

SYMPOSIUM ON TECHNOLOGICAL REQUIREMENTS FOR FUTURE SPACE ASTRONOMY AND
SOLAR-SYSTEM SCIENCE MISSIONS (A7)

Scientific Motivation and Requirements for Future Space Astronomy and Solar System Science Missions (1)

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THE EUCLID SPACECRAFT DESIGN

Abstract

Euclid is a space-based optical/near-infrared survey mission of the European Space Agency (ESA) designed to investigate the nature of dark energy, dark matter and gravity by observing their signatures on the geometry of the Universe and on the formation of large structures over cosmological timescales. Euclid will use two main techniques in the detection of the signature of dark matter and energy: Weak gravitational Lensing, which requires the measurement of the shape and photometric redshifts of distant galaxies, and Galaxy Clustering, based on the measurement of the 3-dimensional distribution of galaxies through their spectroscopic redshifts. The mission is scheduled for a launch date in the first half of 2020 and is designed for 6 years of nominal survey operations. The Euclid Spacecraft is composed of a Service Module and a Payload Module. The Service Module comprises all the conventional spacecraft subsystems, the instruments warm electronics units, the sun shield and the solar arrays. In particular the Service Module provides the extremely challenging pointing accuracy required by the scientific objectives. The Payload Module consists of a 1.2 m three-mirror Korsch type telescope and of two instruments, the visible imager and the near-infrared spectro-photometer, both covering a large common field-of-view enabling to survey more than 35% of the entire sky. Starting from the overall mission requirements, we will describe the spacecraft architectural design and expected performance and will provide a view on the current project status.