

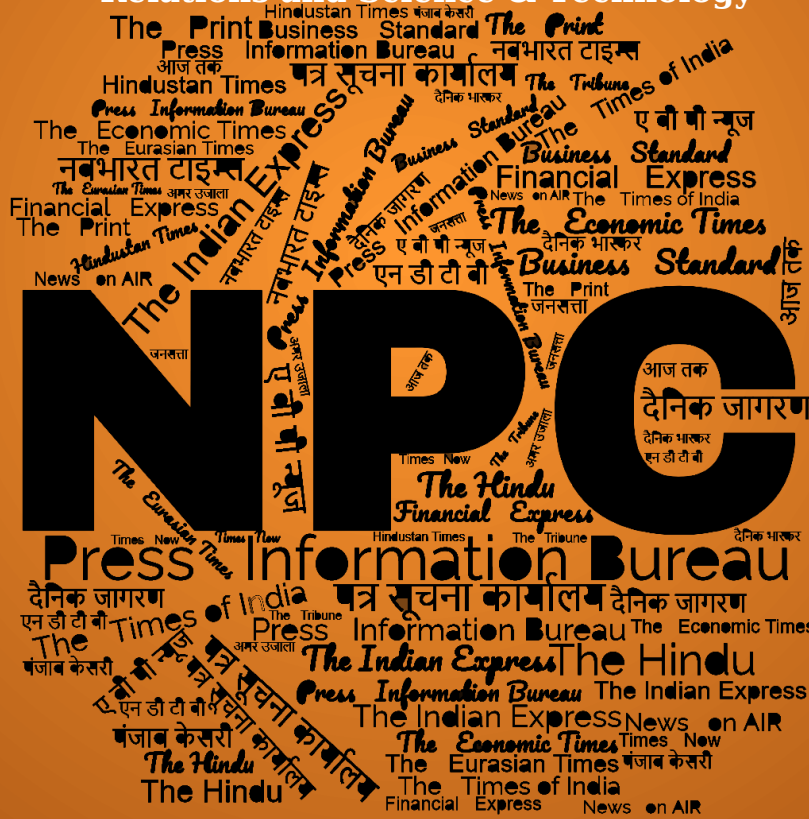
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# समाचार पत्रों से चयित अंश Newspapers Clippings

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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**Press Information Bureau**  
Government of India

**Ministry of Defence**

*Wed, 20 Sep 2023*

## **Indian Army and United States Army to Host Indo- Pacific Armies Chiefs Conference (IPACC), Indo- Pacific Armies Management Seminar (IPAMS) and Senior Enlisted Leaders Forum (SELF)**

The Indian Army and the United States Army will co-host 13th IPACC, 47th IPAMS and 9th SELF, a three-day conference of Chiefs of Armies and delegates of 35 countries in New Delhi from 25th to 27th September 2023.

The central theme for this forum is “Together for Peace: Sustaining Peace and Stability in the Indo-Pacific Region.” The conference will provide an opportunity for Army Chiefs and senior-level leaders from land forces, primarily of the Indo-Pacific region, to exchange ideas and views on security and contemporary issues. The core effort of the forum will be to promote peace and stability in the Indo-Pacific region through mutual understanding, dialogue and friendship amongst the littoral partners.

This event will be organised in Manekshaw Centre, Delhi Cantt and will see over 150 delegates participate in various plenary and round-table sessions. A joint press conference will be held at 9 a.m. with General Manoj Pande, Chief of the Army Staff, Indian Army and General Randy George, Vice Chief of Staff of the US Army. This will be followed by an opening ceremony at 9:30 a.m. on 26th September 2023, at the Manekshaw Centre. Shri Rajnath Singh, Hon’ble Raksha Mantri and General Anil Chauhan, Chief of Defence Staff will attend the opening ceremony.

The conference will feature plenary sessions and informal meetings in three tiers. The Army Chiefs conference will discuss issues of mutual interest and areas of cooperation to synergise efforts of all stakeholders for effecting peace and stability in the region. The IPAMS is a military seminar for Army Officers between the ranks of Lieutenant Colonel to Major General to exchange views on regional security issues and best practices. The SELF will involve the participation of tactical level sub unit commanders to hold open dialogue, share lessons learned and provide understanding about Armies participating in the forum.

