisms of efflux pump function in antibiotic transport, to unravel mechanisms of multi drug resistance that is helpful for biomedical research

Prof. Vivek Polshettiwar, Professor, Tata Institute of Fundamental Research, Mumbai: Prof. Polshettiwar belongs to the group of researchers with unique signature to discover, design and develop drugs from first principles. His work in nanocatalysis realms of "Black Gold" and "Defects" represents a quintessential example of fundamental science and innovation

Prof. Vishal Rai Professor, Indian Institute of Science Education and Research, Bhopal: Prof. Rai has made seminal contributions to precision engineering of proteins and supports Indian biopharma sector for precise protein engineering to empower antibody-conjugates for directed tumor surgery and cancer chemotherapeutic

Dr Roxy Mathew Koll, Scientist F, Indian Institute of Tropical Meteorology, Pune: Dr. Koll has made outstanding and path breaking contribution to Indian ocean warming and its implication to Indian summer monsoon as well as marine productivity, and marine heat extreme events.

Dr Abhilash Senior Principal, CSIR-National Metallurgical Laboratory, Jamshedpur: Dr. Abhilash has contributed significantly to the development of interdisciplinary indigenous processes for extraction of critical/strategic metals from secondary resources like mine and process wastes, etc, as well as contributed exemplarily in leveraging technologies for mining, metallurgical and waste recycling industries.

Dr Radha Krishna Ganti, Professor, Indian Institute of Technology, Madras, Chennai: Dr. Ganti is an excellent researcher, who has indigenously developed 5G Base Station that includes multi-input multi-output (MIMO) 5G base stations, 64/32/16 antenna MIMO RRH and software towards indigenization efforts.

Dr Purabi Saikia, Assistant Professor, Central University of Jharkhand, Ranchi: Dr. (Ms.) Saikia is a passionate researcher proficient in ecological niche modelling, quantitative ecological analysis, and RET plant species conservation. Her research publications have potential for field applications and also important as scientific evidence for policy planning

Dr Bappi Paul Assistant Professor, National Forensic Sciences University, Gandhinagar: Dr. Paul has developed a process and catalyst for direct hydrogenation of carbon dioxide to ethanol as a future fuel and also contributed in removal of volatile organic compounds emitted from industries and transportations leading to global air pollution.

Prof. Mahesh Ramesh Kakde, Professor, Indian Institute of Science, Bengaluru: Prof. Kakde has made decisive progress on the main conjecture of non-commutative Iwasawa theory and the Gross-Stark conjecture which are central problems in number theory using path-breaking ideas.

Prof. Jitendra Kumar Sahu Professor, Postgraduate Institute of Medical Education & Research, Chandigarh: Prof. Sahu is an accomplished paediatric neurologist and working on infantile epileptic spasms syndrome and treatment of infantile-onset epilepsies

Dr Pragya Dhruv Yadav, SCIENTIST 'F' & HEAD, ICMR-National Institute of Virology, Pune: Dr. (Ms.) Yadav is an expert in high-risk pathogens and containment issues related to multiple infectious diseases and has contributed in the development and evaluation of multiple vaccines for COVID19 in the country

Prof. Urbasi Sinha Professor, Raman Research Institute, Bengaluru: Prof. (Ms.) Sinha's main contribution in quantum information, communication and precision tests of quantum mechanics is well recognized in the scientific community. Her loophole-free experiments demonstrating decisive violation of Leggett-Garg inequality and her recent work on Hong-Ou-Mandel interferometry are the important scientific achievements

Dr Digendranath Swain, EXMD / STR, Vikram Sarabhai Space, ISRO, Thiruvananthapuram: Dr. Swain is an expert in experimental solid mechanics of launch vehicle structures with outstanding contributions in supporting structural qualification tests using DIC and other experimental techniques

Dr Prashant Kumar, Scientist-SF, Space Applications Centre, ISRO, Ahmedabad: Dr. Kumar has made valuable research contributions in the domain of atmospheric science and weather forecast and contributed to development of High-Resolution Rapid Refresh system used by Indian Meteorological Department.

