European MSCA Ph.D. grant position on Multicore Fiber Technology and Applications

Nanophotonics Technology Center

Universitat Politècnica de València, Spain

Job Information

Researcher Profile: First Stage Researcher (R1)

Research Field: Telecommunication Engineering, Applied Physics/Optics

Type of Contract: Temporary

Job Status: Full-time

Where to apply: https://match.iscte-iul.pt/phd-candidates-profiles/apply-to-dc-positions/

Application Deadline: 24 February 2025 - 23:59 (Lisbon time)

Offer Starting Date: September 2025 (latest)

Is the job funded through the EU Research Framework Programme? Horizon Europe - MSCA

Marie Curie Grant Agreement Number: 101169370

Is the Job related to staff position within a Research Infrastructure? No

Offer Description

MATCH consortium is looking for outstanding and motivated Doctoral Candidates (DCs) with the skills, knowledge and enthusiasm to develop innovative and breakthrough research in the field of multicore fibre (MCF) technology.

MATCH (Multicore Fiber - Applications and Technologies - Match) is a Marie Sklodowska-Curie doctoral network funded by the European Commission under the Horizon Europe. MATCH is committed to train the next generation of European researchers/engineers in MCF technologies and applications. MATCH will offer its DCs a comprehensive education encompassing the latest developments in MCF, component and subsystem design and implementation, and the practical engineering aspects of MCF-based systems and networks. With the collective expertise of all partners, MATCH stands as a unique consortium, poised to train a cohort of DCs with comprehensive and sound knowledge on MCF technology in Europe. Training of DCs will exploit multidisciplinary consortium expertise spanning design, modelling and simulation of photonic systems, sensor systems, signal processing and device manufacturing, development of machine learning algorithms and design of optical communication networks or power consumption and energy saving.

The synergies of MATCH consortium act together to enable the thirteen DCs to become the next worldwide senior fellow leaders on photonics networks and systems, with a clear understanding of intersectoral scientific fields ranging from the optical fibre communication design and implementation,

components fabrication, artificial intelligence, or techno-economic analysis, which represent qualified skills highly pursued by key technological players worldwide.

The consortium of MATCH doctoral programme represents a multidisciplinary and intersectoral team with large experience in training and innovative research deployment. MATCH comprises some of the most renowned European universities, spanning across 6 different European countries. All these universities have high educational and research standards and suitable infrastructures to host and training DCs. Private sector is represented by 2 high-tech research institutes and 4 European cutting-edge companies with a strong position on the optical fibre communications and optical components segment.

The MATCH methodology includes cross-disciplinary methods and practical experience to all DCs by granting access to top laboratory and test-bed facilities, in both host and secondment institutions within academia and industry.

The most talented candidates will be selected for advanced multidisciplinary and intersectoral research training, starting on September 2025 (the latest).

Key Features of the PhD Positions:

- **Multidisciplinary training:** Training of DCs will exploit multidisciplinary consortium expertise spanning design, modelling and simulation of photonic systems, sensor systems, signal processing and device manufacturing, development of machine learning algorithms and design of optical communication networks or power consumption and energy saving.
- **Secondments activities:** Each DC will experience at least two secondments, with at least one in a country different from that one of the host institution. MATCH comprises a total of 32 secondment actions, from which 25 are hosted by academic partners and 7 by industrial partners.
- **Personalized Career Development Plans:** Each DC of MATCH network has a personalized training program established. The program describes the research training goals of the DCs, transferable skills to attain, collaboration with partners and engagement in MATCH outreach activities, publication in journals and international conferences, and opportunities for the DC's future career development. The career development plan will be adjusted to DC’s personal circumstances that may arise and updated along the Ph.D. programme.

Open position at NTC-UPV for doctoral candidate DC8

DC8 Project Title: Multicore fibre coupling for parallel-scalable signal processing architectures
Host institution: UPVLC, Spain
Supervisors: Prof. Roberto Llorente and Prof. Maria Morant

Ph.D. position at the Nanophotonics Technology Center (NTC) of the Universitat Politècnica de Valencia (Spain) in the field of Photonic Integrated Circuits (PIC) in a MCF-connected photonic parallel architecture. This Ph.D. targets to solve the current bottleneck limiting the scalability in parallel-scalable signal processing applications, which is currently the cost-effective high-capacity optical interconnection of several PIC processing systems by developing cost-effective MCF-based interconnections. The research addresses Silicon-photonics PIC micro-nanofabrication, spatially multiplexed optical modulation/demodulation, optical coupling, device packaging, characterization and experimental validation. This research finds application in photonic beamforming networks, machine learning neural-networks, and general distributed parallel photonic processing.

The doctoral candidate (DC) accepting this position will gain world-class experience in PIC design and fabrication, including state-of-the-art design and simulation tools, experience in leading edge micro-nanofabrication equipment (e-beam lithography, epitaxy, etc.) and associated back-end services, and also experience in state-of-the art MCF design and fabrication. The fabrication will be done in NTC 500 m^2 cleanroom recognized as a Unique Scientific and Technical Facility of Spain, in close cooperation with our fab technicians and in collaboration with international MATCH partners. The candidate will enroll in the Ph.D. programme in Telecommunications of the Universitat Politècnica de València, Spain. This programme has been receiving the Quality Award from the Spain Ministry of Education, Culture and Sports since 2003. Candidates must have completed the Master studies (or a telecommunication-related degree with more than 300 credits) at the time of incorporation. Master studies related to optics and/or nanotechnology will be valuable.

