

Webb Reveals Unusual Jets of Volatile Gas from Icy Centaur 29P

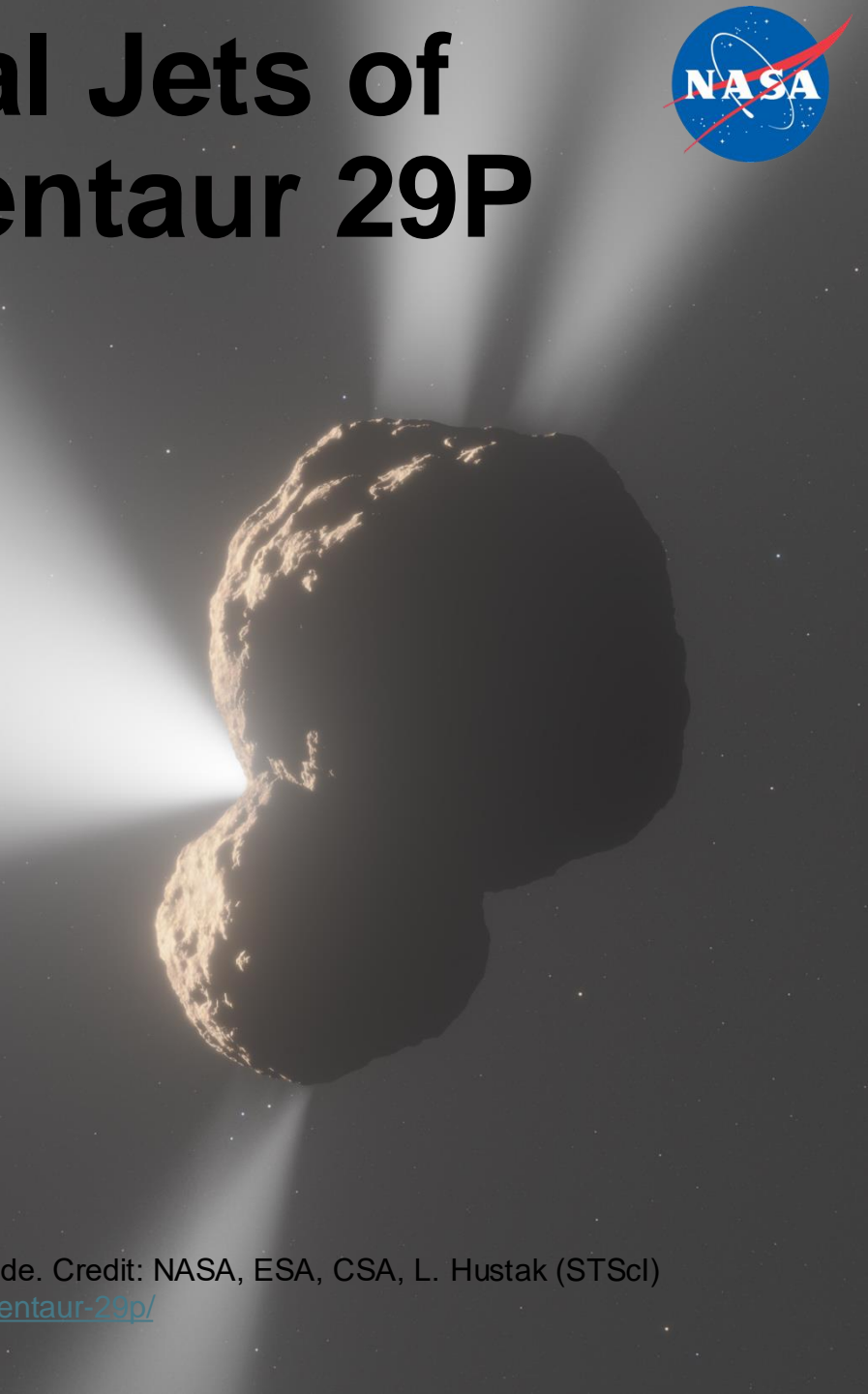
A team using the Webb telescope mapped gases spewing from an object called a centaur, a distant body orbiting the Sun between Jupiter and Neptune. Its observations suggest a varied composition and provide new insights into the formation and evolution of the solar system.

Centaur objects are former trans-Neptunian objects that have been moved inside Neptune's orbit by subtle gravitational influences of the planets in the last few million years and may eventually become short-period comets.

Since these small icy bodies are in an orbital transitional phase, scientists study them to understand their composition, how they serve as a link between primordial icy bodies in the outer solar system and evolved comets, and the reasons behind their outgassing activity — the loss of their ices that lie underneath the surface.

The research team used Webb's NIRSspec instrument to obtain data on Centaur 29P/Schwassmann-Wachmann 1 (29P for short), an object that is known for its highly active and quasi-periodic outbursts. It varies in intensity every six to eight weeks, making it one of the most active objects in the outer solar system.

The team discovered a new jet of carbon monoxide and previously unseen jets of carbon dioxide gas, which give new clues to the nature of the centaur's nucleus.



Caption: An artist's concept of Centaur 29P/Schwassmann-Wachmann 1's outgassing activity as seen from the side. Credit: NASA, ESA, CSA, L. Hustak (STScI)

News article: <https://science.nasa.gov/missions/webb/nasas-webb-reveals-unusual-jets-of-volatile-gas-from-icy-centaur-29p/>

Nature paper: <https://www.nature.com/articles/s41550-024-02319-3>