Prof. Prabhu Rajagopal, Professor, Indian Institute of Technology Madras, Chennai: Dr. Rajagopal's pioneering research on feature-guided ultrasound, waveguide sensing, robotic asset inspections and ultrasonic metamaterials is widely recognized.

Team Chandrayaan-3, Indian Space Research Organisation, ISRO Headquarters, Bengaluru: Team Chandrayaan-3 is awarded under Vigyan Team category. The Chandrayaan-3 arguably is the most globally visible and acknowledged scientific achievement for the nation and represents achievements in different areas of technology as a team work of scientists in Indian Space Research Organisation (ISRO).

<https://pib.gov.in/PressReleasePage.aspx?PRID=2047748>



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*Thu, 22 Aug 2024*

## **Kodaikanal Tower Tunnel Telescope probes deeper into Solar secrets**

A new way to probe deeper into the Sun's secrets has been found by studying the magnetic field at different layers of the solar atmosphere using data from the Kodaikanal Tower Tunnel Telescope. The solar atmosphere is composed of various layers interconnected through magnetic fields. The magnetic field acts as a conduit to transfer energy and mass from the inner layers to the outer layers, commonly known as the "coronal heating problem," and is also the prime driver of the solar wind. To understand the physical mechanisms behind these processes, measurements of magnetic fields at different heights of the solar atmosphere are important. The strength of the magnetic field can be inferred by precise measurements of the spectral line intensities across the Sun in full polarization. Simultaneous multiline spectropolarimetry is an observational technique that captures this magnetic field at different layers of the solar atmosphere. Recent studies have demonstrated the technique's capability to detail the magnetic structure of sunspots, umbral flashes, and chromospheric variations during solar flares.

A study led by astronomers at the Indian Institute of Astrophysics, an autonomous institute of the Department of Science and Technology (DST), examined an active region (sunspot) with complex features, including multiple umbrae and a penumbra, through simultaneous observations in the Hydrogen-alpha and Calcium II 8662 Å lines from the Kodaikanal Tower Tunnel telescope.

The Kodaikanal Solar Observatory (KoSO), operated by the Indian Institute of Astrophysics, is known for the discovery of the Evershed Effect in 1909. The study used data from multiple spectral lines acquired simultaneously, especially the Hydrogen-alpha line, at 6562.8 Angstroms ( $\text{\AA}$ ), to infer the magnetic field's stratification at various heights of the solar atmosphere, taken from the Tunnel Telescope at the Kodaikanal Solar Observatory, which is operated by IIA.

The primary mirror (M1) of the 3-mirror setup at the Tunnel Telescope tracks the Sun, the secondary mirror (M2) redirects sunlight downwards, and the tertiary mirror (M3) makes the beam horizontal. This kind of setup, where the primary mirror is rotated to track a moving object in the sky, in this case, the Sun, is called a Coelostat. An achromatic doublet (38 cm aperture,  $f/96$ ) focuses the Sun's image at a distance of 36 m with an image scale of 5.5 arcsec per mm. The chromospheric magnetic field in the spectral lines is typically inferred using the Calcium II 8542  $\text{\AA}$  and Helium I 10830  $\text{\AA}$  line. However, these diagnostic probes have certain limitations which limit their applicability across diverse solar features. "The  $H\alpha$  line, however, turned out to be a crucial probe to infer the chromospheric magnetic field because it is less sensitive to local temperature fluctuations. This allows us to probe the chromospheric magnetic field in events with sudden temperature fluctuations, such as flaring active regions", said Harsh Mathur, the lead author and a Ph.D. student at IIA.

The study, accepted for publication in The Astrophysical Journal, provides a comprehensive analysis of the line-of-sight (LOS) magnetic field through these simultaneous observations. The results indicate that the  $H\alpha$  line core consistently infers weaker magnetic field strengths than the Ca II 8662  $\text{\AA}$  line inversions, suggesting that the  $H\alpha$  line samples higher atmospheric layers than the Ca II IR triplet. The study found the values of magnetic fields to be 2000 G at the photosphere and 500 G at the chromosphere. "In regions exhibiting localized heating or temperature enhancements, the full Hydrogen-alpha line became sensitive to the chromospheric magnetic field. The study highlights the Hydrogen-alpha line's effectiveness as a chromospheric diagnostic tool, particularly when the other spectral lines, such as Calcium II 8542  $\text{\AA}$ , probe deeper layers of the solar atmosphere.