This Ph.D. position includes two 3-month research secondments at:

- Instituto Universitário de Lisboa (ISCTE, Portugal) for the numerical evaluation of different MCF architecture designs and optimization (during the second year, tentative dates M14-16)
- Danmarks Tekniske Universitet (DTU, Denmark) regarding MCF design considering SDM and MDM transmission (third year, M26-28).

Requirements

Candidates must have completed the Master studies at the time of incorporation so they can enrol in the Ph.D. programme in Telecommunications of the *Universitat Politècnica de València*, Spain. This programme has been receiving the Quality Award from the Spain Ministry of Education, Culture and Sports since 2003. Master studies related to optics and/or nanotechnology will be valuable.

Research Fields: Telecommunication Engineering, Applied Physics/Optics

Education Level: Master Degree or equivalent

Skills/Qualifications:

- Applicants must be proficient in English language.
- Experience in the design and characterization of photonic integrated devices and/or multicore fiber applications will be very valuable. Hands-on experience in simulation analysis software (such as RSoft, Comsol, VPI Photonics, etc.) will be also considered positively.

Additional Information

Benefits

The position is a 36-month employment contract with the competitive conditions and salary adapted to the life cost in each host country, set by the MSCA Doctoral Networks.

The successful candidate will receive a financial package plus an additional mobility and family allowance according to the rules for DCs in MSCA Doctoral Networks:

- Living Allowance: This gross amount is EUR 3 400 per month. To ensure equal treatment and purchasing power parity, this amount is then adjusted through the application of a correction coefficient based on the country in which the DC have been recruited. The coefficients applied can be found in page 112 of “Annex II Horizon Europe Work Programme 2023-2024 - 2. Marie Skłodowska-Curie Actions” (resource.html).

- Mobility allowance: This monthly gross amount of EUR 600 is an addition to the living allowance and should normally be paid at the same time. It is intended to cover the costs associated with the fact that the DC has moved to a different country to take up the position. Furthermore, it is for private use, therefore it is not meant to cover any expenses related to the project (such as secondment costs, travel costs for attending a conference, etc.).
- Family allowance: If the DC has or will acquire family obligations during the action duration, it is entitled to an additional gross "family allowance" of EUR 660 per month. For the purposes of the MSCA, family is defined as "persons linked to the researcher by marriage (or a relationship with equivalent status to a marriage recognised by the legislation of the country where this relationship was formalised) or dependent children who are actually being maintained by the researcher".

Amounts indicated for living allowance, mobility allowance and family allowance, are gross amounts before taxation and compulsory deductions. Additional information can be found in Information Note for MSCA doctoral networks.

Eligibility criteria

All applicants must, at the date of the recruitment, comply with the following two eligibility rules:

- To be eligible for a recruitment within a DN project, the candidate must be a doctoral candidate, i.e. not already in possession of a doctoral degree at the date of the recruitment.
- The MSCA are based on the principle of physical mobility. Each DC is required to undertake transnational mobility to be eligible for recruitment in a doctoral network project. As such, the DC must not have resided or carried out their main activity (work, studies, etc.) in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date.

All the applicants are asked to submit an Eligibility form attesting the compliance with these rules.

Selection process

The selection process of DCs complies with ethical principles, including the highest standards of research integrity as set out in the European Code of Conduct for Research Integrity and, all applicable international, EU and national law, including the EU Charter of Fundamental Rights and the European Convention for the Protection of Human Rights and Fundamental Freedoms and its Supplementary Protocols.

ELIGIBILITY CHECK:

The project manager of MATCH will check that the information of each candidate is complete and comply with the rules of the eligibility criteria. All the candidates must submit their information in English.

Information from eligible candidates directly applying to each position or giving their permission to be considered for others, will be distributed among the host institutions. Not eligible candidates will be notified via email.

ASSESSMENT:

Assessment comprises a two-stage process: a) scientific merit assessed by the application files and b) online interview (only for the short-listed candidates selected in stage a)). In each stage, the following items will be addressed: (i) academic profile, (ii) personal motivation, (iii) relevant background,

(iv) professional experience, (v) scientific knowledge, (vi) transversal skills, and (vii) soft skills and English proficiency.

A Selection Committee, led by the MATCH coordinator, will be set up at each host institution. Each DC Selection Committee will short-list the best candidates among those applying for the DC position and produce a reserve list of potentially interesting candidates.

DECISION:

The project manager will elaborate the final ranked list of the selected candidates for all the positions, considering the candidates' preferred choices as expressed in her/his application form. Then, the decision will be communicated to the candidates by email tentatively by March 10th, 2025. The intention is that **all DCs start by September 2025**.

Additional comments

Documents to be submitted:

- Candidate CV (including candidate personal information with indication of the country(ies) of residence/carried out main activities in the last three years prior to application, nationality, academic qualifications, work experience, English proficiency, publications)
- Signed eligibility form
- Personal motivation letter (up to one page)
- Official transcripts of graduate and postgraduate degrees
- Contact details of master's degree advisor or employer

Websites for additional job details:

https://match.iscte-iul.pt/

https://marie-sklodowska-curie-actions.ec.europa.eu/news/new-information-packages-for-msca-fellows-and-staff-members-published

Contact

Website: https://match.iscte-iul.pt/

Email: match@iscte-iul.pt