

**Lecture for IEEE AP-S Fukuoka chapter**

Date: 2011 August 30 (Tue), Time: From 09:30 – 11:30 morning

Place: Lecture Room 24, 2nd Floor at Building No.2, Faculty of Engineering at Nagasaki University, Nagasaki

**Lecturer:** Dr. Wolfgang-Martin Boerner, Professor Emeritus and Director UIC-ECE Communications, Sensing & Navigation Laboratory

**Lecture title:** *Development of airborne, high-altitude and space-borne microwave POL-IN-SAR Sensors for environmental remote sensing in agriculture & forestry, and geo-environmental stress-change monitoring for East and South Asian regions*

**Abstract:** With the un-abating global population increase our natural resources are stressed as never before, and the global day/night monitoring of the terrestrial covers from the mesosphere to the litho-sphere becomes all the more urgent. Microwave radar sensors are ideally suited for space imaging because those are almost weather independent, and microwaves propagate. The basic radar technologies to do the job are the multimodal Synthetic Aperture Radar (SAR) sensors, for which in the meantime these separate international multi-modal fully polarimetric and also interferometric SAR developmental efforts culminated in a well coordinated group effort of operating Fully Polarimetric Satellite SAR Sensors at L-Band (ALOS-PALSAR launched by JAXA/Japan in 2006 January), at C-Band (RADARSAT-2 launched by CSA-MDA in 2007 December) and at X-Band (TerraSAR-X launched by DLR-Astrium in 2007 July). The impressive images obtained, represented the greatest advancement in space remote sensing since the launch of the NASA/JPL Sea-Sat Mono-polarization SAR of thirty years ago. All of these three satellite sensors provide high-resolution images at close to or better than 1 meter, respectively, and are fully polarimetric in order to be able to differentiate next to shape and scatterer orientation also dielectric parameters of vegetated natural and/or man-made scatterers. It is the objective of this comprehensive state-of-the-art-review to demonstrate why every effort ought to be made for incorporating fully-polarimetric POL-SAR sensors for the next generation SAR sensors and its pertinent implementation.