

Materials Science Department – CENIMAT:I3N

Biosensors and Solar Cells

CENIMAT:I3N / Microelectronic and Optoelectronic Group



INSTITUTO
DE TECNOLOGIA
QUÍMICA E BIOLÓGICA
/UNL
Knowledge Creation



Researcher ID:
C-4484-2013

Hugo Águas

Assistant Professor

1996: Lic. Materials Engineering, FCT-UNL
2000: Master Materials Engineering, FCT-UNL
2005: Ph.D. in Microelectronics and Optoelectronics, FCT-UNL

Objectives

Soft Matter Microfluidics

Biosensors – Lab-on-a-Chip: DNA and single cells detection

Silicon Nanoparticles Synthetizing

Thin Film Solar Cells: New concepts and applications

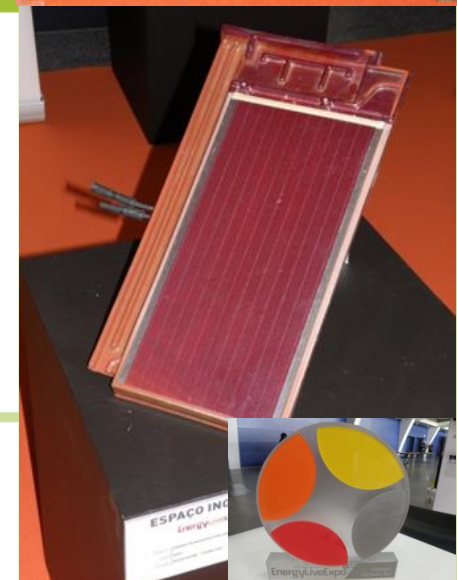
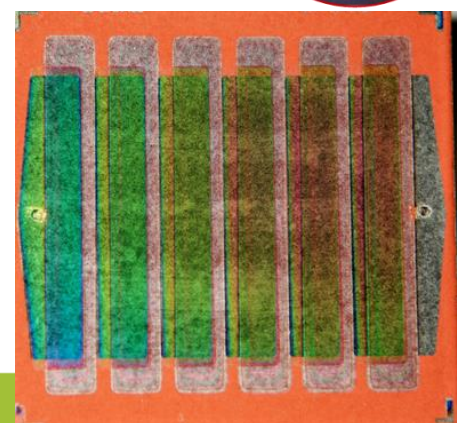
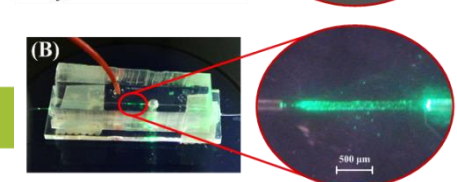
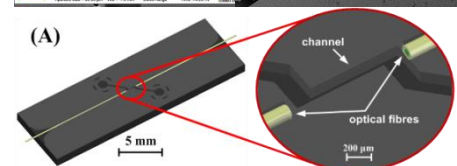
Materials Characterization by optical spectroscopies

Methodology

- Use of soft materials: SU-8 and PDMS
- Photo-lithography and soft-lithography as micro fabrication techniques
- Optical fibres for light conditioning
- Plasma (PECVD) synthetizing of silicon nanoparticles for quantum solar cells
- Amorphous and nanocrystalline silicon deposition (PECVD) for multi junction solar cells
- Development of new concepts for solar cells (e.g. Solar Tiles)
- Development of Plasmonic structures for solar cells and biosensors

Expected Results

- Development of cheap platforms for bio detection using soft materials (PDMS and SU-8) for micro channels fabrication, aiming increased portability, faster reaction times, improved sensitivity and reliability, and lower costs compared to traditional methods.
- Development of new methodologies for cheap bio diagnostics.
- Development of high efficiency multi band gap solar cells
- Development of new Building Integrated Photovoltaic (BIPV) products.



Funding:

FCT Fundação para a Ciência e a Tecnologia
MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA

QR QUADRO
DE REFERÊNCIA
ESTRATÉGICO
NACIONAL