



Scientists Unveil Lasers That Block Light and Create Shadows

Description

Shadows happen when light hits an object that blocks it. For example, when light hits a wall, it creates a shadow on the ground.

Recently, scientists found something surprising. A laser can make its surroundings dark, almost like it creates its own shadow. When two laser beams cross in a special way, one beam can block the other. This creates a shadowed line on a surface.

Physicist Raphael Abrahão from Brookhaven National Laboratory explains this new finding makes us think differently about shadows.

Normally, light waves pass through each other without blocking. But in this experiment, two beams of light interacted differently because of a special material called ruby.

Abrahão and his team used a blue laser and a green laser. The blue laser shone through the ruby while the green laser crossed it. The blue light was blocked where the green light fell, creating a dark line.

This line is a real shadow. It moved with the green laser when it was moved. This discovery could help in new technology, like controlling light in different ways.

Vocabulary List:

1. **Shadow** /'ʃæd.ʊ/ (noun): A dark area produced by a body coming between rays of light and a surface.
2. **Laser** /'leɪ.zə/ (noun): A device that generates an intense beam of coherent monochromatic light.
3. **Interact** /,ɪn.tə'rækt/ (verb): To act upon or influence each other.
4. **Material** /mə'tɪr.i.əl/ (noun): The substance or substances of which a thing is made.
5. **Discovery** /dɪs'kʌv.ər.i/ (noun): The act of finding or learning something for the first time.
6. **Technology** /tek'nɒl.ə.dʒi/ (noun): The application of scientific knowledge for practical purposes especially in industry.

Comprehension Questions

Multiple Choice



1. What causes shadows to occur?
Option: Reflection of light
Option: Absorption of light
Option: Light hitting an object that blocks it
Option: Refraction of light
2. What happens when two laser beams cross in a special way?
Option: They cancel each other out
Option: They create rainbow colors
Option: One beam can block the other
Option: They reflect off each other
3. Which physicist from Brookhaven National Laboratory is mentioned in the text?
Option: Raphael Abrahão
Option: Marie Curie
Option: Albert Einstein
Option: Isaac Newton
4. What material played a role in the interaction of the light beams in the experiment?
Option: Gold
Option: Diamond
Option: Ruby
Option: Sapphire
5. Which two colors of lasers were used in the experiment?
Option: Red and Yellow
Option: Blue and Green
Option: Orange and Purple
Option: Black and White
6. What could the discovery of creating dark lines with lasers potentially help with?
Option: Creating rainbows
Option: Controlling light in different ways
Option: Generating electricity
Option: Enhancing sound waves

True-False



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7. Shadows are created when light is passed through an object.
 8. Light waves always block each other when they intersect.
 9. The dark line created by the laser beams was not a real shadow.
 10. The discovery made by Abrahão and his team has no potential applications in technology.
 11. The movement of the dark line was independent of the green laser.
 12. The blue laser passed through the ruby without any interactions.

Gap-Fill

13. In the experiment, two laser beams crossed in a special way because of a material called _____.
14. The blue light was blocked where the _____ light fell, creating a dark line.
15. The discovery by Abrahão and his team could potentially help in new technology, like controlling light in different ways. This line is a real shadow that moved with the _____ laser.
16. A laser can make its surroundings dark in a similar way to creating a _____ shadow.
17. The interaction of the two laser beams was influenced by a special material called _____.
18. The dark line created by the laser beams was a real shadow that moved with the _____ laser.

Answer

Multiple Choice: 1. Light hitting an object that blocks it 2. One beam can block the other 3. Raphael Abrahão 4. Ruby 5. Blue and Green 6. Controlling light in different ways

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

Gap-Fill: 13. ruby 14. green 16. shadow



Vocabulary quizzes

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

1. What term describes a decrease or reduction in something?
Option: Triplet
Option: Quadruplet
Option: Decline
Option: Embryo
2. What term refers to the ability to conceive children or young?
Option: Shadow
Option: Fertility
Option: Laser
Option: Interact
3. What term refers to the application of scientific knowledge for practical purposes?
Option: Material
Option: Discovery
Option: Technology
Option: Asteroid
4. Which word indicates making something different or altering it?
Option: Surface
Option: Change
Option: Pass
Option: Shake
5. What word is used to describe something shining or full of light?
Option: Bright
Option: Autistic
Option: Diagnosed
Option: Career
6. Which term means to keep something in a good condition or preserve it?



- Option: Understand
- Option: People
- Option: Group
- Option: Maintain

7. What unit of energy is commonly used to measure the energy content of food?

- Option: Calories
- Option: Metabolic
- Option: Expenditure
- Option: Adjust

8. Which term describes the accomplishment of an aim or purpose?

- Option: Maintain
- Option: Success
- Option: Autistic
- Option: Decline

9. What word refers to a collection of individuals who come together?

- Option: Change
- Option: Group
- Option: Calories
- Option: Shadow

10. Which term means to communicate or work together with someone or something?

- Option: Bright
- Option: Interact
- Option: Technology
- Option: Fertility

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

- 11. The _____ used in the construction of the building was of high quality.
- 12. Regular exercise can help boost your _____ rate.
- 13. The scientist made an important _____ that changed the field of physics.
- 14. When nervous some people tend to _____ their hands.
- 15. The child was _____ at an early age.



16. The doctor provided some helpful _____ for leading a healthier lifestyle.
17. It is important to _____ your sails to catch the wind properly while sailing.
18. I could see the train _____ by as I waited on the platform.
19. During the early stages of pregnancy the developing baby is called an _____.
20. The tree cast a long _____ across the lawn in the evening sun.

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

21. Doctors used a focused beam of light to perform eye surgery.
22. Space scientists study rocks orbiting the sun that are smaller than planets.
23. After the assessment the nutritionist provided suggestions for a balanced diet plan.
24. She gave birth to three babies at the same time.
25. The top layer of the earth is known as the crust.
26. She has been working as a lawyer for the past ten years.
27. The doctor determined the illness after a series of tests.
28. There is a diverse group of individuals living in the neighborhood.
29. The company carefully tracks its financial spending to stay within budget.
30. The object blocked the light creating a dark area behind it.

Answer

Multiple Choice: 1. Decline 2. Fertility 3. Technology 4. Change 5. Bright 6. Maintain 7. Calories 8. Success 9. Group 10. Interact

Gap-Fill: 11. Material 12. Metabolic 13. Discovery 14. Shake 15. Autistic 16. Recommendations 17. Adjust 18. Pass 19. Embryo 20. Shadow

Matching sentence: 1. Laser 2. Asteroid 3. Recommendations 4. Triplet 5. Surface 6. Career 7. Diagnosed 8. People 9. Expenditure 10. Shadow



CATEGORY

1. Health - LEVEL1

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