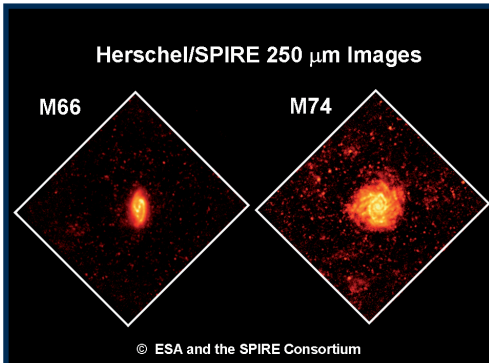


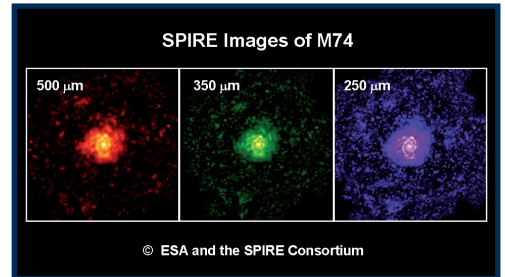


# SPIRE

The UK ATC is part of a consortium of 15 institutes in the UK, France, Spain, Italy, Sweden, Canada and the USA which was formed to build SPIRE, the Spectral and Photometric Imaging REceiver instrument for the Herschel Space Observatory.



SPIRE is one of three instruments on board the Herschel telescope. It consists of a 3-band imaging photometer operating at 250, 350 and 500  $\mu\text{m}$  and an imaging Fourier Transform Spectrometer operating over the wavelength range 200–670  $\mu\text{m}$ . It has been optimised for submillimetre wavebands that are difficult to access from the ground. By measuring the far infrared and submillimetre emission from gas and dust heated by young stars, SPIRE will help astronomers understand the formation and evolution of distant galaxies and the physics of star formation in our own galaxy.



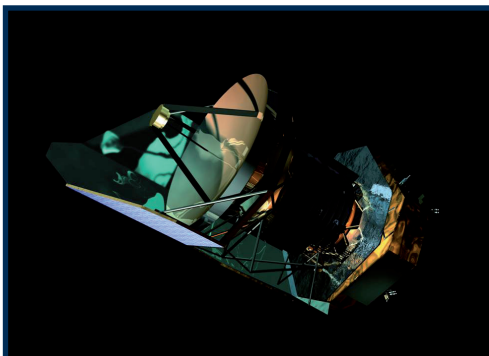
measure alternately regions of the astronomical source of interest and a nearby region of sky. This chopping motion is necessary because it enables changes in the background radiation entering the telescope to be removed from the astronomical signal, improving the accuracy and sensitivity of the measurements.

## The Herschel Space Observatory

The Herschel Space Observatory, launched in May 2009, is the fourth major (cornerstone) mission in ESA's Horizon 2000 programme. With a 3.5m primary mirror, it is the biggest space telescope ever flown.

Herschel provides the astronomical community with a powerful multi-purpose observatory capable of observations in the relatively unexplored 50–700  $\mu\text{m}$  (far-infrared through submillimetre) wavelength range. It is currently undergoing commissioning, and will begin routine operations in late 2009.

## SPIRE



## UK ATC Involvement

In collaboration with other institutions, the UK ATC participated in the project start-up and developing the overall instrument design, and made major contributions to the initial opto-mechanical design of the photometer channels (i.e. the camera optics and layout), and the concepts for the chopper or beam steering mechanism.

The UK ATC is responsible for the design, testing and manufacture of the beam steering mechanism. We are also contributing to the focal plane systems engineering, a key role in ensuring that the final instrument performance will meet the astronomical requirements. We are also contributing effort towards the instrument control centre design – the software necessary to deal with the data that SPIRE will produce.

The beam steering mechanism is the second mirror that the beam from the telescope will encounter when it enters the instrument. It can be moved rapidly back and forth between various angles, so that the detectors

## First Light

Early images from SPIRE demonstrate that the system is working well, and provide an tantalising glimpse of the sort of ground breaking data Herschel will be capable of producing. The detail of the structure in these images show the power of Herschel's large primary mirror. In addition, the vast number of distant galaxies seen in the background (all those small blobs) also demonstrates SPIRE's great sensitivity.

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