



MISSION TITLE

IPVF PhD offer: Atomic Layer Deposition in-situ optical characterization tool for functional material development and implementation in solar cell devices

POSITION DESCRIPTION

Function	Doctoral Researcher	Reference	
Contract type	CDD	Duration	36 months
Starting date	From 2023, Sept 1 st	Education	Ms in Material Science, Physics, or other relevant fields
Working Place	Palaiseau, Paris area	Salary	Profile dependent

IPVF IN BRIEF

Become an actor of the Energy Transition by joining a team driven by innovation and impact to address today's most decisive challenges.

IPVF - Institut Photovoltaïque d'Île-de-France, is a global Research, Innovation and Education center, which mission is to **accelerate energy transition through science & technology**.

Gathering industrial PV leaders (EDF, TotalEnergies, Air Liquide, Horiba and Riber) and world-renowned academic research organizations (CNRS, Ecole Polytechnique), multi-disciplinary and international IPVF teams conduct research for clean energy technologies. Supported by the French State, IPVF is labelled Institute for Energy Transition (ITE).

IPVF at a glance:

- *An ambitious Scientific and Technological Program (6 programs divided in 24 work packages): from tandem solar cell technologies to economy & market assessment, state-of-the art characterization, photocatalysis and breakthrough concepts.*
- *A state-of-the-art technological platform (8,000m²): more than 100 cutting-edge equipment's (worth €30M, located in cleanrooms (advanced characterization, materials deposition, prototypes for fabrication, modelling...)).*
- *A high-standard Education program (M.S. and PhD students).*

JOB CONTEXT

IPVF has launched the Program PEARL to explore breakthrough approaches for future photovoltaic innovations. Atomic Layer Deposition (ALD) has been selected as the method of choice to address PV challenges, by coordinated efforts in molecular chemistry, surface chemistry, material science, modeling and instrumentation.

We have recently developed an **innovative in situ diagnostic tool that combines spectroscopic ellipsometry (SE) and luminescence-based techniques (Photoluminescence PL and Time Resolved PL TRPL)**, to simultaneously probe, at nanometric level, both material **properties and function** during its growth. This tool is intended to assist the development of **new functional materials**, gain **understanding on material growth/property** and accelerate their efficient **integration in solar cells**.

The doctoral researcher will benefit from IPVF expertise and unique capabilities in both ALD material development and optical structural characterization techniques.

Website: <https://www.ipvf.fr>





MAIN MISSIONS

The candidate will directly report to the Programs Deputy Director of IPVF.

She/he will integrate a dynamic and talented team driven by innovation and results. Using the unique home-built diagnostic system, her/his main missions will consist in consolidating the proof-of-concept PL/SE system to develop efficient novel functional materials integrated in solar cell, ie:

- Set up and perform ALD experimental design, ie determine ALD parameters that allow the fabrication of highly controlled functional thin films
- Finely characterize the growth mechanisms with in-situ SE
- Characterize the materials' structural, morphological, electrical, and optical properties with in/ex-situ techniques
- Optimize the materials properties (e.g. with thermal post-treatments)
- Integrate the layer in perovskite-based solar cell

The missions being highly interdisciplinary, the candidate will interact and collaborate with IPVF's teams as ALD is part of the cells' production steps but also with different lab partners.

SOUGHT PROFILE

Knowledge	Know-how	Self-management skills
<ul style="list-style-type: none"> Materials science Optical instrumentation Thin film characterization 	<ul style="list-style-type: none"> Hands-on experience in photoluminescence and/or ellipsometry and/or in situ instrumentation would be a plus Hands-on experience with thin films would be a plus Data treatment Communication of results 	<ul style="list-style-type: none"> Curious and enterprising Autonomous Organizational and collaborative skills Results-oriented

CONTACT

Cover letter, academic records and résumé (including the name and contact details of at least two references) to be sent to : n.schneider@cnr.fr and rh@ipvf.fr

