

Invited lecture

**A NEW VIEW ON THE ISM OF GALAXIES:
FAR-INFRARED AND SUBMILLIMETRE SPECTROSCOPY
WITH HERSCHEL**

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The far-infrared and submillimetre window is amongst the least explored spectral regions of the electromagnetic spectrum. It is, however, one of the most interesting regions to study the interstellar medium of both the Milky Way and other galaxies. Roughly 30% of the bolometric luminosity of galaxies is emitted in the FIR/submm region. Moreover, the FIR/submm region contains important spectral diagnostics, including many rotational lines from molecular gas (CO, H₂O, ...) and fine structure lines from atomic gas.

The European Herschel Space Observatory, to be launched in April 2009, will be the first ever instrument to cover the entire range between 60 and 600 μm . Onboard will be three instruments: PACS and SPIRE are two imaging spectrographs, HIFI is a high-resolution submillimetre spectrograph. In this talk we will discuss the enormous science potential of the Herschel mission and the main extragalactic key programs planned. We will focus on the wealth of spectral lines in the FIR/submm region and what they can teach us about the interstellar medium in nearby galaxies.