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AN OVERVIEW OF THE SCIENTIFIC MISSIONS SUPPORTED BY THE ITALIAN SPACE AGENCY

Abstract

The economic investments in the scientific space missions show that space represents a unique opportunity to bring out advances in science, communications and industrial technology, as well as to reinforce the international cooperation. The Italian Space Agency (ASI) has a long standing tradition in supporting scientific missions both at national and international level for a wide spectrum of topics, from the planetary exploration up to the extragalactic astronomy. ASI supports scientific missions as member of the European Space Agency (ESA) or through bilateral agreements with other space agencies, or else by funding projects proposed by national experts. In particular, significant contributions have been provided for the ESA missions, devoted to the discovery and characterization of exoplanets (CHEOPS, PLATO), high energy astrophysics (ATHENA), dark energy and dark matter investigation (EUCLID), planetary and small body explorations (BepiColombo, JUICE, Comet Interceptor), solar activity (Solar Orbiter) and gravitational waves (LISA). Among the ESA Mission of Opportunity, ASI also participates to the projects proposed by JAXA and CAS, devoted to cosmology (LiteBIRD) and X-ray astronomy (eXTP) respectively. Thanks to a bilateral cooperation between ASI and NASA, a new challenge started to characterize the X-ray astronomical sources through the use for the first time of three X-ray polarimeters, that will flight on board of IXPE mission (planned in 2021). At national level, ASI planned to develop a small-satellites constellations for gamma-ray astronomy (HERMES) and to go on with the laser ranging researches (LARES 2). Other activities concern the support to the operations and data-processing of the in-orbit scientific missions developed by ASI with ESA (INTEGRAL, Mars Express), NASA (JUNO, Fermi, SWIFT, NuSTAR, MRO) and JAXA (CALET). We present an overview of the scientific missions currently supported by ASI, in terms of national investments and industrial contributes, as well as by introducing the research fields and the expected scientific results.