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University of A Coruña | Posted on: 27 August 2025

Doctoral candidate to take part of the European Marie Sklodowska-Curie Training Network programme FADOS

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27 Aug 2025

Hosting Information

Offer Deadline	Tue, 30 Sep 2025 - 23:59
EU Research Framework Programme	Horizon Europe - MSCA
Country	Spain
City	A Coruña

Organisation/Institute

Organisation / Company	University of A Coruña
Department	CITENI
Laboratory	The Functional Polymer Materials group led by Dr. Jaime Martín
Is the Hosting related to staff position within a Research Infrastructure?	No

Contact Information

Organisation / Company Type	Higher Education Institution
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Street	A Maestranza 9

Description

Doctoral candidate in Applied Physics: 'Experimental and machine-learning study of the thermodynamics and microstructure of doped semiconducting polymers', in EU Training Network FADOS

The Functional Polymer Materials group led by Dr. Jaime Martín at University of A Coruña, Spain, is now seeking doctoral applicants to take part of the European Marie Sklodowska-Curie Training Network programme FADOS. The successful candidate will join a cohort of 17 Doctoral students scattered among 16 research groups in Europe and the UK.

About FADOS

FADOS, Fundamentals and Applications of Doped Organic Semiconductors, is a consortium composed of eight universities, four research institutes, and four companies from EU countries, the UK and Switzerland. The mission of FADOS is to achieve targeted modification of semiconductor properties through electronic doping to control and modify its electronic characteristics. The project's goal is to develop fundamental understanding and innovative fabrication processes to solve urgent problems in organic electronic devices, and enable new components with sustainable functionalities. Collaboration with industry partners will enhance the translation of research into real-world applications.

The 17 Doctoral candidates recruited for this international project will receive training at the forefront of research and innovation in organic electronics. Moreover, the network will provide Doctoral candidates with exposure to academic and commercial working environments through a balanced secondment plan, and access to a complete training programme complementing scientific skills with personal and entrepreneurial skills, including communication to various audiences, career development, intellectual property and startup-funding.

The doctoral candidates will form a strong cohort through participation in seven network-wide events as well as secondments and collaborations, which entail travel to several different EU countries.

About the Functional Polymer Materials group at University of A Coruña, Spain

The Functional Polymer Materials group is led by the Oportunius Research Professor Dr. Jaime Martín (https://www.jaimemartinlab.com/) and is devoted to understanding the solid-state microstructure of conjugated polymer thin films and how this is connected with their electronic properties. The group is interested in the fundamental physical processes by which microstructure is developed in organic semiconductors, namely crystallization, glass transition, solid-solid transitions and liquid-crystalline transitions; now also including *in situ* microstructural studies during film formation and/or doping in combination with synchrotron-based radiation (X-rays). More recently, the group has expanded its expertise to the fabrication of functional electronic devices, namely, organic solar cells and diode-like devices. The deployment of machine-learning methods in harmony with high-throughput experimental datasets is also a valuable asset in the group. The key experimental techniques exploited in the Functional Polymer Materials group include fast scanning calorimetry, X-ray scattering (synchrotron-based), atomic force microscopy, polarized optical microscopy, UV-Vis and NIR spectroscopy, thin film processing and orientation, and device fabrication.

JOB DESCRIPTION

The Doctoral Candidate (DC) will investigate how doping alters the thermodynamics (vitrification/crystallization) and the microstructure of semiconducting polymers via fast scanning calorimetry and X-ray diffraction methods. Particular emphasis will be paid to determine the spatial arrangement of the dopant in semiconducting polymer matrices: does the dopant/counterion stay in the crystalline and/or the amorphous phases of the polymer matrix? Does it infiltrate/intercalate within the side-chains or is it preferentially stacked side-by-side to the conjugated

backbone? To answer these questions, the DC is furthermore expected to orient conjugated polymer films and study the infiltration of dopants therein.

Moreover, the structure-property relationship between chemical features of the doping species and molecular descriptors of the polymer and its repeating unit (lattice shrinking/expansion, degree of paracrystallinity, chemical similarity, persistence length, glass transition temperature, etc.) will be studied by machine-learning models to predict the compatibility, calorimetric/microstructural effect and/or the doping efficiency of arbitrary dopant-semiconductor pairs.

