

Third International School on Atmospheric Radar

ISAR-3
ICTP smr1436

Abdus Salam International Centre for Theoretical Physics
Trieste, Italy, 25 November - 13 December 2002

Over the past decades the application of radar techniques to study the structure and dynamics of the mesosphere, stratosphere and the troposphere has continuously grown and quite a few new systems of this kind have been added in the past years. This MST - radar technique has even evolved into applications for operational meteorology, which have become known as wind profiling.

The wide-spread applications of these radars for scientific research of the atmosphere and for meteorological operations demand a proper knowledge of such atmospheric radar systems, and of the analysis, validation and interpretation of the acquired data. The school ISAR-3 is held for the purpose of training young researchers and students, who are active in or have a proven relation to this area, or can certify a solid interest and a sound perspective on this research and the technique.

The school covers the following subjects:

Fundamentals of atmospheric radar, hardware and basics of signal acquisition, data analysis and validation, special applications such as interferometry, scattering of radar waves, atmospheric winds, waves and turbulence, meteorology of the troposphere and stratosphere, mesosphere and the aeronomy of the lower ionosphere.

The lecturers of ISAR-3:

Dr. Philip Chilson holds a joint research position with the University of Colorado (CIRES) and the NOAA (Environmental Research Laboratory), USA. He has also worked as a research scientist at the Max-Planck-Institut für Aeronomie in Germany and the Swedish Institute of Space Physics in Sweden. His current research focuses on the development of novel radar techniques for exploring the Earth's atmosphere and the use of the resulting data to advance our understanding of atmospheric physics.

Prof. Wayne Hocking received his Ph.D. from Adelaide University, Australia. He was Humboldt stipendiat visiting the Max-Planck-Institut für Aeronomie in Germany. He is professor at the Department of Physics and Astronomy of the University of Western Ontario, in London, Canada. He has done leading research in studying atmospheric dynamics with radar methods.

Prof. Robert Palmer received his Ph.D. in electrical engineering from the University of Oklahoma in 1989. From 1989 to 1991 he was a postdoctoral fellow at the Radio Atmospheric Science Center of Kyoto University, Japan. After his stay in Japan, Prof. Palmer held the position of research associate in the Physics Department of Clemson University, South Carolina. He joined the faculty of the Department of Electrical Engineering of the University of Nebraska-Lincoln in January of 1993, where he now holds the rank of Associate Professor. He has published over thirty journal articles in the general area of radar remote sensing of the atmosphere, with emphasis on the use of advanced signal processing algorithms.

Prof. Sandra Radicella is head of the Aeronomy and Radio Propagation Laboratory at the ICTP.

Prof. D. Narayana Rao is head of the Department of Physics of the Sri Venkateswara University in Tirupati, India. He is also coordinator of the UGC-SVU Centre for MST Radar applications using extensively the National MST Radar Facility at Gadanki in India. He was visiting professor to Nagoya University and has done extensive research and teaching on atmospheric science achieved with radars.

Dr. Jürgen Röttger got his Ph.D. from Göttingen University, Germany. He is adjunct professor at the National Central University in Taiwan and affiliated with the Max-Planck-Institut für Aeronomie in Germany. Besides extensive early work on ionospheric irregularities in the equatorial region, he has been involved in the mesosphere-stratosphere-troposphere radar technique and science from the beginning of this research direction in the middle 1970s. He spent research visits to many radar observatories all over the world. He was head of the atmospheric section at the Arecibo Observatory in 1985 and director of the EISCAT Scientific Association 1986-1997. He has written several review and tutorial papers on atmospheric radar and taught classes at universities and lecture courses at radar schools, such as at the International Center for Theoretical Physics in Trieste. He has developed and made extensive scientific use of MST radars and incoherent scatter radars. The most recent ones, where he was the responsible project leader during construction and first operations, were the EISCAT Svalbard Radar and the SOUSY Svalbard Radar.

ISAR-3
Provisional schedule

- Week 1** Fundamentals of atmospheric radar
Basic methods, hardware
Radar control
Radar in meteorology
- Week 2** Signal acquisition
Data analysis and validation
Special techniques (e.g., interferometry)
Scattering and reflection
Waves and turbulence
- Evening public lecture:**
"Radar imaging of our atmosphere"
- Week 3** Radar meteorology
Middle atmosphere (ionosphere, ...)