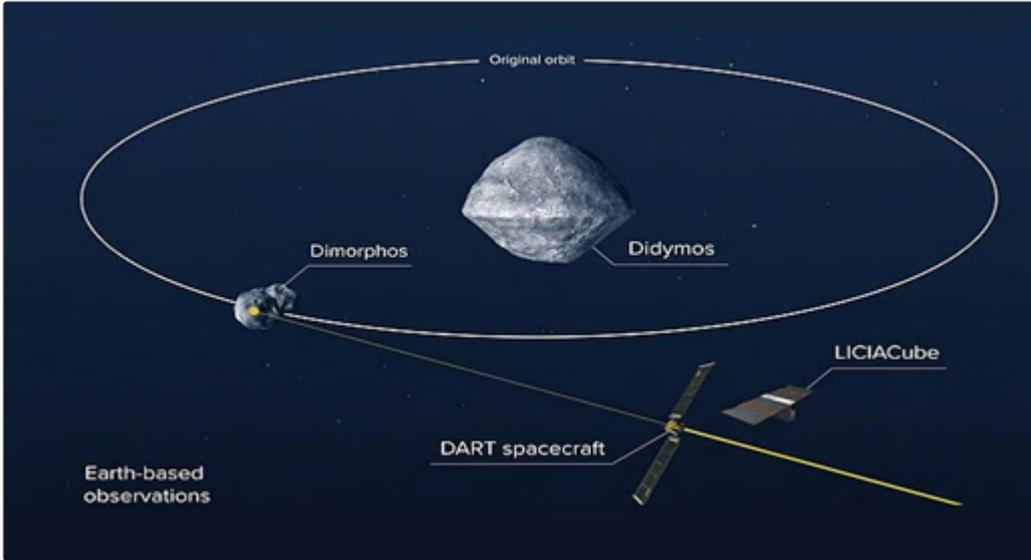




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NASA's DART Mission Successfully Alters Asteroid Orbit

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Why in News?

New observations show that Double Asteroid Redirection Test (DART), conducted by NASA in 2022, slightly changed the orbit of the asteroid system Didymos–Dimorphos.

The collision reduced the time taken by the asteroid pair to complete one solar orbit by less than one second.

About the DART Mission

DART (Double Asteroid Redirection Test) was the first planetary defense experiment designed to test whether a spacecraft could change the trajectory of an asteroid.

In September 2022, the spacecraft intentionally crashed into the asteroid Dimorphos, which orbits the larger asteroid Didymos.

Key Findings

The impact released about 35.3 million pounds of debris, nearly 30,000 times the mass of the spacecraft.

The debris cloud created additional momentum, enhancing the impact effect.

The collision shortened the asteroid system's orbital period around the Sun by about 0.15 seconds.

Even a tiny change in orbital motion can prevent a potential asteroid collision with Earth in the future.

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About the Asteroids

Dimorphos

Approximately 560 feet wide.

A moonlet asteroid orbiting Didymos.

Target of the DART mission.

Didymos

A binary asteroid system consisting of Didymos and its smaller companion Dimorphos.

Used by scientists to test asteroid deflection techniques.

Scientific Observations

Astronomers used stellar occultation observations to measure the orbital changes.

Between October 2022 and March 2025, scientists and volunteer astronomers conducted 22 observations worldwide to precisely track the change.

Importance for Planetary Defense

Demonstrates the kinetic impactor technique, where a spacecraft crashes into an asteroid to change its path.

Even very small orbital changes can prevent a potentially dangerous asteroid from hitting Earth.

Helps develop strategies to protect Earth from near-Earth asteroid threats.

Future Missions

Hera mission by the European Space Agency will study the aftermath of the DART collision.

Near-Earth Object Surveyor mission by NASA aims to detect dark asteroids that are difficult to observe from Earth.

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