

Ph.D. student position at the LMGP and IMEP-LaHC Laboratories in Grenoble

Deposition of functional oxides by spatial atomic layer deposition (SALD) for integration in piezoelectric devices

PhD description:

The SALD team is a very dynamic group focusing of 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](#)]. In the framework of a local collaboration with IMEP-LaHC and LTM laboratories, we plan to develop optimized oxide thin films for integration in piezoelectric devices. Other applications will also be studied through both national and international (Germany, Spain, UK, Portugal) 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. 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: From October to December 2022. Ph.D. Co-supervised by **Dr. D. Muñoz-Rojas** (LMGP) and **Dr. Gustavo Ardila** (IMEP-LaHC).

Research profile & skills (required / highly desirable):

Profile (points in bold are mandatory to apply):

- **Master Degree (or equivalent) in physics, chemistry, chemical engineering or materials science, preferably with a 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, KPFM, 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**
- Experience in piezoelectric devices
- 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, 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 and IMEP-LaHC offer the applicant a rewarding place to work. The laboratory is very dynamic and highly international. The PhD student will perform part of the characterizations and device fabrication and testing at IMEP-LaHC and LTM labs in the framework of local joint project. The candidate will have the possibility to supervise master students and perform teaching.

Laboratories Web Site: <http://www.lmgp.grenoble-inp.fr/>, <http://imep-lahc.grenoble-inp.fr/>, <http://ltmlab.fr/>

Salary: The position is for 3 years, paid by Grenoble INP (gross salary of 1866 €/month)

Application procedure: Please send motivation letter, CV, recommendation letters 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

Gustavo Ardila: ardilarg@minatec.grenoble-inp.fr; Tel: 04 56 52 95 32

Closing date for applications: 31 July 2022