As a result, the DC will gain state-of-the-art expertise on thin film processing from solution and doping methods; use of calorimetric techniques and analysis of their results; (*in situ* and *ex situ*) microstructural characterization via X-ray diffraction in synchrotron facilities; and deployment of statistical and machine-learning tools together with computation of molecular descriptors.

Furthermore, the project will include two secondments:

- A first 3-month secondment hosted by Prof. Martin Brinkmann (CNRS, France) to align conjugated polymer backbones via hot rubbing.
- A second 3-month secondment hosted by the Swedish company Epishine AB to study the lamination properties of doped conjugated polymer layers closer to real-world applications.

The work will be done in close collaboration with the other members of the FADOS network. The Doctoral Degree will be awarded by the University of A Coruña and the work will be locally co-supervised by Dr. Jaime Martín and Dr. Xabier Rodríguez-Martínez, counting with external supervision from Prof. Martin Brinkmann.

QUALIFICATIONS and ELIGIBILITY

Applications are welcomed from candidates with a M.Sc. degree (or equivalent, including candidates who are about to complete their degrees) in physics, material science, chemistry or related fields. In addition to the above, **essential requirements** include:

- Knowledge on polymer physics and organic electronics in general.
- Good communications skills and proficiency in spoken and written English.
- Willingness and the ability to travel both within the Schengen region, the UK and abroad to conduct research (including secondments) and attend conferences and network activities
- Self-motivation and keen interest in science and fundamental research.
- Willingness to work as part of a team.

In addition, **desirable requirements** include:

- Experience with thin film processing of conjugated polymers or small molecules.
- Experience of working in an inert atmosphere (e.g. a nitrogen-filled glove box).
- Experience with differential scanning calorimetry or nanocalorimetry.
- Experience with X-ray scattering.
- Experience with statistics and machine-learning methods.
- Experience with Python programming.

Eligibility for FADOS programme:

- At the time of recruitment, applicants must be in the first four years of their research career and must not have been awarded a doctoral degree.
- **Mobility rule:** Applicants must not have resided or carried out their main activity (work, studies, etc.) in the host country (Spain) for more than 12 months in the three years immediately prior to recruitment. Compulsory national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status under the Geneva Convention are not taken into account.
- Demonstrate their ability to understand English and express themselves fluently in speech and writing.
- The applicant can be of any nationality.

APPOINTMENT

The appointment is for a total of 36 months, starting on 1 February 2026 at the latest, or earlier by agreement.

A competitive salary in the range of €38,000–€40,000 (gross) (*) will be offered, including living and mobility allowances (if applicable).

If the candidate meets the MSCA family allowance criterion, they will receive an additional salary component in accordance with the MSCA regulations for Doctoral Researchers.

APPLICATION PROCEDURE

Apply for the position by sending your application to the following emails:

Jaime Martín (jaime.martin.perez@udc.es)

Xabier Rodríguez (xabier.rodriguez@udc.es)

Juan José Sánchez (j.saguilar@udc.es)

Preselection for interviews will begin on the 1st of October 2025, and we must receive your application by the 30th of September 2025 at the latest. Applications and documents received after this date will not be considered.

Please include the following in your application:

- A motivation letter

- A detailed curriculum vitae, including references that can be contacted.

- A copy of your MSc and Bachelor's degrees, along with all corresponding transcripts listing the courses taken during your Bachelor's and MSc studies.

We welcome applications from people of all backgrounds, genders, races, ages, sexual orientations and abilities for this position. We value diversity and believe that a diverse and inclusive team is essential for success. The selection commission is committed to eliminating bias throughout the recruitment process.

If your application is unsuccessful, you are welcome to consider applying to our partners on the Fados network. The final email notification will include an invitation to indicate whether you would like your profile to be shared with interested Principal Investigators (PIs) in the project consortium. If so, you will have the opportunity to let us know.

CONTACT

Jaime Martín (jaime.martin.perez@udc.es)

Xabier Rodríguez (xabier.rodriguez@udc.es)

Juan José Sánchez (j.saguilar@udc.es)

In addition to the online application procedure, applicants are encouraged to contact the project supervisors directly.
