

Job Title: PhD Student on novel photovoltaic effects

Research area or group: Oxide Nanophysics Group

Description of Group/Project:

Our group is a world leader on research in new electronic functionalities induced by strain gradients (flexoelectricity). Among these, we are currently focusing on a giant flexophotovoltaic effect whereby very large photovoltages (much bigger than the material's bandgap) can be induced in some semiconductors when they are bent. The present project seeks two goals: (1) to explore the possibility of achieving giant flexophotovoltaic effects in gradient-engineered thin films of perovskite oxides and (2) to measure how such photovoltages affect the mechanical properties of the material, and in particular its shape, via photostriction. If successful, these goals would pave the way for, respectively, a new-generation solar cells with increased efficiency thanks to the flexophotovoltaic effect, and photo-mechanical actuators that can be remotely, efficiently and wirelessly operated with just a beam of light.

Main Tasks and responsibilities:

The student will be the main driver of this research project, and we therefore seek someone with a strong sense of responsibility, intellectual autonomy, scientific curiosity and good problem-solving skills.

The main tasks that we envision will be to:

- Fabricate gradient-engineered thin film devices, using our in-house pulsed laser deposition and/or sputtering facilities.
- Measure their photovoltaic and photostrictive properties, by adapting our in-house facilities (comprising atomic force microscope, probe station, interferometric microscope and x-ray diffractometer, among others) for these purposes.
- Analyze, interpret and critically discuss the results.
- Present the results in different formats, ranging from informal in-group presentations to formal talks at international conferences to writing articles for peer-reviewed scientific journals.

Requirements:

- **Education:**
Graduate Degree (BSc, Laurea or equivalent) in Physics or related discipline.
Masters Degree completed before the starting date of the contract, preferably in an area related to this project (materials science, nanotechnology, photovoltaics, etc.)
- **Knowledge:**
Specific experience in condensed matter physics (via summer projects or a master degree) is desirable, but not essential; our group will provide the knowledge and training required for this project.
- **Personal Competences:**
Our group is very cooperative and has a vibrant intellectual atmosphere. We expect the new PhD to both benefit from and contribute to it. Competence, openness, tolerance, and willingness to help are expected. We require a good command of English, which is the lingua franca of our nationally diverse research team as well as the language in which we present and publish all our results.

Summary of conditions:

- Full time work (37,5h/week)
- Contract Length: Temporary (4 years)
- Location: Bellaterra (Barcelona)
- Salary will depend on qualifications and demonstrated experience.
- Support to the relocation issues.
- Life Insurance.

Estimated Incorporation date: January 2025 (flexible)



How to apply:

All applications must be made via the ICN2 website <https://jobs.icn2.cat/job-openings/659/phd-student-on-novel-photovoltaic-effects-oxide-nanophysics-group> and include the following:

1. A cover letter.
2. A full CV including contact details.
3. 2 Reference letters or referee contacts.

Applications will be continuously reviewed.

Equal opportunities:

ICN2 is an equal opportunity employer committed to diversity and inclusion of people with disabilities. ICN2 is following the procedure for contract of people with disabilities according with article 59 of the Royal Decree 1/2015, of 30 of October.