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.

*Source: IE*