

ΣΕΜΙΝΑΡΙΟ ΚΕΝΤΡΟΥ ΚΒΑΝΤΙΚΗΣ ΠΟΛΥΠΛΟΚΟΤΗΤΑΣ &  
NANOTEΧΝΟΛΟΓΙΑΣ/ CCQCN SEMINAR

**Wednesday, 16 March 2016**

**12:00-13:00**

**3<sup>rd</sup> Floor Seminar Room**

**Plasmonic Periodic Structures Composed by 2D Materials**

*Dr. M. Mattheakis*

*Department of Physics, University of Crete  
&  
Crete Center for Quantum Complexity and Nanotechnology*

**Abstract**

Two-dimensional (2D) media, such as Graphene, can give to the host material electromagnetic properties which are not found in nature. From these fascinating effective behaviors, the Epsilon-Near-Zero (ENZ) effect and accordingly the appearance of Dirac Point (DP) is the objective of this work. Since the band-gap of the photonic Dirac Point in Graphene periodic structure is extremely sensitive to structural defects, we propose the role of the background host to be played by another suitable 2D medium like MoS<sub>2</sub>. In this sense, any thickness imperfections are restricted in the atomic level and the various cases of elliptical, linear and hyperbolic dispersion relations are investigated.

In this talk a brief introduction to Surface Plasmon Polariton (SPP) will be given. In addition, the SPP properties in 2D media, likewise Graphene, will be discussed. Furthermore, a periodic structure composed by Graphene monolayers, which are coupled one to each other via plasmonic interaction, is giving rise a photonic Dirac Point leading to Epsilon-Near-Zero (ENZ) metamaterials.

