



Massive 'Space Tornadoes' Found in Milky Way's Core

Description

Within the chaotic turmoil of the Milky Way galactic center, a novel type of turbulent structure has recently been discovered. Astronomers have detected long, slender filaments of gas surrounding the galactic supermassive black hole in the Central Molecular Zone (CMZ). While filaments have been observed in this region before, these latest findings represent a unique and unprecedented mechanism for gas dispersal in the CMZ - akin to a cosmic tornado.

Lead astronomer Kai Yang and his team from Shanghai Jiao Tong University were taken aback by these newly identified structures, noting their spatial offset from star-forming regions in ALMA images. These "slim filaments," as dubbed by the research team, exhibit distinct properties, containing a variety of complex organic molecules and displaying unique velocity distributions dominated by turbulent pressure.

Described as violent streams of gas dissipating quickly, the slim filaments are envisioned as space tornadoes efficiently distributing materials into the surrounding environment. While the exact formation mechanism remains unclear, researchers speculate that shocks generated by collisions in the CMZ may play a crucial role in their genesis. These filaments, abundant throughout the CMZ, likely contribute significantly to the recycling rate of the region.

This groundbreaking research sheds light on the dynamic processes at play in the Galactic Center, offering valuable insights into the complex interplay between shocks, molecular clouds, and the interstellar medium.

Vocabulary List:

1. **Turbulent** /'tɜː.bjʊ.lənt/ (adjective): Characterized by conflict disorder or confusion; not stable or calm.
2. **Dispersal** /dɪs'pɜːr.səl/ (noun): The act of distributing or spreading something over a wide area.
3. **Genesis** /'dʒɛn.ə.sɪs/ (noun): The origin or mode of formation of something.
4. **Velocity** /və'lɒs.ɪ.ti/ (noun): The speed of something in a given direction.
5. **Interstellar** /,ɪn.tə'stel.ər/ (adjective): Occurring or situated between stars.
6. **Molecular** /mə'lɛk.jʊ.lər/ (adjective): Relating to or consisting of molecules.

Comprehension Questions



Multiple Choice

1. What has recently been discovered within the Milky Way galactic center?
Option: Long, slender filaments of gas
Option: Supermassive black holes
Option: Star-forming regions
Option: Cosmic tornadoes
2. Who was the lead astronomer involved in the discovery of the slim filaments?
Option: Kai Yang
Option: Ratan Naval Tata
Option: Galileo Galilei
Option: Albert Einstein
3. What is the proposed mechanism for gas dispersal in the Central Molecular Zone (CMZ)?
Option: Space tornadoes
Option: Black hole fusion
Option: Solar flares
Option: Planetary alignment
4. What type of molecules do the slim filaments contain?
Option: Complex organic molecules
Option: Simple inorganic molecules
Option: Metals
Option: Radioactive isotopes
5. What is believed to be a crucial factor in the genesis of the slim filaments?
Option: Shocks generated by collisions
Option: Radiation from stars
Option: Gravity waves
Option: Quantum fluctuations
6. What plays a significant role in the recycling rate of the Central Molecular Zone?
Option: Slim filaments
Option: Black holes
Option: Stellar winds
Option: Asteroid collisions



True-False

7. The slim filaments were observed to be located within star-forming regions in ALMA images.
8. The slim filaments dissipate materials slowly into the surrounding environment.
9. Researchers have a clear understanding of the exact formation mechanism of the slim filaments.
10. The slim filaments described in the text are composed mainly of simple gases like helium and hydrogen.
11. The slim filaments may contribute significantly to the recycling rate of the Central Molecular Zone.
12. The slim filaments are considered a rare occurrence in the Milky Way galactic center.

Gap-Fill

13. Lead astronomer Kai Yang and his team were from _____ University.
14. The slim filaments exhibit unique velocity distributions dominated by _____ pressure.
15. The slim filaments are described as violent streams of gas dissipating _____.
16. The space tornadoes are envisioned as efficiently distributing materials into the surrounding _____.
17. The groundbreaking research sheds light on the dynamic processes at play in the _____.
18. The findings were detailed in the Astronomy & Astrophysics _____.

Answer

Multiple Choice: 1. Long, slender filaments of gas 2. Kai Yang 3. Space tornadoes 4. Complex organic molecules 5. Shocks generated by collisions 6. Slim filaments

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

Gap-Fill: 13. Shanghai Jiao Tong 14. turbulent 15. quickly 16. environment 17. Galactic Center 18. publication



Vocabulary quizzes

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

1. Which term describes a severe and sudden event causing great damage or suffering?

Option: catastrophic

Option: criticality

Option: prevailing

Option: genesis

2. What is the term used to describe speed in a given direction?

Option: velocity

Option: dispersal

Option: interstellar

Option: adolescence

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

3. The _____ of change is a constant in life.

4. She has a natural _____ for music excelling in playing multiple instruments.

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

5. Studying the between two variables helps understand their relationship.

6. The puzzling left the team scratching their heads for a solution.

Answer

Multiple Choice: 1. catastrophic 2. velocity

Gap-Fill: 3. inevitability 4. propensity

Matching sentence: 1. correlation 2. conundrum

CATEGORY

1. Health - LEVEL5

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