

DART MISSION



Context:

The main aim of the Double Asteroid Redirection Test (DART) mission is to test the newly developed technology that would allow a spacecraft to crash into an asteroid and change its course.

About the Mission- DART: Double Asteroid Redirection Test

- An on-orbit demonstration of asteroid deflection is a key test that NASA and other agencies wish to perform before any actual need is present.
- The DART mission is NASA's demonstration of kinetic impactor technology, impacting an asteroid to adjust its speed and path.
- DART is the first-ever space mission to demonstrate asteroid deflection by kinetic impactor. The spacecraft launched on a SpaceX Falcon 9 rocket out of Vandenberg Space Force Base in California.

Features of the Mission:

- The DART spacecraft will achieve the kinetic impact deflection by deliberately crashing itself into the moonlet at a speed of approximately 6.6 km/s, with the aid of an onboard camera (named DRACO) and sophisticated autonomous navigation software.
- The collision will change the speed of the moonlet in its orbit around the main body by a fraction of one percent, but this will change the orbital period of the moonlet by several minutes - enough to be observed and measured using telescopes on Earth.
- Once launched, DART will deploy Roll Out Solar Arrays (ROSA) to provide the solar power needed for DART's electric propulsion system.
- The DART spacecraft will demonstrate the NASA Evolutionary Xenon Thruster – Commercial (NEXT-C) solar electric propulsion system as part of its in-space propulsion.

About Hera mission:

- After NASA's DART mission, the European Space Agency (ESA) plans to launch the Hera mission in October 2024. Hera is another planetary defence test that is currently under development. It will investigate the Didymos binary asteroid system and measure the outcome of the DART mission in great detail.
- The Hera spacecraft will first rendezvous with the target and then it will begin characterising it in detail. It will measure the internal properties of Dimorphos and the crater made by DART to measure the efficiency of the momentum transfer. Hera will also deploy two Cubesats, Milani and Juventas. These CubeSats will operate in the vicinity of the asteroid for a few months to provide scientific measurements.