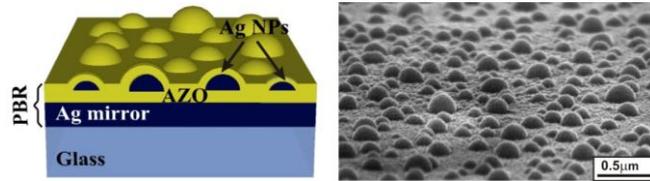




SEMINARIO

AULA SAVAGNONE – DEIM
EDIFICIO 9 - VIALE DELLE SCIENZE
GIOVEDÌ 10/12/2015 – ORE 15:30



Plasmonic Solar Cells

Global warming, climate change and fossil fuel shortage problems have strengthened the need to promote renewable energies like photovoltaics (electricity from sunlight, the most abundant energy source on the planet). Photovoltaics industry is growing rapidly attracting widespread interest in past and ongoing innovations and improvements in the field of materials and devices. One of the key goals in the photovoltaics industry is to achieve high efficiency devices while simultaneously reducing manufacturing costs. The strategy, we want to concentrate on, deals with advanced optical concepts that allow the manipulation of light by employing plasmonic nanoparticles (NPs) with dimensions of the same order of magnitude as the illuminating wavelengths. When the size of a noble-metal particle, such as Au or Ag, is reduced to the few nanometer range, it can sustain Localized Surface Plasmon Resonances (LSPR), collective oscillations of free-electrons resulting from the interaction with the incident light. The LSPR strongly depend on the material of the NPs, their geometrical parameters (i.e. size, shape) and the surrounding medium. Thus, metal NPs should be properly designed in order to reduce as much as possible the parasitic absorption inside their material while allowing high light scattering.

The aim of my lectures is to provide an insight into the light trapping performance of plasmonic solar cells.

Isodiana Crupi is Associate Professor at the DEIM at the University of Palermo. She received the M.Sc. degree in Electronic Engineering in 1999 and the Ph.D. degree in Materials Science in 2003. From 2004 to 2015 she has been Research Scientist at the CNR-IMM. Since 1998, she has been a frequent scientific visitor at IMEC, Leuven (Belgium) collaborating with the CMOS Reliability, FLASH Memory and Solar Cell groups. Her main research interests include the synthesis and characterization of innovative materials for photovoltaic applications, electrical characterization of advanced semiconductor devices for micro- and optoelectronics and the development of Si nanocrystals devices for memory applications. She has authored about 80 papers published in peer-reviewed journals and in international conference proceedings, is coinventor of one U.S. Patent, participant of several national and EU research projects and supervisor of several Master and PhD theses. She serves as referee for outstanding international scientific journals and co-organized various symposia at the European Materials Research Society (E-MRS). Since 2012 she is member of the technical program committee of European Solid-State Device Conference (ESSDERC). She received the “Young Scientist Award” at the E-MRS (2003) and the “Premio per Dottori di Ricerca” from the Accademia Gioenia (2004).