The attendees will hear from distinguished guest speakers and participate in lively discussions on topics, such as peacekeeping operations, humanitarian assistance/ disaster relief, leadership development and empowering women. The delegates will also visit the National War Memorial and pay homage to our fallen heroes. The event will also showcase Atmanirbhar Bharat Equipment

Display. The participants will get a glimpse of India's rich cultural diversity by visiting some heritage sites in the capital. They will also be witnessing various initiatives undertaken by the Army Wives Welfare Association.

During the Curtain Raiser event conducted today in Manekshaw Centre, Lieutenant General MV Suchindra Kumar, Vice Chief of Army Staff, Indian Army briefed the media about the framework of the event. He highlighted that Indian Army has made significant contribution in promoting peace and stability in the Indo-Pacific region. He also emphasised that Indian Army remains committed for humanitarian endeavours and relief efforts in the region. During the Curtain Raiser event, Foreign Service Attaches of the United States of America, France, Japan, Maldives and Singapore participated in a round table discussion conducted on the topic "Collaborative Approach in Combating Non-Traditional Security Threats in Indo-Pacific."

The conference will emerge as a testimony to the shared resolve of participating countries and facilitate fruitful discussions. This will allow the partnerships between the participating countries to be further enduring by exchanging views and sharing best practices.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1959112>



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

**Ministry of Defence**

*Wed, 20 Sep 2023*

## **Indian Naval Ships, Submarine & LRMP Aircraft Reach Singapore To Participate In SIMBEX 23**

Indian Naval Ships Ranvijay and Kavaratti and submarine INS Sindhukesari arrived in Singapore to participate in the 30th edition of the Singapore India Maritime Bilateral Exercise (SIMBEX), an annual bilateral Naval exercise between the Indian Navy and Republic of Singapore Navy (RSN), which is being conducted since 1994. SIMBEX holds the distinction of being the longest continuous naval exercise that Indian Navy has with any other country.

SIMBEX-2023 is being conducted in two phases - Harbour Phase at Singapore from 21 to 24 September 2023, followed by a Sea Phase. Besides Ranvijay, Kavaratti and Sindhukesari, Long-Range Maritime Patrol Aircraft P8I is also participating in the exercise.

The Harbour Phase will witness a wide range of professional interactions, cross-deck visits, Subject Matter Expert Exchanges (SMEE) and sports fixtures, aimed at enhancing interoperability and mutual understanding between the two navies.

The Sea Phase of SIMBEX 23 will involve complex and advanced air defence exercises, gunnery firings, tactical manoeuvres, anti-submarine exercises and other maritime operations. Units of both the navies will endeavour to hone their war-fighting skills while consolidating their capability to undertake multi-discipline operations jointly in the maritime domain.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1959176>

## **After INS Vikrant, Navy's Proposal for Second Indigenous Aircraft Carrier**

In a significant development, the Navy has submitted a major proposal to the Ministry of Defence, seeking approval for the production and procurement of a second indigenous aircraft carrier. This proposal aligns with Prime Minister Narendra Modi's 'Make in India' program in the defense sector. The Cochin Shipyard Limited in Kochi is poised to undertake the construction of this second aircraft carrier, top government officials told IndiaToday.in.

Sources indicate that the Navy will recommend the project to the Cochin Shipyard Limited. The Ministry of Defence is slated to convene soon to evaluate and authorize the proposal forwarded by the Navy.

On September 2, 2022, Prime Minister Narendra Modi commissioned the country's first indigenous aircraft carrier, Indian Naval Ship (INS) Vikrant, at the Cochin Shipyard Limited (CSL).

“Vikrant is not just a warship. This is a testament to the hard work, talent, influence and commitment of India in the 21st century. If the goals are distant, the journeys are long, the ocean and the challenges are endless – then India's answer is Vikrant,” PM Modi said.

INS Vikrant stands as a testament to India's indigenous potential, resources, and skills, PM Modi said. Notably, even the steel used in its construction is indigenous, developed by DRDO scientists and manufactured by Indian companies.

