

INTERNSHIP PROPOSAL

Laboratory name: Laboratory of Physics of Interfaces and Thin Films (LPICM)
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Thesis possibility after internship: YES
Funding: NO If YES, which type of funding:

Silicon nanowire solar cells on flexible substrates

Fabrication of highly flexible solar cells is crucial for applications where rigidity or weight can be an issue, such as solar energy collection on buildings or in space. Nanowire-based devices have increased flexibility due to the reduced nanowire contact area with stress relaxation along the nanowire direction. We are actively developing the growth of highly dense nanowires in plasma-enhanced chemical vapor deposition reactor with diameters from quantum sized (less than 10 nm) to a few tens of nanometers. Fabricated devices on the flexible substrates have to be characterized using opto-electric and scanning electron microscope techniques to relate their performance with nanowire density. Our expectation is that the fabricated flexible solar cells can serve also as water-splitting photoelectrodes in a liquid environment using suitable catalysts in the future. We would like the candidate to fabricate flexible solar cells and develop a model relating nanowire density with the growth speed and the device performance when measured on a flat or a bent flexible substrate, respectively.

Please, indicate which speciality(ies) seem(s) to be more adapted to the subject:

Condensed Matter Physics: YES	Soft Matter and Biological Physics: NO
Quantum Physics: NO	Theoretical Physics: NO