THE HERSCHEL SPACE OBSERVATORY, FAR INFRARED PHOTOMETERY AND SPECTROSCOPY WITHOUT THE ATMOSPHERE

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The Herschel Space Observatory is the fourth European Space Agency corner stone mission in the Horizons 2000 science program. Herschel will be a multi user observatory with a passively cooled (80 Kelvin) 3.5 meter telescope and three cryogenic instruments covering the 670 to 57 μm spectral region. The required mission life time is ¿3 years in the L2 orbit. Herschel will share an Ariane 5 launch with PLANCK in early 2007. The three payload instruments include the Spectral and Photometric Imaging Receiver (SPIRE), which is a three band bolometer based array and a Martin-Puplett FTS with R¡1000 between 200-670 μm, the Photodetector Array Camera and Spectrometer (PACS), which is a three band bolometer based photometer and a grating spectrometer with a photoconductor array with R¡3000 between 57-200 μm and the Heterodyne Instrument for Far Infrared (HIFI), which is a series of seven heterodyne receivers covering 480-1250 GHz and 1410-1910 GHz. The Herschel science program will focus understanding the development, structure and dynamics of galaxies, the stellar life cycle and the molecular universe. In order to achieve the science objectives, Herschel will make many photometric images and many detailed spectral surveys of a wide variety of objects previously obscured by the atmosphere.