



Webb Space Telescope Observes Breathtaking Quasar-galaxy Merger in the Far Reaches of the Universe

Description

An international team of researchers, led by the Italian National Institute for Astrophysics (INAF), made an exciting discovery using the James Webb Space Telescope (JWST). They **observed** a special event in the distant universe involving a quasar and two large satellite **galaxies** within the PJ308-21 system. This discovery helps us understand how galaxies grew in the early universe.

In September 2022, the JWST's Near-Infrared **Spectrograph** (NIRSpec) looked at the PJ308-21 system. It captured detailed information about the **quasar** and its interaction with the galaxies. This data allowed scientists to study the gas in the quasar's host galaxy and its companions. These findings help us learn about the early stages of galaxy formation and the role of quasars.

The information collected is important for understanding the history of the universe and how galaxies changed over time. By studying the **chemical composition** and physical properties of early galaxies, astronomers can learn more about their formation and **evolution**. The JWST's advanced technology continues to uncover new discoveries that expand our knowledge of the universe.

Vocabulary List:

1. **Quasar** /ˈkweɪ.zər/ (noun): A very bright and distant object in the universe powered by a supermassive black hole.
2. **Galaxies** /ˈɡæl.əksiːz/ (noun): Large groups of stars, gas, and dust held together by gravity.
3. **Observed** /əbˈzəʊvd/ (verb): To watch carefully, especially with attention to details.
4. **Spectrograph** /ˈspek.trə.ɡræf/ (noun): An instrument that separates light into a spectrum and records it.
5. **Chemical Composition** /ˈkɪm.ɪ.kəl ˌkɒmpəˈzɪʃən/ (noun): The types and amounts of chemical elements present in a substance.
6. **Evolution** /ˈevəl.juːʃən/ (noun): The gradual development or change of something over time.

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5. **Evolution** /ˌɛv.əˈluːʃən/ (noun): The gradual development or change of something over time.
6. **Observed** /əbˈzɜːrvd/ (verb): To watch carefully especially with attention to details.

Comprehension Questions

Multiple Choice

1. What did the international team of researchers discover using the JWST?
Option: Two small satellite galaxies in the PJ308-21 system
Option: Black holes in distant galaxies
Option: The process of galaxy formation in the early universe
Option: The presence of dark matter in the universe
2. What instrument did the JWST use to capture detailed information about the quasar and galaxies?
Option: Infrared Camera
Option: NIRSpec
Option: Radio Telescope
Option: X-ray Detector
3. What can astronomers learn by studying the chemical composition of early galaxies?
Option: The age of the galaxies
Option: The distance between galaxies
Option: The formation and evolution of galaxies
Option: The speed of galaxy rotation
4. What was the role of the quasar within the PJ308-21 system?
Option: To produce new stars
Option: To emit radiation
Option: To maintain galaxy structure
Option: To consume nearby galaxies
5. Why is the information collected by JWST important for astronomers?
Option: To predict future galactic collisions
Option: To understand the history and changes of galaxies
Option: To determine the exact size of the universe
Option: To identify alien life forms in other galaxies



6. What technology continues to uncover new discoveries about the universe?

- Option: Hubble Space Telescope
- Option: Kepler Space Telescope
- Option: JWST
- Option: Chandra X-ray Observatory

Answer

Multiple Choice: 1. Two large satellite galaxies in the PJ308-21 system 2. NIRSpect 3. The formation and evolution of galaxies 4. To emit radiation 5. To understand the history and changes of galaxies 6. JWST

Vocabulary quizzes

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

1. What is described as difficult to find catch or achieve?

- Option: Culminating
- Option: Elusive
- Option: Bonuses
- Option: Mysteries

2. Which word relates to the structure and coordination of activities in a business or organization?

- Option: Prioritize
- Option: Unit
- Option: Organizational
- Option: Operations

3. What is a distant astronomical object that emits powerful energy?

- Option: Galaxies
- Option: Quasar
- Option: Spectrograph
- Option: Chemical Composition

4. Which word means to introduce new ideas methods or products?

- Option: Evolution
- Option: Observed
- Option: Innovate
- Option: Intellectual Property

5. Which term refers to the state or fact of exclusive rights and control over property?



- Option: Significant
- Option: Ownership
- Option: Fair Use
- Option: Configurations

6. What is a sum of money granted by the government to assist an industry or business to keep the price of a commodity low?

- Option: Competitive
- Option: Subsidy
- Option: Independent
- Option: Acquiring

7. Which word means to notice or perceive something and register it as being significant?

- Option: Profound
- Option: Ownership
- Option: Fair Use
- Option: Observed

8. Which term signifies the gradual development of something especially from a simple to a more complex form?

- Option: Ownership
- Option: Fair Use
- Option: Evolution
- Option: Significant

9. What is described as limiting or limited to one person or group?

- Option: Adjustment
- Option: Exclusive
- Option: Acquiring
- Option: Unit

10. Which word refers to something that can be used again or repeatedly?

- Option: Payloads
- Option: Reusable
- Option: Competitive
- Option: Subsidy

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

11. Employees were happy to receive _____ for their hard work during the year.



12. After feedback from customers the company made an _____ to its pricing strategy.
13. To complete the project on time the team needed to _____ their tasks effectively.
14. The company focused on _____ new technology to stay ahead of the competition.
15. The new product launch had a _____ impact on the company's revenue.
16. The philosopher made a _____ statement about the nature of existence.
17. Educators can utilize copyrighted material under the principle of _____.
18. The IT team customized the software _____ to suit the needs of the users.
19. The industry's _____ landscape required companies to adapt quickly to survive.
20. The artist preferred to remain _____ and not be tied to any particular gallery.

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

21. Before they could on their space mission the astronauts had to undergo extensive training.
22. Detectives are drawn to solving complex cases that involve various clues and .
23. The sales team worked together as a to achieve their monthly targets.
24. The structure of the company ensured that tasks were delegated effectively.
25. The smooth of the factory was crucial for meeting production deadlines.
26. Clear documentation is essential to prove of intellectual property.
27. Scientists used a to analyze the light emitted by distant stars.
28. Companies invest in safeguarding their through patents and copyrights.
29. The speaker made a impact on the audience with her insightful words.
30. The mentorship program focused on ensuring the of new employees with experienced staff.



Answer

Multiple Choice: 1. Elusive 2. Organizational 3. Quasar 4. Innovate 5. Ownership 6. Subsidy 7. Observed 8. Evolution 9. Exclusive 10. Reusable

Gap-Fill: 11. Bonuses 12. Adjustment 13. Prioritize 14. Acquiring 15. Significant 16. Profound 17. Fair Use 18. Configurations 19. Competitive 20. Independent

Matching sentence: 1. Embark 2. Mysteries 3. Unit 4. Organizational 5. Operations 6. Ownership 7. Spectrograph 8. Intellectual Property 9. Profound 10. Matching

CATEGORY

1. Sci/Tech - LEVEL2

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