



Physicists Claim Breakthrough in Proton Size Puzzle

Description

In recent studies, scientists worked on measuring the proton's size. They did this in a vacuum chamber using hydrogen atoms. Their goal was to find the proton's charge radius, which is very small.

In 2010, a different team found the proton's radius to be 0.84 femtometers. A femtometer is one million-billionths of a meter. Other experiments tried to confirm this result but had different findings. Some studies agreed with the 2010 finding, while others showed a larger size.

In 2019, scientists from York University also measured the proton radius. They found it to be 0.833 femtometers. This again matched the smaller size from 2010.

Now, two new papers showed similar results using lasers and hydrogen atoms. They measured energy changes to find the proton's size. Based on their findings, the proton's radius is about 0.84 femtometers. This agrees with the earlier 2010 study.

A physicist said the proton's size should be the same no matter how you measure it. These new studies support the original findings from 2010.

Vocabulary List:

1. **proton** //ˈprɒʊtɒn// (noun): a very small particle inside an atom's nucleus
2. **radius** //ˈreɪdiəs// (noun): the distance from the center to the edge
3. **femtometer** //ˈfɛmtəʊ,mi:tər// (noun): a unit of length equal to one million-billionth meter
4. **vacuum** //ˈvækjuəm// (noun): a space with almost no air or particles
5. **hydrogen** //ˈhaɪdrədʒən// (noun): a chemical element; the lightest gas
6. **lasers** //ˈleɪzərz// (noun): devices that make a strong, focused light beam

Comprehension Questions

Multiple Choice

1. What was the proton's radius measured by a team in 2010?

Option: 0.84 femtometers



- Option: 0.833 femtometers
- Option: 0.5 femtometers
- Option: 1.0 femtometers

2. What measurement technique was used by scientists to measure the proton's size?

- Option: In a vacuum chamber
- Option: In a water tank
- Option: In an oil chamber
- Option: In a solid state

3. Which university's scientists measured the proton radius in 2019?

- Option: Harvard University
- Option: Yale University
- Option: York University
- Option: Stanford University

4. What is a femtometer a measure of?

- Option: Length
- Option: Weight
- Option: Volume
- Option: Time

5. What findings did the new studies using lasers and hydrogen atoms agree with?

- Option: Findings from 2005
- Option: Findings from 2010
- Option: Findings from 2015
- Option: Findings from 1990

6. According to a physicist, the proton's size should be _____.

- Option: different based on measurement
- Option: the same no matter how measured
- Option: larger when measured with lasers
- Option: smaller in a vacuum

Gap-Fill

6. According to a physicist, the proton's size should be _____.



True-False

7. The proton's radius was first measured in 2010.
8. All studies confirmed the proton's size to be 0.84 femtometers.
9. The 2019 measurement by York University was larger than the 2010 measurement.
10. Scientists used hydrogen atoms to measure the proton's size.
11. Femtometer is a unit of time.
12. The new papers showed results that contradicted earlier findings.
13. The proton's charge radius was found to be about _____ femtometers.
14. In 2010, a team found the proton's radius to be _____ femtometers.
15. The 2019 measurement by scientists from York University was _____ femtometers.
16. The proton's radius is about _____ femtometers according to new studies.
17. Femtometer is one million-billionths of a _____.
18. According to a physicist, the proton's size should be the same no matter how you _____ it.

Answer

Multiple Choice: 1. 0.84 femtometers 2. In a vacuum chamber 3. York University 4. Length 5. Findings from 2010 6. the same no matter how measured

True-False: 7. True 8. False 9. False 10. True 11. False 12. False

Gap-Fill: 6. the same no matter how measured 13. 0.84 15. 0.833 17. meter 18. measure

Vocabulary quizzes



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

1. What instrument is commonly used by astronomers to observe distant celestial objects?
Option: Microscope
Option: Telescope
Option: Thermometer
Option: Barometer

2. What type of spacecraft is designed to explore the surface of other planets?
Option: Orbiter
Option: Rover
Option: Satellite
Option: Probe

3. What is typically used in gaming consoles to store game data?
Option: Discs
Option: Cartridges
Option: Cloud storage
Option: Flash drives

4. What term is used for the ability of a system to imitate the functions of another system?
Option: Simulation
Option: Emulation
Option: Duplication
Option: Recreation

5. What is formed when two or more parties collaborate for a common goal?
Option: Contract
Option: Partnership
Option: Agreement
Option: Alliance

6. What term refers to improvements or new information provided for software or systems?
Option: Upgrades
Option: Updates
Option: Fixes
Option: Maintenance

7. What are tools designed for scientific measurements and observations called?
Option: Equipment
Option: Instruments
Option: Devices



Option: Machinery

8. Which element is the simplest and most abundant in the universe?

Option: Oxygen

Option: Carbon

Option: Hydrogen

Option: Helium

9. What technology is used for precise cutting and measurement in various fields?

Option: Lenses

Option: Lasers

Option: LEDs

Option: Filaments

10. What term describes an event that has been postponed or rescheduled?

Option: Accelerated

Option: Delayed

Option: Cancelled

Option: Completed

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

11. The spacecraft intended to study Mars will be an _____ that remains in its orbit.

12. Studies conducted in a _____ state allow for more accurate results.

13. Astronomers often conduct _____ to gather data about celestial bodies.

14. The _____ radius is a fundamental measurement in particle physics.

15. The precise _____ of distance can be critical in scientific research.

16. Research requires specialized _____ to ensure accurate results.

17. A powerful _____ is essential for observing distant galaxies.

18. The _____ of the spacecraft was a collaborative effort between multiple teams.

19. The successful mission was due to a strong _____ between different space agencies.

20. The use of _____ has revolutionized the way scientists conduct experiments.



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

21. Scientists frequently conduct experiments in controlled environments to validate their hypotheses.
22. Software developers release an update to fix bugs and enhance features.
23. The design of the new telescope includes advanced features for better observation.
24. High-quality equipment is essential for collecting reliable data in research studies.
25. Experts in the field gathered to discuss the latest advancements in technology.
26. The partnership between universities and industries fosters innovation and research.
27. The organization conducts surveys to gather public opinion on various issues.
28. The launch of the rocket has been delayed due to unfavorable weather conditions.
29. The rover was equipped with advanced technological instruments to explore the Martian surface.
30. Hydrogen is the most abundant element in the universe and is crucial for many chemical reactions.

Answer

Multiple Choice: 1. Telescope 2. Rover 3. Cartridges 4. Emulation 5. Partnership 6. Updates 7. Instruments 8. Hydrogen 9. Lasers 10. Delayed

Gap-Fill: 11. orbiter 12. vacuum 13. surveys 14. proton 15. measurement 16. equipment 17. telescope 18. design 19. partnership 20. lasers

Matching sentence: 1. conduct 2. update 3. design 4. equipment 5. experts 6. partnership 7. surveys 8. delayed 9. rover 10. hydrogen

CATEGORY

1. Sci/Tech - LEVEL1

POST TAG

1. AI
2. ESL learning
3. esl news
4. proton
5. puzzle
6. size



Tags

1. A1
2. ESL learning
3. esl news
4. proton
5. puzzle
6. size

Date Created

2026/04/15

Author

aimeeyoung99

ESL-NEWS.COM