



IEEE KW Photonics Chapter  
and  
**ELECTRICAL AND COMPUTER ENGINEERING**



Presents a Seminar on  
**“On natural and artificial materials: Metamaterials, transformation optics, and graphene”**

By  
**Professor Philippe Tassin**

**Date: Wednesday, 21st February 2018      Time: 1:00 PM – 2:00 PM      Room: ENG E5-4106-4128**

**REFRESHMENTS WILL BE SERVED**

**ABSTRACT:** I will give an overview of my group’s work on metamaterials, transformation optics, and graphene photonics. Metamaterials are artificial materials in which the basic units for interaction with light are not atoms, but small electrical circuits. Smart design of metamaterial structures makes it possible to create materials with new optical properties that are impossible to obtain from natural materials, for example, negative refraction, magnetism at optical frequencies, perfect absorption, and strong chirality. The invention of metamaterials has also allowed for a new full-wave optical design technique called transformation optics. This technique uses coordinate transformations to exert precise and unlimited control over electromagnetic waves. It can be used not only to create light trajectories at will, but also to enhance optical forces or manipulate the Cherenkov effect. Finally, I will talk about the opportunities of graphene in metamaterials and other nanophotonic structures.

**About the Speaker:** Philippe Tassin was born in Belgium and lived in several countries at both sides of the Atlantic Ocean. Graduating in electrical engineering and applied physics, he obtained a M.Sc. degree and a Ph.D. degree from the Free University of Brussels, both summa cum laude. After his doctoral studies, he had postdoctoral appointments at Iowa State University and Ames Laboratory (a national lab of the U.S. Department of Energy). Dr. Tassin is now an associate professor at Chalmers University. His research interests encompass the physics of electromagnetic structured materials and systems, including metamaterials, plasmonics and nanophotonics. His research has led to well-cited publications in scientific journals, including papers in Science, Nature Photonics, and Physical Review Letters, and he is frequently asked to deliver invited talks at international conferences. His research has been recognized by awards and fellowships from IEEE, SPIE, and the Flemish Research Foundation, and he recently received the BAEF Alumni Award, Belgium's most important prize for scientists under 35. Dr. Tassin is also an editor of the journal “Photonics and Nanostructures” and he is a frequent reviewer for most journals in his field. He is a senior member of SPIE and IEEE and a founding member and board member of the IEEE Photonics Sweden Chapter. He is also active in the promotion of science and technology to the public and to students.

**Organized by: Professor Hamed Majedi & Professor Ali Safavi-Naeini (director of CIARS)**