



CCQCN

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QUANTUM COMPLEXITY  
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ΣΕΜΙΝΑΡΙΟ ΚΕΝΤΡΟΥ ΚΒΑΝΤΙΚΗΣ ΠΟΛΥΠΛΟΚΟΤΗΤΑΣ & ΝΑΝΟΤΕΧΝΟΛΟΓΙΑΣ/  
CCQCN SEMINAR

**Tuesday, 11 February 2014**

**12:30-13:30**

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

**Surface plasmon-polaritons: loss and gain**

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**Abstract**

Surface plasmon-polaritons (SPPs) are coherent oscillations of electron densities at the boundary between a metal and a dielectric, coupled to propagating electromagnetic fields. SPPs have been attracting considerable attention because they present unique properties, such as subwavelength confinement and high sensitivity to the environment. However, metal loss leads to high attenuation of the electromagnetic wave, limiting the propagation length of the SPP and the potential applications. Indeed, there is a trade-off between strong mode confinement and low propagation losses. One way to overcome this issue is by providing gain to the SPP by employing gain materials in the dielectric, forming a SPP amplifier. In this talk, we will discuss theory, numerical methods, materials and application of SPP amplifiers to silicon technology.

