The Institute of Communication Networks and Satellite Communication together with JOENNEUM RESEARCH Digital invites you to following

Guest Lecture

Merhala Thurai-Rajasingam

Colorado State University, Fort Collins, CO, USA

Titel: Polarimetric Weather Radars: Applications, Accomplishments and Challenges – a Tribute to Prof. V.N. Bringi

When: Wednesday, April 9, 2025, 10:00 am

Where: Seminar room HF01092, Inffeldgasse 12/1, 8010 Graz

Abstract:

Polarimetertic weather radars have long been used to derive rain drop size distributions (DSDs) and their spatial variations. The original paper by Seliga and Bringi published nearly 50 years ago showed via theoretical calculations that rain fall estimates can be improved in accuracy if the added parameter, the differential reflectivity (Z_{dr}) between the horizontal and vertical polarizations, is used in combination with the backscatter reflectivity (Z_h) for horizontal polarization. This was soon followed by practical demonstrations of Z_h and Z_{dr} measurements at S-band during field experiments. The use of the S-band dual polarization measurements for radiowave propagation applications was also demonstrated soon after the theoretical considerations, e.g. rain attenuation effects on communication links and somewhat later on studies relating to interference due to hydrometeor scatter. Since the original work back in 1976, applications of polarimetric weather radars have proliferated. Applications include radar meteorology, hydrology, radiowave propagation, rain/ice microphysics as well as non-meteorological applications such as smoke plume detection. Examples of such applications will be presented as well as discussion on the uncertainties relating to rainfall estimates and drop size distributions (DSDs). Factors such as drop oscillations, fall velocities, DSD models and their impact on radar retrievals will be the main focus.

Biography:

Merhala Thurai is a research scientist at Colorado State University, USA. She received her B. Sc. in Physics from Imperial College, London, in 1980 and her Ph. D. in Physics from King's College, London, in 1985. After one year of post-doctoral experience, she joined the Tropospheric Propagation Group at Rutherford Appleton Laboratory, Oxon, UK in 1986. Her work was primarily related to radiowave propagation, especially evaluating interference due to hydrometeor scatter and other precipitation effects on terrestrial and earth-space links. This entailed both experimental projects as well as simulations using dual-polarization radar data. She joined the polarimetric weather radar group at Colorado State University (Electrical and Computer Engineering Department) in 2004 and has been primarily involved with radar data analyses as well as studies relating to rain drop shapes, drop oscillations, fall velocities and drop size distributions. She has participated in several field campaigns in climatically different locations.