The Prime Minister spoke about the massive proportions of the carrier, comparing it to a floating city. The Navy achieved a significant milestone in operationalising the indigenous aircraft carrier by successfully conducting the landing of a light combat aircraft (Navy) and MiG-29K on INS Vikrant in the Arabian Sea. The Navy has been working towards maintaining a three-carrier force with the ability to deploy one carrier on each coast at any given time while one undergoes refit.

The construction of IAC-2 is anticipated to create substantial employment opportunities in and around Kochi, where the shipyard will be located.

<https://www.indiatoday.in/india/story/navy-proposal-for-second-indigenous-aircraft-carrier-2438346-2023-09-20>

## **Indian Navy's Swavlamban-2023 Spotlights Cutting-edge Defence Prototypes**

In a bid to promote innovation and indigenization, the Indian Navy is gearing up for the second edition of its Naval Innovation and Indigenisation Seminar, 'Swavlamban-2023,' scheduled for October 4-5. This event follows the success of the inaugural edition held in July 2022, which saw the launch of the 'SPRINT Challenges' initiative.

SPRINT aims to foster indigenous technology use in the Navy, with 75 challenges presented to startups and MSMEs. The Navy's commitment to developing 75 technologies aligns with the 'Azadi ka Amrit Mahotsav' celebrations. Swavlamban-2023 will showcase 75 prototypes, including underwater lasers, autonomous weaponized swarms, and maritime drones, highlighting the Navy's commitment to innovation in defense technology.

### **Fostering indigenous tech for Indian Navy's advancement**

The SPRINT initiative, short for Supporting Pole-Vaulting in R&D through Innovations for Defence Excellence (iDEX), is a collaborative effort involving the Defence Innovation Organisation (DIO), NIIO (Naval Innovation and Indigenisation Organisation), and Technology Development Acceleration Cell (TDAC). During its launch, SPRINT presented 75 challenges to startups and MSMEs, emphasizing the use of indigenous technology within the Indian Navy.

The response was overwhelming, with 1106 proposals submitted for consideration. After a rigorous evaluation process, 113 winners in the DISC 7 SPRINT category were declared, each receiving grants of up to 1.5 crore. Additionally, 5 winners in the DISC 7 SPRINT-PRIME category were announced, receiving grants of up to 10 crores. These winning teams are actively collaborating with iDEX and industry partners to develop prototypes across various niche technologies.

The selected projects encompass a wide range of innovations, including blue-green lasers designed for underwater applications, autonomous weaponized swarms, underwater swarm drones, diverse firefighting aids, and the integration of Artificial Intelligence (AI) for various applications. Notably, one of the projects focuses on an ultra-endurance small drone tailored for maritime missions.

### **Swavlamban-2023: Showcasing Indigenous Defense Prototypes**

Scheduled for October 4-5, 2023, in New Delhi, Swavlamban-2023 aims to exhibit these 75 prototypes that highlight the Indian Navy's commitment to fostering innovation and indigenization in defense technology. The event will feature live demonstrations of select promising technologies, showcasing the Navy's dedication to harnessing indigenous innovations for a stronger defense.

The Indian Navy's Swavlamban-2023 seminar serves as a testament to India's growing focus on innovation and indigenization, reflecting its aspiration to become self-reliant in defense technology, ultimately strengthening national security.

<https://www.republicworld.com/india-news/general-news/indian-navys-swavlamban-2023-spotlights-cutting-edge-defence-prototypes-articleshow.html>



*Wed, 20 Sep 2023*

## **Indian Navy and IAF Conduct Joint Air Drop of RIB Followed by a Combat Freefall by MARCOS**

The Indian Navy and Air Force achieved another milestone by conducting the maiden air drop of a Rigid Hull Inflatable Boat (RIB) from a C-17 aircraft near Visakhapatnam on September 19, 2023. This operation, as per Navy officials, showcased the seamless coordination between the two forces in a challenging maritime setting.

Following the precise airdrop, the Marine Commandos (MARCOS), a specialised unit of the Indian Navy known for their expertise in amphibious assault and other missions, executed a Combat Freefall manoeuvre into the sea. This feat demonstrated their HALO (High-Altitude, Low-

Opening) parachute jump capabilities, which are necessary to deploy during an array of maritime operations. After landing safely in the water, the MARCOS boarded the airdropped RIB, as per visuals.

