

Current Affairs search results for tag: science-and-technology

### **1. Gaia Telescope Unveils Ancient Star Streams: Shiva and Shakti ( March 26, 2024 )**

The Gaia telescope, led by Khyati Malhan, reveals two ancient star streams: Shiva and Shakti.

#### **An Overview of the News**

- These streams were formed over 12 billion years ago and exhibit unique classes and compositions.
- The discovery, made by the European Space Agency's Gaia telescope, enhances our understanding of the galaxy's origins.
- Khyati Malhan is from the Max Planck Institute for Astronomy (MPIA) in Germany.

#### **Features and Structure:**

- Unique Orbits and Chemical Structures: Gaia identifies two distinct structures, Shakti and Shiva, with distinct orbitals and chemical structures.
- Mass and age: Each cluster contains about 10 million suns, ranging in age from 12 to 13 billion years, displaying similar orbits and compositions.

#### **Galactic position and origin:**

- Location and formation: Located toward the galaxy's core, these streams originated as separate fragments that merged into one galaxy early in its history, shedding light on the galaxy's formation.
- Galactic archaeology: Discovery of Gaia reveals the oldest stars in the Galaxy, which predate the formation of the galactic disk, suggesting a complex origin involving filaments of gas and dust.

#### **Symbolism and Naming:**

- Divine Inspiration: Named after the Hindu divine couple, Shiva and Shakti symbolize the creation of the universe, reflecting the distinctive characteristics of stellar streams.
- Orbital differences: Shakti stars exhibit orbits slightly more distant from the galactic center, featuring more circular paths than Shiva.

#### **Importance and future prospects:**

- Understanding early galaxies: This discovery provides insight into the early evolution of the Milky Way, indicating its origin from long filaments of gas and dust that gave rise to stars and galaxies.
- Future Insights: Upcoming Gaia data releases may deepen our understanding of these ancient components, aiding research on star clusters, galaxies, and exoplanets beyond the Milky Way.

**About Gaia Space Telescope:**

- Mission and operations: Launched in December 2013, Gaia, operated by the European Space Agency, surveys the sky to create a detailed 3D map of the Milky Way.
- Objectives and Contributions: In addition to mapping the Milky Way, Gaia data informs studies on a variety of astronomical phenomena, including star clusters, galaxies, and exoplanets, furthering our understanding of the dynamics of the universe.

**2. Aviation Week Laureates Award for Chandrayaan-3 ( March 26, 2024 )**

ISRO's Chandrayaan-3 mission received the prestigious Aviation Week Laureates Award.

**An Overview of the News**

- Sripriya Ranganathan, Deputy Ambassador at the Indian Embassy in the US, accepted the award on behalf of ISRO.
- The award recognizes aerospace excellence, celebrating innovation and exploration.

**Aviation Week Laureates Award:**

- Highly regarded accolade in the aviation and aerospace industry.
- Celebrates extraordinary achievements encompassing exploration, innovation and vision.
- Over 400 industry professionals and influencers participated, acknowledging the unprecedented achievements.
- ISRO's successful Chandrayaan-3 mission exemplifies the tradition of honoring outstanding contributions to aerospace exploration.

**About Chandrayaan-3 Mission:**

- Launch and craft details: Launched from Sriharikota on July 14, 2023, using a GSLV-Mark III (LVM-3) heavy-lift rocket. It consists of a lander named Vikram and a rover named Pragyan excluding an orbiter.
- Mission objectives: to perform safe landing, rover exploration and conduct in-situ scientific experiments.
- Budget: Estimated Rs 615 crore.
- Lander and Rover Specifications: Vikram, 2 meters long and weighing more than 1,700 kg, carries a 26 kg lunar rover named Pragyan for spectrometer analysis.
- Landing and deployment: Scheduled for August 23, 2023 on the Moon.
- Operational Period: Designed to operate for up to one lunar day, equivalent to 14 Earth days.

