

Postdoctoral Position on Photonic Nanostructures

The candidate will join the team led by Agustín Mihi within the EIC Pathfinder Challenge Program RADIANT. Dr. Mihi's team is part of the Nanostructured Materials for Optoelectronics and Energy Harvesting (NANOPTO) group, which is generally devoted to materials for energy and photonic applications.

RADIANT (Chiral Light Emitting Diodes in Photonic Architectures) aims to develop high-performance, cost-efficient chiral LEDs by leveraging scalable chiral metasurfaces, covering the visible to near-infrared range. LEDs, a disruptive energy-efficient technology, are expected to reach a market value of \$192.68 billion by 2030. The project focuses on integrating chirality into emerging OLED, PeLED, and QdotLED technologies, enhancing performance and adding a competitive advantage. A novel, scalable, low-carbon imprinting process enables seamless integration of photonic nanostructures across different LED technologies.

Main tasks of the candidate

To develop the project, the main tasks that will be carried out within the project include:

- Construction of optical set ups for the optical characterization of the nanostructures. Fundamental study/characterization of materials and devices using, *e.g.* advanced spectroscopy (*optical spectroscopy experience valued*). Special emphasis in circular dichroism set ups and LED characterization.
- Experience modelling optical properties of nanostructures via FDTD (*Comsol, Lumerical, etc*)
- Fabrication and optimization of different nanostructures exhibiting photonic properties will be valued.

Requirements

We look for an enthusiastic researcher familiarized with the fields of Circular Dichroism and photonics/plasmonics. These skills will be valued:

- PhD in Materials Science, Nanoscience, Physics or similar subjects.
- A good level of written and spoken English.
- Optical setups know-how and optical spectroscopy background.
- Nanofabrication experience valued but not necessary.
- Familiar with LED or lasing systems and measurements.
- Familiarity with FDTD modelling or similar will be valued.

About The Nanostructured Materials for Optoelectronics and Energy Harvesting Group

The Nanostructured Materials for Optoelectronics and Energy Harvesting (**NANOPTO**) research group focuses on producing and characterizing advanced semiconducting structures with the main objective of understanding their fundamental behavior in order to tailor and improve their functionalities and empower different applications in the areas of optoelectronics, energy-related, and sensing devices.

In particular, Dr. Mihi's team focusses mainly on three research aspects: i) the investigation of the fundamentals behind the enhanced light-matter interaction observed in devices that use wave optics components; ii) the development of fabrication routes for large area and low cost photonic and plasmonic structures using techniques similar to those employed in industry, so they could be easily incorporated in technologies such as roll to roll; and iii) the fabrication and characterization of prototype solar cells, photodetectors and sensors based in photonic architectures, demonstrating improved performance without deterioration of other figures of merit in the device.

Dr. Mihi's research line relies on unconventional nanofabrication to produce photonic architectures with exciting optical properties easily incorporated into large area devices. They have the capabilities to design photonic nanostructures for each device type using current numerical simulation tools. They combine soft nanolithography, transfer printing and industry compatible fabrication approaches to integrate the architectures as part of the optoelectronic devices. Finally, they characterize optically and electrically the enhanced prototypes employing state of the art spectroscopic equipment.

We value a diverse and inclusive work environment where all team members have excellent opportunities for learning and contributing.

For more information, please visit:

<https://nanophotonics.icmab.es/>

<https://nanopto.icmab.es/>

About ICMAB

The Institute of Materials Science of Barcelona (ICMAB-CSIC) is a multidisciplinary research center focused on cutting-edge research in functional advanced materials in the fields of ENERGY, ELECTRONICS, NANOMEDICINE and application fields yet to imagine.

The ICMAB is integrated within the Barcelona Nanocluster in Bellaterra (BNC-b), a research network that includes the UAB, the CSIC (ICMAB, IMB-CNM and ICN2) and IRTA, part of the UAB Research Park of the Universitat Autònoma de Barcelona (PRUAB) and the ALBA Synchrotron. The BNC-b aims to share advanced scientific equipment and promote and disseminate nanoscience and nanotechnology.

The ICMAB offers a complete range of scientific services, including a 10,000 class cleanroom (the Nanoquim Platform) that are open to interested parties, whether these are academic or from industry, and it participates in all kinds of educational and promotional activities. Many ICMAB researchers teach at the UAB Master's degree in Nanotechnology and Materials Science and also on the UAB degree on Nanoscience and Nanotechnology.

<https://icmab.es/>

Details of the position

Contract (full time) duration for 2 years, within the EIC Pathfinder Challenge RADIANT

Tentative Starting date: January-February 2025

How to apply

Interested candidates should send by email to the following address (jobs.nanopto@icmab.es) including the following documents:

- **motivation letter** (where you introduce yourself, previous experience in relation to the post and future goals)
- **detailed CV**, including the academic record, and a list of references with contact details

HIRING PROCESS will take place via the CSIC employment platform. This is a lengthy process but we will help you with it.

Closing date for application: The recruitment process will be closed on December 30th or when a suitable candidate is found.

However, in the interest of gender equality, this may be extended until the ratio between female and male applicants is reasonable.