This joint operation demonstrates another example of the growing integration of capabilities between the Indian Navy and IAF and the interoperability between the tri-services. It further signifies their capacity for mutual strategising and execution of intricate missions within the maritime domain. Among the various missions that stand to benefit from this collaboration are anti-piracy efforts, counter-terrorism operations, and thwarting maritime smuggling activities.

Additionally, this exercise enhances the Indian Navy's capabilities in Medium-Range Maritime Interdiction Operations (MIOs). These operations involve intercepting, boarding, and potentially detaining vessels at sea, typically in coastal or territorial waters. They serve to enforce maritime laws and regulations, encompassing objectives such as countering piracy, suppressing smuggling activities, and enforcing sanctions.

<https://www.republicworld.com/india-news/general-news/indian-navy-and-iaf-conduct-joint-air-drop-of-rib-followed-by-a-combat-freefall-by-marcos-articleshow.html>



Wed, 20 Sep 2023

## **IAF's Newest Transport Aircraft C-295 Lands in Vadodara, to be Inducted Next Week**

The Indian Air Force's (IAF) newest transport aircraft, the C-295, on Wednesday landed at the Vadodara air base in Gujarat, a week after Airbus Defence and Space handed over the plane to IAF at Seville in Spain, officials said.

IAF chief Air Chief Marshal VR Chaudhari took the delivery of the plane, part of a ₹21,935-crore Make in India project to upgrade the IAF's transport fleet, at a ceremony held at Airbus' San Pablo site in Seville on September 13.

The plane was flown to Vadodara by a joint IAF-Airbus crew.

It is expected to be the centrepiece of the upcoming Air Force Day parade, and the IAF will raise its first squadron of the tactical airlifters at the Vadodara.

The C-295s will boost the air force's logistics capabilities to meet mission requirements in forward areas, including those near the contested border with China, and replace its ageing fleet of Avro transport aircraft that entered service in the early 1960s, the officials said.

The first aircraft, which will be formally inducted into the IAF at the Hindan air base on September 25, is likely to take part in this year's Air Force Day parade to be held at Prayagraj in Uttar Pradesh on October 8 when the IAF celebrates its 91st anniversary. The first squadron will be raised in Vadodara as the IAF wants the first lot of these planes to be based near the C-295 production facility there. A C-295 squadron will consist of 10 to 12 aircraft, the officials said.

The first C-295 came two years after the defence ministry signed a contract with Airbus for 56 planes to boost self-reliance in the defence manufacturing sector. Tata Advanced Systems Limited and Airbus are jointly executing the programme. The European plane maker will deliver 16 planes in flyaway condition, while the rest will be assembled in India at the Tata facility in Vadodara.

IAF's second C-295 is in final assembly at Seville and will be delivered in May 2024. The last of the 16 flyaway aircraft will be delivered to IAF by August 2025, while the first "made in India" C-295 will roll out of the Vadodara facility in September 2026 and the remaining 39 by August 2031.

<https://www.hindustantimes.com/india-news/iafs-newest-transport-aircraft-c-295-lands-in-vadodara-to-be-inducted-next-week-101695212359694-amp.html>



Wed, 20 Sep 2023

## Defence Expert Calls for Vigil Against Cyber Attacks

Lieutenant General Vinod G. Khandare PVSM, AVSM, SM, (Retd), Principal Advisor, Ministry of Defence (MoD,) has flagged the importance of maintaining vigil against cyber attacks in the changing scenario of geo-political rivalries.

In a lecture on "Comprehensive National Power and Security of India" hosted recently by the Department of Politics and International Studies of Pondicherry University, Mr. Khandare dealt with a range of issues, from defining the conception of comprehensive national power and the Indian philosophy of Arthashastra to the current scenario of India's border skirmishes and the growing vulnerability of cybersecurity attacks on different agencies of India.

The event also featured the launch of the book, "Reimagining India: In the Geopolitics of the 21st Century," jointly edited by Nanda Kishor M.S. and Prashanth Vaidyaraj.

Vice-Chancellor of Pondicherry University Gurmeet Singh, Subramanyam Raju, Head of the Department, South Asian Studies, Pondicherry University, Nanda Kishor M.S, Associated Professor, Department of Politics and International Studies, and Richa Tiwari, Chair of Sri Aurobindo, Pondicherry University, also spoke.

