

# ***Sol-gel – derived materials for Ultrathin III-V/Si tandem solar cells***

## **Postdoc position at IPVF**

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The Ile-de-France Photovoltaic Institute (IPVF) and the Center for Nanosciences and Nanotechnologies (C2N-CNRS) are seeking a postdoctoral researcher to work on new sol-gel derived multifunctional materials to be integrated to ultrathin III-V/Si tandem solar cells. The project will be carried out in close collaboration with the Laboratoire Chimie de la Matière Condensée de Paris at the Sorbonne University / Collège de France (Dr. M. Faustini) and the Fraunhofer Institute for Solar Energy Systems (ISE).

C2N and Fraunhofer recently demonstrated a ultrathin (200 nm) GaAs solar cell with record efficiency of 20% using efficient light trapping. Starting from these concepts, the aim of the project is to develop and integrate a multifunctional sol-gel derived materials in the cell in order to achieve a 2-terminals III-V/Si tandem solar cell, the ideal configuration for real applications. The main task of the post-doc will be the development of new sol-gel derived films allowing robust bonding and providing electrical conductivity and light trapping. Inorganic or/and organic/inorganic hybrid materials will be engineered at the molecular and nanoscopic level by soft-chemistry approaches that needs to be compatible with the nanofabrication methods for solar cells. A second task will be related to the design and nanofabrication of light-trapping architectures and the partial fabrication of the tandem cell.

The post-doc will benefit from a multidisciplinary environment involving several renowned teams and institutes. The work will involve the development of new sol-gel derived materials and processes, micro and nanofabrication based on nanoimprint lithography and optical lithography and the use of different characterization techniques and optoelectronic modeling methods already available.

*The ideal candidate will have a PhD in material science or related. Previous experience on sol-gel synthesis, thin film deposition, nanofabrication, nanophotonics, photovoltaics are desirable but not essential. More information and recent publications from the C2N and LCMCP team can be found here: <http://sunlit-team.eu/> and [www.labos.upmc.fr/lcmcp/site/](http://www.labos.upmc.fr/lcmcp/site/)*

*The positions will start immediately for a duration of 18 months. Interested applicants should submit a CV to: [stephane.collin@c2n.upsaclay.fr](mailto:stephane.collin@c2n.upsaclay.fr), [andrea.cattoni@c2n.upsaclay.fr](mailto:andrea.cattoni@c2n.upsaclay.fr), [marco.faustini@upmc.fr](mailto:marco.faustini@upmc.fr). Applications will be reviewed as received until the position is filled.*

### IPVF IN BRIEF

The Ile-de-France Photovoltaic Institute (IPVF) aims to become one of the main world's centers for research, innovation and training in the field of photovoltaic solar energy by bringing together academic internationally recognized research teams (CNRS, Ecole polytechnique) and leaders of the of the photovoltaic industry (EDF, Total, Air Liquide, Horiba Jobin Yvon et Riber). IPVF aims to improve performance and competitiveness of photovoltaic cells and to develop new disruptive technologies by activating the following levers:

- A research program targeting high conversion efficiencies and low manufacturing costs
- An experimental research platform, open to the photovoltaic players