
New Time Crystal Created in Quantum Computer

Description

A complex time crystal has been created in a quantum computer at the Donostia International Physics Center in Spain. This discovery is important because it shows how quantum computers can help in scientific research.

Normal crystals have atoms that repeat in space, while time crystals repeat in time. This means they can cycle through the same patterns endlessly, unless affected by outside forces. For a long time, scientists were unsure about the effects of time crystals on physics. However, over the past ten years, researchers have made several types in labs. Now, Nicolás Lorente and his team have created an even more complex version using an IBM quantum computer.

Most earlier studies looked at one-dimensional time crystals. This team aimed to build a two-dimensional version using 144 qubits, which are basic units of quantum information. They arranged these qubits in a honeycomb pattern. Changing how these qubits interact led to the creation of the time crystal.

This new complexity helps map out the qubit system's features, which is essential for understanding materials. Jamie Garcia from IBM believes this work could be a step towards using quantum computers to design new materials. Researchers face challenges with errors in existing quantum computers, but combining different methods could improve our understanding of quantum systems in the future.

Vocabulary List:

1. **Crystal** /'krɪstəl/ (noun): A solid material whose atoms are arranged in a highly ordered repeating pattern.
2. **Quantum** /'kwɔːn.təm/ (adjective): Relating to the smallest possible discrete unit of any physical property.
3. **Complex** /'kɒmpleks/ (adjective): Consisting of many different and connected parts.
4. **Discovery** /dɪs'kʌv.ər.i/ (noun): The act of finding or learning something for the first time.
5. **Researchers** /rɪ'sɜː.tʃɜːrz/ (noun): People who conduct systematic investigations to establish facts and reach new conclusions.
6. **Features** /'fiː.tʃɜːrz/ (noun): Distinctive attributes or aspects of something.

Comprehension Questions

Multiple Choice

1. What type of crystals repeat in time?

- Option: Normal crystals
- Option: Space crystals
- Option: One-dimensional crystals
- Option: Time crystals

2. How many qubits were used to create the two-dimensional time crystal?

- Option: 64
- Option: 100
- Option: 144
- Option: 200

3. Who led the team that created the time crystal at the Donostia International Physics Center?

- Option: Nicolás Lorente
- Option: Jamie Garcia
- Option: Ratan Naval Tata
- Option: Albert Einstein

4. What is essential for understanding materials according to the text?

- Option: Creating time crystals
- Option: Researching quantum computers
- Option: Mapping out qubit systems
- Option: Understanding qubit features

5. What is a challenge faced by researchers in existing quantum computers?

- Option: Lack of funding
- Option: Complex qubit systems
- Option: Limited processing power
- Option: Errors

6. What does the creation of time crystals in a quantum computer suggest?

- Option: Advancements in scientific research
- Option: Limitations of quantum computers
- Option: Existence of parallel universes
- Option: Irrelevancy of quantum systems

True-False

7. Time crystals cycle through patterns endlessly without outside interference.
8. Most earlier studies focused on two-dimensional time crystals.
9. Jamie Garcia is a member of the team that created the time crystal in Spain.
10. Errors in quantum computers do not pose challenges for researchers.
11. The creation of time crystals is unrelated to designing new materials.
12. Quantum computers are not helpful in understanding materials.

Gap-Fill

13. The team aimed to build a _____ version of the time crystal using 144 qubits.
14. Researchers face challenges with errors in existing _____.
15. The new complexity helps map out the qubit system's _____.
16. Over the past ten years, researchers have made several types of time crystals in _____.
17. Changing how these qubits interact led to the creation of the time crystal in a _____ pattern.
18. Nicolás Lorente and his team created an even more complex version using an IBM _____.

Answer

Multiple Choice: 1. Time crystals 2. 144 3. Nicolás Lorente 4. Mapping out qubit systems 5. Errors 6. Advancements in scientific research

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

Gap-Fill: 13. two-dimensional

14. quantum computers 15. features 16. labs 17. honeycomb 18. quantum computer

Vocabulary quizzes

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

1. Which branch of physics deals with the behavior of particles at the atomic and subatomic levels?

- Option: Quantum
- Option: Complex
- Option: Cyber
- Option: Genetics

2. Who are individuals with specialized knowledge in a particular field?

- Option: Challenges
- Option: Experts
- Option: Regulating
- Option: Dominance

3. In a medical study what is an inactive substance or treatment that has no therapeutic effect?

- Option: Systems
- Option: Placebo
- Option: Cycle
- Option: Tropical

4. Which medication is used for the acute treatment of migraines in adults?

- Option: Primary
- Option: Pelvis
- Option: Ubrogepant
- Option: Birth

5. What is the long-term pattern of temperature humidity and rainfall in an area?

- Option: Repeat
- Option: Insights
- Option: Climate
- Option: Recovering

6. What type of malicious software threatens to publish a victim's data or perpetually block access to it unless a ransom is paid?

- Option: Sensitivity
- Option: Ransomware
- Option: Understanding

Option: Dizziness

7. What are difficulties or obstacles that need to be overcome?

Option: Challenges

Option: Dominance

Option: Quantum

Option: Genetics

8. Which field of biology focuses on the study of genes and heredity?

Option: Cyber

Option: Features

Option: Genetics

Option: Regulating

9. What is the process of regaining health or returning to normalcy after an illness or injury?

Option: Trust

Option: Recovering

Option: Migraines

Option: Cyber

10. Which climate zone is characterized by warm temperatures and high humidity?

Option: Symptoms

Option: Tropical

Option: Experts

Option: Complex

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

11. The water cycle involves the continuous movement of water through the atmosphere land and

_____.

12. _____ complications can arise during pregnancy or labor that require medical attention.

13. Some individuals have a high level of auditory _____ making them sensitive to loud noises.

14. In genetics the principle of _____ states that some alleles are dominant over others.



15. A computer _____ can be vulnerable to cyber attacks if not properly secured.

16. Consulting with medical _____ can provide valuable insights into complex health conditions.

17. Governments play a key role in _____ industries to ensure fair competition and consumer protection.

18. The spread of _____ attacks highlights the importance of cybersecurity measures.

19. Studying the genetic code can provide valuable _____ into hereditary diseases.

20. Understanding the _____ nature of quantum mechanics is a significant challenge for physicists.

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

21. Severe headaches that can be accompanied by sensitivity to light and sound.
22. A feeling of lightheadedness or unsteadiness that can be caused by various factors.
23. The basin-shaped structure in the lower part of the trunk that supports the spine and hips.
24. The ability to comprehend or grasp the meaning of something.
25. Distinct characteristics or traits of a particular object or system.
26. The confidence and reliance placed in someone or something.
27. Interconnected components working together to achieve a specific objective.
28. Individuals with specialized knowledge and skills in a particular field.
29. A series of events or processes that repeat in a particular order.
30. The average weather conditions in a region over a long period of time.



Answer

Multiple Choice: 1. Quantum 2. Experts 3. Placebo 4. Ubrogepant 5. Climate 6. Ransomware 7. Challenges 8. Genetics 9. Recovering 10. Tropical

Gap-Fill: 11. oceans 12. Birth 13. sensitivity 14. dominance 15. system 16. experts 17. regulating 18. cyber 19. insights 20. complex

Matching sentence: 1. Migraines 2. Dizziness 3. Pelvis 4. Understanding 5. Features 6. Trust 7. Systems 8. Experts 9. Cycle 10. Climate

CATEGORY

1. Sci/Tech - LEVEL2

POST TAG

1. A2
2. ESL learning
3. esl news
4. Level 2
5. quantum computer
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