

(BL139/2026-IST-ID)

Research Studentships (for students of a Master or Integrated Master students)

Applications are open for one Research Studentship, within the framework of project SPECTRUM - Solar PolyGeneration Collector for combined heat, power, hydrogen fuel and wastewater treatment/Associação do Instituto Superior Técnico para a Investigação e Desenvolvimento, reference Horizon Europe nº 101172891, financed by the European Commission funds through Horizon Europe programme – the Framework Programme for Research and Innovation Actions (2021-2027), of the call HORIZON-CL5-2024-D3-01 — Next generation of renewable energy technologies, under the following conditions:

Scientific Area: Plasmas, Lasers and Nuclear Fusion

Admission Requirements: *To be enrolled at an integrated master or a master.*

Workplan: Thermal and Optical Design of a High-Temperature Hybrid Solar Collector (SPECTRUM-HT)

The research work will be developed within the scope of Work Package 2 (WP2) of the Horizon Europe Project with Grant nº 101172891, entitled “SPECTRUM - Solar PolyGeneration Collector for combined heat, power, hydrogen fuel and wastewater treatment”.

This workplan aims to integrate a simulation model of a Photoreactor for wastewater treatment into an existing optical-thermal simulation model used to study the high-temperature hybrid solar collector (SPECTRUM-HT), contributing specifically to the tasks performed by the IST-ID team. The work will focus on creating a design tool that integrates an existing combined ray-tracing optical and 1D steady-state thermal model, with a model of a photoreactor (interaction of radiation with a participating medium) to predict and optimize the system's overall performance. The specific objectives are as follows:

1. To develop a simulation tool to describe the interaction of radiation with the wastewater (participating medium) to be treated in the photoreactor.
2. To integrate this new simulation tool into the existing optical-thermal model to simulate the overall performance of the SPECTRUM-HT collector under varying operating conditions.

This integrated tool will be used to perform parametric studies and optimize the SPECTRUM-HT collector design, ensuring high efficiency in heat, power, and hydrogen generation. The results will directly feed into the collaborative tasks of WP2, supporting the final prototype design specifications.

The candidate must demonstrate skills in programming, ray tracing for designing optical systems, and heat transfer processes in thermal systems, as well as knowledge of the interaction of radiation with participating media.

Legislation and Regulations: Statute of Scientific Research Fellow, approved by Law nr. 40/2004, of August 18, as worded by Decree-Law nr. 123/2019, of August 28; IST-ID Regulation of Scientific Research Fellowships, available on <https://ist-id.pt/recursos/documentos/recursos-humanos/bolseiros/#1690453819726-6707f7f2-ce04>

Workplace: The work will be developed at the Department of Physics of the Instituto Superior Técnico (DF-IST), Avenida Rovisco Pais 1, 1049-001 Lisboa, and in the Unidade de Energias Renováveis e Eficiência Energética of LNEG, Estrada do Paço do Lumiar 22, 1649-038 Lisboa, under the scientific supervision of Professor Luís Filipe Moreira Mendes (DF-IST) and Engenheiro João Cardoso (LNEG).

Duration: The research fellowship will have the duration of 3 months. It's expected to begin in October 2026. The contract of the research fellowship is not renewable.

Monthly maintenance allowance: the amount of the monthly maintenance allowance is €1090,98, being the payment method an option of the Fellow by Wire Transfer/Check.

Selection methods: The selection methods will be the following: *Curriculum Vitae* evaluation and individual interview (to be carried out in person), with the respective grades of 0 to 20 points attributed to each method and with the weight of 50% (*Curriculum Vitae* evaluation) and 50% (individual interview).

Composition of the selection Jury: Professor Luís Filipe Moreira Mendes; Professor Carla Isabel Costa Pinheiro; Professor João Alberto dos Santos Mendanha Dias.

Announcement/ notification of the results: The final evaluation results will be communicated to all applicants by email.

Application deadline and formalization: The call is open from September 18 until September 24, 2026.

It is mandatory to formalize applications with the submission of the following documents: i) B1 Form – Fellowship application (<https://ist-id.pt/recursos-humanos/bolseiros/#documentos-relacionados>); ii) *Curriculum Vitae*; iii) academic degree certificate, where applicable; iv) proof of enrollment at an academic degree course (Master, Integrated Master); v) motivation letter;

Applications must be submitted to the email: filipe.mendes@tecnico.ulisboa.pt