The seminar participants included students and scholars of political science and international relations.

<https://www.thehindu.com/news/cities/puducherry/defence-expert-calls-for-vigil-against-cyber-attacks/article67326229.ece>



Wed, 20 Sep 2023

## India's Diplomatic Approach, Military Records with Canada Continue, Says Indian Army

The Indian Army on Wednesday said tensions in India-Canada relations "don't impact us" and that India's "diplomatic approach, military records with Canada continue".

While addressing the curtain raiser event on the scheduled Indo-Pacific Army Chiefs conference, Indian Army's Additional Director General (Strategic Planning) Major General Abhinaya Rai said Canada's Chief of the Defence Staff (CDS) General Wayne Eyre will be visiting India for the Indo-Pacific Armies Chiefs Conference to be held at Manekshaw Centre, Delhi Cantonment from September 26-27.



The conference that is being held to ascertain multilateral security partnerships in the region, takes place regularly to thrash out differences, build trust and better communication among professional armies for a free and open Indo-Pacific.

Chief-of-Staff of the US Army, General James C McConville, along with his delegation, will also be present for the three events that he will co-host along with Chief of Indian Army Staff General Manoj Pande.

Indo-Canadian relations dipped after Canadian PM Justin Trudeau on Monday alleged that the Indian government was behind the fatal shooting of Hardeep Singh Nijjar a designated terrorist in India. The allegations were rejected by India's Ministry of External Affairs (MEA) which dubbed them 'absurd' and 'motivated'.

Signalling a further souring of bilateral ties, Canadian Foreign Minister Melanie Joly then said that an Indian diplomat in the country had been expelled from Canada.

This was followed by a reciprocal move from India on Tuesday with the expulsion of a senior Canadian diplomat who was given 5 days to leave the country.

After coming under severe pressure the Canadian Prime Minister appeared to tone down the rhetoric on Tuesday saying Canada was not looking to provoke India.

"We are not looking to provoke or escalate, we want to work with the government of India to lay everything clear and to ensure there are proper processes" Trudeau said in a news briefing.

Khalistan Tiger Force chief Hardeep Singh Nijjar who was a designated terrorist in India, was gunned down outside a Gurdwara, in a parking area in Canada's Surrey, British Columbia on June 18.

<https://theprint.in/world/indias-diplomatic-approach-military-records-with-canada-continue-says-indian-army/1769682/>

# The Tribune

Wed, 20 Sep 2023

## In 'Active Talks' with India for Defence Production: US

The US is in active talks with India to look at producing military systems in areas related to ISR (Intelligence, Surveillance and Reconnaissance) and ground-based conventional warfare, a senior Pentagon official said. Efforts are also on to establish a reciprocal defence procurement agreement with India, Siddharth Iyer, Director for South Asia Policy, Secretary of Defence, said here on Tuesday at an event organised by the prestigious Hudson Institute.

Indian-American Iyer said the talks between India and the US to finalise the security of supply arrangement, which would streamline the ability of defence firms to procure their requirements, were making good progress. "Our belief is that getting the US-India relationship right is not just necessary, it's essential to achieving our strategy in the Indo-Pacific," he added.

<https://www.tribuneindia.com/news/world/in-active-talks-with-india-for-defence-production-us-546319>



Wed, 20 Sep 2023

## **Russia-Iran Ties have Reached New Level, Russian Defence Minister Says**

Relations between Russia and Iran have reached a new level despite opposition from much of the Western world, Russia's Defence Minister Sergei Shoigu said during his visit to Tehran on Wednesday.

"We are aiming at an entire range of planned activities, despite opposition from the United States and its Western allies," the Interfax news agency cited Shoigu as saying.

"Sanctions pressure on Russia and Iran shows its futility, while Russian-Iranian interaction is reaching a new level."

Shoigu met Iran's top security official Ali Akbar Ahmadian on Wednesday and they talked about a wide range of topics, especially the developments in the Caucasus region, according to Iran's Nour News.

Iran's Tasnim news agency reported that Russia's minister of defence also visited the Islamic Revolutionary Guard Corps (IRGC) Aerospace Force on Wednesday, where he met the head of the Revolutionary Guards Aerospace Force Amirali Hajizadeh while Iran's drones, missile and air defence systems were displayed to him.