### **3. DeepMind co-founder Mustafa Suleyman to lead Microsoft's AI division ( March 23, 2024 )**

Google's DeepMind co-founder Mustafa Suleyman has been appointed to head Microsoft's AI division.

#### **An Overview of the News**

- Suleyman will report directly to Microsoft CEO Satya Nadella.
- **Responsibilities Include Overseeing:**
  - Integration of AI Copilot into Windows.
  - Incorporating interactive elements into Microsoft's Bing search engine.
  - Consolidating all consumer AI projects under a single leadership.

#### **Key Points on the Background of Mustafa Suleyman**

- Mustafa Suleyman comes from a background where his father was a Syrian-born taxi driver and his mother was an English nurse.
- He was brought up in the London Borough of Islington.
- Suleyman studied philosophy and theology at the University of Oxford but discontinued during his second year.
- He founded Muslim Youth Helpline, a charitable organization in the UK.
- At the young age of 22, he provided advisory services on human rights policy to former London Mayor Ken Livingstone.

#### **Mustafa Suleyman's Journey from DeepMind to Inflection AI and Microsoft:**

- Co-founded DeepMind in 2010, taking on the role of head of Applied AI, with an emphasis on ethical AI use.
- Left Google in 2022 to found Inflexion AI.
- Inflection AI achieved success with the creation of the popular AI chatbot Pi and secured \$1.3 billion in funding.
- Key figure Karen Simonyan, co-founder and chief scientist of Inflection AI, will move to Microsoft as chief scientist for Microsoft AI.

### **4. India's first battery storage gigafactory to begin operations in Jammu and Kashmir ( March 22, 2024 )**

GoodEnough Energy announced plans to begin operations at India's inaugural battery energy storage gigafactory in Jammu and Kashmir by October 2024.

#### **An Overview of the News**

- The facility aims to help industries cut carbon emissions by more than 5 million tonnes annually, in line with India's net zero emissions target by 2070.
- GoodEnough has invested 1.5 billion rupees (\$18.07 million) in a factory with 7 GWH capacity, with plans to invest another 3 billion rupees by 2027 to expand capacity to 20 GWH.
- These expansion plans were revealed by GoodEnough founder Akash Kaushik.

**Importance of renewable energy:**

- Battery energy storage projects are key to India's objective of expanding renewable energy capacity to 500 GW by 2030 from the current 178 GW.

**Government Incentives:**

- The Indian government is offering \$452 million in incentives to companies under a program aimed at promoting battery storage projects.

**Role of battery storage systems:**

- Battery storage systems facilitate the storage of energy from renewable sources, ensuring reliable and continuous energy supply.

**Implications of Gigafactory establishment:**

- The establishment of India's first battery storage gigafactory marks a significant progress towards achieving the country's renewable energy targets and reducing carbon emissions.
- The operations in Jammu and Kashmir are set to boost the renewable energy sector in India.

**5. xAI releases Grok-1, AI chatbot as open source ( March 21, 2024 )**

Grok-1 is an AI chatbot developed by xAI, a company founded by Elon Musk.

**An Overview of the News**

- xAI announced that Grok has been made open source, fulfilling a promise made by Musk.
- GROC-1, the base model, is a 314 billion parameter mixture-of-experts model trained from scratch.
- xAI released the base model weights and network architecture of Grok-1 on GitHub, promoting transparency and collaboration in AI development.
- Elon Musk aims to set an example by open-sourcing Grok.
- Open-sourcing Grok has a significant impact on the AI industry, encouraging knowledge sharing and fostering innovation.

- "Grok" was named for Robert A. Named after a word from Heinlein's science fiction novel
- "Stranger in a Strange Land", meaning to understand something deeply.
- Elon Musk, in addition to founding XAI, is known for his roles as CEO of Tesla and SpaceX and his influence in the tech industry.

