PLATO spacecraft to find new Earth-like exoplanets

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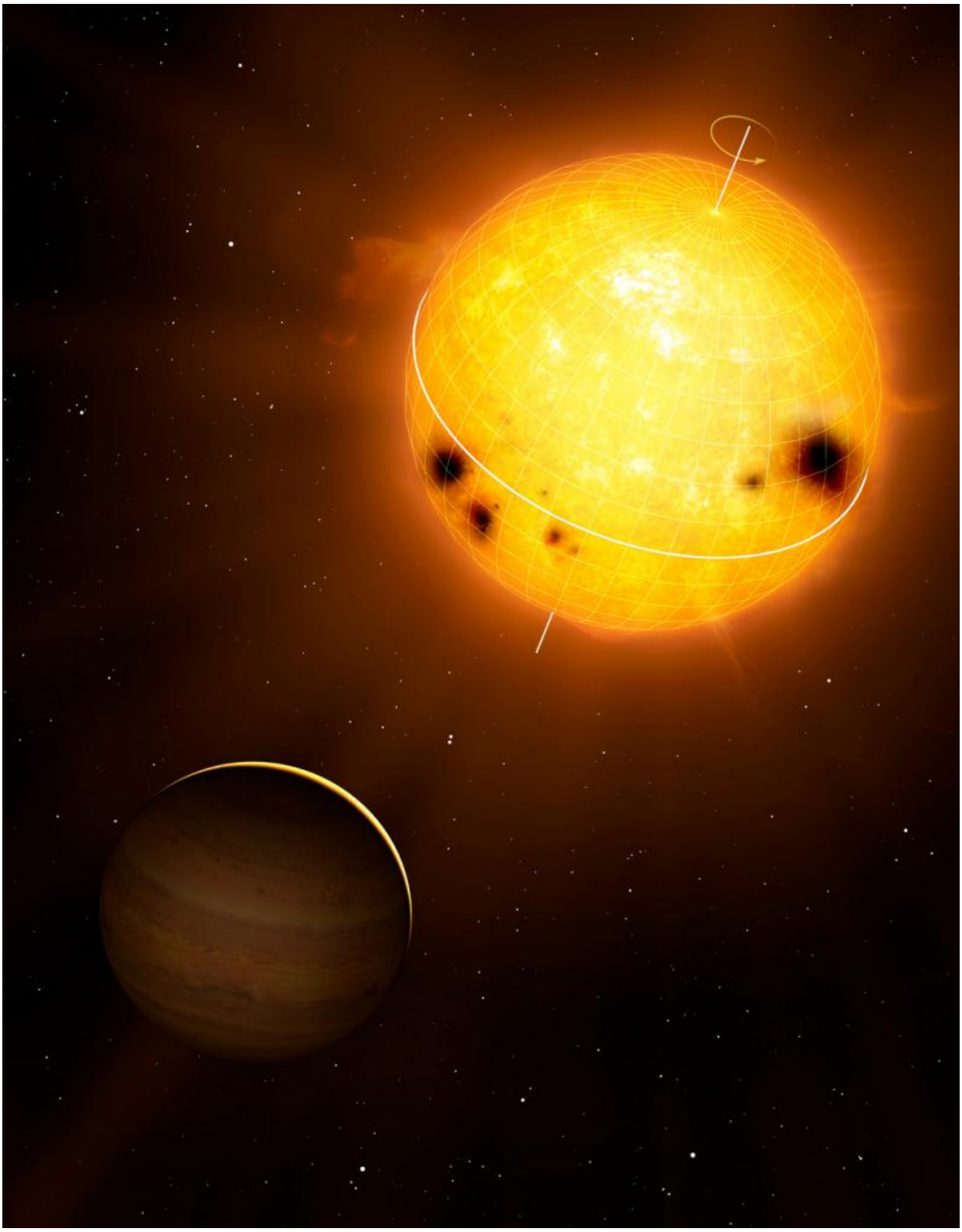

Artist's impression of one of the fascinating new worlds that PLATO will

discover. Among those there will be Earth-like planets around Sun-like stars with the potential to host life. Credit: MPS/ Mark A. Garlick (markgarlick.com)

The planet-hunting and asteroseismology space mission PLATO has reached an important milestone: Today, the European Space Agency (ESA) announced the official adoption of the mission. After a three year definition phase following the mission's selection in 2014, PLATO is now fit for implementation. The launch is scheduled for the end of 2026. In its at least four year lifetime, the spacecraft will search for planets around several hundred thousands of stars; the radii, masses, and ages of many thousands of planetary systems will be precisely determined. The goal is to find habitable worlds and even Earth twins. In close collaboration with many European partners Germany will play a key role in the mission: the German Aerospace Center (DLR) in Berlin will head the overall mission; the Max Planck Institute for Solar System Research (MPS) in Göttingen will lead the processing of the observations at the PLATO Data Center.

Several thousands of exoplanets orbiting distant stars are known to date, many of these discovered by the Kepler and CoRoT space missions. However, these worlds are so far away and their host stars so faint that they cannot be characterized in detail. PLATO will be the first planet-hunting spacecraft capable of discovering and characterizing Earth-like planets around nearby Sun-like stars.

By surveying a large area of the sky for at least four years, PLATO will thus study the full diversity of stars and planetary systems across our galactic neighbourhood. "Using observations of stellar vibrations, PLATO will for the first time fully characterize these stars and their planets with regard to mass, radius, and age", says Prof. Dr. Laurent Gizon, director of the MPS and head of the PLATO Data Center. "This

will revolutionize the study of the evolution of exoplanets and their host stars", he adds. The ultimate goal of the mission is to find an Earth-twin.

"We are very pleased that PLATO has reached adoption and that the mission is now moving forward into its next decisive phase", says Gizon. In the past three years since the selection of the mission, scientists at ESA, DLR-Berlin, MPS, and other European partner institutions have worked on specifying the mission's technical and programmatic details necessary to achieve the scientific goals within time and budget. With today's adoption, the implementation – the actual building and construction of the spacecraft and its instruments – can begin. In parallel, the design of the software to analyse the observations will be developed at the PLATO Data Center.

PLATO's instrumentation chiefly consists of 26 telescopes mounted on one satellite platform making it possible to gaze at very large area of sky at once. PLATO observes the dimming of a star's light when a planet passes in front of it. The spacecraft will stare at patches of sky for up to two years, in order to capture two transits of an Earth twin. It will change its field of view several times during the mission to find exoplanets across the sky. "With this concept and the high precision of the instrument we will find rocky planets orbiting sunlike stars and will be able to characterise them accurately", says Prof. Dr. Heike Rauer from DLR-Berlin, who is the Principal Investigator of the mission.

The observations from the mission will be processed by the PLATO Data Center, which consists of several data processing units across Europe and a central database located at the MPS in Göttingen (Germany). The scientists expect to be handling several petabytes of scientific data by the end of the mission. With support from the German Space Agency (DLR Raumfahrt-Agentur in Bonn) the PLATO Data Center will now start developing the computer software for the processing of the scientific data to ensure smooth operations when the

first data arrives.

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