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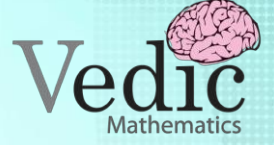
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Space & Astronomy

Indian Space & Astronomy News

- **Indian Astronaut Shubhanshu Shukla Returns from ISS Mission:** Indian astronaut Group Captain Shubhanshu Shukla has safely returned to Earth after an 18-day mission aboard the International Space Station (ISS) as part of the Axiom-4 mission. This groundbreaking mission, the first by an Indian national to the ISS, is expected to significantly boost India's Gaganyaan project. His health is reported stable, and he is undergoing a rehabilitation program. This collaboration between NASA, Axiom Space, and ISRO is seen as a crucial "stepping stone" for India's human spaceflight ambitions.
- **NISAR Mission Nears Launch:** The joint NASA-ISRO Synthetic Aperture Radar (NISAR) satellite is likely to launch by the end of July from the Satish Dhawan Space Centre in Sriharikota. Both the NISAR spacecraft and the GSLV-F16 launch vehicle are undergoing final checks. This \$1.5 billion mission, the most expensive satellite project undertaken by ISRO and NASA, will be the world's first Earth observation mission to utilize dual-frequency radar technology, providing unprecedented coverage of Earth's land and ice surfaces.
- **IIST Team Discovers Circular Polarization in Radio Emission near Protostar:** An international team led by astronomers from the Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram, has discovered radio emission with circular polarization near a massive young protostar (IRAS 18162-2048) located about 4,500 light-years from Earth. This is the first direct clue to the strength of magnetic fields in the immediate neighborhood of a massive protostar and supports the theory that powerful jets from stars and black holes are driven by the same

magnetic engine. The findings were published in The Astrophysical Journal Letters.

International Space & Astronomy News

- **Perseid Meteor Shower Begins:** The annual Perseid meteor shower has begun on July 17th and will be visible until August 24th, promising stunning displays with up to 100 meteors per hour. The shower is expected to peak between August 12th and 13th.
- **Titan's Shadow Transits Saturn:** Saturn's moon Titan is transiting its shadow across the planet's cloud tops today, starting around 2:50 AM EDT. This celestial event offers a viewing opportunity for observers, particularly in the U.S.
- **Mars and Vesta in the Night Sky:** Mars remains visible in the evening sky near the star Sigma Leonis, and the large asteroid Vesta appears close to a field star, creating a temporary double star effect.
- **Lunar Occultation of Pleiades:** A lunar occultation of the Pleiades star cluster will be visible from parts of North and Central America.
- **ESA's Invictus Hypersonic Space Plane Program:** The European Space Agency (ESA), in partnership with UK-based Frazer-Nash, has launched the "Invictus" research program to develop a fully reusable hypersonic test vehicle capable of reaching Mach 5 by 2031. This program aims to advance air-breathing propulsion technology for future aerospace and space access.
- **SpaceX Starlink Launch:** SpaceX has a Falcon 9 Block 5 launch scheduled for today (July 18, 2025) from Vandenberg Space Force Base, California, carrying a batch of Starlink satellites into low-Earth orbit.
- **SpaceX Starship Flight 10 Preparations:** SpaceX is preparing for the 10th fully integrated launch of its Starship Super Heavy rocket, following recent setbacks. The mission aims to demonstrate improved reusability and system reliability, crucial for





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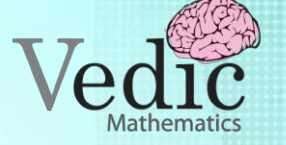
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for its long-term goals of lunar missions, space station resupply, and Mars colonization.

- **SpaceX Delegation in Bangladesh:** A high-level delegation from SpaceX, led by Lauren Dreyer, Vice President of Business Operations at Starlink, arrived in Dhaka, Bangladesh, today to explore potential investments and strategic partnerships for enhancing the country's ICT infrastructure and formally launch Starlink services.

MCQs

1. Which Indian astronaut recently completed an 18-day mission aboard the International Space Station (ISS) as part of the Axiom-4 mission?

- A) Rakesh Sharma
- B) Kalpana Chawla
- C) Shubhanshu Shukla
- D) Sunita Williams

Correct Answer: C

Explanation: The news states, "Indian astronaut Group Captain Shubhanshu Shukla has safely returned to Earth after an 18-day mission aboard the International Space Station (ISS) as part of the Axiom-4 mission."

