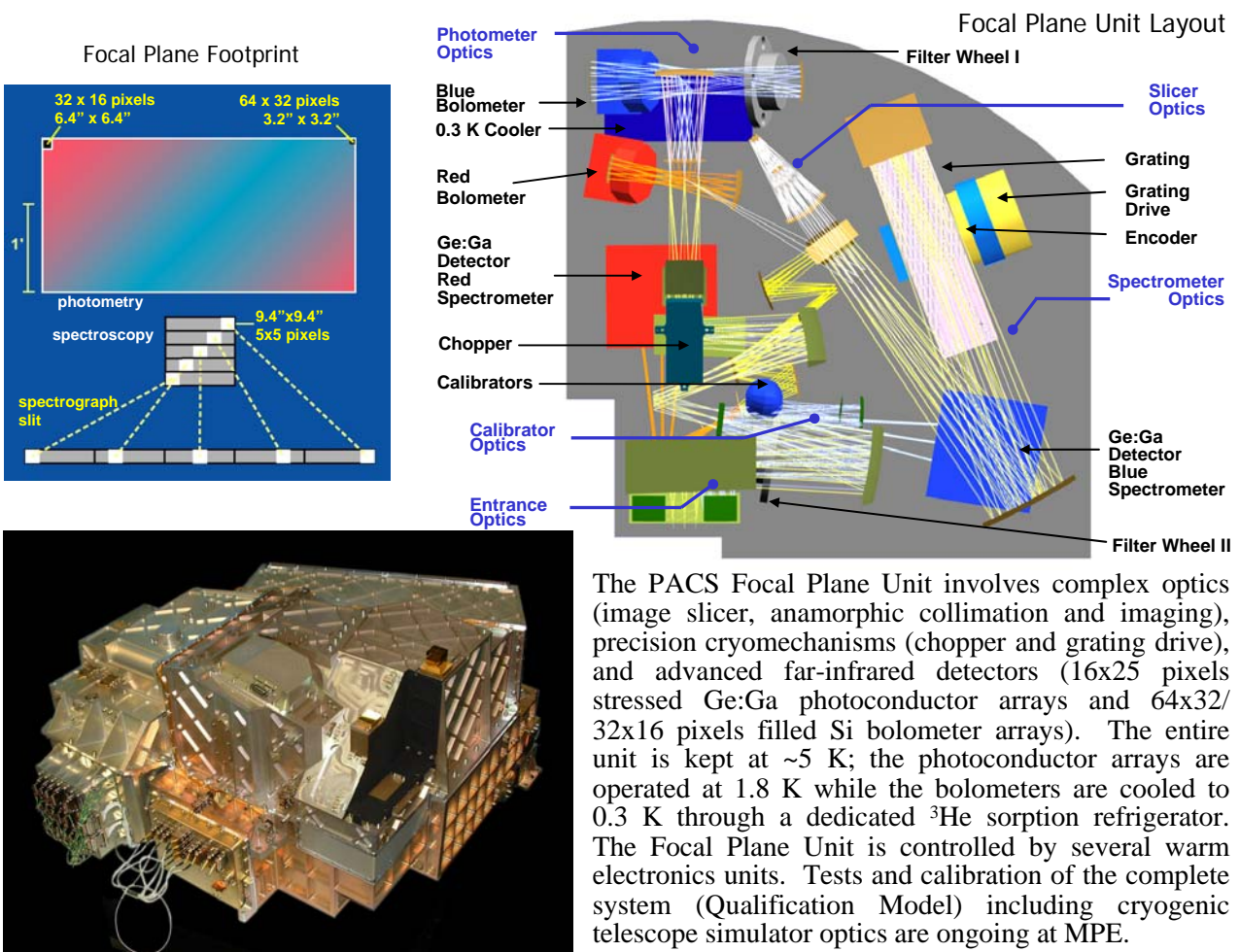


The Herschel Space Observatory, an ESA cornerstone mission to be launched in summer 2007, will explore the formation and evolution of galaxies and stars through photometric and spectroscopic observations in the far-infrared and submillimeter wavelength range. With a 3.5 m telescope, passively cooled to ~ 80 K, it will step into a new regime of angular resolution and sensitivity at these wavelengths and, for the first time, allow observations of luminous objects in the distant universe at the expected peak of their emission.

MPE as the PI-institute in a European consortium of 15 institutes from 6 countries is leading the construction and operation of one of the three focal plane instruments, the Photodetector Array Camera & Spectrometer (PACS). PACS will be a combined imaging photo/spectrometer for the wavelength range 57–210 μm . In its photometric mode it will image two bands simultaneously (60-85 or 85-130 μm and 130-210 μm) with point a source detection limit of ~ 3 mJy (5σ , 1h), enabling e.g. deep surveys of the extragalactic FIR background down to the confusion limit. In spectroscopy mode PACS will image a field of $\sim 50'' \times 50''$, resolved into 5×5 pixels, with an instantaneous spectral coverage of ~ 1500 km/s at a spectral resolution of ~ 75 –300 km/s and with a point source detection limit of 3 – 10×10^{-18} W/m² (5σ , 1h).



The PACS Focal Plane Unit involves complex optics (image slicer, anamorphic collimation and imaging), precision cryomechanisms (chopper and grating drive), and advanced far-infrared detectors (16x25 pixels stressed Ge:Ga photoconductor arrays and 64x32/32x16 pixels filled Si bolometer arrays). The entire unit is kept at ~ 5 K; the photoconductor arrays are operated at 1.8 K while the bolometers are cooled to 0.3 K through a dedicated ³He sorption refrigerator. The Focal Plane Unit is controlled by several warm electronics units. Tests and calibration of the complete system (Qualification Model) including cryogenic telescope simulator optics are ongoing at MPE.

Poglitsch, A., Waelkens, C., Geis, N., Proceedings of the SPIE, Volume 4850, pp. 662-673 (2003)

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