This multi-line approach is crucial for understanding the intricate magnetic field stratification in the chromosphere," said Dr. K. Nagaraju, principal investigator of this study. "The study underscores the necessity for further spectropolarimetric observations of the  $H\alpha$  line using advanced telescopes with superior spatial and spectral resolution. Telescopes like the Daniel K. Inouye Solar Telescope (DKIST), the forthcoming European Solar Telescope (EST), and the National Large Solar Telescope (NLST) hold great potential in providing deep insights into the chromospheric magnetic field's stratification," said Dr. Jayant Joshi, a co-author of the study.

The National Large Solar Telescope is a proposed ground-based 2-m class optical and near-infrared (IR) observational facility. It is proposed to be built in Merak village in Ladakh in India. The Bengaluru, India team includes Mr. Harsh Mathur, a Ph.D. student at IIA, Dr. K. Nagaraju from IIA, and Dr. Jayant Joshi from IIA. The USA team comprises Dr. Rahul Yadav from the Laboratory for Atmospheric and Space Physics, Boulder. This research marks a significant step towards a more detailed and nuanced understanding of the Sun's magnetic field, paving the way for future studies and observations to elucidate the complexities of solar magnetic phenomena further.



For more information, please contact Harsh Mathur at [harsh.mathur@iiap.res.in](mailto:harsh.mathur@iiap.res.in).

The preprint of the article is available to read at: <https://arxiv.org/pdf/2406.02083>.

The DOI of the article is: <https://doi.org/10.3847/1538-4357/ad54ba>

<https://pib.gov.in/PressReleasePage.aspx?PRID=2047648>



**Press Information Bureau**  
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*Thu, 22 Aug 2024*

## **JNCASR partners with HZL to scale up indigenous Zn-ion battery technologies**

Indigenous Zn-ion battery technologies with new variant of zinc materials could soon facilitate low-cost grid-scale energy storage and other related applications. Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute of the Department of Science and Technology (DST) has signed a Memorandum of Understanding (MoU) with Hindustan Zinc Limited (HZL) on August 21, 2024, to develop new variants of zinc materials and propel the commercialization of zinc-based batteries.

Low-cost and superior performance driven zinc-ion batteries are acclaimed as India's innovative alternative to expensive and imported lithium-ion batteries. Zinc-ion batteries hold enormous potential for large-scale energy storage due to low-cost and Earth abundant raw materials. Zinc-based batteries offer a fairly mature and safe choice in the market and with recent advancements in material stability, performance and reliability across various temperature ranges, zinc batteries can revolutionize the energy storage sector. With zinc-ion batteries, certain suitable modifications to the electrode, electrolyte and interfaces can yield far superior results to the existing lithium-based battery options in the market.

However, their commercialization is dependent on stabilizing the material's performance. For instance, zinc is thermodynamically unstable with water-based solutions and therefore requires suitable modifications at the electrode, electrolyte and interfaces. Addressing these issues, the partnership is poised to drive material innovation and accelerate the development of indigenous Zn-ion battery technologies. Prof. Premkumar Senguttuvan's group at JNCASR has built a robust research foundation in zinc-based batteries. The group's state-of-the-art battery characterization facility, funded by the Department of Science and Technology (DST) has led to significant advancements in the field. The resulting research has produced significant publications which have attracted the interest of leading industry players like Hindustan Zinc in the zinc sector.

A direct result of the research funded by DST, the Memorandum of Understanding (MoU) between Hindustan Zinc and Prof. Premkumar's group will leverage JNCASR's research expertise and

Hindustan Zinc's product innovation capabilities. It will explore developing new Zinc alloys for use as anodes in Zn-ion batteries and electrolytes for their application in rechargeable batteries. Prof. Senguttuvan plans to modulate the structure and chemical compositions of alloys and electrolytes from atomic/molecular to device level to evolve the existing issues with materials. A modified electrolyte is expected to increase the life and safety of devices.

