Abstract of Presentation

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Presentation Title:
Nanomaterials for high efficiency energy conversion, energy storage and sustainable energy processes

Abstract :

The main research lines of the Area of Advanced Materials for Energy at IREC will be presented. This is an interdisciplinary research area with main activities focused on innovations in the energy field based on the performances at the nanometer scale and the engineering of new devices. Main research lines are: 1) Synthesis of nanostructured materials. Different techniques are applied to produce nanoparticles, core-shell, nanowires, mesoporous, etc., and providing control of the nanostructured properties for new photon/phonon or chemical to electrical energy conversion devices as well as energy storage; 2) New solar cells for 3rd generation PV technologies (with emphasis on technologies based on chalcopyrite compounds and nanostructured materials) and solar $H_{2,}$; 3) Nanoionic based devices with electrolyte and electrodes defining feasible low temperatures direct and reverse fuel cell for chemical energy storage, CHESS; 4) High zT thermoelectrics based on nanowires and stacked nanolayers; 5) Photoreactor for CO_2 reduction and its re-use; 6) Nano materials for electrical, BEES, and thermal, TESS energy storage; and 7) New systems for high efficient water/energy management.