

Nel quadro delle iniziative scientifiche dell' IEEE-LEOS Italian Chapter e nell'ambito del corso di Sistemi Optoelettronici, il Prof. Iam-Choon Khoo della Pennsylvania State University, terrà un seminario su

Nano-Dispersed Liquid Crystalline Structures for Tunable Sub-unity/negative Index Meta-Materials

Il seminario, aperto a tutti gli studenti e docenti interessati, avrà luogo il giorno 10 giugno alle ore 15,30 in aula 7 della Facoltà di Ingegneria de "La Sapienza".

Abstract. There have been intense interests in designing materials which possess a negative refractive index. Most of the materials under development are, nevertheless, passive and apply only to a very limited selected frequency regime. By incorporating constituents with tunable dielectric constant such as liquid crystals, we recently demonstrated the feasibility of designing materials with effective dielectric constant that can be tuned over a very broad spectral range. Furthermore, because of the extremely broadband transparency and birefringence of liquid crystals, presentation, we describe the fundamental electromagnetic formalisms and material properties underlying the working principles of these meta-materials, and present recent results obtained in the studies of planar frequency selective surfaces (FSS) and bulk nano-spheres dispersed liquid crystalline materials. We will describe two approaches to realize tunable or reconfigurable sub-unity/negative index metamaterials: (1) planar nano-structured frequency selective surfaces with aligned nematic liquid crystal; (2) core-shell nano-size spheres randomly distributed in a bulk nematic liquid crystal matrix. Such metamaterials can be designed for applications in the optical, terahertz and microwave regimes. This work is supported by the Army Research Office, the Air Force Office of Scientific Research, and NSF-MRSEC Center for Nanoscale Science.

Short Biography Prof. Iam-Choon Khoo received the B.Sc with First Class Honors in Physics from the University of Malaya in 1971, and the M.A. and Ph. D. degrees in Physics [quantum optics] from the University of Rochester in 1973, and 1976 respectively. He is presently the W. E. Leonhard Professor of Electrical Engineering at The Pennsylvania State University, University Park, PA. His current research programs are centered on the nonlinear and electro-optical properties of liquid crystals and nano-structured novel refractive meta-materials, and on the development of multifunctional materials and devices for optical switching, signal/image processing, and sensor protection application. These programs are supported by the Army Research Office, the Air Force Office of Scientific Research, The Defense Advanced research Project Agency and the National Science Foundation. He is a Fellow of the IEEE, OSA and the UK Inst. of Phys. He has authored and edited/co-edited 6 books, 12 book chapters, over 400 journal papers and conference proceedings and holds two patents. He has previously served a 3-year term [2002-2004] as vice-President of Technical Affairs for IEEE-Lasers and electro-Optics Society and is currently serving a 3-year term [2008-2010] as Chair of the United States Advisory Committee/International Commission for Optics of the US National Academies.

**Il docente di Sistemi Optoelettronici
Prof. Antonio d'Alessandro**