

The Herschel far-infrared and submillimetre space observatory

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The Herschel Space Observatory is the fourth cornerstone mission in the European Space Agency (ESA) science programme. It will perform imaging photometry and spectroscopy in the far infrared and submillimetre part of the spectrum, covering approximately the 60-650 micron range. Compared to previous FIR facilities, it will improve angular resolution by a factor of 4.

The key science objectives emphasize current questions connected to the formation and evolution of galaxies, stars, and our own planetary system. Many of these observations critically depend on angular resolution, which the FIR has been lacking to date, to resolve e.g. individual prestellar condensations in molecular clouds or the sources that constitute the Cosmic Infrared Background.

Herschel will carry a 3.5 metre diameter passively cooled telescope. The science payload complement - two direct detection cameras/medium resolution spectrometers (PACS and SPIRE) and a very high resolution heterodyne spectrometer (HIFI) - will be housed in a superfluid helium cryostat.

Once operational in orbit around L2 sometime in 2008, Herschel will offer a minimum of 3 years of routine observations; roughly 2/3 of the available observing time is open to the general astronomical community through a standard competitive proposal procedure.

We present the design and the expected performance of the telescope and the instruments, report on the current implementation status of the various elements that together make up the Herschel mission, introduce the mission from the perspective of the prospective user of this major facility, and describe the plans for announcing observing opportunities.