

June 5th, 2024

PhD student Position Available

INNOVATIVE EPITAXIAL PROCESSES FOR SEMICONDUCTOR PHOTOVOLTAICS

RESEARCH LINE

The semiconductor structure is the core of photovoltaic devices such as **solar cells, photodetectors, power converters** and **thermophotovoltaic cells**. The most widely used technique for its fabrication is the metal-organic, vapor-phase epitaxy (MOVPE) of III-V semiconductors, using a reactor and process scripts.

The resulting structures are then characterized using a variety of techniques, including electron microscopy, X-Ray diffractometry, and capacitance-voltage, which provide information to continue improving the MOVPE process. Successful structures are then processed into devices for the assessment of their performance by quantum efficiency, current-voltage or luminescence measurements.

This Thesis targets novel semiconductor structures to **break the current performance and manufacturability limitations** of, mainly, solar and thermophotovoltaic cells, and it will provide you with a **wide and valuable knowledge on all the steps in the development of semiconductor photovoltaic devices** of interest for a career in this field.

RESEARCH CENTER

III-V Semiconductor Group of the **Solar Energy Institute - Technical University of Madrid**, an internationally renowned group in the field of III-V photovoltaics, holding several photovoltaic conversion efficiency records.

REQUIREMENTS

- A degree in Physics, Electronics/Electrical/Telecommunication Engineering or Materials Science.
- Basic knowledge on semiconductor physics, device physics and characterization techniques, computational skills are highly desirable (proficiency in IGOR and/or MATLAB and/or PYTHON is valuable).
- Good academic record.
- Great motivation for scientific experimental team work.
- Full proficiency in English.
- Starting date during Autumn 2024.

GENERAL CONDITIONS

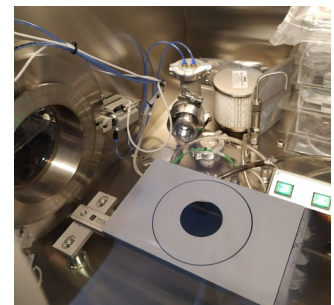
- Contract according to University regulations and support for application to public funding (FPU/University/Marie Curie grants).
- Excellent experimental infrastructure and international atmosphere.
- Publication of results in high impact international journals.
- Attendance to scientific conferences worldwide.
- Research stays in partner labs in Europe and/or the USA.

APPLICATIONS

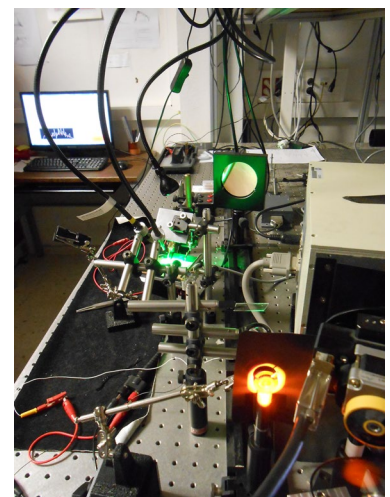
Interested candidates should send their CV to Prof. Iván García (igarcia@ies.upm.es)



MOVPE R&D reactor during an epitaxial process



Semiconductor wafer on graphite susceptor after epitaxy process



System for the measurement of quantum efficiency