<https://www.reuters.com/world/russia-iran-ties-have-reached-new-level-russian-defence-minister-2023-09-20/>



Wed, 20 Sep 2023

## **Tokyo Appoints Two New Defence Personnel Amid China's Increasing Military Manoeuvres Near Taiwan**

Japan made two important defence personnel appointments last week in the face of China's increasing military manoeuvres near Taiwan and Japan, Voice of America (VOA) reported.

Voice of America is the state-owned news network and international radio broadcaster of the US.

Analysts think the moves reflect the growing level of importance that Tokyo attaches to the status across the Taiwan Strait.

A regional security expert at the International Christian University in Japan, Stephen Nagy told VOA in a phone interview: "China has engaged in a lot of provocative activities near Taiwan and the Japanese are deeply worried about these."

"Japan is sending a signal to Beijing that they seek to prioritize peace and stability across the Taiwan Strait by appointing pro-Taiwan individuals to defence-related positions," he added. Last week, Japan appointed a serving defence ministry official as its de facto defence attaché in Taiwan, reversing the previous policy of appointing retired Japan Self-Defense-Force officers to the role at

the Japan-Taiwan Exchange Association, the organization that represents Japanese interests in Taipei.

Experts say this development shows Tokyo's desire to improve the quality of conversations related to the security situation across the Taiwan Strait. They hope to achieve the goal by appointing the right person to be the de facto defence attaché.

Professor of war and strategy in East Asia at King's College London, Alessio Patalano, said: "This [move] speaks to the ability to develop stronger ties at the human level."

"Stability across the Taiwan Strait has an inevitable repercussion for Japanese security and there is a growing perception in Tokyo that having someone in Taipei makes it easier to have a better quality conversation," he added, as per VOA.

Japanese Prime Minister Fumio Kishida also appointed Minoru Kihara, a politician with a track record of promoting stronger ties between Tokyo and Taipei, as Japan's new defence minister. Kihara's appointment is part of the cabinet reshuffle announced by the Japanese government on September 13.

Kihara was secretary general of the Japan-Taiwan inter-parliamentary group and visited Taiwan as part of a Japanese parliamentary delegation last August. Patalano from King's College says his appointment shows Tokyo wants to have someone capable of understanding what role Japan may or may not play amid rising tensions across the Taiwan Strait.

"Kihara has served as a junior minister at the Ministry of Defense before, he has visited Taiwan and he has a personal interest in cross-Strait stability. It shows that Japan is taking development across the Taiwan Strait seriously," he told VOA.

<https://www.aninews.in/news/world/asia/tokyo-appoints-two-new-defence-personnel-amid-chinas-increasing-military-manoevres-near-taiwan20230920103206/>



*Wed, 20 Sep 2023*

## **Israel Unveils Next Generation Artificially Intelligent Tank**

Israel's Defence Ministry unveiled its next-generation tank, the artificially intelligent Barak, on Tuesday.

The Barak, or Lightning, includes AI-based sensing and processing capabilities and includes an unprecedented 360-degree "pilot's helmet" for the tank commander, as well as multi-touch screens and controls.

"How symbolic that the days when we celebrate fifty years to the Yom Kippur War, and to the heroic battles fought during it by the armour fighters in defence of our country, we receive further proof of the relevance and power of the tank as a fundamental factor and decisive in land manoeuvring," said Defence Minister Yoav Gallant.

The tank will be able to adapt itself to the needs of the tank commander — and even more senior commanders not physically present — who may be interested in different aspects of battlefield information. The "pilot's helmet," referred to as Iron Vision, "generates an image that enables the crew to 'see through' the vehicle's armour" and will allow the crew to "overcome inherent visibility limitations, while improving mission efficiency and safety," according to Elbit Systems, which developed the headgear.

As a result, soldiers will be able to fight more effectively when the tank is sealed. Crew members will no longer need to open the hatch to examine their surroundings and expose themselves to enemy snipers.

The Barak's profile and peripheral observation capabilities will enable the tank to engage enemies at closer ranges. The cannon, sights and night vision have also been upgraded.

Part of the IDF's Merkava series, the Barak will replace the IDF's older Mark 3 tanks. While the technology will ease the burdens of the crew, the tanks will continue to be manned by a commander, driver, gunner and loader.