The JNCASR team also plans to demonstrate Zn-ion pouch batteries which is easily scalable for large-scale commercial applications. By providing innovative new product solutions, Hindustan Zinc aims to be at the forefront of the battery revolution to support the ongoing global energy transition. The research agreement targets two major Sustainability Development Goals SDG7 (Affordable and Clean Energy) and SDG13 (Climate Action) – ensuring access to affordable, reliable, sustainable and modern energy for all and taking urgent action to combat climate change and its impact, marking a pivotal moment in the evolution of battery technologies.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2047647>



*Fri, 23 Aug 2024*

## **National Space Day 2024: Theme, origin, significance—all you need to know about ISRO Chandrayaan 3 Mission**

Today, India celebrates its first National Space Day, marking the successful landing of the Vikram Lander from the Chandrayaan-3 mission. This mission was a follow-up to Chandrayaan-2 and aimed to demonstrate the ability to safely land and roam on the lunar surface.

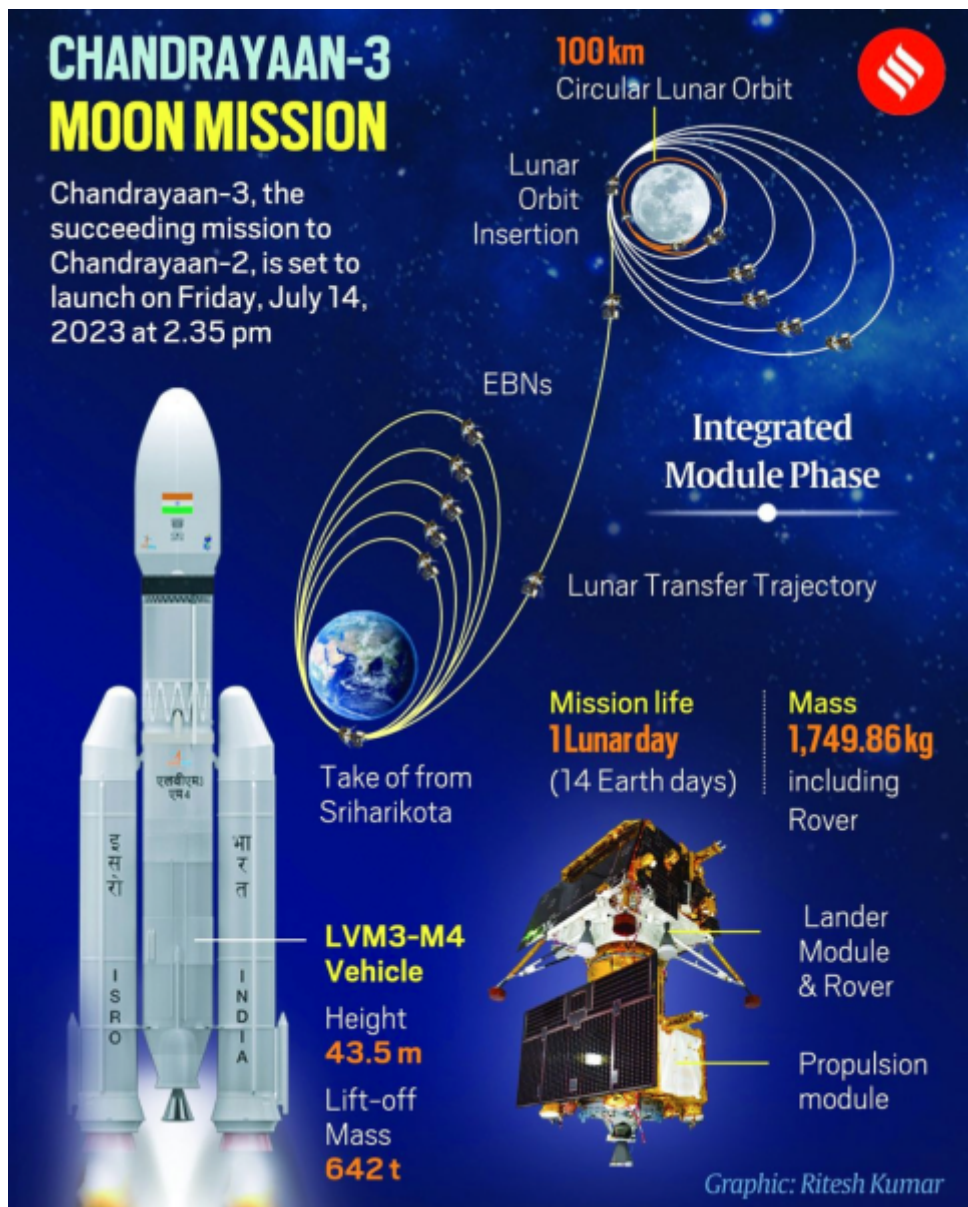
The Indian government officially designated August 23 as National Space Day in recognition of this significant accomplishment, reflecting India's expanding capabilities in space exploration and highlighting the vital role of space science and technology in national development.

