

**Research Studentships (for Master or Integrated Master students)**

Applications are open for 6 Research Studentship(s), within the framework of project/R&D institution COOSPOT: Interfacial COOLing Strategies for high POwer dissipation conversion Technologies, (PTDC/EME-TED/7801/2020), financed by national funds through FCT/MCTES (PIDDAC), under the following conditions:

**Scientific Area:** Mechanical Engineering and Engineering Systems – Energy and Environment

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

**Workplans:**

1. Experimental study addressing the use of alternative geometries for the design and assembly of microchannel based heat sinks for the dissipation of high heat loads. The work addresses the detailed characterization of temperature and pressure fields to determine the solution maximizing the heat transfer without significant pressure drops. As the candidates are developing their studies to complete their thesis, they can work on a thesis developed under this topic and use relevant engineering concepts in the area of energy and environment.
2. Experimental study addressing the use of microstructured surfaces to be integrated in microchannel based heat sinks for the dissipation of high heat loads. The work addresses the detailed characterization of temperature and pressure fields to determine the solution in terms of the microstructured patterns to be tested maximizing the heat transfer without significant pressure drops. As the candidates are developing their studies to complete their thesis, they can work on a thesis developed under this topic and use relevant engineering concepts in the area of energy and environment.
3. Experimental study towards the development of energy conversion strategies/systems (e.g. based on green hydrogen) which have high cooling needs. As the candidates are developing their studies to complete their thesis, they can work on a thesis developed under this topic and use relevant engineering concepts in the area of energy and environment.
4. development and characterization of a custom air-cooled condenser to be implemented on a cooling system based on pool/flow boiling and condensation of a liquid. This thermosyphon is mainly used for the dissipation of high heat loads (e.g. electronics cooling). Previous work has allowed us to optimize the design of the evaporator, but the condenser also plays a relevant role. The main activities address a parametric study to determine the most suitable geometry of the condenser for the established working/boundary conditions of the thermosyphon. The working plan addresses a detailed numerical study supported on experimental validation to be also developed by the candidate. Ultimately, the designed condenser can be assembled and briefly tested at the end of the work. As the candidates are developing their studies to complete their thesis, they can work on a thesis developed under this topic and use relevant engineering concepts in the area of energy and environment.
5. Detailed characterization of the flow boiling regimes in microchannels. The workplan addresses the characterization of the flow dynamics together with information gathered from thermography to describe the mechanisms observed to find solutions to control flow instabilities which are vital to develop efficient cooling systems based on microchannels. As the candidates are developing their studies to complete their

thesis, they can work on a thesis developed under this topic and use relevant engineering concepts in the area of energy and environment.

6. Experimental study addressing the use of microstructured surfaces to be integrated in pool boiling thermosyphon heat sinks for the dissipation of high heat loads. The work addresses the detailed characterization of the boiling curves and bubble dynamics to determine the solution in terms of the microstructured patterns to be tested maximizing the heat transfer, mostly looking and electronic cooling applications. As the candidates are developing their studies to complete their thesis, they can work on a thesis developed under this topic and use relevant engineering concepts in the area of energy and environment.

**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; FCT Regulation for Research Studentships and Fellowships, available on <https://www.fct.pt/apoios/bolsas/docs/RegulamentoBolsasFCT2019.pdf> and <https://dre.pt/application/file/a/127230968>.

**Workplace:** The work will be developed at IN+ Center for Innovation, Technology and Policy Research of LARSyS/IST-ID, under the scientific supervision of Prof Ana Sofia Oliveira Henriques Moita

**Duration:** The research fellowship(s) will have the duration of 5 months. It's expected to begin in October/2024 and cannot be renewed.

**Monthly maintenance allowance:** According to the values for Research Fellowships awarded by FCT in Portugal ([https://www.fct.pt/wp-content/uploads/2024/02/Tabela-de-Valores-SMM\\_atualizacao-2024.pdf](https://www.fct.pt/wp-content/uploads/2024/02/Tabela-de-Valores-SMM_atualizacao-2024.pdf)), the amount of the monthly maintenance allowance is € 990,98, being the payment method an option of the Fellow by Wire Transfer/Check.

**Selection methods:** The selection methods will be the following: *Curriculum evaluation 80%, individual interview 20% (for the candidates with the highest scores in the curriculum evaluation)*. The curriculum evaluation addresses the respective weight of 40% for curricular experience and 40% for experience relevant for the project.

**Composition of the selection Jury:** Professor António Luís Nobre Moreira, Professor Edgar Caetano Fernandes and Professora Ana Sofia Oliveira Henriques Moita

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

**Deadlines and procedures of complaint and appeal.** A complaint may be lodged from the final decision within 15 working days, or an appeal to the Executive Board of IST-ID within 30 working days, both counted from the respective notification

**Application deadline and formalization:** The call is open from September 25 until October 8, 2025.

It is mandatory to formalize applications with the submission of the following documents: i) B1 Form – Fellowship application (<https://ist-id.pt/concursos/bolsas>); ii) *Curriculum Vitae*; iii) academic degree certificate, where applicable; iv) proof of enrollment at an academic degree course (Master, Integrated) or at a course that does not award an academic degree; v) motivation letter;

Applications must be submitted to the email: [jobs@in3.tecnico.ulisboa.pt](mailto:jobs@in3.tecnico.ulisboa.pt)



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