



UNIVERSIDADE DE ÉVORA

Department of Mechatronics Engineering

Doctoral scholarship - 1 vacancy

14 of July of 2023

A call for tenders is open for one Doctoral Scholarship within the scope of the project Mobilising Agenda: New Space Portugal (Ref.^a C644936537-00000046, Aviso ACC02/CO5-i01/2022, funded by the "Mobilising Agendas for Business Innovation" through the "Recovery and Resilience Programme (PRR), under the following conditions:

Scientific area: Mechanical Engineering, Space Missions (orbital vehicles)

A call for tender is open for the award of a Doctoral Scholarship, to deal with work for missions to space (using new space materials), in the area of instrumentation for monitoring orbital vehicles. The work will focus more specifically on the development of instrumentation solutions for vehicle monitoring under cryogenic operating conditions, addressing sensors based on optical fiber Bragg gratings, their characterization and implementation of a system for data acquisition and transmission and sensors fusion.

Admission requirements:

1) Master in Mechanical Engineering; 2) Knowledge of systems for suborbital vehicles; 3) Advanced training in intelligent systems; 4) Knowledge of electronic control instrumentation; 5) Knowledge in the design of electronic systems for signal acquisition, using Altium; 6) Knowledge in finite element mechanical simulation (ESATAN, Siemens NX); 7) Experience in implementing instrumentation and signal acquisition; 8) Knowledge and programming of controllers with fractional order controllers.

As set forth FCT Research Scholarship Regulation No. 950/2019 of December 16, 2019, article 3 and 6, candidates for "BI" must comply as a rule condition for the award of the scholarship, the effective inclusion in study cycles leading to the attribution of academic degrees or in courses not leading to an academic degree. Courses that do not confer an academic degree correspond to the courses provided for in subparagraph e) of paragraph 3 of article 4 of Decree-Law No. 74/2006 of 24 March and must be developed in a higher education institution in association with at least one R&D unit, including a course plan in one or several research areas of the unit.

Work plan:

1) Review of the state of the art within the scope of multi-channel instrumentation system solutions for monitoring orbital vehicles under cryogenic operating conditions;

2) Survey of the fiber optic Bragg grating system requirements for the vehicle: within the scope of cryogenic operating conditions (operating temperatures, vibrations); within the scope of technical needs (interfaces, parameters to be monitored, acquisition tasks, storage needs); within the scope of data transmission protocols (processing needs, final data format);



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- 3) Definition of acquisition system requirements using fiber optic Bragg grating for the vehicle;
- 4) Design of the vehicle condition acquisition and monitoring system using a fiber optic Bragg network (on-board computer);
- 5) Simulation and implementation of the monitoring system;
- 6) Definition of test plans;
- 7) Conducting functional tests;
- 8) Qualification of the vehicle status acquisition and monitoring system using fiber optic Bragg grating;
- 9) Carrying out tests in an operational environment on the orbital vehicle.

Applicable legislation and regulations: The granting of the Research Scholarship will be carried out upon the signing of a contract between the University of Évora and the scholarship holder, as set in the template [former.fct.pt/apoios/Minuta_Contrato_Bolsa.docx](https://www.fct.pt/apoios/Minuta_Contrato_Bolsa.docx), pursuant to the Research Scholarship Statute (Law No. 40/2004 of August 18 and Decree-Law No. 123/2019 of August 28) and in accordance with the legislation and Regulation of Research Grants of the Foundation for Science and Technology, IP in force, regulation nº950/2019 of December 16, 2019 <https://files.dre.pt/2s/2019/12/241000000/0009100105.pdf> and other applicable rules.

Place of work: The work will be carried out at the CENTRA Laboratories, Faculty of Sciences, University of Lisbon; IDMEC, Instituto Superior Técnico, and Instituto Superior de Engenharia de Lisboa, under the scientific guidance of Doctor Rui Melício, Doctor Paulo Gordo and Doctor Duarte Valério.

Duration of the scholarship(s): The scholarship will have an initial duration of 12 months, starting in September 2023. The scholarship will be subject to an evaluation report after 6 months of contract. The scholarship contract may be renewed up to a maximum of 31 months or until the end of the budget allocation of the funding project.

Amount of monthly maintenance allowance: The amount of the scholarship corresponds to €1 199,64, according to the table of scholarships awarded directly by FCT, I.P. in Portugal (https://www.fct.pt/wp-content/uploads/2023/02/Tabela-de-Valores-SMM_2023.pdf), payments being made monthly, by check or bank transfer.

Selection methods: The selection methods to be used will be as follows:



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- curricular assessment (100%)

If considered necessary by the jury, for additional clarifications, or for tie-breaking purposes, the first two candidates may be called for a selection interview.

In the case of using the interview, the evaluation elements will be evaluated as follows:

- curricular assessment (85%)
- interview (15%)

Composition of the Selection Jury:

President: Professor Rui Melício (IDMEC, Centro de Ciências e Tecnologias Aeronáuticas e Espaciais, Instituto Superior Técnico e Universidade de Évora)

1st Member - Professor Paulo Gordo (CENTRA, Center for Astrophysics and Gravitation, University of Lisbon)

2nd Member - Professor Duarte Valério (IDMEC, Instituto Superior Técnico, Universidade de Lisboa)

1st Alternate - Professor Luís Santos (AEROG, Astronautics Research Center, University of Beira Interior and ISEC Lisbon, Instituto Superior de Educação e Ciências)

2nd Alternate - Professor José Figueiredo (CENTRA, Center for Astrophysics and Gravitation, University of Lisbon)

Advertising/notification of results: The final results of the evaluation will be publicized, through an ordered list *by final grade obtained* posted in a visible and public place *University of Évora, Colégio Luis António Verney, Rua Romão Ramalho, nº59, Évora 7000-671*, being the candidate (a) approved notified through *email*.

To ensure the right of prior hearing of interested parties, the Final Classification project will be announced by any written means to all interested parties.

After communicating the provisional list of the results of the evaluation, candidates have a period of 10 working days to express their opinion in a preliminary hearing of interested parties.

Application deadline and submission of applications: The tender is open from 24th of July to 7th of August of 2023 and the results of the selection will be published by 16th of August of 2023.

Applications must be formalized, obligatorily, by sending an application letter with the following documents: Curriculum Vitae, certificate of qualifications and other supporting documents considered relevant.

For the purposes of application, the evidence may be replaced by a declaration of honor signed by the candidate, but the failure to demonstrate that evidence, in the contracting phase, possession of the required degree on the deadline for application or the non-



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presentation of proof of enrollment in the study cycle or non-degree course, for scholarships with this component, imply the cancellation of the candidate's application.

Academic degrees obtained in foreign countries require registration by a Portuguese Institution in accordance with Decree-Law no. 66/2018, of August 16 and Ordinance No. 33/2019, of January 25th.

The presentation of the certificate is mandatory for the signing of the contract. More information can be obtained at: <https://www.dges.gov.pt/pt/pagina/recognition?plid=374>

Applications must be sent by email to:

Subject: "Candidatura Bolsa de Doutoramento Projeto New Space Portugal".

Professor Rui Melício;

Departamento de Engenharia Mecatrónica

email: ruimelicio@uevora.pt