"The Barak tank is the fighting machine the most advanced of its kind in the world, which will bring fire capabilities to the IDF, the land arm and the armoured fighters, AI, intelligence, connectivity between tools and active defence are breaking ground on the modern battlefield," said Major General (res.) Eyal Zamir, the Defence Ministry's Director General.

The tank, which was five years in the making, was developed jointly by the Defence Ministry's Armored Vehicles Directorate and the IDF's Ground Forces and Armored Corps with individual systems produced by various Israeli defence companies.

<https://www.aninews.in/news/world/middle-east/israel-unveils-next-generation-artificially-intelligent-tank20230920230434/>

## Science & Technology News

INDIA  
TODAY

Wed, 20 Sep 2023

### **Chandrayaan-3: Sunrise on Shiv Shakti Point Today, ISRO Preps to Wake up Vikram**

As the sun rises over the lunar south pole on Wednesday, the Indian Space Research Organisation (Isro) is preparing to re-establish communication with its Chandrayaan-3 mission's Vikram lander and Pragyan rover.

The lunar duo have been in sleep mode for the past 15 days due to the lunar night, but with the arrival of sunlight at the Shiv Shakti point, their operational conditions are expected to improve.

Isro told India Today that sunrise has happened at the Chandrayaan-3 landing site in the south polar region of the Moon and they are waiting for batteries to recharge. Officials said that they are hopeful of re-establishing communications with Vikram and Pragyan.

The sunrise is a crucial moment for the mission as it will provide the necessary heat for the lander and rover to function. Isro has stated that they will wait for the temperature to rise above a certain level before initiating communication attempts on September 22.

The Chandrayaan-3 mission, launched on July 14, 2023, has already achieved significant milestones. It marked India as the fourth country to successfully land on the moon and the first to

do so near the lunar south pole. The mission's primary objective is to explore this scientifically intriguing region, believed to hold substantial amounts of frozen water.

The Vikram lander and Pragyan rover have been conducting various experiments since their landing on August 23.

They have measured electron densities in the Moon's ionosphere and taken temperature readings of the lunar surface. The Pragyan rover even captured the first image of the Vikram lander on the moon's surface.

However, the lunar night brought operations to a halt as the solar-powered vehicles' batteries were not powerful enough to keep their systems running in the absence of sunlight. With the lunar dawn, Isro is hopeful that the mission could resume its groundbreaking exploration if the electronics are able to survive the frigid night.

The successful reconnection with Vikram and Pragyan will be another feather in the cap for Isro, demonstrating its resilience and technological prowess in the field of space exploration. As the world watches, the sunrise at the Shiv Shakti point could mark the dawn of a new chapter in lunar exploration.

<https://www.indiatoday.in/science/chandrayaan-3/story/chandrayaan-3-sunrise-on-shiva-shakti-point-today-isro-preps-to-wake-vikram-up-2438205-2023-09-20>

## THE TIMES OF INDIA

Wed, 20 Sep 2023

### **Trouble for ISRO's Aditya-L1? NASA's Parker Gets Caught in a Dangerous Solar Storm**

NASA had earlier released a terrifying video on September 5, showcasing an intense Coronal Mass Ejection (CME) cloud. As India anticipates the success of its Sun mission, Aditya L1, concerns are arising that a similar fate may await India's first mission aimed at studying the Sun.

NASA's Goddard Space Flight Center has provided valuable insights into the harmful impacts of solar storms, with NASA's Parker Solar Probe mission playing a pivotal role in gathering crucial data on these solar phenomena.

Recent observations indicate that Earth has been subjected to solar storms from various directions, leading to noticeable changes in climate and the appearance of auroras around the polar regions.

— isro (@isro)

Although NASA's Parker Probe successfully navigated the solar storm and collected important solar data, it has also underscored the potential hazards faced by space probe missions. With ISRO's Aditya L1 Mission en route to the Lagrange 1 point to observe the Sun in about four months, concerns are arising that it too may encounter similar challenges.

According to a NASA blog post, "On Sept. 5, 2022, NASA's Parker Solar Probe soared gracefully through one of the most powerful coronal mass ejections (CMEs) ever recorded – not only an impressive feat of engineering, but a huge boon for the scientific community."

