Foreword

It is a pleasure for me to write a few words introducing the current volume containing the Proceedings of the Les Houches winter school of theoretical physics "Astronomy in the submillimeter and far infrared domains with the Herschel Space Observatory" which was held on 23 April – 4 May 2007.

In the past Les Houches schools have repeatedly played an important role in preparing the user community for important new instruments. With this positive track record in mind the current school was organised to provide the participants with a good base to enable them to exploit the exciting scientific capabilities to be offered by the European Space Agency Herschel Space Observatory.

Herschel will be launched in April 2009, and after an initial six month shakedown period will offer the astronomical community three years of unprecedented observational capabilities in the poorly explored 55–672 mm far infrared and submillimetre part of the spectrum. The observatory will carry a 3.5 metre diameter telescope and a suite of three science instruments into space; PACS and SPIRE are cameras and imaging spectrometers, while HIFI is a very high spectral resolution heterodyne spectrometer. By necessity these instruments make use of a variety of detector technologies, including two different bolometer technologies, photoconductors, and two different mixer technologies, and they are also quite different in optical design. As a consequence the way to conduct observations with Herschel will to a degree depend not only on the observational objectives but also on the instruments used. Thus it is important that the user community has an understanding of the observatory and its instruments as well as the observing planning tool HSpot in order to design good observations.

The school presented Herschel as an observatory from the perspective of the prospective user, and provided detailed lectures on how to design Herschel observations using the Herschel observation planning tool HSpot. In addition the school provided lectures on many of the astronomical areas where the contribution of Herschel is expected to be particularly significant. The school was attended to the capacity of the venue by young astronomers from Europe, USA, Mexico, China and Japan. The lecturers included members of the Herschel Science Team, Herschel Science Centre, and prominent invited astronomers. Everyone enjoyed the natural beauty of the venue facing the Massif du Mont Blanc which was visible bathing in sunshine for most of the time, and the convivial atmosphere created during lectures, meals, and spare time, including outdoor activities of various kinds. Some daredevils were reported to have skied the Vallee Blanche during the weekend. The organisers should be congratulated for making not only all of this possible but also very enjoyable.

These Proceedings are the tangible legacy of the school, but the real legacy of the school is the knowledge and spirit absorbed by and networks created among a new generation of astronomers ready to use Herschel. In the not too distant future we shall witness the results!

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