Paola Barbara, J Nanomed Nanotechol 2012, 3:9
http://dx.doi.org/10.4172/2157-7439.S1.011

OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference on
Nanotek and Expo

December 3-5, 2012 DoubleTree by Hilton Philadelphia Center City, USA

Nanoscale optical devices

Paola Barbara
Director of the Georgetown Nanoscience and Microtechnology Laboratory (GNuLab), Department of Physics, Georgetown University, USA

One-dimensional and two-dimensional conductors offer exciting opportunities to explore novel design structures for sensing and optoelectronic devices.

Here I will discuss two examples. The first is a terahertz sensor based on carbon nanotubes. I will show that carbon nanotube quantum dots coupled to antennas are extremely sensitive, broad–band terahertz quantum detectors with spectral resolution. I will also report a striking and counterintuitive effect: the THz irradiation *reduces* the effective temperature of the electrons in the dot and drastically increases the device response. I will compare carbon-nanotube based terahertz sensors with graphene-based sensors.

The second example is an optoelectronic device based on MoS_2, a layered semiconductor that can be exfoliated to obtain atomically thin flakes. I will discuss the photovoltaic effect in MoS_2 Schottky diodes made with multilayer flakes. This type of device can open the way to engineering efficient nanoscale photodiodes.

barbara@physics.georgetown.edu