

The Asteroid Impact and Deflection Assessment (AIDA) mission to the binary near-Earth asteroid Didymos

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AIDA is a joint ESA-NASA mission, which includes the ESA Asteroid Impact Mission (AIM) rendezvous spacecraft and the NASA Double Asteroid Redirection Test (DART) mission. The target is the binary near-Earth asteroid (65803) Didymos. The primary goals of AIDA are (i) to characterize the moon of a binary asteroid, including for the first time the internal and sub-surface properties, (ii) to perform various technology demonstrations, including the deployment of a small lander and CubeSats, inter-satellite communication systems and optical communication with the Earth (iii) to test our ability to impact a small asteroid by an hypervelocity projectile, (iv) to measure the deflection caused by the impact. The separate launches of the two spacecraft is planed in 2020. AIM will arrive in May 2022 for the early characterization of Didymos' moon and the deflection experiment is planed to occur in October, 2022. The DART impact on the secondary member of the binary at 7 km/s will alter the binary orbit period, which can be measured by Earth-based observatories. The AIM spacecraft will monitor results of the impact in situ at Didymos, including possible changes in the moon's properties and dynamics. The decision to launch the european AIM component will take place at ESA Council and Ministerial level in December 2016. Meanwhile, four working groups are supporting the mission study, which includes impact modeling issues, ground based observation planing, studies of the dynamics and physical properties of the binary asteroid, and close-proximity operations. The current status of the mission as well as working group activities, in particular concerning the dynamics and physical properties of the binary system, will be presented. References: Michel, P. et al. 2016. Science case for the Asteroid Impact Mission (AIM): a component of AIDA. *Adv. Space Res.*, in press; Cheng et al. 2016. AIDA Mission: Kinetic Impactor. *Plan. Space Sci.* 121, 27-35. AIDA web site: <http://www.oca.eu/AIDA/>