## Solar Wind Measurements on Solar Orbiter: Discovering the Links between the Solar Wind and the Atmosphere of Our Sun

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The Solar Orbiter spacecraft, a collaborative mission between ESA and NASA, will be launched in 2017 and will include the Solar Wind Analyzer instrumentation suite. This space mission will allow for unprecedented data collection of particle characteristics near the Sun at various heliolatitudes during both the quiet and active phases of the solar cycle. The close proximity will allow for determination of the source regions on the sun for the observed events. Of particular interest will be the study of the origins of and processes related to solar energetic particles. This mission will lead to a better understanding of the Sun and the interstellar medium in our solar system.

The Solar Wind Analyzer (SWA) suite is composed by a comprehensive set of sensors to characterize the Solar Wind plasma: the Electron Analyzer System to determine the properties of solar wind electrons, the Proton and Alpha Sensor to measure at high cadence the distribution functions of protons and alphas, and the Heavy Ion Sensor to analyze the minor ion components of the solar wind.

As a result of the measurements SWA will take, we will be able to: Identify interplanetary shocks and characterize their spatial and temporal evolution; characterize the power spectra of density and velocity fluctuations upstream and downstream of shocks; study the heating and dissipation mechanisms at shocks at various radial distances and latitudes; and identify the mechanisms that heat thermal solar wind ions near shocks and determine the energy partition at shocks.