ITN Stardust

Close-Range Navigation and Manipulation of Space Debris and Asteroids

S T A R D U S T

PUSHING THE BOUNDARIES OF
SPACE RESEARCH TO SAVE OUR FUTURE

Goal

The Initial Training Network (ITN) Stardust will provide Europe with a first generation of decision makers, engineers and scientists that have the knowledge and capabilities to address the asteroid and space debris issue now and in the future. The overriding goal of this network is to train researchers to develop and master techniques for asteroid and space debris monitoring, removal/deflection and exploitation such that they can be applied in a real scenario.

The researcher at the DFKI will work in the fields of active removal/deflection of uncooperative targets specifically on close-range navigation and manipulation of space debris and asteroids.

Background and Motivation

Asteroids and space debris represent a significant hazard for space and terrestrial assets; at the same time asteroids represent also an opportunity. In recent years it has become clear that the increasing amount of space debris could lead to catastrophic consequences in the near term.

The Kessler syndrome (where the density of objects in orbit is high enough that collisions could set off a cascade) is more realistic than when it was first proposed in 1978. Though statistically less likely to occur, an asteroid impact would have devastating consequences for our planet. Although an impact with a large (~10 km) to medium (~300 m) sized, or diameter, asteroid is unlikely, still it is not negligible as the recent case of the asteroid Apophis has demonstrated. Furthermore impacts with smaller size objects, between 10 m to 100 m diameter, are expected to occur more frequently and hence are,

proportionally, equally dangerous for humans and assets on Earth and in space.

The observation, manipulation and disposal of space debris and asteroids represent one of the most challenging goals for modern space technology. It represents a key scientific and commercial venture for the future in order to protect the space and Earth environment. Such a significant multidisciplinary technical challenge, with real societal benefit for the future, represents a compelling topic for a training network.

Duration: 02/2013 – 01/2017

Partners:
University of Strathclyde, Universitá di Roma Tor Vergata, Universitá di Pisa, University of Southampton, Universidad Politécnica de Madrid, Astronomical Observatory, Consiglio Nazionale delle Ricerche, Dinamica, DEIMOS Space S.L.U., European Space Agency, Centre National de la Recherche Scientifique, Astrium Ltd, Telespazio

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