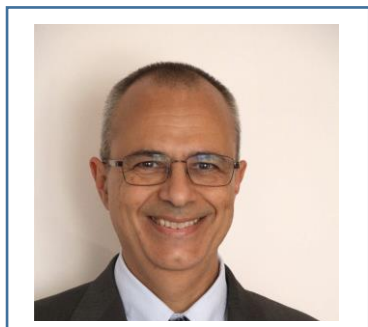


PRESENTER INFORMATION



Name: Mula

First name: Guido

E-mail: guido.mula@unica.it

Institute/ affiliation: Physics Department, Università degli Studi di Cagliari, Italy

BIOGRAPHICAL SKETCH

Guido Mula is a full time Experimental Physics researcher at the Università degli Studi di Cagliari, where he works on the properties of hybrid structures based on porous Si. His research interests in this field span from biosensor to photovoltaic devices, with a major focus on the processes leading to the understanding and controlling the fillings processes of the porous Si pores with a foreign material, in particular Er and polymers.

GM has also expertise in fabrication and characterization of nanostructured III-V, II-VI, and silicon-based semiconductors for technology applications (telecommunications, light generation, photovoltaics, ...). He is co-author of 80 scientific peer-reviewed publication in international journals and inventor of two patents on semiconductors technology, one of them on an innovative electrochemical nanolithography process allowing the fabrication of ordered nano-sized indentations on semiconductor surfaces.

TITLE

Pore filling in porous Si: a complex task with unexpected advantages

ABSTRACT

The understanding of the filling processes for porous Si pores is a mandatory step for the fabrication of hybrid structures with optimized performances. However, the understanding of these processes is far from obvious, since the reduced size and the complexity of the pore shapes for diameters of a few tens of nm make the experimental access to the detailed interface and pore structure remarkably complex. While information on average material properties can give valuable hints about the behavior and the main control parameters for the fabrication of these structures, gaining access to nanoscale information on structural and conduction properties of the filling material is the key to real advancements. In this presentation, the path leading to the understanding of the porous Si pores filling with Er and with melanins will be described, and the use of porous Si as a powerful nanoscale probe for the filler properties will be highlighted.