

Current Affairs Revision

Category: Science & Technology · Entries: 46

July 15, 2026

Science and Technology

Science & Technology

Government Initiative

IPC-UPPPC MoU for Pharmaceutical Quality

NEWS ITEM

The **Indian Pharmacopoeia Commission (IPC)** signed an MoU with the **Uttar Pradesh Promote Pharma Council (UPPPC)** to strengthen quality standards, regulatory compliance and innovation in the pharmaceutical and medical device sectors. The partnership also covers capacity building, industry-academia collaboration, patient safety and digital adverse-event reporting support for MSMEs.

PRELIMS FACTS

- The MoU was signed during the **YEIDA MedTech Investors Meet & Site Visit 2026** at Greater Noida.
- The partnership covers pharmaceuticals as well as medical devices.
- It promotes awareness of the **Indian Pharmacopoeia**, pharmacovigilance and materiovigilance.
- MSMEs will be supported through digital tools for adverse-event reporting.
- The collaboration includes training programmes, workshops and industry-academia initiatives.

July 12, 2026

Polity and Governance

Education

Awards & Honours

Science & Technology

India Wins Five Gold Medals at International Physics Olympiad 2026

NEWS ITEM

Five Indian students won **gold medals** at the **56th International Physics Olympiad (IPhO) 2026**, held in **Bucaramanga, Colombia**, from **4 to 12 July 2026**. With this performance, India secured **joint first position** along with Russia, China, Kazakhstan, South Korea and Taiwan.

PRELIMS FACTS

- India won **five gold medals** at the **56th International Physics Olympiad 2026**.
- The Olympiad was held in **Bucaramanga, Colombia**.
- It was held from **4 to 12 July 2026**.
- Indian gold medallists were **Kanishk Jain, Riddhesh Anant Bendale, Rishit Garg, Shresth Suraiya and Svarit Joshi**.
- The students came from **Pune, Indore, New Delhi, Mumbai and Ahmedabad**.
- India secured **joint first position** with **Russia, China, Kazakhstan, South Korea and Taiwan**.
- The competition saw participation of **381 students from 87 countries**.
- India's Olympiad programme is led by **HBCSE**, a National Centre of **TIFR**.
- Secretary, Department of Atomic Energy, **Dr Ajit Kumar Mohanty**, congratulated the winners.

July 12, 2026

Science and Technology

Health

Species & Environment

Science & Technology

Deadly Bird Virus PaBV-4 Identified for First Time in India

NEWS ITEM

A team of scientists has identified and genetically characterised **Parrot Bornavirus-4 (PaBV-4)** in India for the first time. The virus was found among captive **psittacine birds** and is linked to **Proventricular Dilatation Disease (PDD)**, a largely fatal viral disease affecting the digestive and nervous systems of birds.

PRELIMS FACTS

- **PaBV-4** has been identified and genetically characterised in India for the first time.
- The study was led by **Pankaj Deka** and **Sangeeta Das** of the **Assam Veterinary and Fisheries University, Guwahati**.
- The study was published in **Scientific Reports**.
- Researchers tested **83 psittacine birds** from **13 species** in aviaries in **Assam, Karnataka and West Bengal**.
- The study period was **2020-2024**.
- Bird species included African grey parrot, ochre-marked parakeet, yellow-collared macaw, eastern rosella, blue-crowned hanging parrot, rainbow lorikeet and scarlet-chested parrot.
- The birds were divided into three groups: birds with clinical signs of PDD, healthy cage mates of suspected cases and birds that had died of suspected PDD.
- Infection was detected in almost **88% of dead birds** and **19% of apparently healthy cage mates**.
- Researchers found no patterns linking genetic clusters to host species, geography or time.
- The findings highlight risks to conservation programmes based on breeding captive birds.

July 12, 2026

Science and Technology

Places in News

Science & Technology

Government Initiative

Indian Lab's Quantum Algorithm Shows Active Quantum Advantage

NEWS ITEM

A team led by **Dr. Indrakshi Raychowdhury** of **BITS Pilani**, working with **IBM Quantum**, designed a quantum algorithm that simulated the behaviour of subatomic particles on **120 qubits** of an IBM processor. The result has been marked "**active**" by the **Quantum Advantage Tracker**, making it the first such verified active quantum-advantage result from an Indian laboratory.

PRELIMS FACTS

- The quantum algorithm was designed by a team led by **Dr. Indrakshi Raychowdhury** of **BITS Pilani**.
- The team worked with **IBM Quantum**.
- The algorithm simulated subatomic particle behaviour on **120 qubits** of an IBM processor.
- The quantum calculation took about **20 seconds**, compared with about **two hours** on a classical computer.
- The result was marked "**active**" by the **Quantum Advantage Tracker**.
- This is the first active quantum-advantage result from an Indian laboratory.
- The work is linked to simulating **quarks and gluons** governed by the **strong nuclear force**.
- The team used a simplified model of the strong force and reduced mathematical redundancy to scale the simulation.
- A task earlier run by others on at most **27 qubits** was pushed to **120 qubits**.
- The **Quantum Advantage Tracker** was launched in **November 2025** by IBM with the Flatiron Institute, BlueQubit, Algorithmiq and academic reviewers.
- The article mentions **CERN, Switzerland**, in the context of high-energy physics and future particle simulations.
- India's **National Quantum Mission** was approved in **2023** with an outlay of **₹6,003 crore**.
- The Mission funds quantum algorithms and a computing hub in **Bengaluru**.
- India currently does not have high-end quantum hardware of its own and researchers often depend on machines abroad.

July 12, 2026

Science and Technology

Health

Science & Technology

How Leucine Helps Cells Maintain Energy Production

NEWS ITEM

A science explainer highlighted the role of the essential amino acid **leucine** in protecting mitochondria, the cell organelles that produce energy. A study using the roundworm **Caenorhabditis elegans** found that leucine helps prevent premature degradation of outer mitochondrial membrane proteins, thereby supporting normal mitochondrial function and cellular energy production.

PRELIMS FACTS

- **Leucine** is an essential amino acid.
- It belongs to the family of **branched-chain amino acids (BCAAs)**.
- BCAAs include **leucine, isoleucine and valine**.
- Essential amino acids cannot be produced by the body and must be obtained from diet.
- **Mitochondria** produce **ATP**, the energy currency of the cell.
- The outer mitochondrial membrane is important for normal mitochondrial function.
- Researchers from the **University of Cologne Centre for Excellence Cluster on Aging and Aging-Associated Diseases, Germany**, used **Caenorhabditis elegans** as the model organism.
- The study was published in **Nature Cell Biology** on **27 November 2025**.
- The study found that leucine acts as a protective shield for outer mitochondrial membrane proteins.
- Leucine interacts with a protein called **SEL1L**, which is involved in recognising and removing damaged or misfolded proteins.
- Excessive degradation of outer mitochondrial membrane proteins can lead to metabolic and age-related diseases.

