NASA developing first asteroid deflection mission

This file computer-generated handout image taken on May 15, 2015 and released by the European Space Agency (ESA) on May 15, 2015 shows the impact of the DART (Double Asteroid Redirection Test) projectile on the binary asteroid system (65803) Didymos observed by the AIM (Asteroid Impact Mission) satellite. | Photo Credit: AFP/NASA IMAGES

NASA is developing the first-ever mission that will deflect a near-Earth asteroid, and help test the systems that will allow mankind to protect the planet from potential cosmic body impacts in the future.

The Double Asteroid Redirection Test (DART) — which is being designed and would be built and managed by the John Hopkins Applied Physics Laboratory — is moving from concept development to preliminary design phase, the US space agency said.

“DART would be NASA’s first mission to demonstrate what’s known as the kinetic impactor technique — striking the asteroid to shift its orbit — to defend against a potential future asteroid impact,” said Lindley Johnson, planetary defense officer at NASA Headquarters in Washington.

“This approval step advances the project towards a historic test with a nonthreatening small asteroid,” said Johnson.

“DART is a critical step in demonstrating we can protect our planet from a future asteroid impact,” said Andy Cheng, who serves as the DART investigation co-lead.

“Since we don’t know that much about their internal structure or composition, we need to perform this experiment on a real asteroid,” Andy said.

“With DART, we can show how to protect Earth from an asteroid strike with a kinetic impactor by knocking the hazardous object into a different flight path that would not threaten the planet,” he said.

The target for DART is an asteroid that will have a distant approach to Earth in October 2022, and then again in 2024.

The asteroid is called Didymos — Greek for “twin” — because it is an asteroid binary system that consists of two bodies: Didymos A, about 780 metres in size, and a smaller asteroid orbiting it called Didymos B, about 160 metres in size.

DART would impact only the smaller of the two bodies, Didymos B.

The Didymos system has been closely studied since 2003.

The primary body is a rocky S-type object, with composition similar to that of many asteroids. The composition of its small companion, Didymos B, is unknown, but the size is typical of asteroids that could potentially create regional effects should they impact Earth.

After launch, DART would fly to Didymos and use an APL- developed onboard autonomous targeting system to aim itself at Didymos B.

Then the refrigerator-sized spacecraft would strike the smaller body at a speed about nine times faster than a bullet, about six kilometres per second.

Earth-based observatories would be able to see the impact and the resulting change in the orbit of Didymos B around Didymos A, allowing scientists to better determine the capabilities of kinetic impact as an asteroid mitigation strategy.

The kinetic impact technique works by changing the speed of a threatening asteroid by a small fraction of its total velocity, but by doing it well before the predicted impact so that this small nudge will add up over time to a big shift of the asteroid's path away from Earth.

A study of nearly 300 people living in different parts of India found that nine single-base variants (single-nucleotide polymorphisms or SNPs) account

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