

Position Offered: PREDOCTORAL RESEARCHER

Project: *Implementation of Machine Learning techniques for the design of new photonic materials*

Technological and scientific fields: Artificial Intelligence, Machine Learning, Computational Chemistry and Physics

Location: Madrid, Spain, Instituto de Química Física Blas Cabrera, <https://www.iqfr.csic.es/es/>

Research Group/PI: Molecular Simulation & Modelization group, Grupo de Simulación molecular y Modelización, Lara Martínez Fernández, <https://www.smcm.iqfr.csic.es>

PROJECT SUMMARY

This project will study how DNA origami can be used as building blocks to form low-density crystalline structures with optical properties suitable for applications in high-resolution imaging, big data storage, or (bio)sensors. To this aim, challenging simulations that capture the fundamental ingredients of the interactions between blocks and between them and light, will be carried out through the implementation of Machine Learning techniques. The candidate will explore a wide range of simulation methods from Monte Carlo and Molecular Dynamics to Quantum mechanics. The experience of both PIs in these fields, together with the multidisciplinary team provided by the possible collaborations/short stays, will provide a unique environment for the candidate from both scientific and personal points of view.

PROFESSIONAL PROFILE

Minimum requirements:

- Degree in Chemistry/Physics/Informatics, Mechanical/Telecommunications Engineering or equivalent qualifications.
- Proficiency in English.

Merits to be considered:

- Programming skills.
- Knowledge in quantum chemistry and/or classical simulations.

WHAT IS OFFERED

This project offers many opportunities to the candidate. From the scientific and technological point of view it will allow the candidate to learn different programming languages, techniques, and methods that are commonly used in a broad range of areas, from Chemistry and Biology to Physics. This knowledge is highly demanded by companies, so this project will be very useful for the candidate's future employability, whether the student continues in research or in pharmaceutical, consulting and/or software development companies. In addition, during the project, other transversal aspects will be encouraged: i) mobility and internationalization, through short stays in groups of recognized experts in the fields, ii) strategies for the design and implementation of research projects, through the writing of reports and articles, and iii) dissemination and presentation of results through the participation in conferences. With these aims in mind, a thorough training plan has been designed with a total of 278 ECTS.

Contract conditions:

Predocctoral Researcher contract of 4 years' duration. Gross annual salary of 23,871.33 €.

Start of contract: before 31 December 2024

PRINCIPAL INVESTIGATOR CONTACT

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