Call reference number	(2025-28)
Call name	Predoctoral researcher: Laser-based Patterning of Nanomaterial Composites
Application Deadline	2025/09/25

Introduction and main description

BCMaterials, the Basque Center for Materials, Applications and Nanostructures, Leioa, Spain (www.bcmaterials.net), is an autonomous research center, belonging to Ikerbasque, the Basque Foundation for Science, and the University of the Basque Country (UPV/EHU).

We seek a pre-doctoral researcher in Chemical Physics/Materials Chemistry focusing on emerging colloidal techniques for deposition of nanomaterials to pattern optically-active surfaces. We offer a full-time position as a pre-doctoral researcher within a project supported by the ATRAE program, funded by the Spanish Ministry of Science, Innovation and Universities, until August 31, 2029. The position focuses on developing novel patterning techniques harnessing light-directed colloidal assembly at interfaces. Specifically, laser-induced microbubbles will be used for the deposition of colloidal nanomaterials into optically-active microstructures on solid surfaces.

The work will involve the synthesis of ligands, functionalization of nanomaterials and solid substrates with different chemical moieties, and fabrication of assemblies via the use of a custom optical setup. Fabricated assemblies will be characterized by techniques such as dark field microscopy, electron microscopy, and various types of optical spectroscopy. Detailed studies of the colloidal interactions between nanoparticles, ligands, and solvent will provide the opportunity for combining experimental and computational studies.

Skills and Requirements

A Master's Degree in Chemistry, Physics, or a related field.
A strong research background in laser-based optical setups.
Experience working with nanoparticle synthesis/functionalization/assembly is beneficial.
Proficiency in speaking and writing in English.
Self-motivation and ability to work in a team.
Willingness to coordinate research.
A high level of motivation and independent thinking skills.
Ability and eagerness to learn new skills outside their own discipline.
Presentation skills and ability to meet deadlines.

Work Program / Duties / Responsibilities

Main responsibilities include:
Optical patterning of nanomaterials
Synthesis, surface modification, and characterization of nanoparticles
Characterization of printed assemblies of nanoparticles, including techniques such as:
- Scanning electron microscopy (SEM)
- Back-scattered UV-visible spectroscopy
- Fluorescence Microscopy

Developing a theoretical understanding of the mechanisms involved in the printing process using computational methods such as:

Work Program / Duties / Responsibilities

- Molecular Dynamics simulations
- Multiphysics and fluid dynamics simulations

Additional responsibilities:
Writing of manuscripts
Presenting research at national/international conferences
Maintaining optical setup and lab equipment
Working closely with collaborators
Maintaining a positive and collaborative group atmosphere

Further details:
The pre-doctoral researcher will be incorporated at BCMaterials under the supervision of Eric H. Hill, Ikerbasque Research Associate Professor.
The candidate will be in close contact with several renowned international groups in the fields of colloidal chemistry and nanoscience in Europe and abroad.

Application Procedure

Apply by submitting a motivation letter and a CV (in English) using the "Contact" button at the corresponding offer, at the "Join Us" area on BCMaterials' portal (https://www.bcmaterials.net/join-us).
Your name and email address will be required for furher contact too.

Other Relevant Information

Include contact details for 2 referees.
Interviews will be conducted soon after the deadline.
The preferred starting date to join is November 1, 2025.

We provide a highly stimulating and interdisciplinary environment, with state-of-the-art infrastructures and unique professional career development opportunities. We offer and promote a diverse and inclusive environment and welcome applicants regardless of age, disability, gender, nationality, ethnicity, religion, sexual orientation or gender identity.