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.

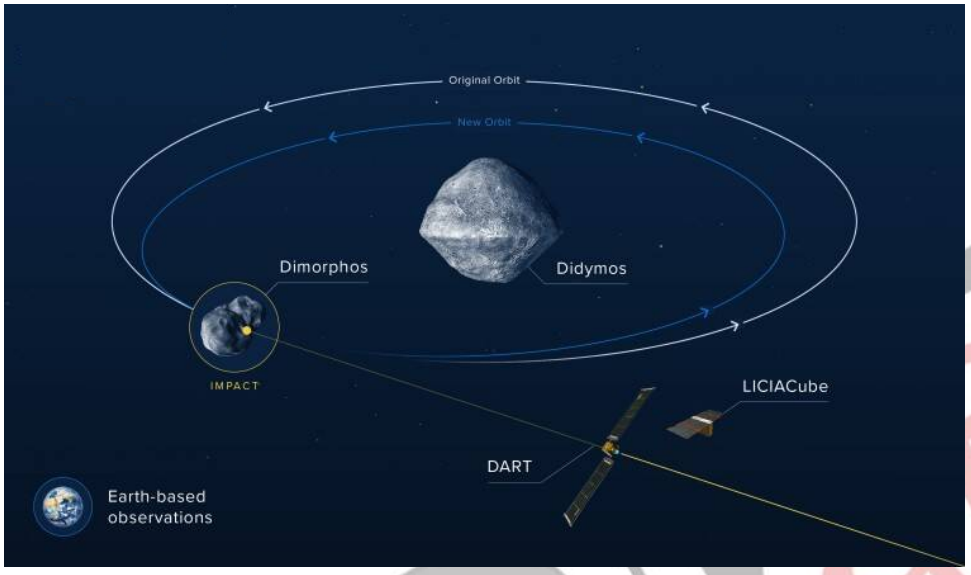
Key Points

- **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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