

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Small Bodies Missions and Technologies (Part 1) (4A)

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NEW KNOWLEDGE GAINED FROM THE HERA MISSION – THE EUROPEAN COMPONENT OF
THE ASTEROID IMPACT AND DEFLECTION ASSESSMENT (AIDA) COOPERATION**Abstract**

The European component of the joint ESA-NASA Asteroid Impact Deflection Assessment (AIDA) project has been redesigned from the original version called Asteroid Impact Mission (AIM), and is now called Hera. The main objectives of AIDA are twofold: (1) to perform an asteroid deflection test by means of a kinetic impactor under detailed study at NASA (called DART, for Double Asteroid Redirection Test); and (2) to investigate with Hera the changes in geophysical and dynamical properties of the target binary asteroid after the DART impact. This joint mission will allow extrapolating the results of the kinetic impact to other asteroids and therefore fully validate such asteroid deflection techniques. Hera leverages technology and payload pre-developments of the previous AIM, and focuses on key measurements to validate impact models such as the target's mass and the detailed characterization of the impact crater. As such, AIDA will be the first documented deflection experiment and binary asteroid investigation.

The baseline target is the binary near-Earth asteroid (NEA) (65803) Didymos. In particular, its secondary component, called hereafter Didymoon (163 meters diameter), is the target of the DART mission and will be fully investigated by Hera, providing precious data for planetary defense, science, and mining purposes on the smallest investigated asteroid, as it will be presented.

Hera will thus be the first mission to investigate a binary asteroid and return new knowledge with important implications for our understanding of asteroid formation and solar system history. The mission will certainly fire the imagination of young people and adults, as the gain in knowledge serves various purposes (defense, science, mining), is accessible and understandable to those audiences and is associated with fascinating challenges and goals.