

# **Surface Plasmons in Metallic Nano-structures: Carrier Dynamics, Biosensing and Optoelectronics**

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In this talk, we shall report latest results of our ongoing research activities on the topic of plasmonics. With team members in our university coming from biological, physics and engineering disciplines, we have been working on using metallic nano-structures for studying carrier dynamics of plasmons and various bio-related applications such as optical trapping and biosensing. The contents of this presentation include: (i) Experimental investigation on the lifetime of plasmons and their implications on radiation coupling. (ii) Highly sensitive surface plasmon resonance biosensors based on the inverted-prism and micro-cavity configurations. (iii) Optical trapping actuated by plasmonic absorption. (iv) A new aptamer-based bio-barcode assay (ABC) for rapid nucleic acid-based biodetection. (v) Novel optoelectronic devices based on graphene electronics. (vi) Coherent control of surface plasmon for studying non-Hermitian coupled systems.