PhD Position in Photonic Nanostructures

The candidate will join the team led by Agustín Mihi within the Spanish National Research Funding Call PID 2022. 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.

Photonic and plasmonic architectures hold great promise to improve the performance of many optoelectronic technologies through the ability to manipulate light at the nanoscale. However, these nanostructures are typically produced via cumbersome and costly lithographic processes. In our group, we work fabricate photonic nanostructures using a scalable and low-cost ***soft nanoimprinting technique*** compatible with emerging optoelectronic devices. Our approach is compatible with a wide variety of materials such as biopolymers and colloids leading to a new generation of unconventional photonic architectures.

Main tasks of the candidate

To develop the project, the candidate will learn how to use a large variety of techniques and methodologies. The main tasks that will be carried out within the project include:

a) Fabrication and optimization of different nanostructures exhibiting photonic and phononic properties
b) Design and building optical set ups for the optical characterization of the nanostructures
c) Fundamental study/characterization of materials and devices using, e.g. advanced spectroscopy.
d) Literature review and paper drafting
e) Contributing to the group (e.g. taking care of the maintenance of a given piece of equipment, giving presentations at group meetings, helping new students, etc.)

Requirements

We look for an enthusiastic researcher familiarized with the fields of photonics/plasmonics and:
- Master in Photonics, Nanoscience, Physics or similar subjects.
- A good level of written and spoken English.
- Optical setups know-how and optical spectroscopy background.
- Nanofabrication experience, knowledge of vacuum and cleanroom work environments.

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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 fundaments 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.

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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 4 years, within the Spanish National Research Funding call PID 2022
Gross annual salary in the range of PhD fellowships from the Spanish MICINN
Tentative Starting date: January 2024
Further information (contact person): Dr. Agustín Mihi, agustin.mihi@csic.es

The student will be enrolled into a graduate PhD program of the UAB (Universitat Autònoma de Barcelona). UAB is a public university, and a young one too (it has only just celebrated its first half century of life). It is full of energy, of ideas and of an innovative spirit, a 'disruptor', not afraid to embrace modern methods in teaching, in research and in knowledge transfer to society. UAB is among the best young universities in the world; within this group, it stands out through its research and its capacity to establish collaborative networks with the best international research groups.

The UAB campus is a green, sustainable, friendly and welcoming environment where there is time and space to go beyond the activities of teaching and research. It is a space for culture, sport, associations, and participation in university life, both that which is institutional and that which takes place outside the regulated areas.

How to apply

Interested candidates should send by email to Dr. Agustín Mihi (agustin.mihi@csic.es) 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

Closing date for application: The recruitment process will be closed on October 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.

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