July 11, 2026

Economy

Species & Environment

Science & Technology

AEL and Dioxcycle Tie Up for Low-Carbon Chemical Manufacturing

NEWS ITEM

Adani Enterprises Ltd. (AEL) has entered into a long-term agreement with French clean-technology company **Dioxcycle** to develop and scale low-carbon chemical production in India. The initiative will begin with a pilot facility at an Adani Group site to produce **formic acid** using captured carbon dioxide and renewable electricity.

PRELIMS FACTS

- **Adani Enterprises Ltd. (AEL)** has signed a long-term agreement with **Dioxcycle**.
- **Dioxcycle** is a French clean-technology company specialising in chemical manufacturing.
- The project aims to develop and scale **low-carbon chemical production** in India.
- The first pilot facility will be set up at an **Adani Group site**.
- The pilot will produce **formic acid** using **captured carbon dioxide** and **renewable electricity**.
- Formic acid and its derivatives are used in textiles, agriculture and manufacturing.
- The tie-up combines Dioxcycle's electrochemical manufacturing technology with Adani Group's clean-energy and infrastructure capabilities.

July 11, 2026

International Relations

Places in News

Science & Technology

Defence

PM Modi's New Zealand Visit Elevates Ties to Strategic Partnership

NEWS ITEM

Prime Minister **Narendra Modi** paid an official visit to **Auckland, New Zealand, on 10-11 July 2026**, the first visit by an Indian Prime Minister to New Zealand in **40 years**. He held talks with New Zealand Prime Minister **Christopher Luxon** at **Government House, Auckland**, and both sides elevated India-New Zealand relations to a **Strategic Partnership**.

PRELIMS FACTS

- PM **Narendra Modi** visited **Auckland, New Zealand** on **10-11 July 2026**.
- It was the first visit by an Indian Prime Minister to New Zealand in **40 years**.
- PM Modi met New Zealand Prime Minister **Christopher Luxon** at **Government House, Auckland**.
- India and New Zealand elevated ties to a **Strategic Partnership**.
- Both sides endorsed the **India-New Zealand Strategic Partnership: Roadmap to 2030**.
- The two sides welcomed the conclusion and signature of the **India-New Zealand Free Trade Agreement**.
- Both sides set a target to double bilateral trade to **NZ\$7 billion / ₹35,000 crore by 2030**.
- A **Maritime Cooperation Arrangement** was signed between India's Ministry of Defence and the New Zealand Defence Force.
- An arrangement on **Hydrography and Nautical Cartography** was signed.
- A **Mutual Logistics Support Arrangement** was signed between the Indian Navy and the New Zealand Defence Force.
- A **Joint Working Group on Counter-Terrorism** was established.
- India's **NDMA** and New Zealand's **National Emergency Management Agency** signed cooperation on disaster risk management.
- Cooperation was agreed in **Animal Husbandry and Dairying**.
- A **Tourism MoA** was signed to increase tourist flow and cultural understanding.
- **India-New Zealand Joint Action Plan on Sport** was signed.
- Cooperation was agreed between **NMHC Lothal** and the **New Zealand Maritime Museum**.
- An **Arrangement on Cultural Cooperation** was signed.
- New Zealand nominated **Maritime Security** as its priority pillar under **IPOI**.
- New Zealand joined the **Global Biofuels Alliance**.
- A **Kiwifruit Action Plan** was launched with two Centres of Excellence in **Nagaland** and **Uttarakhand**.
- **NCPOR Goa** and **University of Canterbury** signed an MoU for Antarctic research cooperation.
- **NIFTEM-Kundli** and **Massey University** signed an MoU on food technology, research, academic exchange and student mobility.
- Important places in news: **Auckland, Government House, Nagaland, Uttarakhand, Goa, Kundli, Lothal**, and the **New Zealand Maritime Museum**.

July 9, 2026

Economy

Indexes & Reports

Science & Technology

WIPO Report Highlights India's Rise in Intangible Investment

NEWS ITEM

The **World Intangible Investment Report 2026**, launched by **World Intellectual Property Organization (WIPO)** and **Luiss Business School**, highlighted India's rise as a global innovation powerhouse. Union Commerce and Industry Minister **Piyush Goyal** said India recorded the fastest growth in intangible investment among the world's 15 largest economies, reaching **USD 78.2 billion in 2023** with **7.9% growth**.

PRELIMS FACTS

- The **World Intangible Investment Report 2026** was launched by **WIPO** and **Luiss Business School**.
- The report highlights investment in software, R&D, intellectual property, innovation and organisational capabilities.
- India's intangible investment reached **USD 78.2 billion in 2023**.
- India recorded **7.9% growth** in intangible investment.
- India was reported as having the fastest growth in intangible investment among the world's **15 largest economies**.
- Intangible investment in India grew ahead of tangible investment.
- Union Commerce and Industry Minister **Piyush Goyal** said India is building a knowledge-driven future powered by ideas, innovation and enterprise.
- The report links India's progress with reforms, digital transformation, startups and a strengthening innovation ecosystem.

July 9, 2026

International Relations

Science & Technology

Defence

PM Modi's Australia Visit Deepens Comprehensive Strategic Partnership

NEWS ITEM

Prime Minister **Narendra Modi** visited **Australia from 8-10 July 2026** for the **3rd India-Australia Annual Summit** in **Melbourne** with Australian Prime Minister **Anthony Albanese**. The visit produced major outcomes in **defence, maritime security, civil nuclear energy, critical minerals, cyber and critical technologies, education, sports, traditional knowledge and cultural heritage**.

PRELIMS FACTS

- PM Narendra Modi visited **Australia from 8-10 July 2026**.
- The visit was for the **3rd India-Australia Annual Summit** in **Melbourne**.
- The summit was hosted by Australian Prime Minister **Anthony Albanese**.
- India and Australia completed **six years of Comprehensive Strategic Partnership**.
- Both sides agreed to work towards early finalisation of **CECA**.
- Key outcomes included **Joint Declaration on Defence and Security Cooperation** and **Maritime Security Collaboration Roadmap**.
- India and Australia finalised administrative arrangements under civil nuclear cooperation, enabling supply of **Australian uranium to India** for peaceful purposes under **IAEA safeguards**.
- **PACTS** was announced for cyber, critical technologies and supply chains.
- A MoU was concluded between the **Indian Coast Guard** and Australia's **Maritime Border Command**.
- Australia invited an **Indian military instructor** to the Australian Defence College for **2028-29**.
- A Centre of Excellence in **Mining Equipment, Technology and Services** will be set up at **NSTI Bhubaneswar** with TAFE Western Australia.
- Flinders University received a Letter of Intent to set up a campus in **Bengaluru**.
- Victoria University received approval to set up and operate a campus in **Gurugram**.
- Three Indian artefacts of Tamil Nadu origin will be repatriated: **Nandi, Bhadrakali Trident, and six-headed Skanda/Karttikeya**.
- A Rooftop Solar Training Academy was operationalised at **Pandit Deendayal Energy University, Gandhinagar**, aiming to train **2,000 women and youth**.
- **CSIR-TKDL** access agreement was signed with **IP Australia**.
- PM Modi addressed the Indian diaspora at **Marvel Stadium, Melbourne**.
- PM Modi and PM Albanese visited the **Melbourne Cricket Ground** and jointly released the **India-Australia Roadmap for Sports Collaboration**.

