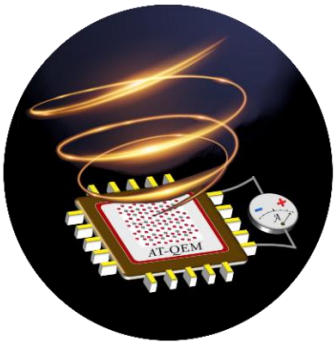
PhD Student Position in Optical Properties of Quantum Materials

The University of Salamanca (USAL) welcomes applications for a 4-years PhD Student position, starting from October/November 2023, to obtain a PhD degree in Physics.
The position is part of the project CHIROTRONICS, "Controlling chirality in atomically thin quantum electronic materials", funded by the European Research Council (ERC), grant agreement No. 101039754, supervised by Dr. José Caridad.

Application deadline: **August 1st, 2023**

Complete information at: link



Research environment and team

The NANOTECH section at USAL consists of several groups conducting cross-disciplinary research in the application of nanotechnology to a wide range of scientific and engineering disciplines (electronics, chemistry, biology, optics, etc).
The PhD candidate will join the Quantum Materials and Devices (QMADE) laboratory (https://qmade.usal.es/) at USAL, led by Dr. José Caridad. QMADE is a dynamic and interdisciplinary experimental team aiming to investigate unique properties of electronic states in novel quantum materials by combining advanced nanofabrication techniques, transport measurements and optical spectroscopy. The group is currently interested in exploring exotic anisotropic phenomena predicted to occur in two-dimensional 2D materials with broken symmetries, towards the realization of high-performance electro-optical and electronic devices.
We strive for academic excellence in an environment characterized by collegial respect and academic freedom tempered by responsibility.

Project description

CHIROTRONICS is an ERC project at the boundary of materials science, physics and engineering. It aims to study the striking optical and electronic responses and related anisotropic phenomena predicted to occur in atomically-thin chiral materials (ultimate chiral systems with atomic-scale thickness).
These intriguing and exotic 'chiral' signals are expected to be large and actively controlled by local fields, and therefore useful for a myriad of novel applications including biochemical sensing or quantum technologies.
In this PhD position, ***the successful candidate will explore novel optical and optoelectronic properties of 2D materials and heterostructures via spectroscopy***. Such

measurements will be conducted at different frequency ranges (visible and infrared), temperatures (down to mK), and with/without the presence of an external magnetic field (more details below).

You will

− Design and fabrication of state-of-the-art 2D heterostructures (by precise positioning & stacking of 2D crystals) and electro-optical nanodevices.
− Characterize the optical and optoelectronic properties of these quantum materials via spectroscopic measurements at different frequency ranges, temperatures (down to mK) and (eventually) in the presence of an external magnetic field.
− Work within a friendly, cross-disciplinary, highly competent team featuring both scientists and engineers.
− Write progress reports and contribute to write manuscripts
− Participate in dissemination activities (e.g. conferences).

Requirements

− Bachelor's degree (BSc) in Physics or Materials Science.
− Master program (MSc), Physics-related or Materials Science-related.
− Advanced level of English: B2
− We will favor applicants with a solid theoretical and experimental background within solid-state physics.
− Candidates should be able to demonstrate a promising track record of achievements appropriate to their career stage.

Benefits

− 4-year PhD contract, full-time (37,5 hours/week)
− Gross Salary:
- 1500 EUR (14 payments per year), during 1st and 2nd years
- 1600 EUR (14 payments per year), during 3rd and 4th years

− Workplace: University of Salamanca, Salamanca, Spain.
− Estimated starting date: October/November 2023

Application

− Application deadline: **August 1st, 2023**.
− Interested candidates should send: a letter motivating the application (cover letter), Curriculum Vitae (maximum 3 pages), a complete list of grades during his/her Bachelor's degree and Masters program, and two recommendation letters to Dr. José Caridad at qmade@usal.es
− For further information, please contact Dr. José Caridad at qmade@usal.es

Selection process

The selecton process will be transparent and fair for all applicants. Applications will be evaluated based on the matching of the CV to the demanded profile. Selected candidates will be invited for an on-line interview where they will provide a 15-minute presentation and will answer questions from the selection committee.