URSI Union Radio-Scientifique Internationale
International Union of Radio Science

COMMISSIONE ITALIANA URSI
CONVEGNO URSI ITALIA

10 settembre 2012

Centro Ricerche ENEA- Via E. Fermi 45- Frascati, Roma
e
Facoltà di Ingegneria dell'Università Roma Tre, Via della Vasca Navale 79/81, Roma

PROGRAMMA

I parte
Centro Ricerche ENEA, Frascati, Roma

ore 10:30-12.30 Visita laboratori Centro Ricerche ENEA Frascati
ore 12:30-13:30 Pausa pranzo
ore 13.30-14:30 Trasferimento Roma TRE

II parte.
Facoltà di Ingegneria dell'Università Roma Tre. Aula N11

ore 14:30-16:00. Riunione aperta della Commissione URSI Italia

ore 16:00-18:00. Sessione Tutorials

- Commission B – Fields and Waves. Gaetano Marrocco, Università di Roma Tor Vergata

The Electromagnetic Way to the Internet of Things

The Internet of Things can be considered as a positive convergence among a number of heterogeneous disciplines (wireless communication, identification, real-time localization, sensor networks, pervasive computing) that enable the Internet to get into the real world of physical objects interacting with web services. Things equipped with electronic tags, having both identification and sensing capability, could be naturally turned into digital entities, readable in wireless modality. The Radiofrequency Identification (RFID) technology offers the natural background to achieve such features, provided that the basic Physics governing the sensing and electromagnetic interaction phenomena is fully exploited. The synergic interaction of the classic Electromagnetics with the Materials Science, Computer Science, Sensors, Medicine, Mechanics and Electronics potentially originates a new research edge discipline, a kind of Pervasive Electromagnetics, that promises in the near future a rich fan of sensing radio devices, ready to be seamlessly embedded into objects as well as over and even inside the human body, so becoming one of the enabling technologies for the Smart Cities and Smart Environment, Precise Agriculture, and e-Health.
This talk will describe how transforming bare antennas or antennas doped with new materials (shape memory alloys, carbon nanotube and conductive polymers) into passive RFID sensors, by the help of many computer-simulated and experimental examples concerning the wireless sensing of the environment (vapors, gases, temperature, deformations) and the much more challenging sensing of Humans (motion and diseases).

- Commission D – Electronics and Photonics: Stefano Selleri, Università degli Studi di Parma

Il progetto ALPINE

The presentation will highlight the scientific results of the FP7 ALPINE project with emphasis on the fiber laser applications and exploitation of new photovoltaic modules. New devices achieved by the project and their market impact will be discussed as well.

- Commission F – Wave Propagation and Remote Sensing: M. Brogioni, S. Paloscia, P. Pampaloni, Pettinato, E. Santi (IFAC-CNR, Firenze)

Microwave Remote Sensing of snow

Remote sensing of snow cover, and in particular the monitoring of snow water equivalent (SWE), is crucial in the study of hydrological cycle including climate changes, as well as in several economical factors such as water management, hydro-electrical power, tourism, natural disaster. optical sensors can monitor snow cover in cloud free conditions. However, only microwave sensors are able to acquire data independently of day light and in adverse weather conditions

as well as to estimate SWE. Multifrequency Radiometers operating at frequencies, between 10 and 40 GHz, revealed a good sensitivity to SWE, but their operational capability is limited by the poor spatial resolution (5- 20 Km). On the other hand, due to the high transmissivity of dry snow at frequencies lower than 10-12 GHz the estimation of SWE with the present available satellite SAR systems (C-X- band) is a challenge. This presentation, which includes experimental results and model analyses, summarizes the potential of both types of sensors in producing maps of snow cover and SWE at regional and global scale. Particular attention has been paid to the capability of the recent ASI/Cosmo-Skymed mission. Synergetic combination of active/passive sensors is suggested for operational use.

- Commission H – Waves in Plasma: Angelo Tuccillo, UTFUS-MAG, Associazione EURATOM-ENEA sulla Fusione, Centro Ricerche Frascati

High power RF in Fusion Plasmas: from 10s of MHz to 100s of GHz

The presentation will summarise the use of high power RF systems to heat, control and drive non inductive current in magnetically confined plasmas. A brief history with major achievements and perspective for future reactors “ITER - DEMO” will be presented for Ion Cyclotron (ICRF, 10-100 MHz), Lower Hybrid (LH, 8 GHz) and Electron Cyclotron (EC, 20-300 GHz) systems.