July 8, 2026

Defence and Security

Science & Technology

Government Initiative

Defence

DRDO Tests Pinaka Long Range Guided Rocket

NEWS ITEM

DRDO successfully flight-tested the **Pinaka Long Range Guided Rocket (LRGR)** at the **Integrated Test Range, Chandipur, Odisha**. The rocket was tested for a user-defined minimum range of **60 km** and was launched from the in-service Pinaka launcher.

PRELIMS FACTS

- **DRDO** successfully flight-tested **Pinaka Long Range Guided Rocket (LRGR)**.
- The test was conducted at **Integrated Test Range, Chandipur, Odisha**.
- The rocket was tested for a user-defined minimum range of **60 km**.
- The rocket was launched from the **in-service Pinaka launcher**.
- Pinaka LRGR was designed by **Armament Research and Development Establishment (ARDE)**.
- **High Energy Materials Research Laboratory (HEMRL)** was associated with the design.
- **Defence Research and Development Laboratory (DRDL)** and **Research Centre Imarat (RCI)** provided support.
- Defence Minister **Rajnath Singh** called the test a major milestone in indigenous long-range guided rocket capability.

July 8, 2026 Health Health Science & Technology

Finerenone May Slow Kidney Disease Beyond Diabetes

NEWS ITEM

Three global studies published in **The New England Journal of Medicine**, **JAMA** and **The Lancet** suggest that **finerenone**, a drug earlier used mainly for diabetes-related kidney disease, may also help patients with **chronic kidney disease (CKD) without diabetes**. Researchers found that it slowed kidney disease progression, reduced protein leakage in urine and lowered the risk of kidney failure.

PRELIMS FACTS

- Three global studies on finerenone were published in **NEJM**, **JAMA** and **The Lancet**.
- Finerenone was earlier used mainly in **diabetes-related kidney disease**.
- New evidence suggests benefit in **CKD patients without diabetes**.
- Finerenone blocks **inflammation and scarring** inside the kidneys.
- Across CKD forms, it slowed disease progression, reduced protein leakage in urine and lowered kidney failure risk.
- **FIND-CKD** enrolled **1,584 non-diabetic CKD patients**.
- A related analysis of over **900 patients** with glomerular diseases found about **42% reduction in protein leakage in urine**.
- Combined data across **14,574 patients** suggested benefits across different causes and stages of kidney disease.
- Main safety concern: **hyperkalaemia**, or high potassium levels in blood.
- About **17%** of finerenone-treated patients developed elevated potassium levels, but severe cases were uncommon.
- Finerenone is already available in India and costs around **₹80-90 per day**.
- It may become cheaper after patent protection ends in **2028**.
- Routine urine testing for protein leakage can help detect kidney damage early.

July 8, 2026 Science and Technology Space Science & Technology

Contact Lost with Mission Drishti, World's First OptoSAR Satellite

NEWS ITEM

Bengaluru-based space start-up **GalaxEye** said it has lost contact with **Mission Drishti**, the world's first **OptoSAR satellite**, after it encountered an anomaly following a geomagnetic solar storm. The company said recovery efforts are ongoing, but the chances of recovery currently appear low.

PRELIMS FACTS

- **GalaxEye** is a Bengaluru-based space start-up.
- **Mission Drishti** is described as the world's first **OptoSAR satellite**.
- It is also India's largest privately developed **Earth observation satellite**.
- It was launched on **3 May 2026** aboard a **SpaceX Falcon 9** from **Vandenberg, California**.
- The satellite combines **electro-optical** and **SAR** sensors in one operational platform.
- The anomaly occurred during the final stage of **LEOP**.
- GalaxEye said radiation effects linked to a geomagnetic solar storm likely impacted a critical onboard system.
- Communication with the spacecraft later became intermittent and was eventually lost.

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NAL Completes Design Phase of Saras MK-II Aircraft

NEWS ITEM

Civil Aviation Minister **Ram Mohan Naidu** congratulated **National Aerospace Laboratories (NAL)** for completing the design phase of the **19-seater Saras MK-II** aircraft. He said the aircraft advances the **Aatmanirbhar Bharat** vision and can support the **UDAN** goal of connecting remote and high-altitude airfields with Made-in-India aircraft.

PRELIMS FACTS

- **NAL** has completed the design phase of the **19-seater Saras MK-II**.
- Saras MK-II is being developed as an indigenously designed **light transport aircraft**.
- The development supports the **Aatmanirbhar Bharat** vision.
- The aircraft is linked with the **UDAN** vision of improving regional air connectivity.
- It is expected to help connect remote and high-altitude airfields with Made-in-India aircraft.
- Union Civil Aviation Minister **Ram Mohan Naidu** congratulated NAL for the achievement.

July 7, 2026

Science and Technology

Science & Technology

Oldest Quasars Found Deepen Early Universe Mystery

NEWS ITEM

Astronomers using the **European Space Agency's Euclid space telescope** have discovered **four ancient quasars**, including two of the oldest ever found. The light from the oldest pair dates back to a time when the universe was only about **670 million years old**, nearly **5% of its current age of 13.8 billion years**.

PRELIMS FACTS

- Astronomers discovered **four ancient quasars**, including two among the oldest ever found.
- The discovery used the **Euclid space telescope** of the **European Space Agency**.
- The oldest pair dates to when the universe was about **670 million years old**.
- The current age of the universe is about **13.8 billion years**.
- A **quasar** is a luminous galactic core powered by a **supermassive black hole**.
- Quasars help scientists study the early evolution of galaxies and black holes.
- The discovery deepens the mystery of how massive black holes formed so soon after the Big Bang.
- The study is linked with the early universe period called **cosmic dawn**.
- The findings were published in **Nature Astronomy**.

July 7, 2026

Science and Technology

Science & Technology

FDA Approval of Vepdegestrant Marks Major Shift in Cancer Therapy

NEWS ITEM

The **U.S. Food and Drug Administration (FDA)** approved **vepdegestrant**, sold as **Veppanu**, for adults with **ER-positive, HER2-negative, ESR1-mutated advanced or metastatic breast cancer** after progression on endocrine therapy. The approval is significant because vepdegestrant is the **first FDA-approved PROTAC-based targeted protein degrader**, a therapy designed to remove disease-causing proteins rather than only block them.

PRELIMS FACTS

- The **FDA approved vepdegestrant** on **1 May 2026**.
- Brand name: **Veppanu**.
- It is indicated for adults with **ER-positive, HER2-negative, ESR1-mutated advanced or metastatic breast cancer** after progression on endocrine therapy.
- It is the **first FDA-approved PROTAC-based targeted protein degrader**.
- **PROTAC** stands for **Proteolysis-Targeting Chimera**.
- PROTACs remove target proteins by using the cell's **ubiquitin-proteasome system**.
- Vepdegestrant targets and degrades the **estrogen receptor**.
- **ESR1 mutations** can cause resistance to endocrine therapy in breast cancer.
- The FDA approval was based on the **Phase 3 VERITAC-2 trial**.
- In the ESR1-mutated subgroup, vepdegestrant showed median progression-free survival of about **5.0 months** compared with **2.1 months** for fulvestrant.
- Vepdegestrant is an **oral therapy**, while fulvestrant is given by injection.
- FDA also approved **Guardant360 CDx** as a companion diagnostic to identify ESR1 mutations.