The strength of the Sun's coronal mass ejection was so remarkable that NASA emphasized in its blog post that the Parker Solar Probe's journey was "indeed an impressive feat of engineering and a significant asset to the scientific community."

Some of these insights have been published in the *Astrophysical Journal*, highlighting fascinating aspects of the impact of CMEs on space probe missions.

The Parker Solar Probe, launched in 2018, was designed to study the Sun's outer layer and explore whether CMEs can interact with planetary dust, as well as predict space weather patterns. This latter aspect is particularly critical for the future of our planet, human activities, and satellites.

"CMEs are immense eruptions from the Sun's outer atmosphere, or corona, that help drive space weather, which can endanger satellites, disrupt communications and navigation technologies, and even knock out power grids on Earth," NASA stated in a blog post.

Additionally, interplanetary dust plays a crucial role in understanding how quickly CMEs can travel from the sun to Earth, allowing for more accurate forecasting of their impact on our planet.

Interplanetary dust, present around planets like Earth, is significantly affected by CMEs. These solar phenomena can displace this dust up to 6 million kilometers away from Earth, a phenomenon explained by current scientific theories.

### **Will Aditya L1 face a similar fate?**

Currently, Aditya L1 is situated in deep space, on a journey to reach a point within the solar system known as the Lagrange point, where it can observe the Sun. ISRO estimates that it will take about four months for L1 to reach this point, coinciding with a period of heightened solar activity.

Concerns about potential harm to the Aditya L1 mission must be considered with some key factors in mind. First, the Parker mission was specifically designed to approach very close to the Sun, approximately 6.9 kilometres from its surface. In contrast, Aditya L-1 is positioned at a considerable distance from the sun.

Aditya L1 is situated just above 1.5 million kilometres away from Earth, which, in the vastness of space, is relatively close. Secondly, the spacecraft is equipped with protective layers and special materials designed to shield it from space-based dangers, including radiation and CME clouds.

<https://timesofindia.indiatimes.com/etimes/trending/trouble-for-isros-aditya-l1-nasas-parker-gets-caught-in-a-dangerous-solar-storm/articleshow/103814817.cms?from=mdr>



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## **This IIA Study could Help Understand how Gravitational Instabilities are Connected to Galaxy Evolution**

A study conducted by the Indian Institute of Astrophysics (IIA) could help understand how gravitational instabilities are connected to galaxy evolution.

K. Aditya, a post-doctoral fellow at the IIA, tried to explore how gravitational instabilities are connected with the star formation, gas fraction, time scale for growth of gravitational instabilities and finally, the observed morphology.

"They then compared the star formation rate, gas fraction, and time scale for the growth of gravitational instabilities of nearby galaxies and investigated the stability levels of a sample of 175 galaxies taken from the Spitzer Photometry and Accurate Rotation Curves (SPARC) database. This helped them trace the role of dark matter in regulating the stability levels of the galaxies and understand if stars and gas can self-regulate the stability levels," Department of Science and Technology (DST) said.

### **The ways of Milky Way**

DST added that they found that spiral galaxies like the Milky Way exhibit a higher median star formation rate, lower stability, lower gas fraction, and a smaller time scale for the growth of gravitational instabilities.

“This indicates that gravitational instabilities in spirals rapidly convert a substantial amount of gas into stars, depleting the gas reservoirs,” DST added.

It further said that the study which compared the stability levels in the nearby galaxies with those observed at high redshift, which are precursors to the galaxies in the local universe, could help understand how gravitational instabilities are connected to galaxy evolution.

### **Pace of star formation**

The results obtained in this work suggest a simple mechanism in which galaxies characterized by marginal stability levels undergo intense star formation activity for a short time scale, depleting the gas reserves. Whereas in galaxies that are highly stable, the star formation proceeds more slowly over longer time scales in galaxies with relatively higher stability gradually converting the available gas into stars.

The study not only contributes to the understanding of gravitational instabilities but also emphasizes the need for future investigations into the impact of these instabilities on the morphological evolution of galaxies across different redshifts.

<https://www.thehindu.com/news/national/karnataka/this-iaa-study-could-help-understand-how-gravitational-instabilities-are-connected-to-galaxy-evolution/article67326296.ece>