National Space Day 2024: Know about the Chandrayaan-3 mission and theme

The Chandrayaan-3 mission, launched from the Satish Dhawan Space Centre in Sriharikota, Andhra Pradesh, achieved a safe and soft landing of the Vikram Lander on the Moon's surface. This achievement signifies a historic milestone for the nation, as India became only the fourth country globally to successfully land a rover on the Moon and the first to do so in the southern polar region.

Accompanied by the Pragyaan Rover, the Vikram Lander touched down at a site designated as 'Shiv Shakti.' Following the successful landing, the Pragyaan Rover was deployed, further advancing India's exploration efforts on the lunar surface.

The theme for National Space Day 2024 is "Touching Lives while Touching the Moon: India's Space Saga," highlighting the broader impact of space exploration on society and emphasising how advancements in space technology can enhance the quality of life on Earth.



### National Space Day 2024: Significance and celebrations

Celebrations for National Space Day are taking place at Bharat Mandapam in New Delhi, with events streamed live on ISRO's official website and YouTube channel. These aim to engage the public and inspire future generations to pursue careers in science, technology, engineering, and mathematics (STEM).

National Space Day serves not only as a celebration of India's achievements in space but also as a platform to promote awareness and education about the importance of space exploration. By commemorating this day, India underscores its commitment to advancing space science and technology, fostering international collaboration, and inspiring innovation.

<https://indianexpress.com/article/when-is/national-space-day-2024-isro-chandrayaan-3-mission-9528602/>

## **‘Mission Rhumi 2024’: India to launch 1st reusable hybrid rocket on August 24**

India is set to launch its first reusable hybrid rocket – RHUMI 1 – on August 24, developed by the Tamil Nadu-based start-up Space Zone India. The rocket will be launched from Thiruvudandhai in Chennai using a mobile launcher and will carry “3 Cube Satellites and 50 PICO Satellites to a suborbital trajectory.” This launch, scheduled for 7 am on Saturday, is a collaboration between Space Zone India and the Martin Group and is designed to focus on flexibility and reusability.

According to a report by Money Control, the RHUMI series of rockets, which includes RHUMI-1, RHUMI-2, and RHUMI-3, is engineered to reach altitudes ranging from 1 km to 500 km.

This event marks the third collaboration between the Martin Group and Space Zone India. In 2023, as part of the ‘Dr. APJ Abdul Kalam Students Satellite Launch - 2023’ mission, over 2,500 students from government, tribal, and public schools across the country collaborated to design and build a student [satellite](#) launch vehicle. This mission included a payload of 150 Pico satellite research experiment cubes. In 2021, during the ‘Dr. APJ Abdul Kalam Space Research Payload Cubes Challenge 2021,’ 100 FEMTO satellites developed by 1,200 students were successfully launched.