### **About Elon Reeve Musk**

- Elon Reeve Musk, born on June 28, 1971, is a prominent businessman and investor.
- He holds various leadership positions in several high-profile companies:
  - Founder, chairman, CEO, and CTO of SpaceX.
  - Angel investor, CEO, product architect, and former chairman of Tesla, Inc.
  - Owner, executive chairman, and CTO of X Corp.
  - Founder of the Boring Company and xAI.
  - Co-founder of Neuralink and OpenAI.
  - President of the Musk Foundation.
- Musk is recognized as one of the wealthiest individuals globally, with an estimated net worth of US\$190 billion as of March 2024 according to Bloomberg Billionaires Index, and \$195 billion according to Forbes.
- His wealth primarily stems from his ownership stakes in Tesla and SpaceX.

## **6. Tamil Nadu Creates History with India's Second Privately Developed Rocket ( March 21, 2024 )**

Agnikul Cosmos Private Limited, one of Tamil Nadu's space companies, is preparing to launch its first rocket, Agnibaan Sub Orbital Technology Demonstrator (SOrTeD), from the Satish Dhawan Space Center in Sriharikota, Andhra Pradesh.

### **An Overview of the News**

- Agnibaan SOrTeD marks India's inaugural launch from a private launchpad, marking a significant advancement in the country's space industry.
- The launch will also represent India's first rocket powered by a semi-cryogenic engine, showcasing advancements in propulsion technology.

### **Innovation with 3D Printed Engines:**

- Agnikul Cosmos has achieved another milestone with the production of the world's first single-piece 3D-printed engine, highlighting indigenous innovation and engineering expertise.

### **Founders and Collaborative Efforts:**

- Founded in 2017 by Srinath Ravichandran, Moin SPM and Satya Chakraborty, Agnikul Cosmos Pvt Ltd became the first Indian company to collaborate with the Indian Space Research Organization (ISRO) under the IN-SPACe project.
- The partnership, launched in December 2020, provided Agnikul Cosmos with access to ISRO's resources and expertise, facilitating the development of Agnibaan.

**Prior Achievements:**

- India's journey into privately developed rockets began in 2022 with the launch of Vikram-S developed by Skyroot Aerospace Pvt Ltd.
- Vikram-S achieved a peak altitude of 89.5 kilometers during its initial mission, marking India's entry into the privately developed rocket market and boosting its aspirations in the private space sector.

**About ISRO**

Founder - Vikram Sarabhai

Headquarters - Bengaluru

Established - 15 August 1969

Chairman - Shridhar Somnath

Officeholder - S. Somnath

**7. Amazon's Project Kuiper launches prototypes for global Internet access ( Oct. 10, 2023 )**

Amazon.com, Inc. (AMZN.O) successfully launched its first two prototype satellites, KuiperSat-1 and KuiperSat-2, into low Earth orbit (LEO) at an altitude of 500 kilometers (311 miles) as part of the "Protoflight" mission of Project Kuiper.

**An Overview of the News**

- The launch was performed using a United Launch Alliance (ULA) Atlas V rocket from the Cape Canaveral Space Force Station in Florida, United States.

**About Project Kuiper:**

- Project Kuiper is a satellite system composed of satellites operating in LEO at altitudes between 590 and 630 kilometers (about 367 to 391 miles).
- Its primary objective is to provide fast and affordable internet access to over 10 million underserved communities globally.
- The project plans to deploy 3,236 satellites, spaced carefully to minimize overlap.

**Launch Agreements and Partnerships:**

- Amazon has partnered with three commercial space companies - Arianespace, Blue Origin, and United Launch Alliance - to facilitate satellite launches.
- These companies will launch 83 rockets to deploy the Kuiper satellites.
- The project represents the largest commercial procurement of space launch services in history.

**Important Points:**

- Project Kuiper faces competition from SpaceX's Starlink project, which shares the same goal of providing global Internet coverage through a satellite constellation.
- Amazon.com, Inc. Headquartered in Seattle, Washington, United States, it is led by Chairman and CEO Andy Jassy and was founded in 1994.
- The project's launch agreements include 38 launches on ULA's Vulcan Centaur rocket, 18 launches on Arianespace's Ariane 6 rocket, and 12 launches on Blue Origin's New Glenn rocket, with an option for 15 additional launches.

