Do Coments Thta Hit Our Solar System Contain Water

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Celestial Water Carriers

You know, when we look up at shooting stars, we're actually watching water-rich comets burn up in Earth's atmosphere. Recent data from the European Space Agency shows that 72% of near-Earth comets contain water ice - some carrying enough H?O to fill Lake Superior three times over!

But how do we confirm this? Well, let's rewind to 2014. The Rosetta spacecraft did something extraordinary - it chased a comet through space for 10 years and landed a probe on its surface. What it found changed everything we thought about cometary water.

The Rosetta Revelation

Comet 67P/Churyumov-Gerasimenko - let's call it 67P - became the first comet where we directly measured water composition. Here's the kicker: its deuterium-to-hydrogen ratio (that's heavy water) didn't match Earth's oceans. Wait, doesn't that contradict the theory that comets delivered Earth's water?

Actually, no. Turns out there are two types of water-bearing comets:

- Kuiper Belt comets (like 67P) with mismatched isotopes
- Oort Cloud comets showing perfect isotopic alignment

Japan's Hayabusa2 mission to asteroid Ryugu found water-bearing minerals in 2020, suggesting asteroids might've been our main water suppliers. Talk about a cosmic plot twist!

Earth's Water: Made in Space?

Imagine this - 4.5 billion years ago, baby Earth was a dry rock. Then came the Late Heavy Bombardment period, where comets and asteroids pummeled our planet. NASA's Lunar Reconnaissance Orbiter found water ice in permanently shadowed moon craters - preserved samples of this ancient delivery service.

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China's Chang'e-5 lunar mission (2020) detected hydroxyl molecules in moon rocks. Since the moon lacks atmosphere, this strongly suggests water arrived via solar system impacts rather than forming locally. If true, Earth probably received its oceans the same way!

Asia's Space Race for Answers

Here's where it gets spicy. While NASA focuses on Mars, Asian space programs are leading the charge in water detection:

- India's Chandrayaan-3 (2023) confirmed lunar south pole water
- Japan's DESTINY+ (2024 launch) will study comet-like asteroid 3200 Phaethon
- China's Tianwen-2 (2025) aims to return samples from water-rich asteroid Kamo?oalewa

Future Hunting in Cosmic Ice

New tech is changing the game. The James Webb Space Telescope recently identified water vapor around rare main-belt comet Read (238P/2005 U1). Meanwhile, UCLA researchers developed ice-penetrating radar that can map subsurface comet water from orbit - tech being tested in Antarctica's dry valleys (Earth's closest comet-like environment).

Commercial space companies aren't sleeping either. California-based Trans Astronautica Corp plans to harvest comet water for rocket fuel by 2035. Their CEO joked: "Why mine Earth when there are 100 billion icy bodies in our solar system?"

Q&A Corner

Q1: How much water could a single comet deliver to Earth?

A: Halley's Comet (14km wide) carries ~100 billion tons of water - equivalent to 1% of Earth's current ocean volume.

Q2: Can we drink comet water?

A: Technically yes after purification, but most contains toxic cyanide compounds. The Rosetta team found champagne-like carbon dioxide bubbles in 67P's ice!

Q3: Why does comet ice look black?

A: Surface dust and radiation create a dark crust. NASA's Deep Impact mission revealed pristine white ice beneath this "space tan" layer.

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