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# The Solar Orbiter Dust Telescope

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Dust particles inside 1 AU originate from comets and asteriodal debris, but their relative contributions are not known. Their sizes range from millimeter objects to submicron meteoroids. The objectives of the instrument are to determine the spatial distribution and the compositional diversity of different dust populations within 1 AU. Further studies investigate the sources of the micrometeoroids, their interaction with the solar wind and the generation of collisional fragments and pick-up ions.

The dust telescope proposed measures the trajectory (<10 deg), speed (1-50 km/s), mass ($10^{-18}$ - $10^{-9}$ kg), primary charge (0.1 to 100 fC) and elemental composition (mass resolution >100) of individual dust grains. The telescope combines a trajectory sensor (based on individual wires to measure the induced charge) and a time-of-flight mass spectrometer (analysis of the chemical composition). The sensitive area of the impact ionisation based instrument is 110 $cm^2$. The instrument consumes 10 Watts and has a mass of 2 kg.