

IAF SPACE EXPLORATION SYMPOSIUM (A3)  
Solar System Exploration including Ocean Worlds (5)

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## THE SOLAR ORBITER MISSION: THE SUN UP CLOSE

**Abstract**

After the continuing success of the Solar Heliophysics Observatory (SOHO), launched in 1995, ESA is readying the Solar Orbiter spacecraft for launch in February 2020. Solar Orbiter is an ESA-led mission with strong NASA participation.

Solar Orbiter's main scientific goal is to address the central question of Heliophysics: How does the Sun create and control the heliosphere.

To achieve this goal, the Spacecraft will carry a unique combination of 10 scientific instruments (6 remote-sensing instruments and 4 in-situ instruments) towards the innermost regions of the Solar System, as close as 0.28 AU during part of its orbit. The orbital inclination will be progressively increased so that the spacecraft reaches higher solar latitudes (up to 34 degrees close to the end of the mission), making detailed studies of the Sun's polar regions possible. The in-situ measurements of the solar wind plasma, fields, waves, and energetic particles close enough to the Sun will be traced back to their source regions and structures on the Sun through simultaneous, high-resolution imaging and spectroscopic observations both in and out of the ecliptic plane.

This paper presents the spacecraft and its intended trip around the Sun. It will also discuss the main engineering challenges that had to be addressed during the development cycle, integration and testing of the Spacecraft, including the specific requirements on thermal environment, EMC characterization, magnetic cleanliness and contamination control. Last but not least, some lessons learnt will be shared for the benefit of future multi-instrument science missions.