



UNIVERSIDADE DE ÉVORA

**CIMA - CENTRE FOR RESEARCH IN MATHEMATICS AND APPLICATIONS**

**CIMA/BII2/2023 - Research Initiation Scholarship – 1 vacancy**

**28 of August of 2023**

A call for tenders is open for one Research Initiation Scholarship, Ref.: CIMA/BII2/2023, within the scope of the project com reference **UIDB/04674/2020**, Financiamento Plurianual 2020-2023 of CIMA financed by national funds through FCT/MCTES, under the following conditions:

**Scientific area:** Mathematics

**Admission requirements:** Students of 1st Cycle with academic experience in the field of Mathematics.

As set forth FCT Research Scholarship Regulation No. 950/2019 of December 16, 2019, article 5th, candidates for “Research Initiation Scholarship” cannot be awarded to anyone who has already benefited from research grants directly or indirectly financed by FCT, awarded under the terms of the Statute of Research Fellows.

**Work plan:**

Introduction to scientific writing with LaTeX. Installation of MiKTeX and TEXstudio. [1 week]

Installation of Sagemath software - Open-Source Mathematical Software System. Introduction to the main features of the software. [1 week]

Study and implementation in Sagemath of several numerical methods for solving initial value problems.

- Taylor's Methods
- Runge-Kutta Methods
- Implicit methods
- Multistep methods
- Predictor-corrector methods
- Adaptive methods
- Systems of ordinary differential equations
- Higher order ordinary differential equations

The study of numerical methods will be complemented with a monograph written in LaTeX including the presentation of the results obtained with the simulations. [2 weeks]



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The computational implementation of numerical methods will be carried out in SageMath with testing and validation through examples. Comparison of the efficiency of different methods. [8 weeks]

**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 developed at CIMA of the University of Évora, under the scientific guidance of the Professors Paulo Correia and Fernando Carapau.

**Duration of the scholarship(s):** The scholarship will have a duration of 3 months, starting on December of 2023. The scholarship contract may be renewed up to *the end of* the funding project's budget allocation .

**Amount of monthly maintenance allowance:** The amount of the scholarship corresponds to €541,12, 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](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 the following, with the respective valuation :

- Curriculum evaluation : 40%;
- Motivation Letter Evaluation - 40%;
- Academic experience in the area of Mathematics – 20%.

**Composition of the Selection Jury:**

President: Professor Fernando Manuel Lucas Carapau

1<sup>st</sup> Vogal – Professor Luís Manuel Zorro Bandeira

2<sup>nd</sup> Vogal – Professor Paulo Manuel de Barros Correia

Alternate Member – Professor Maria Manuela Melo Oliveira

Alternate Member – Professor Paulo de Jesus Infante dos Santos

**Advertising/notification of results:** The final results of the evaluation will be publicized, through an ordered list alphabetically, posted in a visible and public place of the Mathematics Department, being the candidate 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.



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**Application deadline and submission of applications:** The tender is open from 21 of September of 2023 to 9th of October of 2023, and the results of the selection will be published by 23 of October of 2023.

Applications must be formalized, obligatorily, by sending an application letter with the following documents:

- Curriculum vitae;
- Qualification certificate
- Letter of interest
- Letter of recommendation

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-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, with the reference CIMA/BII2/2023 by email to:

Prof. Feliz Manuel Barrão Minhós

Department of Mathematics, University of Évora

e-mail : [dircima@uevora.pt](mailto:dircima@uevora.pt)



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