



Hubble Returns to Investigate a Mysterious Nova from 40 Years Ago

Description

Exploring the Mysterious Star System HM Sagittae

Astronomers are captivated by the enigmatic binary star system, HM Sagittae (HM Sge), where a white dwarf and a red giant companion engage in a celestial dance. In 1975, this system experienced a rare event, growing 250 times brighter, yet not fading away as novae typically do. Instead, it has maintained its luminosity for decades, perplexing researchers.

Recent observations using NASA's Hubble Space Telescope and SOFIA have revealed intriguing insights into HM Sge. The system has gotten hotter, but curiously faded slightly. The ultraviolet data from Hubble shows an increase in temperature, indicating changes in the white dwarf and accretion disk. The discovery of highly ionized magnesium has provided clues to the system's energetics over the past three decades.

Additionally, data from SOFIA has unveiled the movement of water, gas, and dust around the system. The giant star, a prolific dust producer, returned to normal behavior post-explosion but has since dimmed, posing another mystery. Amateur astronomers collaborating with the AAVSO continue to monitor HM Sge, revealing changes unseen since the initial outburst 40 years ago.

This unique event offers astrophysicists a rare treasure, shedding light on the dynamics of stellar evolution in binary systems. The team's research, published in the *Astrophysical Journal*, marks a significant milestone in understanding the captivating phenomena of HM Sagittae.

The continued discoveries made possible by the Hubble Space Telescope highlight the ongoing quest to unravel the mysteries of the cosmos and expand our knowledge of the universe.

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Vocabulary List:

1. **Enigmatic** // (adjective): Difficult to interpret or understand; mysterious.
2. **Celestial** // (adjective): Relating to the sky or outer space.
3. **Luminosity** // (noun): The brightness of a celestial body.
4. **Perplexing** // (adjective): Causing confusion or uncertainty; puzzling.
5. **Intriguing** // (adjective): Arousing curiosity or interest; fascinating.
6. **Energetics** // (noun): The study of energy transformations and interactions.

Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. Which term is used to describe objects related to the sky or outer space?
Option: Celestial
Option: Energetics
Option: Genome
Option: Torque
2. What term refers to the study of energy and its transformation?
Option: Cancellation
Option: Energetics
Option: Replicative barriers
Option: Hybrid powertrains
3. If a purchase is reversed and the money is given back what term describes this action?
Option: Transparency
Option: Refunded
Option: Turbocharged
Option: Neanderthals
4. What is the term for mating or breeding between different species or populations?
Option: Luminosity
Option: Refunded



Option: Interbreeding

Option: Infertility

5. What term is used to describe a state of being puzzled or unable to proceed?

Option: Enigmatic

Option: Stumped

Option: Replicative barriers

Option: Hybrid powertrains

6. What concept refers to the inability of genetic material to combine and produce fertile offspring?

Option: Genetic incompatibility

Option: Infotainment system

Option: Torque

Option: Intriguing

7. What technology combines two or more types of power sources for propulsion?

Option: Neanderthals

Option: Cancellation

Option: Hybrid powertrains

Option: Transparency

8. Which word puzzle usually consists of black and white squares arranged in a grid pattern?

Option: Perplexing

Option: Crossword

Option: Infotainment system

Option: Steptonic automatic transmission

9. What term describes something that is fascinating or captivating?

Option: Intriguing

Option: Neanderthals

Option: Revamped

Option: Luminosity

10. Which term refers to an engine equipped with a turbocharger for increased power output?

Option: Energetics

Option: Turbocharged

Option: Infertility

Option: Celestial

Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)



11. _____ is essential in building trust between individuals and organizations.
12. _____ were an ancient human species that existed in Eurasia.
13. The company _____ its marketing strategy to appeal to a younger audience.
14. The new car model comes with an advanced _____ that includes navigation and media features.
15. High _____ is essential for powerful acceleration in vehicles.
16. The artist's work was so _____ leaving critics debating its true meaning.
17. The math problem was so _____ that even the advanced students struggled with it.
18. The concert was postponed due to bad weather and ticket holders were offered a _____.
19. The star's _____ or brightness depends on its size and age.
20. Some pesticides can affect soil quality and lead to _____ in plants.

Matching Sentences (Match each definition to the correct word from the vocabulary list.)

21. Astronomers study objects in the realm such as stars and planets.
22. The field of focuses on how energy is transferred and utilized in different systems.
23. The travel agency announced the of the flight due to logistical issues.
24. The engine produces high allowing the car to accelerate quickly.
25. The concept of is common in animals leading to new and varied offspring.
26. were ancient hominids with distinct physical features.
27. The of an organism contains all of its hereditary information.
28. Issues with fertility can lead to and challenges in conception.



29. The company its entire product line to attract a younger demographic.

30. combine traditional internal combustion engines with electric power for improved efficiency.

Answer

Multiple Choice: 1. Celestial 2. Energetics 3. Refunded 4. Interbreeding 5. Stumped 6. Genetic incompatibility 7. Hybrid powertrains 8. Crossword 9. Intriguing 10. Turbocharged

Gap-Fill: 11. Transparency 12. Neanderthals 13. Revamped 14. Infotainment system 15. Torque 16. Enigmatic 17. Perplexing 18. Cancellation 19. Luminosity 20. Infertility

Matching sentence: 1. Celestial 2. Energetics 3. Cancellation 4. Torque 5. Interbreeding 6. Neanderthals 7. Genome 8. Infertility 9. Revamped 10. Hybrid powertrains

CATEGORY

1. Sci/Tech - LEVEL6

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