



State Key Laboratory of  
Terahertz and Millimeter Waves  
(City University of Hong Kong)



### Seminar On

**Active control of high-frequency and optical functions  
using fast electrical and optical switching of phase change materials**

By

**Dr Aurelian Crunteanu**

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**Date : 13 December 2018 (Thursday)**

**Time : 04:00 pm – 05:00 pm**

**Venue : Room 15-202, 15/F, State Key Laboratory of Terahertz and Millimeter Waves,  
Lau Ming Wai Academic Building, City University of Hong Kong**

#### Abstract

We present our current researches on phase change materials performing a thermally-, electrically-or optically-triggered insulator-to-metal- transition and we focus on their applications in different domains, spanning from DC to microwaves, millimeter waves, THz and optics. Following a brief presentation of the material fabrication and its integration in practical low- and high-frequency devices at XLIM, we will also highlight their unusual non-linear electrical and optical properties in the infrared and far-infrared regions of the spectrum (negative differential resistance and negative differential emittance) with potential applications as relaxation oscillators for neuromorphic computing or in active coatings for thermal regulation, optical limiting or camouflage coatings.

As the state transition induces extremely abrupt changes in the electronic and optical properties of the material (the electrical resistivity increases up to five orders of magnitude while the optical properties -transmission, refractive index..., are drastically modified) we will show that devices integrating these materials may act as efficient elements which can perform modulation and filtering functions resulting in complex, novel reconfigurable systems for millimeter-waves and THz telecommunications.

#### Biography

**Aurelian Crunteanu** received the Phys. Eng. Degree in optics and optical technologies in 1995 and the MSc in 1996, both at the University of Bucharest, Romania. He obtained a Ph.D. degree in Physics from the University of Bucharest in 2000 and the Ph.D. degree in Material Sciences from the Claude Bernard University-Lyon1, France, in 2001. As a post-doctoral fellow at the Swiss Federal Institute of Technology, Lausanne (2001- 2003) his research was oriented on micro- and nano-structures in laser-host materials, optical investigations of planar and channel active waveguides and laser-assisted deposition. In 2003 he joined CNRS at the XLIM Research Institute in Limoges (France) where he is currently a CNRS Senior Researcher, leading the Micro- and Nano-structures for Telecoms (MINT) team. His present research interests are focused on developing new active materials and associated devices for high-frequency electronics, THz and optics, oxide-based devices reliability and their implementation for bio-inspired functions.

\*\*\* ALL ARE WELCOME \*\*\*

#### Enquiries:

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