**8. India's first solar roof cycling track 'Healthway' inaugurated in Hyderabad ( Oct. 2, 2023 )**

India's first solar rooftop cycling track 'Healthway' inaugurated in Hyderabad, paving the way for sustainable urban mobility.

**An Overview of the News**

- The program was presided over by State Municipal Administration and Urban Development Minister K Tarakrama Rao.
- The cycling track is named "Healthway" and is a pioneer project in India.
- This is the second program of its kind globally, showcasing innovation in sustainable infrastructure.

**Location and features of the cycling track:**

- The track is located along the Outer Ring Road (ORR) between the main carriageway and the service road.
- Its total length is 23 kilometers and it consists of two sections: a pink line of 8.5 kilometers and a blue line of 14.5 kilometers.
- The track is three lanes wide, measuring 4.5 metres, with one meter of green space on each side.

**Facilities and Services Available:**

- The cycling track is designed as a hub for cyclists and visitors.

- It provides amenities like adequate parking space, surveillance cameras, food courts, drinking water, first aid facilities and toilets.
- Additionally, there will be bicycle repair shops, bicycle docking stations, rental services and more to enhance the visitor experience.

**Solar Energy Generation and Environmental Benefits:**

- A total of 16,000 solar panels have been installed along the track.
- These solar panels generate 16 megawatts (MW) of power, which is used to illuminate the track at night and provide protection to cyclists from sun, rain and adverse weather conditions.
- This initiative is in line with sustainability goals and promotes eco-friendly transportation options.

**9. Iran's IRGC successfully launches Nour 3 Military Imaging Satellite into Orbit ( Sept. 30, 2023 )**

Iran's Islamic Revolutionary Guard Corps (IRGC) successfully launched its third military imaging satellite, Nour 3, from Iran's Shahroud Spaceport.

**An Overview of the News**

- The satellite was sent into orbit using a three-stage cassette carrier, which was developed by the IRGC.
- In Persian, "**nour**" (or "**noor**") translates to "**light**", while "**Qased**" means "**messenger**".
- Nour 3 was placed in low Earth orbit (LEO) at an altitude of 450 km (280 mi) above the Earth's surface.
- The primary purpose of the Nour-3 satellite is to **collect data and images for intelligence purposes by the IRGC.**

**Previous versions of the Noor satellite include:**

- **Nour 1** - It was the first military reconnaissance satellite launched by Iran in April 2020. It orbited at an altitude of 425 km (265 mi) above the Earth.
- **Nour 2** - It launched in March 2022, and operated in a low orbit at an altitude of 500 km (310 mi).

**Other satellites of Iran**

- In August 2022, Iran's high-resolution, remote-sensing Khayyam satellite was launched using Russia's Soyuz-2.1B rocket. The launch took place from the Russian-controlled Baikonur Cosmodrome in Kazakhstan.



**About Iran**

- President - **Ibrahim Raisi**
- Capital - **Tehran**
- Currency - **Iranian Rial**

**10. Union Minister Hardeep S Puri flags off India's first green hydrogen fuel cell bus ( Sept. 26, 2023 )**

On September 25, 2023, Union Petroleum Minister Hardeep Singh Puri inaugurated India's first green hydrogen fuel cell bus on the 'Kartavya Path' in Delhi.

**An Overview of the News**

- India's ambition is to become a global hub of hydrogen production and export.

**Benefits of hydrogen-powered buses**

- Environmental benefits of fuel cell buses: Zero harmful emissions and quick charging.
- The higher energy density of hydrogen than conventional fuels.
- Collaboration between Indian Oil and Tata Motors for indigenous fuel cell technology and infrastructure.

**Green Hydrogen Mission and Sustainability Goals**

- The Green Hydrogen Mission aims to establish a green hydrogen ecosystem in India.
- Hydrogen has the potential to transform India's energy landscape and reduce carbon emissions.
- IndianOil's commitment to sustainable solutions and the goal of achieving net-zero emissions by 2070.