SOLAR ENERGY INSTITUTE
UNIVERSIDAS POLITÉCNICA DE MADRID

April, 2026

Research Position Available at the Group of III-V Semiconductors on

DEVELOPMENT and MANUFACTURE OF PHOTOVOLTAIC LASER POWER CONVERTERS WITH RECORD EFFICIENCIES

INTRODUCTION

Power-by-light (PBL) is an emerging technology aimed at replacing conventional copper wire-based powering of sensor systems in applications or regions that have strict safety requirements. Such applications or regions usually called "exclusion regions", typically present a critical risk of explosion or high electromagnetic noise, such as refineries, mines, fuel tanks, high-voltage lines, satellites, aircrafts, nuclear plants, etc. The **III-V Semiconductors Group at the Solar Energy Institute** of the Universidad Politécnica de Madrid) is a world leading research group in the field with an experience of more than 30 years[1],[2]. PBL systems are made up of a high power laser, an optical fibre and a photovoltaic converter. **The objective of the work is the achievement of photovoltaic converters with the highest efficiency in the world, over 70%, under laser light.**

SCOPE

The work proposed will be framed within a "**Synergic R&D project in new and emergent scientific areas at the cutting edge" funded by the Comunidad de Madrid.** The tasks to accomplish in the work will be focused on the development and manufacturing of the PV converter and it includes the theoretical design, experimental manufacturing and electro-optical characterization.

REQUIREMENTS

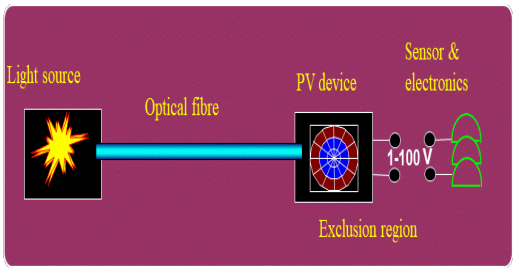
- A Degree and a Master in Physics, Electronic Engineering or Materials Science
- Basic knowledge on semiconductor physics and device physics. Computational skills are highly desirable
- Good academic record (above 8/10)
- Great motivation for scientific work and ability for team work
- Flexible starting date in June-September of 2026, after finishing the Master course, if it is the case.

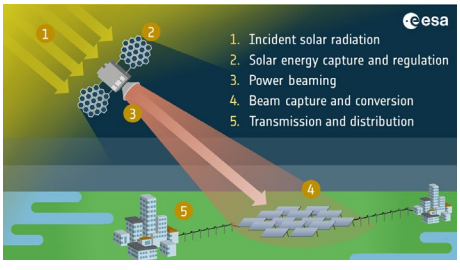
GENERAL CONDITIONS

- The selected candidate would start the work in our group with a contract within the frame of a Comunidad de Madrid project with a duration of 2.5 years.
- Depending on the aptitudes of the candidate, the duration of the contract could be extended in order to carry out a PhD work.
- Excellent experimental infrastructure and international atmosphere.
- Attendance to scientific conferences worldwide
- Research stays in partner labs in Europe and/or the USA

APPLICATIONS

Interested candidates should send his/her CV and transcripts of all undergraduate and graduate (if any) coursework to Prof. Mercedes Gabás (mercedes.gabas@upm.es)





[1] Carlos Algora et al. "Beaming power: Photovoltaic laser power converters for power-by-light", Joule 6 (2), 340-368 2022, https://doi.org/10.1016/j.joule.2021.11.014

[2] Iván García, Manuel Hinojosa, Marina Delgado, Carlos Algora, Photovoltaic laser power converters producing 21 W/cm2 at a conversion efficiency of 66.5%, Cell Reports Physical Science, Volume 5, Issue 11, 2024, https://doi.org/10.1016/j.xcrp.2024.102263.