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Press release

PLATO space telescope mission to hunt out planetary systems similar to our own

ESA's Science Programmes Committee has selected the PLAnetary Transits and Oscillation of stars mission (PLATO) designed to study the formation and evolution of planetary systems comprising a star and one or more planets. Scheduled to launch in 2024, PLATO will detect and characterize thousands of exoplanet of all sizes—and likely several tens of them similar to Earth—as well as their parent stars. CNES will provide funding and technical support to science teams at CNRS, the Paris Observatory, CEA and universities to build the instrument and process science data from the mission.

As with all missions on ESA's science programme, Europe's space agency will be in charge of building and launching the satellite and operating it once in orbit. A consortium of European research laboratories will supply the satellite's science payload and the science data processing centre. CNES is one of the principal partners on this project alongside the French national scientific research centre CNRS, the Paris Observatory and CEA, the French atomic energy agency. The French research laboratories involved are the LESIA space and astrophysics instrumentation research laboratory (Paris Observatory/CNRS/Paris Diderot University/UPMC), the IAS space astrophysics institute (CNRS/Paris-Sud University), the LAM astrophysics laboratory in Marseille (CNRS/AMU) and the LAIM astrophysics, instrumentation and modelling laboratory (CEA-IRFU/Paris Diderot University/CNRS).

The 34 telescopes on the PLATO satellite's platform will continuously record the brightness of a million stars for up to three years. These measurements will then be subjected to in-depth analysis to detect the mini-eclipses that occur when a planet passes in front of its star, and to study star vibrations to deduce their behaviour, a field known as asteroseismology.

PLATO will extend these methods already proven by CNES's CoRoT mission and NASA's Kepler mission to scan a very large number of bright and close stars for very long periods. These two aspects are crucial, as long surveys will be able to detect exoplanets with long orbital periods (a year, for example) far enough from their stars to be in the 'habitable zone' where any water on their surface will be in liquid form, thought to be a prerequisite for life as we know it. Only bright stars will be selected for study so that the most interesting discoveries can be observed with powerful ground telescopes.

Combined with other complementary ground or space measurements, like those from GAIA, data from PLATO will enable scientists to characterize as fully and precisely as possible any planets detected transiting their star. To identify Earth-like planets unambiguously, we need to be able to precisely measure their radius, mass and mean density, as well as their age. That level of precision will be obtained by very precise seismic measurements to determine these same parameters for their parent stars, which must be known for planet calculations.

Such information obtained for a wide spectrum of planetary system properties will yield new insights into the mechanisms governing the formation and evolution of planetary systems and the processes driving how stars and planets interact.

More information:

http://smsc.cnes.fr/PLATO/Fr/index.htm
http://lesia.obspm.fr/PLATO.html
http://irfu.cea.fr/Sap/Phocea/Vie_des_labos/Ast/ast.php?t=fait_marquant&id_ast=3449

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