July 6, 2026

Health

Science & Technology

Government Initiative

Over 104 Crore Health Records Linked to ABHA Accounts

NEWS ITEM

The government said that over **104 crore health records** have been linked to more than **93 crore Ayushman Bharat Health Account (ABHA)** accounts. This is a major step towards creating a connected digital public health ecosystem under the **Ayushman Bharat Digital Mission**.

PRELIMS FACTS

- Over **104 crore health records** have been linked to over **93 crore ABHA accounts**.
- **ABHA** is a **14-digit unique health identifier**.
- ABHA is part of the **Ayushman Bharat Digital Mission**.
- ABHA helps connect individuals with doctors, hospitals, labs, insurers and other digital health services.
- Health records linked to ABHA can include prescriptions, lab reports, discharge summaries and treatment history.
- **ABDM** aims to create fully digital health records for citizens across India.
- Data sharing under ABHA is based on user consent.

July 6, 2026

Defence and Security

Science & Technology

Government Initiative

Indian Navy to Commission Project 17A Stealth Frigate Mahendragiri

NEWS ITEM

The Indian Navy will commission its sixth **Project 17A indigenous stealth frigate, Mahendragiri (F38)**, at **Visakhapatnam** on **11 July 2026**. The ship has been designed by the Indian Navy's **Warship Design Bureau** and built by **Mazagon Dock Shipbuilders Limited**, Mumbai.

PRELIMS FACTS

- **Mahendragiri (F38)** will be commissioned at **Visakhapatnam** on **11 July 2026**.
- It is the **sixth Project 17A indigenous stealth frigate** of the Indian Navy.
- It was designed by the Indian Navy's **Warship Design Bureau**.
- It was built by **Mazagon Dock Shipbuilders Limited**, Mumbai.
- Mahendragiri is named after the **Mahendragiri mountain range in the Eastern Ghats**.
- It is the first Indian Naval warship to bear the name **Mahendragiri**.
- Its motto is **"Mighty-Majestic-Matchless."**
- Project 17A frigates are also known as **Nilgiri-class frigates**.
- Project 17A is the follow-on class of the earlier **Project 17 Shivalik-class frigates**.
- Mahendragiri is powered by **Combined Diesel or Gas (CODOG)** propulsion.
- The project has around **75% indigenous content** and supports the **Aatmanirbhar Bharat** initiative.
- Project 17A ships strengthen India's maritime capability in the **Indian Ocean Region** and the **Indo-Pacific**.

July 6, 2026

Science and Technology

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Government Initiative

ISRO Tests SOLVE Motor for Gaganyaan Mission

NEWS ITEM

ISRO successfully conducted the first ground test of the solid motor-based **Sub-Orbital Launch Vehicle for Experiments (SOLVE)** at the **Static Test Facility, Satish Dhawan Space Centre, Sriharikota**, on **3 July 2026**. SOLVE will be used to validate the **Gaganyaan crew module's parachute-based deceleration system** under different test conditions.

PRELIMS FACTS

- ISRO conducted the first ground test of **SOLVE** on **3 July 2026**.
- The test was conducted at the **Static Test Facility, Satish Dhawan Space Centre, Sriharikota**.
- SOLVE stands for **Sub-Orbital Launch Vehicle for Experiments**.
- SOLVE is a solid motor-based platform for **Gaganyaan test missions**.
- It will be used for **Integrated Parachute Tests** of the Gaganyaan crew module.
- In SOLVE test missions, the crew module will be carried to an altitude of **10 km to 17 km** and then separated.
- A series of **10 parachutes** will reduce the crew module's velocity before sea splashdown.
- SOLVE's solid stage is derived from the **PSLV strap-on motor**.
- Key modifications include **slow burn-rate propellant** and **secondary injection thrust vector control**.
- ISRO stated that motor performance parameters were as expected.
- ISRO has also carried out **IADT-02** and **Mission MITRA** for Gaganyaan.

July 5, 2026

Science and Technology

Awards & Honours

Science & Technology

Government Initiative

ICMR-MINDS Wins Gold at e-Governance Awards

NEWS ITEM

ICMR-MINDS, a flagship digital mental healthcare initiative of the **Indian Council of Medical Research**, won the **Gold Award** at the **National Awards for e-Governance 2026**. It was awarded under the category **Innovation by Use of AI and Other New Age Technologies for Providing Citizen-Centric Services**.

PRELIMS FACTS

- **ICMR-MINDS** won the **Gold Award** at the **National Awards for e-Governance 2026**.
- The award was presented by **Dr. Jitendra Singh**, Union Minister of State for Personnel, Public Grievances and Pensions.
- ICMR-MINDS is a **National Health Research Priority** project.
- It integrates screening and management of mental and substance use disorders with other **non-communicable diseases**.
- Its **AI-enabled CDSS** supports mental health screening, assessment, follow-up and routine management by trained non-specialist frontline healthcare providers.
- It is being implemented across seven States through seven collaborating institutions.
- Collaborating institutions include **AIIMS Guwahati, Gujarat Institute of Mental Health, Ahmedabad, AIIMS New Delhi, St. John's Medical College, Bengaluru, AIIMS Bhopal, AIIMS Bhubaneswar** and **PGIMER Chandigarh**.

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GLM-5.2 and China's AI Catch-Up Race

NEWS ITEM

China-based **Z.ai** released **GLM-5.2**, its most advanced large language model, along with **ZCode**, an AI coding assistant. Researchers cited in the report said the model can seriously challenge leading U.S. systems in specialised coding and cybersecurity tasks, though it still trails top models in broader reasoning and general-purpose tasks.

PRELIMS FACTS

- **GLM-5.2** is an advanced AI model released by China-based **Z.ai**.
- **Z.ai** was co-founded by **Tang Jie**.
- GLM-5.2 was released as an **open-weight model**.
- Open-weight models can be downloaded and run by developers on their own hardware.
- **ZCode** is Z.ai's AI coding assistant introduced alongside GLM-5.2.
- Researchers cited in the report said GLM-5.2 can challenge leading U.S. systems in specialised coding and cybersecurity tasks.
- The report says GLM-5.2 still trails top U.S. models in broader reasoning and general-purpose tasks.
- Chinese AI companies face constraints due to U.S. restrictions on advanced semiconductor hardware.
- The rise of GLM-5.2 is being compared by some developers to a **DeepSeek moment** for China's open-source AI ecosystem.

