

Ph.D. student position at the LMGP Laboratory in Grenoble

Evaluation of new organometallic precursors for the SALD deposition of functional thin films for application in optoelectronic devices

Job description:

The SALD team is a very dynamic group focusing on the development of functional thin films using scalable chemical vapour deposition approaches ([see link](#)). Materials of interest include oxides, metals and metallic nanowire networks for different applications including photovoltaics, sensors, antimicrobial coatings, encapsulation of devices, resistive switching, etc. Our activity and recent research outputs can be checked in the following links: sites.google.com/site/workdmr/ and [TALK](#). We have recently optimized the deposition of Cu₂O thin films with record mobility and conductivity using our SALD deposition system [[Nature Communication materials 2021](#), [J. Mater. Chem A 2021](#), [Nature Communications 2022](#)]. In the framework of an international France-Germany project, we plan to develop new oxides with superior optical/transport properties using new precursors synthesized in Ruhr-University Bochum (RUB). The materials developed will be integrated in functional devices such as photovoltaic cells and photoelectrochemical cells. Other applications will also be studied through both national and international (Germany, Spain, UK, Portugal, Canada) collaborations.

The candidate will focus on the optimization of the SALD deposition parameters and thorough characterization of the materials deposited. The candidate will also be involved in device fabrication and characterization and will have hands on experience on the synthesis of precursors in our partner's lab in Bochum. The ideal candidate is a highly self-motivated individual of any nationality with a strong experimental background in semiconductor device physics and thin films.

START DATE: October 2023 or when position is filled. Ph.D. supervised by **Dr. D. Muñoz-Rojas** and **Dr. M. Weber**

Research profile & skills (required / highly desirable):

- **Master Degree (or equivalent) in physics, chemistry, chemical engineering or materials science, preferably with a master thesis related to thin films**
- Experience in thin film deposition techniques (CVD, MOCVD, ALD, SALD, MBE)
- **Experience in processing, developing and characterizing thin films via techniques such as XPS, AFM, KFM, electrical characterization and ellipsometry, XRR, XRD, TEM, SEM, SIMS,**
- **Have a solid understanding of physics of semiconductor devices**
- **Fast learner, hands on and have a flexible attitude**
- Programming skills (labview/python/matlab/etc)
- 3D drawing and CAD design (Blender/Solid Works/Catia/Fusion 360 etc)
- Have experience in 3D printing
- Have experience in building and/or setting up laboratory equipment or simple systems (i.e. Arduino, etc.)
- **Be someone able to and enjoy to solve problems and pushing your research to achieve results**
- **High degree of responsibility and independence, while collaborating with your team and lab mates, and other laboratory staff.**
- **Good management skills, good presentation skills, excellent written and oral English level (among non-native English speakers, equivalent TOEFL score of 100 or higher).**

Scientific environment:

The candidate will work mainly at the LMGP, Materials and Physical Engineering Laboratory, in the SALD team within the FUNSURF group. Located in the heart of an exceptional scientific environment, the LMGP offers the applicant a rewarding place to work. The laboratory is very dynamic and highly international. The PhD student will perform as well short stays in Germany (Bochum) in the framework of our French-German joint project. The candidate will have the possibility to supervise master students and perform teaching.

LMGP Web Site: <http://www.lmgp.grenoble-inp.fr/>

Salary: The position is for 3 years, paid by Grenoble INP (gross salary of approx. 2000 €/month)

Application procedure: Please send motivation letter CV and the name and contact details of 2 references to:

David Muñoz-Rojas: david.munoz-rojas@grenoble-inp.fr ; Tel: 04 56 52 93 36

Closing date for applications: 31 July 2023