

IAF SYMPOSIUM ON FUTURE SPACE ASTRONOMY AND SOLAR-SYSTEM SCIENCE MISSIONS
(A7)
Space Agency Strategies and Plans (1)

Author: Mr. Enrico Suetta
Leonardo Spa, Italy, enrico.suetta@leonardocompany.com

Dr. Enrico Battistelli
Leonardo Spa, Italy, enrico.battistelli@leonardocompany.com

THE SEARCH FOR EXOPLANETS: TELESCOPES FOR CHEOPS AND PLATO AND MORE

Abstract

The CHaracterising ExOPlanet Satellite (CHEOPS) is an ESA “S-class” space mission dedicated to search for exoplanet transits by means of ultra-high precision photometry whose launch is scheduled within 2018. The CHEOPS telescope will be the first space instrument that will be targeted to bright stars already known to host planets, searching for transits. The telescope will be the only payload on-board the fine pointing platform. The CHEOPS optics is a Ritchey-Chretien lightweight telescope with 300 mm effective aperture diameter, which provides a defocussed image of the target star with minimum straylight thanks to a dedicated field stop and a dedicated baffle. The lessons learned from CHEOPS telescope design and manufacturing will be presented, as well as those technological developments that have been transferred to PLATO telescope design. PLATO, instead, is an ESA exoplanet mission –whose name stands for PLANetary Transit and stars Oscillations- scheduled for launch in 2025. Its telescopes combine an high field of view and, at the same time, a large aperture, that has been obtained by dividing the telescope aperture among smaller telescopes, suitably co-registered. Twenty-six telescopes are put in parallel, covering more than 2000 square degrees on the sky. Each telescope is based on a “Telescopes Optical Units” (TOU) design, based on lenses and suitably baffled and grouped in sub-arrays. The telescopes design achievements are presented, as well as the technological development necessary for these telescopes. Once in operations in the Lagrangian Point L2 of the Earth-Sun system, PLATO will set a new standard in the global search for exoplanets. Future telescopes, such as ARIEL, and the trends in the space-based exoplanets search are presented altogether a technological roadmap.