

CALL FOR GRANT APPLICATIONS

(AE2026-0182)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) within the scope of the within QUANTUM_IBER_IA project, with reference 0590_QUANTUM_IBER_IA_6_E, co-financed by the European Regional Development Fund (ERDF), in the scope of Interreg VI-A Spain – Portugal Cooperation Program (POCTEP) 2021-2027.

1. GRANT DESCRIPTION

Type of grant: Research Grant (BI)

General scientific area: COMPUTER SCIENCE

Scientific subarea: Informatics

Area of Work: Quantum Computing

Grant duration: 6 months, starting on 2026-07-15, with the possibility of being renewed until the end of the project.

Scientific advisor: Luís Soares Barbosa

Workplace: Braga

Maintenance stipend: € 1359.64, [according to the table of monthly maintenance stipend for FCT grants](#), paid via bank transfer. Grant holders may be awarded potential supplements, according to a quarterly evaluation process (Articles 19, 21 and 22 of the [Regulations for Grants of INESC TEC](#) and Annex II), up to a maximum limit of 50% of the monthly maintenance stipend.

INESC TEC supports costs with registration, enrolment or tuition fees, during the grant duration, under the terms established in the internal document: [Payment of Tuition fees to grant holders](#).

The grant holder will benefit from health insurance, supported by INESC TEC.

2. OBJECTIVES:

- To broaden the understanding of the state of the art in the specific scientific field covered by the fellowship;
- To identify and select the appropriate methods for the study in question;
- To develop research skills through the application of the selected methods;
- To apply critical thinking when evaluating the research process and the results obtained.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

Topic: Harnessing paraconsistent logic and non-additive probability in the formulation of quantum theory

Background and objectives: Standard classical logic obeys the principle of explosion: from a contradiction, every statement follows. Any theory containing a single contradiction is thereby trivialized — it proves everything and becomes useless. This is a structural obstacle wherever contradictory assertions arise without genuine pathology: inconsistent databases, conflicting legal norms, and — most relevant here — the no-go theorems arising in quantum theory (Bell, Kochen–Specker,...). Such theorems establish a contradiction between the predictions of quantum theory and the assumptions of certain hidden-variable models, whose underlying structure is classical (a

Boolean algebra of properties with classical probability).

Paraconsistent logics reject the principle of explosion: a contradiction is tolerated locally without trivializing the surrounding theory. The natural algebraic setting is the class of co-Heyting algebras — the order-duals of Heyting algebras — in which the law of non-contradiction $p \wedge \neg p = \perp$ may fail. Co-Heyting algebras arise canonically in point-free topology: the lattice of sublocales of a locale is a coframe, hence a co-Heyting algebra, providing a large and well-understood class of paraconsistent models.

This project develops models based on paraconsistent logic and non-additive probability theory to replace the hidden-variable models. The project has two objectives: (i) a paraconsistent reformulation of the no-go theorems of quantum theory (starting from Bell's theorem), and (ii) the corresponding development of the theory of non-additive probability on co-Heyting algebras.

Activities: - prepare a report on paraconsistent models in quantum theory;

- prepare a report on the development of non-additive probability theory in co-Heyting algebras;

- analyse the possible implications for quantum computing, particularly in the development of algorithms that exploit contextuality;

- submit two articles on the research results obtained;

- collaborate with the quantum computing group at INESC TEC, exploring synergies between this topic and the group's current research;

- deliver a module on transferable skills.

4. REQUIRED PROFILE:

Admission requirements:

- Master's degree in Computer Science, Physics or a related field.

The awarding of the fellowship is dependent on the applicants' enrolment in study cycle or non-award courses of Higher Education Institutions.

Preference factors:

- Publications in paraconsistent logics, quantum theory, and quantum computing.

Minimum requirements:

- Knowledge and previous research experience in paraconsistent logic, quantum theory and quantum computing;
- 2 articles published in a conference proceedings or peer-reviewed journal in the field of quantum theory or quantum computing.

5. EVALUATION OF APPLICATIONS AND SELECTION PROCESS:

Selection criteria and corresponding valuation: the first phase comprises the Academic Evaluation (AC), based on the criteria referred to in Article 12 of the [Regulations for Grants of INESC TEC](#), while the second phase comprehends the Individual Interview (EI). All factors are evaluated on a scale of 0 to 100, taking into account the applicants' merit, suitability and conformity with the preference factors.

The weight of the AC factors are as follows: Academic Qualifications (FA, 40%), Scientific Publications (PC, 30%), Experience (EX, 20%) and Motivation Letter (CM, 10%).

Candidates who score less than 50 points in the AC average will be considered excluded on absolute merit. The top five candidates approved on absolute merit will be qualified for the individual interview. The Final Grade (CF) is obtained by the weighted average of AC (70%) and EI (30%).

DISABILITY INCENTIVE

Candidates who present a degree of disability equal to or greater than 90% will benefit from an incentive (20) in the score of the CV Assessment.

Candidates who present a degree of disability equal to or greater than 60% and less than 90% will also benefit from an incentive (10) in the score of the CV Assessment.

Said score may, in these cases, exceed 100 points.

Candidates must demonstrate the degree of disability during the application, namely through the submission of the Multi-Purpose Medical Certificate of Disability, issued in accordance with Decree-Law no. 202/96, of October 23 currently in effect.

Candidates must declare, in the application form, the type of disability used throughout the selection process, in order to proceed with the required adaptations.

The Selection Jury is composed of the following members:

- President of the Jury: Luís Soares Barbosa
- Full member: Luís Paulo Santos
- Full member: Renato Jorge Neves
- Substitute member: André Manuel Sequeira

Release of results and prior hearing: the results of the selection process, as well as the terms and procedures for prior hearing, will be released to the applicants by email, under the terms referred to in Article 13 of the Regulations for Studentships and Fellowships of INESC TEC.

6. FORMALISATION OF APPLICATIONS:

Application Documents:

1. Motivation letter;
2. Curriculum Vitae (must include the list of previous fellowships, their type, beginning and end dates, funding entities and host institutions);
3. Certificate or diploma degree;
4. Proof of enrollment in a degree awarding study cycle or in a non degree awarding Higher Education program.
 - The proof of enrollment may be presented just during the grant hiring stage.
5. Signed declaration stating the infringement of the grant holder's duties (article 14, no. 4)
6. Documental evidence to support the country of residence, residence permit or other legally equivalent document, in cases where the applicant is a foreigner or non-resident in Portugal - valid until the beginning of the grant.
7. Other supporting documents relevant to the final assessment.

Failure to deliver the required documents within the 90-day period after the date of the notice of the conditional awarding of the grant implies its cancellation.

Application period: From 2026-06-15 to 2026-06-26

Submission of applications: the application will be formalised by submitting the form available in the *Work With Us* section of INESC TEC website.

7. BINDING LEGISLATION AND REGULATION

The hiring process shall comply with the current legislation regarding the Research Grant Holder Statute, approved by Law no. 40/2004 of August 18, in its current wording, as well as by the [Regulations for Grants of INESC TEC](#) and for [FCT Grants Regulation in force](#).

For more information, please check the [Regulations for Grants of INESC TEC](#) and relevant annexes at www.inesctec.pt/bolsas

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