

## *Preface*

# **The Twelfth EISCAT International Workshop**

This special issue contains invited and contributed papers presented at the 12th bi-annual EISCAT International Workshop held at the Swedish Institute of Space Physics in Kiruna, Sweden, from 29 August to 2 September 2005. So far peer-reviewed papers from all EISCAT workshops have been published in Special Issues.

The EISCAT Scientific Association is heading towards exciting new challenges. A new agreement for the organisation was recently signed, starting in 2007. In addition, a four-year-long European Union-financed design project “EISCAT\_3D” for a third generation phased array Incoherent Scatter Radar (ISR) is well underway. To cater for future needs for expertise, the Workshop was preceded by an eleven-day-long Incoherent Scatter Radar school, also hosted by the Swedish Institute of Space Physics in Kiruna. The school was attended by 50 students and 20 lecturers from the international ISR community. The lecture notes are available on-line at [http://documents.irf.se/get\\_document.php?group=Administration&docid=442](http://documents.irf.se/get_document.php?group=Administration&docid=442).

The workshop was attended by 107 scientists from 15 countries. It was organized according to topic and included 12 oral sessions and a poster session. The topics covered the traditional ionospheric regions: mesosphere, thermosphere, and coupling to the magnetosphere where ISRs have been very powerful instruments, providing data for nearly 5 decades. New techniques, mostly based on multi-antenna arrays, promise a further stride forward as regards the capabilities of ISRs. For example the novel usage of the existing two antennas on Svalbard as an interferometer has already produced exciting results. Such progress in measurement technique is most welcome, since the effects of solar wind and geomagnetic variability on the space plasma, ionosphere and upper atmosphere are still not fully understood. Computer simulations of the coupled complex systems are becoming more and more advanced, and can be matched increasingly successfully to real measurements such as those from ISRs. The EISCAT radars have also been very powerful tools for studying the heliosphere and its properties, the source of many phenomena in the magnetosphere, ionosphere, and atmosphere. The 8 papers selected by the peer-review process for this special issue inform the reader about a subset of the many results that were presented at the workshop.

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*Special Issue Editors*