2. The NISAR mission, a joint project between NASA and ISRO, is described as the world's first Earth observation mission to utilize what technology?

- A) Single-frequency optical imaging
- B) Dual-frequency radar technology
- C) Triple-frequency infrared sensing
- D) Quad-frequency X-ray scanning

Correct Answer: B

Explanation: The news highlights, "This \$1.5 billion mission... will be the world's first Earth observation mission to utilize dual-frequency radar technology,

providing unprecedented coverage of Earth's land and ice surfaces."

3. Astronomers from which Indian institution discovered radio emission with circular polarization near a massive young protostar (IRAS 18162-2048)?

- A) Indian Institute of Astrophysics (IIA)
- B) Physical Research Laboratory (PRL)
- C) Indian Institute of Space Science and Technology (IIST)
- D) Aryabhata Research Institute of Observational Sciences (ARIES)

Correct Answer: C

Explanation: The news clearly states, "An international team led by astronomers from the Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram, has discovered radio emission with circular polarization near a massive young protostar..."

4. The discovery of circular polarization in radio emission near the protostar is the first direct clue to the strength of what in its immediate neighborhood?

- A) Gravitational waves
- B) Dark matter density
- C) Magnetic fields
- D) Cosmic background radiation

Correct Answer: C

Explanation: The news explains that this discovery "is the first direct clue to the strength of magnetic fields in the immediate neighborhood of a massive protostar..."

5. What celestial event, involving Saturn's moon Titan, is occurring on July 18, 2025?

- A) Titan is undergoing a rare eclipse of Saturn.
- B) Titan's shadow is transiting across Saturn's cloud tops.
- C) Titan is in conjunction with Mars.





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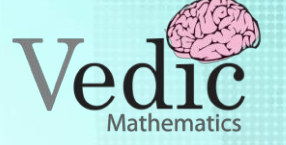
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D) Titan is experiencing a meteor shower.

Correct Answer: B

Explanation: The news states, "Saturn's moon Titan is transiting its shadow across the planet's cloud tops today, starting around 2:50 AM EDT."

6. The annual Perseid meteor shower, which began on July 17th, is expected to peak between which dates?

- A) July 20th-21st
- B) August 1st-2nd
- C) August 12th-13th
- D) August 20th-21st

Correct Answer: C

Explanation: The news mentions, "The shower is expected to peak between August 12th and 13th."

7. What is the primary goal of the European Space Agency's (ESA) "Invictus" research program?

- A) To develop a new type of space telescope.
- B) To establish a human colony on the Moon.
- C) To develop a fully reusable hypersonic test vehicle capable of reaching Mach 5 by 2031.
- D) To explore exoplanets for signs of life.

Correct Answer: C

Explanation: The news indicates, "The European Space Agency (ESA)... has launched the "Invictus" research program to develop a fully reusable hypersonic test vehicle capable of reaching Mach 5 by 2031."

8. SpaceX has a Falcon 9 Block 5 launch scheduled for July 18, 2025, from Vandenberg Space Force Base, California, carrying what type of satellites?

- A) GPS satellites
- B) Weather satellites
- C) Starlink satellites
- D) Spy satellites

Correct Answer: C

Explanation: The news states, "SpaceX has a Falcon 9 Block 5 launch scheduled for today (July 18, 2025) from Vandenberg Space Force Base, California, carrying a batch of Starlink satellites into low-Earth orbit."

9. What is one of the main goals for SpaceX's upcoming 10th fully integrated launch of its Starship Super Heavy rocket?

- A) To achieve the first successful orbital refueling.
- B) To demonstrate improved reusability and system reliability.
- C) To launch a crewed mission to Mars.
- D) To deploy a new space telescope.

Correct Answer: B

Explanation: The news highlights that the mission "aims to demonstrate improved reusability and system reliability, crucial for its long-term goals of lunar missions, space station resupply, and Mars colonization."

10. A high-level delegation from SpaceX, led by Lauren Dreyer, arrived in which country on July 18, 2025, to explore potential investments and officially launch Starlink services?

- A) Nepal
- B) Sri Lanka
- C) Bangladesh
- D) Bhutan

Correct Answer: C

Explanation: The news states, "A high-level delegation from SpaceX... arrived in Dhaka, Bangladesh, today to explore potential investments and strategic partnerships for enhancing the country's ICT infrastructure and formally launch Starlink services."

