



## Two stars show evidence of acetic acid, the key component in ant stings

### Description

The James Webb Space Telescope's Mid-Infrared Instrument has captured an intriguing picture of an area parallel to the massive protostar dubbed IRAS 23385. The protostar itself, however, remains unseen within this particular image. Astronomers wielding this space observatory have unearthed common chemical constituents, which can be found in everyday elements such as vinegar, stings of ants and even margaritas, around duo juvenile stars, NASA reveals.

The organic molecules' intricacy observed through the space observatory's Mid-Infrared Instrument encompasses acetic acid, a fundamental component of vinegar, and ethanol, more conventionally recognised as alcohol. Simultaneously, they also discovered rudimentary molecules of formic acid, known for causing the sting sensation in ant bites, along with sulfur dioxide, methane, and formaldehyde. The likelihood is that sulfurous compounds such as sulfur dioxide played an instrumental role in paving the way for life to evolve on early Earth.

The newfound molecules were discerned as frozen compounds encircling IRAS 2A and IRAS 23385, two protostars or nascent stars that are yet to form planets. Stars originate from the swirling clouds of dust and gas, with the remaining material resulting in planet formation. The protostar, IRAS 23385, positioned nearly 15,981 light-years from Earth within our Milky Way galaxy, piqued the interest of astronomers. The reason being the molecules found around these stars could be the key ingredients for eventual habitable worlds, and these vital ingredients could be integrated into the planets likely to form around these stars in the future.

The cosmos is filled with an abundance of heavy metals, elements, and chemical compounds, produced and released by star explosions over time. These chemical elements eventually become part of clouds formulating the upcoming generation of stars and planets. Back on our home planet, the precise amalgamation of these elements allowed life to take shape. As the renowned astronomer Carl Sagan once put it, "We are made of star-stuff." However, the query persists among astronomers about the prevalence of elements necessary for life in the cosmos.

Previously, scientists employing the Webb telescope discovered ice made of assorted elements in a frigid, shadowy molecular cloud. This interstellar lump of dust and gas enables the formation of hydrogen and carbon monoxide molecules. The denser clusters within these clouds are capable of collapsing, resulting in protostar formation. The detection of complex organic molecules in space assists astronomers in determining the source of these molecules as well as other cosmic molecules of larger size.

The detection of these complex molecules lends weight to the theory that they could have been created by the sublimation of ices in space, a process that transmutes a solid into a gas without passing through the liquid stage. The detection of these molecules in ices propounds that reactions taking place on the surfaces of cold dust grains could be contributing towards building such complex kinds of molecules.

The findings from the examination of these protostars offer intriguing insights. The chemical compounds



found around the protostars could be a mirror image of our solar system's early history, offering astronomers a window into the conditions and elements present during the formation of our sun and planets, including Earth. With more Webb data expected to be released in the future, astronomers are keen to follow the step-by-step progress of this astrochemical phenomenon.

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## Vocabulary List:

1. **Intriguing** // (adjective): Arousing curiosity or interest fascinating.
2. **Protostar** // (noun): A contracting mass of gas that represents an early stage in the formation of a star.
3. **Constituents** // (noun): Components elements that make up something.
4. **Encircling** // (verb): To form a circle around surround.
5. **Amalgamation** // (noun): The actionprocessor result of combining or uniting.
6. **Sublimation** // (noun): The process of changing from a solid to a gas without passing through a liquid state.

## Vocabulary quizzes



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

1. What word describes something that is attractive or tempting?  
Option: Encircling  
Option: Enticing  
Option: Deterioration  
Option: Contentious
  
2. Which word means deserving praise or admiration?  
Option: Seminal  
Option: Commendable  
Option: Dismissal  
Option: Fervently
  
3. What term refers to a state of relying on someone or something else?  
Option: Dependence  
Option: Behemoth  
Option: Exceedingly  
Option: Dependency
  
4. Which word best describes something fascinating or interesting?  
Option: Feasibility  
Option: Intriguing  
Option: Amalgamation  
Option: Geoengineering
  
5. What term describes something that speeds up a process or activity?  
Option: Respite  
Option: Accelerator  
Option: Skeptical  
Option: Protostar
  
6. Which word means likely to cause arguments or controversies?  
Option: Contentious  
Option: Fervently  
Option: Amplifies  
Option: Constituents
  
7. Which term refers to the likelihood of something being successful or effective?  
Option: Lucrative  
Option: Sublimation  
Option: Feasibility



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Option: Protostar

8. What word means a short period of rest or relief?

Option: Counsel

Option: Respite

Option: Commendable

Option: Amalgamation

9. Which term means the process of becoming progressively worse?

Option: Behemoth

Option: Deterioration

Option: Dismissal

Option: Counsel

10. What word describes the action of combining or uniting to form a whole?

Option: Amalgamation

Option: Amplifies

Option: Skeptical

Option: Constituents

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

11. Investing in real estate can be very \_\_\_\_\_ if done wisely.

12. She quickly became a \_\_\_\_\_ figure in the field of medicine.

13. Beauty is in the eyes of the \_\_\_\_\_ .

14. Twins are often said to be \_\_\_\_\_ since they are always together.

15. The company's code of \_\_\_\_\_ serves as a guide for employee behavior.

16. She \_\_\_\_\_ believed in the cause and dedicated all her time to it.

17. After the incident he faced immediate \_\_\_\_\_ from his position.

18. Despite the challenges she always \_\_\_\_\_ with a positive attitude.

19. The new shopping mall is a \_\_\_\_\_ of modern architecture.

20. The child had a strong \_\_\_\_\_ on his parents for support.



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

21. The use of social media the spread of information.
22. The elected official listened to the concerns of his before making a decision.
23. The moat was dug the castle to protect it from invaders.
24. The of dry ice is the process of changing from a solid to a gas without becoming a liquid.
25. Her plan to climb the highest mountain impressed even the most seasoned climbers.
26. The concept of aims to manipulate the Earth's climate to counteract the effects of global warming.
27. A is a contracting mass of gas that represents an early stage in the formation of a star.
28. She was with the idea of traveling to far-off lands and experiencing new cultures.
29. The software update provided an to the user interface making it more user-friendly.
30. From its as a small startup the company has grown into a global corporation.

**Answer**

**Multiple Choice:** 1. Enticing 2. Commendable 3. Dependency 4. Intriguing 5. Accelerator 6. Contentious 7. Feasibility 8. Respite 9. Deterioration 10. Amalgamation

**Gap-Fill:** 11. lucrative 12. prominent 13. beholder 14. inseparable 15. ethics 16. fervently 17. dismissal 18. contended 19. behemoth 20. dependency

**Matching sentence:** 1. amplifies 2. constituents 3. encircling 4. sublimation 5. audacious 6. geoengineering 7. protostar 8. enamored 9. enhancement 10. inception

**CATEGORY**

- 1. Sci/Tech - LEVEL5

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