July 5, 2026

Science and Technology

International Organisations

Science & Technology

Infrastructure

CERN's LHC Upgrade and Future Collider Debate

NEWS ITEM

CERN's Large Hadron Collider (LHC) has entered a four-year shutdown for a major upgrade costing about **\$1.5 billion**, which will convert it into the **High-Luminosity LHC**. The upgrade aims to increase collision data and improve chances of detecting rare physics signals, while CERN also debates whether to build the much larger **Future Circular Collider**.

PRELIMS FACTS

- **CERN** is the European Organization for Nuclear Research.
- **Large Hadron Collider** is CERN's flagship particle collider.
- The LHC discovered the **Higgs boson** in **2012**.
- The LHC has entered a four-year shutdown for an upgrade costing about **\$1.5 billion**.
- The upgraded machine will be called the **High-Luminosity LHC**.
- The upgrade aims to increase the number of collisions, not primarily the collision energy.
- The LHC is expected to run until around **2041**.
- The proposed **Future Circular Collider** involves a **91-km** tunnel.
- A build-or-abandon decision on the FCC is expected around **2028**.
- The current cost estimate for the FCC is about **\$19 billion**.
- A possible later FCC proton machine could reach around **100 TeV**.
- The Standard Model cannot fully explain dark matter, dark energy and matter-antimatter imbalance.

July 5, 2026

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Webb Finds Atmosphere Around Planet Orbiting Dead Star

NEWS ITEM

Using the **James Webb Space Telescope**, scientists detected an atmosphere around **WD 1856 b**, a Jupiter-sized exoplanet orbiting a **white dwarf** star. The atmosphere shows signs of hydrocarbons and aerosol clouds, suggesting that some planets can survive and continue evolving even after their host star dies.

PRELIMS FACTS

- **WD 1856 b** is a Jupiter-sized exoplanet orbiting a **white dwarf** star.
- The atmosphere was studied using the **James Webb Space Telescope**.
- The atmosphere shows signs of **hydrocarbons** and **aerosol clouds**.
- This is significant because it shows that planets can survive after their host stars become white dwarfs.
- The planet was hotter than expected, possibly due to **tidal heating** after it moved inward.
- The finding helps scientists study the long-term fate of planetary systems, including systems around Sun-like stars after stellar death.

July 5, 2026

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Caged vs Open Frontier AI Models

NEWS ITEM

An article examined whether **closed or “caged” frontier AI models** from U.S. companies can continue to lead when **open-weight AI models** from China and other countries are becoming cheaper, powerful and widely accessible. It discussed Anthropic’s temporary restriction of its model **Fable**, OpenAI’s controlled release approach, and the rise of open models from firms such as **DeepSeek** and **Z.ai**.

PRELIMS FACTS

- **Anthropic** released its advanced AI model **Fable** generally, but soon suspended paid-user access over safety concerns.
- Anthropic later reopened **Fable** in a trimmed version called **Mythos** to limited users.
- **OpenAI** avoided similar disruption with **GPT-5.6** by restricting access from the outset to a government-vetted user list.
- The U.S. Commerce Department classified some advanced AI models as **dual-use cyber tools**.
- The article mentions concerns over **guardrail bypass, model distillation**, and misuse of advanced models for cyber purposes.
- **DeepSeek** showed that Chinese AI models could approach U.S. frontier performance at lower cost.
- **Z.ai** released an open-weight model that reportedly scored close to Anthropic’s best model on a coding benchmark.
- The article argues that export controls work better on scarce hardware than on freely released software.
- Japan’s **Sakana AI** and European AI sovereignty investments are cited as signs that countries want to reduce dependence on U.S. frontier models.

July 5, 2026

Science and Technology

Science & Technology

New CAR T-cell Therapy Shows Promise Against Solid Tumours

NEWS ITEM

Researchers have developed a promising new **CAR T-cell therapy** for rare solid tumours, including **alveolar soft-part sarcoma (ASPS)** and some kidney cancers. The therapy targets a protein called **GNMB**, which was found to be consistently present on these tumour cells.

PRELIMS FACTS

- Researchers developed a new **GNMB-targeting CAR T-cell therapy** for rare solid tumours.
- The therapy is being studied for **alveolar soft-part sarcoma (ASPS)** and some kidney cancers.
- **GNMB** was found to be consistently expressed on the relevant tumour cells.
- One patient with advanced ASPS reportedly had stable disease for **three months**.
- Several smaller tumours disappeared in that patient.
- The therapy was reported to be well tolerated in the case mentioned.
- Combining CAR T-cell therapy with **immune checkpoint blockers** may help overcome treatment resistance.
- The finding is promising but still early-stage; it does not mean the therapy is already a standard cure.

July 4, 2026

Science and Technology

Science & Technology

Government Initiative

Infrastructure

CG Semi OSAT Facility Inaugurated in Sanand

NEWS ITEM

Prime Minister **Narendra Modi** inaugurated the **CG Semi Outsourced Semiconductor Assembly and Test (OSAT) facility** at **Sanand, Gujarat**. The facility marks a major step in India's semiconductor journey by starting commercial chip packaging and testing and strengthening India's position in the global semiconductor value chain.

PRELIMS FACTS

- Prime Minister **Narendra Modi** inaugurated the **CG Semi OSAT facility** at **Sanand, Gujarat** on **04 July 2026**.
- **OSAT** stands for **Outsourced Semiconductor Assembly and Test**.
- The facility begins commercial chip packaging and testing operations.
- The Prime Minister had laid the foundation stone of the project in **2024**.
- Chip testing at the facility started by **August 2025**, as mentioned in the official release.
- The facility is linked with industrial partners from **India, Japan and Thailand**.
- The current stated production capacity is **20 crore units per year**.
- The future target mentioned is **500 crore units per year**.
- **Sanand** is emerging as a semiconductor cluster with companies such as **Micron, Kaynes** and **CG Semi**.
- India's semiconductor strategy aims to cover **design, fabrication, assembly, testing and packaging**.
- The Prime Minister described the semiconductor push as the next stage of India's electronics manufacturing growth: products, then components, and now semiconductors.
- The facility is expected to support sectors such as **AI, robotics and next-generation technologies**.

July 3, 2026

Science and Technology

Places in News

Species & Environment

Science & Technology

700-Year-Old Banyan Scientifically Dated in Munger

NEWS ITEM

A banyan tree in **Munger, Bihar** has been scientifically dated to around **700 years** using **radiocarbon dating**. The finding identifies it as the oldest accurately dated **banyan tree**, based on scientific evidence rather than folklore or local traditions.

PRELIMS FACTS

- The banyan tree is located in **Munger, Bihar**.
- Its estimated age is around **700 years**.
- The species identified is **Ficus benghalensis**.
- The study used **radiocarbon dating** with **Accelerator Mass Spectrometry**.
- The research was led by **Dr. Trina Bose** of the **Birbal Sahni Institute of Palaeosciences**.
- The study was published in **Quaternary Research**.
- The finding suggests that the tree may be a surviving remnant of an older natural forest in the area.

July 3, 2026

Science and Technology

Science & Technology

Government Initiative

Infrastructure

Vikram-1 Set for India's First Private Orbital Launch

NEWS ITEM

Skyroot Aerospace announced the launch window for **Vikram-1**, India's first privately developed orbital-class rocket, under **Mission Aagaman**. The test flight is targeted no earlier than **July 12, 2026**, with the window extending till **August 4, 2026**, from the **Satish Dhawan Space Centre, Sriharikota**.

