



Double Asteroid Redirection Test (DART) Mission: NASA

Why in News

NASA will launch its **first planetary defense test mission** named the **Double Asteroid Redirection Test (DART)**.

- The DART spacecraft **will be launched on a [SpaceX Falcon 9 rocket](#)**.

Key Points

▪ Aim of the Mission:

- The mission is to test the new technology **to be prepared in case an [asteroid](#) heads towards Earth in the future**.
- The aim is to test the newly developed technology that **would allow a spacecraft to crash into an asteroid and change its course**.
 - After the mission has collided with the asteroid, **scientists will study its impact on the trajectory of the asteroid** with a range of telescopes deployed on different regions of the planet.
 - DART will be the **first demonstration of the kinetic impactor technique** to change the motion of an asteroid in space.
- The target of the spacecraft is a **small moonlet called Dimorphos** (Greek for “two forms”).
 - **Dimorphos** orbits a **larger asteroid named Didymos** (Greek for “twin”).
- It is a **suicide mission** and the spacecraft will be completely destroyed.
- The collision is expected to take place **between 26th September and 1st October, 2022**.

▪ About the Mission:

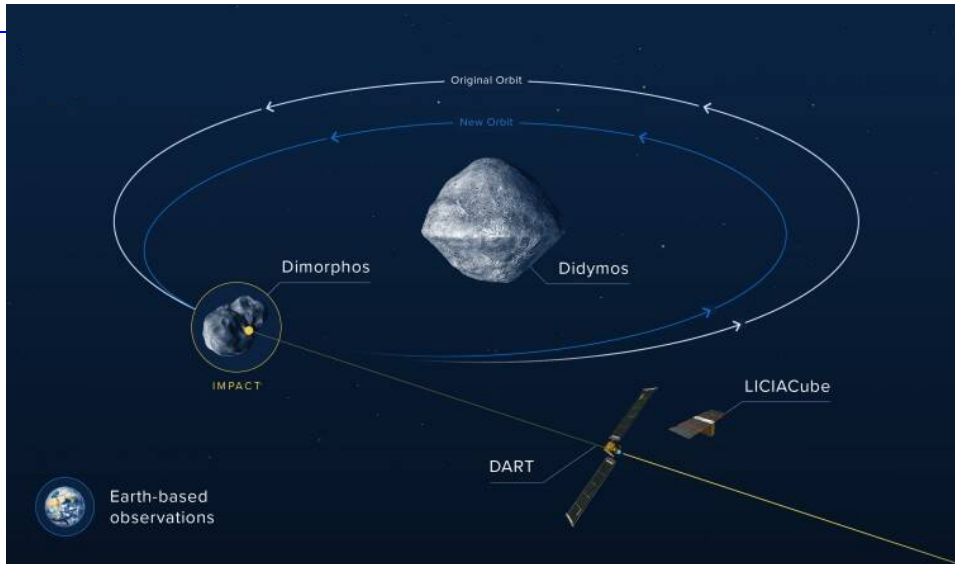
- DART is a **low-cost spacecraft**.
- It has **two solar arrays and uses hydrazine propellant** for maneuvering the spacecraft.
- It also carries about 10 kg of xenon which will be used to demonstrate the **agency's new thrusters called NASA Evolutionary Xenon Thruster-Commercial (NEXT-C)** in space.
 - **NEXT-C** gridded ion thruster system provides a combination of performance and spacecraft integration capabilities that **make it uniquely suited for deep space robotic missions**.
- The spacecraft carries a **high-resolution imager called Didymos Reconnaissance and Asteroid Camera for Optical Navigation (DRACO)**.
 - Images from DRACO will be sent to Earth in real-time and will help study the impact site and surface of Dimorphos (the target asteroid).
- DART will also carry a **small satellite or [CubeSat](#) named LICIAcube (Light Italian**

CubeSat for Imaging of Asteroids).

- LICIACube is expected to **capture images of the impact and the impact crater** formed as a result of the collision.

▪ Reason for Choosing Dimorphos:

- **Didymos is a perfect system** for the test mission because it is an **eclipsing binary** which means it has a **moonlet that regularly orbits the asteroid** and which can be seen when it passes in front of the main asteroid.
- **Earth-based telescopes can study this variation in brightness** to understand how long it takes Dimorphos to orbit Didymos.



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