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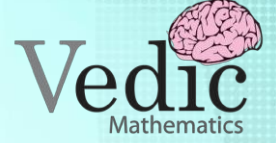
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Space & Astronomy:

Major Missions & Discoveries:

NISAR Satellite Launch Imminent: The NASA-ISRO Synthetic Aperture Radar (NISAR) mission, a groundbreaking joint Earth observation satellite, is set to launch on July 30, 2025, at 5:40 PM IST from the Satish Dhawan Space Centre in Sriharikota, India. This \$1.5 billion mission, developed over a decade of collaboration between ISRO and NASA, will be carried into a Sun-synchronous orbit by India's GSLV-F16 rocket.

Mission Purpose: NISAR will scan the entire globe every 12 days, providing high-resolution, all-weather, day-and-night data. It can detect subtle changes in Earth's surface, such as ground deformation (important for earthquakes, landslides, volcanoes), ice sheet shifts, vegetation dynamics, soil moisture, and sea ice characteristics. It will use a dual-frequency Synthetic Aperture Radar (NASA's L-band and ISRO's S-band) with a 12-meter unfurlable mesh reflector antenna.

Significance: NISAR is considered one of the most advanced Earth-observation satellites ever, with its data being freely available. It aims to revolutionize disaster prediction, climate research, agriculture, water management, and contribute to a better understanding of our changing planet. This mission highlights a significant milestone in India-US space collaboration.

Hubble and Chandra Capture Rare Black Hole Event: NASA's Hubble Space Telescope and Chandra X-ray Observatory have together

witnessed a rare cosmic event: an intermediate black hole devouring a star in the galaxy NGC 6099. This intermediate-mass black hole, named NGC 6099 HLX-1, was first observed by Chandra in 2009. The discovery is remarkable because intermediate black holes are difficult to find, typically shining only when consuming a star. This observation could pave the way for future research into the statistical study of such black holes.

DART Mission Update: Collision at Asteroid Dimorphos: New analyses of the 2022 DART (Double Asteroid Redirection Test) mission's collision with asteroid moonlet Dimorphos show that the effects of the impact are "different than expected." Scientists are working to understand why. A time-lapse video from the ejected LICIACube camera LUKE, featured today, shows the expanding debris field. Europe's Hera mission is set to reach the asteroids in 2026 to further study the matter.

Astronomy & Sky Watching:

Moon and Mars Conjunction: On July 28, 2025, the Moon passed 1.3° south of Mars, offering a picturesque view in the western sky after sunset. The celestial pair appeared horizontally aligned in the constellation Virgo. Mars, at a magnitude of 1.6, appeared as a bright star, though its small apparent disk size limited surface detail visibility through telescopes. The Moon was a nearly 20%-lit crescent.

India's Growing Space Sector:

PM Modi on Space Startups: In his "Mann ki Baat" program, Prime Minister Narendra Modi expressed pride in India's rapidly growing space sector. He noted that the number of space startups has quadrupled in the last five years.





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increasing from fewer than 50 to over 200. He also highlighted that astronaut Group Captain Shubhanshu Shukla's recent journey to the International Space Station (ISS) and the success of the Chandrayaan-3 mission have sparked a new wave of interest and curiosity in space science among Indian youth and children. He mentioned the 'INSPIRE-MANAK Abhiyan' promoting innovation among children, which has seen doubled participation since Chandrayaan-3.

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MCQS

1. What is the scheduled launch date and time for the NISAR satellite?

- a) July 29, 2025, 5:40 PM IST
- b) July 30, 2025, 5:40 PM IST
- c) July 31, 2025, 5:40 PM IST
- d) August 1, 2025, 5:40 PM IST

Answer: b) July 30, 2025, 5:40 PM IST

The news states, "The NASA-ISRO Synthetic Aperture Radar (NISAR) mission... is set to launch on July 30, 2025, at 5:40 PM IST..."

2. Which Indian rocket will carry the NISAR satellite into orbit?

- a) PSLV
- b) GSLV Mk-III
- c) GSLV-F16
- d) SSLV





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Answer: c) GSLV-F16

The news mentions, "...will be carried into a Sun-synchronous orbit by India's GSLV-F16 rocket."

3. What type of celestial body was observed being devoured by an intermediate black hole in the galaxy NGC 6099?

- a) A planet
- b) An asteroid
- c) A star
- d) A nebula

Answer: c) A star

The news states, "...an intermediate black hole devouring a star in the galaxy NGC 6099."

4. What is the name of the intermediate-mass black hole observed by Hubble and Chandra?

- a) NGC 6099 BH-1
- b) NGC 6099 IMBH-2
- c) NGC 6099 HLX-1
- d) NGC 6099 XRB-3

Answer: c) NGC 6099 HLX-1

The news identifies the black hole as "NGC 6099 HLX-1".

5. What is Europe's Hera mission set to do in 2026 concerning the DART mission's target asteroids?

- a) Launch a new impactor to Dimorphos.
- b) Reach the asteroids to further study the matter.
- c) Collect samples from Didymos.
- d) Redirect another asteroid away from Earth.

Answer: b) Reach the asteroids to further study the matter.

The news states, "Europe's Hera mission is set to reach the asteroids in 2026 to further study the matter."

6. In which constellation did the Moon and Mars appear horizontally aligned on July 28, 2025?

- a) Leo
- b) Taurus
- c) Virgo
- d) Gemini

Answer: c) Virgo

The news mentions, "The celestial pair appeared horizontally aligned in the constellation Virgo."

7. How has the number of space startups in India changed in the last five years, according to PM Modi?

- a) Halved
- b) Remained stagnant
- c) Doubled
- d) Quadrupled

Answer: d) Quadrupled

PM Modi noted that "the number of space startups has quadrupled in the last five years increasing from fewer than 50 to over 200."

8. Which recent event, along with the success of Chandrayaan-3, has sparked new interest in space science among Indian youth?

- a) The launch of NISAR satellite.
- b) Astronaut Group Captain Shubhanshu Shukla's journey to the International Space Station (ISS).
- c) The discovery of a new exoplanet.
- d) The establishment of a new space research center.

Answer: b) Astronaut Group Captain Shubhanshu Shukla's journey to the International Space Station (ISS).

The news states that "astronaut Group Captain Shubhanshu Shukla's recent journey to the International Space Station (ISS) and the





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success of the Chandrayaan-3 mission have sparked a new wave of interest..."

9. What is the primary purpose of the NISAR satellite's dual-frequency Synthetic Aperture Radar?

- a) To collect atmospheric data.
- b) To measure ocean currents.
- c) To detect subtle changes in Earth's surface and provide high-resolution data.
- d) To observe distant galaxies.

Answer: c) To detect subtle changes in Earth's surface and provide high-resolution data.

The news explains that NISAR "will scan the entire globe every 12 days, providing high-resolution, all-weather, day-and-night data. It can detect subtle changes in Earth's surface..."

10. What is a key characteristic that makes intermediate black holes difficult to find, as highlighted by the NGC 6099 HLX-1 discovery?

- a) They are extremely small.
- b) They only shine when consuming a star.
- c) They are always hidden behind dust clouds.
- d) They emit no radiation.

Answer: b) They only shine when consuming a star.

The news states, "...intermediate black holes are difficult to find, typically shining only when consuming a star."

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