### **Key features of RHUMI-1**

- The rocket’s launch angle can be precisely adjusted between 0 to 120 degrees, allowing accurate trajectory control.
- A cost-effective, innovative, and eco-friendly descent mechanism uses CO<sub>2</sub> to ensure the safe recovery of rocket components.
- The rocket’s applications extend beyond space exploration, impacting fields such as agriculture, environmental monitoring, and disaster management.
- The three cube satellites being sent will monitor atmospheric conditions, including cosmic radiation, UV radiation, and air quality, according to the Money Control report.
- Pico satellites will analyse environmental factors like vibration, accelerometer data, altitude, ozone levels, toxic content, and molecular bonding, contributing to a deeper understanding of atmospheric dynamics.
- The rocket utilises a hybrid propulsion system that combines solid fuel with liquid oxidizer technologies to ensure environmental safety.
- Space Zone India Founder and CEO Anand Megalingam highlighted that this system is reusable, offering a more sustainable and cost-effective approach to satellite launches.

<https://www.hindustantimes.com/science/ai-scientists-are-producing-new-theories-of-how-the-brain-learns-101723920347311.html>

## **Smart Laboratory on Clean Rivers developed at IIT-BHU to rejuvenate small rivers**

New Delhi, In a bid to sustainable river management, a Smart Laboratory on Clean Rivers has been developed at IIT-BHU to rejuvenate small rivers through innovative and sustainable approaches, the Jal Shakti ministry said.

This initiative, part of the Green Strategic Partnership between India and Denmark, aims to rejuvenate small rivers through innovative and sustainable approaches, the ministry said in an official statement.

The SLCR project is designed to rejuvenate the Varuna River, leveraging cutting-edge technology and international expertise.

With an initial funding of ₹16.80 crore from Ministry of Jal Shakti and an additional grant of ₹5 crore from Denmark, the project aims to create a collaborative platform for government bodies, academic institutions and local communities to develop and implement solutions for clean river water.

A hybrid lab model will be established at IIT-BHU, coupled with an on-field living lab at the Varuna River. This model will allow for real-world testing and scaling of solutions aimed at improving river health, the statement said.

The SLCR's institutional framework includes a robust appraisal mechanism to ensure excellence and diligence in project execution.

The Indo-Danish Joint Steering Committee , the highest authority within the SLCR, will provide strategic guidance and review the project's progress. Additionally, a Project Review Committee , comprising members from the National Mission on Clean Ganga , Central Water Commission , Central Ground Water Board , IIT-BHU and Denmark's Urban Sector Counsellor, will oversee quality control at the project level.

Coordination efforts will be managed by the Multi-Stakeholder Working Group , chaired by the district magistrate of Varanasi and co-chaired by representatives from NMCG and IIT-BHU.

The SLCR Secretariat, a joint establishment of NMCG and IIT-BHU, will handle day-to-day operations, project development and knowledge dissemination.

The Joint Steering Committee has already cleared four key projects under the SLCR initiative. Among them is the development of a Decision Support System for water management aimed at analysing basin water dynamics through advanced hydrological models and data analytics.

This project, expected to last two to three years, will facilitate real-time monitoring and scenario simulations to support holistic planning and effective water management.

Another vital project focuses on the characterisation of emerging pollutants in the Varuna River. Over the next 18 months, advanced analytical techniques will be employed to identify and quantify contaminants, creating a comprehensive fingerprint library for water quality monitoring and proposing effective remediation strategies, the statement said.

In line with the SLCR's vision, a selected stretch of the Varuna River will serve as a demonstration site for holistic interventions, based on research and consultation.

he project aims to preserve the region's archaeological and historical heritage while promoting economic and social development.

The final project centres on developing a hydrogeological model of the Varuna Basin for Managed Aquifer Recharge .

Utilising advanced geophysical techniques, the project will identify optimal recharge sites and develop a comprehensive river-aquifer flow dynamics model over the next 24 months, supporting informed decision-making and water resource optimisation, the statement said.

<https://www.hindustantimes.com/science/smart-laboratory-on-clean-rivers-developed-at-iit-bhu-to-rejuvenate-small-rivers-101724321658577.html>