PRELIMS FACTS

- **Vikram-1** is India's first privately developed orbital-class rocket.
- It has been developed by **Skyroot Aerospace**, a Hyderabad-based private space company.
- Vikram-1's first test flight is named **Mission Aagaman**.
- The launch window is from **July 12 to August 4, 2026**.
- The launch is planned from **Satish Dhawan Space Centre, Sriharikota**.
- Vikram-1 follows the successful suborbital flight of **Vikram-S** on **November 18, 2022**.
- The test flight will gather data on propulsion, stage separation, guidance, navigation, control and overall vehicle performance.
- All stages of Vikram-1 have been integrated and stacked at the launch pad.

July 3, 2026

Science and Technology

Places in News

Science & Technology

Infrastructure

I-2SEA Submarine Cable to Link India and Southeast Asia

NEWS ITEM

A consortium comprising **Lightstorm, Microsoft, Singtel** and **Tata Communications** has unveiled the **I-2SEA submarine cable system** to connect India, Malaysia and Singapore. The project is designed to support rising demand from AI, cloud, hyperscale and GPU infrastructure users across the India-Southeast Asia corridor.

PRELIMS FACTS

- **I-2SEA** is a proposed submarine cable system linking **India, Malaysia and Singapore**.
- The consortium includes **Lightstorm, Microsoft, Singtel** and **Tata Communications**.
- It will connect India's east coast with **Singapore** and **Kuala Lumpur**.
- Indian landing points include **Machilipatnam** and a new diverse landing location in **South Chennai**.
- **NEC Corporation** has been appointed as the system supplier.
- **ASEAN Cables (ACPL)** is the marine installation partner.
- The cable system is targeted to be ready-for-service in **Q4 2029**.
- The estimated cable length from Singapore to Machilipatnam is around **3,600 km**.

July 2, 2026

Science and Technology

Science & Technology

Government Initiative

Infrastructure

India's First PinS Procedure for Helicopter Operations

NEWS ITEM

India has approved its first **Private Point-in-Space (PinS) Instrument Approach Procedure** for helicopter operations at **Undavalli Heliport**. Developed by the **Airports Authority of India (AAI)** and approved by the **Directorate General of Civil Aviation (DGCA)**, it enables safer satellite-based approaches where conventional landing infrastructure is absent.

PRELIMS FACTS

- India's first private **PinS Instrument Approach Procedure** has been approved for **Undavalli Heliport**.
- It was developed by **AAI** and approved by **DGCA**.
- PinS uses satellite-based navigation for helicopter instrument approaches.
- It is useful where conventional landing infrastructure or ground-based navigation aids are unavailable.

July 2, 2026

Environment and Ecology

Government Schemes

Science & Technology

Infrastructure

ACME Signs Green Ammonia and Methanol Offtake Deals with Japan

NEWS ITEM

Under the **National Green Hydrogen Mission**, **ACME Cleantech Solutions Private Limited** signed long-term offtake agreements with Japanese companies for green hydrogen derivatives. It will supply **405 kTPA green ammonia** to **IHI Corporation** and **100 kTPA green methanol** to **Mitsubishi Gas Chemical Company** from its Paradip facility.

PRELIMS FACTS

- The agreements were signed at **Atal Akshay Urja Bhawan, New Delhi**.
- **ACME Group** signed long-term offtake agreements with **IHI Corporation** for green ammonia and **Mitsubishi Gas Chemical Company** for green methanol.
- **National Green Hydrogen Mission** was approved in January 2023 with an outlay of **₹19,744 crore**.
- **SIGHT Programme** provides financial support for production through bidding conducted by **SECI**.
- ACME Group has been awarded **370 kTPA** production capacity under the SIGHT Programme.
- ACME will supply **405 kTPA green ammonia** to IHI Corporation.
- ACME will supply **100 kTPA green methanol** to Mitsubishi Gas Chemical Company under a **10-year agreement** from its **Paradip facility**.
- Japan's **METI** administers the CfD scheme supporting low-carbon ammonia.

July 2, 2026

Polity and Governance

Awards & Honours

Science & Technology

Government Initiative

29th National e-Governance Conference Concludes in Jaipur

NEWS ITEM

The **29th National e-Governance Conference** concluded in **Jaipur** with the presentation of the **National e-Governance Awards**. The conference focused on digital governance, emerging technologies and better use of technology in public service delivery.

PRELIMS FACTS

- The **29th National e-Governance Conference** was held in **Jaipur, Rajasthan**.
- The conference concluded with the presentation of the **National e-Governance Awards**.
- The awards recognise outstanding e-governance initiatives by Central and State Governments and other organisations.
- **Dr. Jitendra Singh** was the chief guest at the valedictory and awards ceremony.
- The conference was jointly organised by **DARPG, MeitY** and the **Government of Rajasthan**.
- The concluding day included three plenary sessions on digital governance and emerging technologies.

July 2, 2026

Defence and Security

Science & Technology

Government Initiative

Personalities in News

Army Chief Unveils VIJAY Roadmap

NEWS ITEM

Chief of the Army Staff **General Dhiraj Seth** unveiled a roadmap titled **VIJAY** to transform the Indian Army into a technology-enabled, future-ready force. The roadmap focuses on vigilance, innovation, jointness, self-reliance and soldier-centric development for modern multi-domain warfare.

PRELIMS FACTS

- **General Dhiraj Seth** is the **31st Chief of the Army Staff**.
- He unveiled the **VIJAY** roadmap for a technology-enabled, future-ready Indian Army.
- **V** stands for Vigilance and Readiness.
- **I** stands for Innovation and Transformation.
- **J** stands for Jointness and Integration.
- **A** stands for Aatmanirbharta.
- **Y** stands for Yodha First.
- The roadmap emphasises multi-domain operational capability, indigenous technologies, civil-military fusion and a Whole-of-Nation approach.

July 2, 2026

Economy

Science & Technology

Government Initiative

Infrastructure

Building India's Coal Chemistry Capability

NEWS ITEM

An opinion article argued that India's energy security needs deeper **coal chemistry capability**, not only import diversification. It highlighted that while India managed the 2026 **Strait of Hormuz** disruption through refinery flexibility, long-term resilience requires domestic alternatives such as **Dimethyl Ether (DME)** produced through **coal gasification** to reduce LPG import dependence.

PRELIMS FACTS

- The article was written by **R.A. Mashelkar**, distinguished scientist and former Director General of **CSIR**.
- The core argument is that India must move from crisis management to structural reduction of energy import dependence.
- During the Hormuz disruption, India's non-Hormuz crude sourcing reportedly rose from **55% to 70%**.
- Domestic LPG production during the crisis reportedly increased from **35 TMT per day** to **54 TMT per day** within five days.
- **DME** can be produced through coal gasification and can be blended with LPG.
- **BIS** has approved blending of up to **20% DME with LPG**.
- A 20% DME blend could displace around **6.3 million tonnes** of LPG imports annually and save nearly **₹34,000 crore** in foreign exchange.
- The **Surface Coal and Lignite Gasification Scheme** has an outlay of **₹37,500 crore** and targets **100 million tonnes** of coal gasification annually by **2030**.

