HAWAII CENTER FOR ADVANCED COMMUNICATIONS

College of ENGINEERING
UNIVERSITY OF HAWAI'I AT MĀNOA

IEEE
MTT-S Hawaii Chapter

Presents AP Distinguished Lectures in Hawaii:

Peter de Maagt, Ph.D.

European Space Research and Technology Centre (ESTEC)
European Space Agency, Noordwijk, The Netherlands

Terahertz Technology for Space and Earth Applications

December 9, 2008 (Tues) *1:30 – 2:30 p.m.*
Holmes Hall Room 389, College of Engineering

The terahertz (THz) part of the electromagnetic spectrum falls between the lower frequency millimetre wave region and, at higher frequencies, the far-infrared region. The frequency range extends from 0.1 THz to 10 THz, where both these limits are rather loose. As the THz region separates the more established domains of microwaves and optics, a typical THz technique will incorporate aspects of both realms, and may even draw on the best of both. The two bounding parts of the spectrum also yield distinct sets of methods of generating and detecting THz waves. These approaches can thus be categorized as having either microwave or optical/photonic origins. As a result of breakthroughs in technology, the THz region is finally finding applications outside its traditional heartlands of remote sensing and radio astronomy. Extensive research has identified many attractive uses and has paved the technological path towards flexible and accessible THz systems. Examples of novel applications include medical and dental imaging, gene theory, communications and detecting the DNA sequence of virus and bacteria. The presentation will discuss the range of THz applications and will present the components and systems that are utilized for the frequency region.

Electromagnetic Bandgap Materials

December 10, 2008 (Wed) *2:00 – 3:00 p.m.*
Holmes Hall Room 287, College of Engineering

Electromagnetic Bandgap Materials are artificially engineered materials exhibiting novel properties. Since their discovery and first demonstration in the late 1980's, interest in EBGs has grown explosively. The potential takeup of these structures in Communications and Sensing Systems is primarily due to the control of the frequencies and wavenumbers of propagating and non-propagating electromagnetic waves to an extent that was not previously possible. Much effort is now being concentrated on the design and manufacture of these different classes of EBG-based components. This presentation will highlight application areas of EBG technology at microwave and (sub) millimetre wave. It sets out with a brief introduction of the concepts. It then discusses some generic configurations and resulting practical applications. Examples of FSS, EBG and AMC generic technology in the microwave region include: patch antennas, cavity antennas, parabolic antennas, metallo-dielectric antennas, waveguides, filters and tunable structures. Examples of applications are array antennas, high precision GPS, mobile telephony, wearable antennas and diplexing antennas. In the submillimetre wave region a 500 GHz dipole configuration is shown and some components.

Peter de Maagt, Ph.D. was born in Pauluspolder, The Netherlands, in 1964. He received the M.Sc. and Ph.D. degrees from Eindhoven University of Technology, Eindhoven, The Netherlands, in 1988 and 1992, respectively, both in electrical engineering. In the period 1992/1993 he was station manager and scientist for an INTELSAT propagation project in Surabaya, Indonesia. He is currently with the European Space Research and Technology Centre (ESTEC), European Space Agency, Noordwijk, The Netherlands. His research interests are in the area of millimetre and submillimeter-wave reflector and planar integrated antennas, quasioptics, electromagnetic bandgap antennas, and millimetre- and submillimetre-wave components. Dr. de Maagt was co-recipient of the H.A. Wheeler Award of the IEEE Antennas and Propagation Society for the best applications paper of 2001. He was granted a European Space Agency Award for innovation in 2002. He was co-recipient of the LAPC 2006 and IWAT 2007 best paper award. In 2008 he received as a co-recipient the H. A. Wheeler Award for the Best Applications Paper for a second time.

If you are interested in attending, please RSVP to Teri at imanaka@hawaii.edu or 956-9687 by December 8, 2008