July 1, 2026

Polity and Governance

Government Schemes

Science & Technology

11 Years of Digital India: Transforming Governance and Empowering the Poor

NEWS ITEM

Marking the 11th anniversary of the **Digital India** initiative, Prime Minister Narendra Modi highlighted its massive success in redefining governance and making life easier for millions. From laying optical fibres in remote villages to executing seamless **Direct Benefit Transfers (DBT)**, the scheme has empowered the underprivileged, fueled rural startups, and positioned India as a global leader in emerging technologies like AI and quantum computing.

PRELIMS FACTS

- **Launch Year:** 2015, operating under the **Ministry of Electronics and Information Technology (MeitY)**.
- **Nine Pillars:** Includes Broadband Highways, Public Internet Access, e-Governance, e-Kranti, Information for All, Electronics Manufacturing, IT for Jobs, Early Harvest Programmes, and Universal Access to Mobile Connectivity.
- **Direct Benefit Transfer (DBT):** Works seamlessly on the backbone of the **JAM Trinity**, ensuring targeted delivery without middlemen.
- **Future Focus:** The initiative is now driving emerging sectors through missions like the **India Semiconductor Mission**, **National Quantum Mission**, and **IndiaAI Mission**.

July 1, 2026

Science and Technology

Science & Technology

NASA Launches Daring Robotic Mission to Rescue Swift Space Telescope

NEWS ITEM

NASA has launched an unprecedented 30-million-dollar robotic rescue operation to save its ageing Neil Gehrels Swift Observatory from burning up in the atmosphere. Developed by U.S. startup Katalyst and launched via a Pegasus rocket, the specialized robot aims to latch onto the falling telescope and tow it back into a stable orbit.

PRELIMS FACTS

- The Swift Observatory was launched in **2004** into a **Low Earth Orbit (LEO)** at an altitude of approximately 600 km.
- The robotic rescue spacecraft was developed by the private U.S. startup **Katalyst**.
- The rescue vehicle was launched using a small air-launched rocket named **Pegasus**.
- Swift's primary payload instruments are tuned to study **Gamma-Ray Bursts (GRBs)**, which represent the explosive death of stars.

June 30, 2026

Science and Technology

Important Days

Science & Technology

International Asteroid Day Observed on June 30

NEWS ITEM

International Asteroid Day is observed globally on June 30 every year to raise public awareness about the asteroid impact hazard. The day emphasizes the need for planetary defense mechanisms and global cooperation to protect Earth from potential Near-Earth Object (NEO) threats.

PRELIMS FACTS

- **International Asteroid Day** is observed every year on **June 30**.
- The date commemorates the 1908 **Tunguska event** in Siberia, the largest recorded asteroid impact on Earth.
- The **Main Asteroid Belt** is located primarily between the orbits of **Mars** and **Jupiter**.
- **OSIRIS-REx** (NASA) and **Hayabusa2** (JAXA) are notable missions that have successfully collected physical samples from asteroids (Bennu and Ryugu, respectively) and returned them to Earth.

June 30, 2026

Defence and Security

Indexes & Reports

Science & Technology

India's 12 'Operationally Deployed' Nuclear Warheads: SIPRI Report

NEWS ITEM

For the first time, the **Stockholm International Peace Research Institute (SIPRI)** has reported that 12 of India's estimated 190 nuclear warheads are "operationally deployed" (pre-assembled and ready to launch). This development highlights the maturation of India's **second-strike capability** and submarine-based deterrent, ensuring maximum national security without shifting away from its traditional 'No First Use' policy.

PRELIMS FACTS

- The **Nuclear Command Authority (NCA)** of India consists of a Political Council chaired by the **Prime Minister** and an Executive Council chaired by the **National Security Advisor (NSA)**. The final authority to launch nuclear weapons rests strictly with the Prime Minister.
- **Canisterisation** of missiles (like the Agni-V) involves keeping the missile integrated with its warhead in a sealed, climate-controlled tube. This drastically reduces the time required for launch and improves operational readiness.
- Globally, the nine nuclear-armed states possess an estimated 12,187 nuclear warheads as of January 2026.

June 30, 2026

Science and Technology

Species & Environment

Science & Technology

Do Animals Understand Death? Scientists Test Cockatoos

NEWS ITEM

Researchers have conducted a unique touchscreen-based study on **Goffin's cockatoos** to test if animals can understand "permanent non-functionality"—a basic cognitive step toward understanding death. The study suggests that while animals may not grieve exactly like humans, they might possess the mental tools to realize when something has irreversibly stopped working.

PRELIMS FACTS

- The cognitive study involving touchscreen interactions to test the understanding of permanent non-functionality was conducted on **Goffin's cockatoos**.
- **Antonio J. Osuna-Mascaró** and **Susana Monsó** proposed the "**minimal concept of death**," which strips away the need for human-like grief and focuses on recognizing that a body has irreversibly stopped functioning.
- Independent researchers caution that understanding the non-permanence of inanimate objects (like digital buttons or food rewards) does not automatically equal understanding the death of a living, social being.

June 30, 2026

Science and Technology

Science & Technology

Diseases That Changed the Course of Human History

NEWS ITEM

Throughout history, infectious diseases have not only caused massive health crises but also shaped human societies, legal institutions, and global demographics. Pathogens like the bacteria causing syphilis and leprosy, or the viruses behind smallpox and HIV, have drastically altered the course of human development and exploration.

PRELIMS FACTS

- **Syphilis** is caused by the *Treponema pallidum* bacteria, which possesses a unique helical (corkscrew) shape allowing it to move quickly through mucous membranes.
- The discovery of the **Cholera toxin**, which proved how *Vibrio cholerae* causes severe life-threatening diarrhea, was made by the eminent Indian scientist **Sambhu Nath De**.
- **HIV (Human Immunodeficiency Virus)** mutates extremely fast and hides inside host immune cells, which is why scientists have struggled for decades to develop a definitive vaccine.

June 29, 2026

Polity and Governance

Government Schemes

Science & Technology

Union Health Minister Launches 'e-Sushrut@Clinic' for Small Clinics

NEWS ITEM

Union Health Minister J.P. Nadda has launched **e-Sushrut@Clinic**, a simple and low-cost digital software. Developed by C-DAC, it helps small clinics and primary health centres (PHCs) easily manage patient records and daily operations using computers or smartphones.

PRELIMS FACTS

- **Developed by:** Centre for Development of Advanced Computing (C-DAC).
- **Mandatory Registry:** Doctors must be registered on the **Healthcare Professionals Registry (HPR)** to access the system.
- **Cost:** Highly subsidized effective rate of ₹299 per month for up to 5 users, with the first 3 months completely free.
- **ABDM Integration:** Includes features to create ABHA IDs and scan/share health records seamlessly.

June 29, 2026

Science and Technology

Science & Technology

Smart AI Caching and SAGIN for Disaster Management

NEWS ITEM

Researchers have proposed an AI-driven 'collaborative caching' system to maintain uninterrupted data flow during natural disasters when traditional communication networks fail. Utilizing a Space-Air-Ground Integrated Network (SAGIN), this technology enables drones, satellites, and ground vehicles to seamlessly share and store critical real-time information, speeding up rescue operations.

PRELIMS FACTS

- The concept of **collaborative caching** involves different nodes (satellites, drones, emergency vehicles) working cooperatively to store and share useful data locally, significantly reducing delays.
- AI caching systems use models like **CMAB (Contextual Multi-Armed Bandit)** to optimize decisions in microseconds, ensuring that life-saving data is available even with limited storage.
- The **SAGIN framework** eliminates the reliance on a single point of failure by creating a resilient three-tier network (Space, Air, Ground).
- These technologies operate on **Federated Learning**, a decentralized approach where AI models are trained across multiple devices holding local data samples, without exchanging them.

June 29, 2026

Science and Technology

Places in News

Science & Technology

NASA's Perseverance Rover Discovers Robust Organic Matter on Mars

NEWS ITEM

In a major breakthrough, an international team of scientists has discovered complex organic carbon on Mars. Using NASA's Perseverance rover, they found this hardy organic matter directly on natural rocks within an ancient river valley in the Jezero Crater, boosting the search for ancient Martian life.

PRELIMS FACTS

- The latest discovery of organic matter was made using the **SHERLOC** instrument on the Perseverance rover.
- The robust organic material, identified as **macromolecular carbon**, was found in the fine-grained mudstones of the **Neretva Vallis** channel inside the Jezero Crater.
- Previously, NASA's **Curiosity rover** had discovered localized organic molecules in the **Gale Crater**.
- The newly found organic matter exists alongside minerals like **carbonates and sulphates**, indicating they were likely trapped and preserved by water-driven processes billions of years ago.

June 28, 2026

Polity and Governance

Government Schemes

Places in News

Science & Technology

Personalities in News

PM Modi Addresses 135th Episode of 'Mann Ki Baat'

NEWS ITEM

In the 135th episode of 'Mann Ki Baat', Prime Minister Narendra Modi highlighted India's recent achievements in defence indigenisation, sports, environmental conservation, and social initiatives. He emphasized the power of public participation (Jan Bhagidari) in tackling global challenges and preserving the nation's cultural and ecological heritage.

PRELIMS FACTS

- **Defence Indigenisation:** INS Dunagiri, INS Sanshodhak, and INS Agray were recently inducted into the Indian Navy in Kolkata. They are indigenously designed and manufactured.
- **Aerospace:** The first 'Made in India' C-295 aircraft successfully completed its maiden flight. A total of 40 such aircraft are being manufactured in India.
- **Missile Technology:** DRDO and Indian Industries Partners successfully tested the indigenous 'Long Range Land Attack Cruise Missile'.
- **Sports:** India topped the medal tally at the **World Yogasana Championship** in Ahmedabad, winning 114 medals, including 102 gold medals.
- **Grassroots Sports in Nagaland:** The state is promoting talent through the 'Nagaland Baby League' (football for 5-12 year olds) and the 'Nagaland Women Futsal League' (indoor football with 5 players per team).
- **Education & Heritage:** Nalanda University has revived the ancient tradition of 'Shastrarth' (debate and discussion). Meanwhile, the Central Sanskrit University in Delhi is starting a B.Tech Programme in Artificial Intelligence and Data Science to link traditional knowledge with modern technology.
- **Global Cultural Footprint:** 'Brahmakamal Dominicana', a Spanish-speaking team in the Dominican Republic, is actively learning and chanting Vedic mantras like Purusha Sukta and Sri Rudra.
- **Waste Management:** Women in Biaora, Rajgarh district (Madhya Pradesh) have initiated a campaign to convert plastic waste and empty bottles into eco-bricks to beautify public spaces.

June 28, 2026

Science and Technology

Species & Environment

Science & Technology

Molecular Solar Thermal (MOST): Storing Sunlight as Chemical Energy

NEWS ITEM

Researchers have developed a novel method to capture and store solar energy in a molecular form using 'photo-switches'. This **Molecular Solar Thermal (MOST)** technology utilizes specific molecules that change shape upon absorbing sunlight, storing the energy to be released later as heat for domestic or industrial use.

PRELIMS FACTS

- **India's Solar Capacity:** Current land-based solar capacity is ~150 GW, while rooftop solar capacity stands at 23 GW.
- **PM Surya Ghar Mufti Bijli Yojana:** Subsidizes typical home grid-connected solar installations, bringing costs down to approximately ₹30,000 per kW.
- **Silicon Panels vs. MOST:** Silicon crystals free electrons using red/near-infrared light (400-1,100 nm), whereas MOST molecules like 2-pyrimidone absorb UV light (below 500 nm).
- **Inverters:** Required in standard solar setups to convert the direct current (DC) produced by panels into usable alternating current (AC) for households.

June 27, 2026

Science and Technology

Places in News

Science & Technology

India Launches World's First Nuclear Heat-Based Hydrogen Facility

NEWS ITEM

India has inaugurated the world's first hydrogen production facility based on the **Copper-Chlorine (Cu-Cl) Thermochemical Cycle** at the **Indira Gandhi Centre for Atomic Research (IGCAR)**, Kalpakkam. The facility represents a major breakthrough by utilizing nuclear process heat generated from the **Fast Breeder Test Reactor (FBTR)** to produce clean hydrogen.

PRELIMS FACTS

- The world's first nuclear process heat-based hydrogen facility is located at **IGCAR, Kalpakkam** (Tamil Nadu).
- It relies on the **Copper-Chlorine (Cu-Cl) Thermochemical Cycle**, which was indigenously developed by the **Bhabha Atomic Research Centre (BARC)**.
- The heat required for the process is sourced from the **Fast Breeder Test Reactor (FBTR)**.
- Unlike traditional fossil fuel-based hydrogen production (Grey Hydrogen), this nuclear-assisted method produces carbon-free **Pink Hydrogen**.

June 25, 2026

Defence and Security

Science & Technology

Final Operational Clearance (FOC) for Netra AEW&C System

NEWS ITEM

The Defence Research and Development Organisation (DRDO) has achieved Final Operational Clearance (FOC) for the indigenous **Netra Airborne Early Warning and Control (AEW&C)** system. The system was officially handed over to the Indian Air Force (IAF) in Bengaluru, marking a major milestone in India's airborne surveillance and network-centric warfare capabilities.

PRELIMS FACTS

- **Netra** is India's first indigenously developed Airborne Early Warning and Control (AEW&C) system.
- It utilizes an indigenous **Active Electronically Scanned Array (AESA)** radar.
- It was notably deployed to monitor airspace during the **Balakot airstrikes** in 2019.
- **FOC (Final Operational Clearance)** indicates a military platform is fully combat-ready for unrestricted operations.