

21/04/2022

22/ECUM/CMAT- UIDB/00013/2020 (BII)

Where to apply

Application Deadline: 06/05/2022 23:00 - Europe/London

Contact Details

Where to send your application.

COMPANY

Universidade do Minho

E-MAIL

candidaturas@cmat.uminho.pt

Hiring/Funding Organisation/Institute

ORGANISATION/COMPANY

Universidade do Minho

COUNTRY

Portugal

DEPARTMENT

Escola de Ciências

CITY

Braga

ORGANISATION TYPE

Higher Education Institute

STATE/PROVINCE

Braga

WEBSITE

POSTAL CODE

<https://www.uminho.pt>

4710-057

E-MAIL

sec@cmat.uminho.pt

STREET

Campus de Gualtar

PHONE

+351 253604367

ORGANISATION/COMPANY

Universidade do Minho

LOCATION

Portugal › Braga

RESEARCH FIELD

Mathematics

REFERENCE NUMBER

UIDB/00013/2020

RESEARCHER PROFILE

First Stage Researcher (R1)

APPLICATION DEADLINE

06/05/2022 23:00 - Europe/London

OFFER DESCRIPTION

ANNOUNCEMENT FOR THE AWARD OF SIX RESEARCH INITIATION FELLOWSHIPS

A call for applications is now open for the awarding of six research initiation fellowships, in the area of Mathematics, below designated by Fellowships, within the scope of the pluriannual R&D project (UIDB/00013/2020) of the Centre of Mathematics of the University of Minho (CMAT), financed by Fundação para a Ciência e a Tecnologia (FCT), I.P. /MCTES, through national funds (PIDDAC), under the following conditions:

Scientific Area: Mathematics

Recipient category: Students enrolled in a BSc course (“1º ciclo”) in the areas of Mathematics, Computer Science or Statistics.

Requirements for granting the fellowship:

The candidates may apply without prior enrollment in one of the courses defining the recipients of the fellowship. The requirement to enroll in one such course will be verified on the date of contracting the fellowship.

For contractualization purposes, it will only be accepted those selected candidates who present valid proof of enrollment in one such course, issued by the academic services of the Higher Education Institution responsible for the

course, indicating either the academic year of enrollment or the duration of the course (beginning and end).

Applicants' eligibility: Applicants must comply with the eligibility conditions laid down in article 9 of the Research Grants Regulation of the Portuguese Foundation for Science and Technology (2019).

Work plan

[Projeto BII2022-A] Analysis of patterns and correlation between variables in pelagic fish landings in mainland Portugal

Supervisor: Raquel Menezes (rmenezes@math.uminho.pt)

Description: This work intends to analyze the regional and temporal patterns in the landings of pelagic fish in mainland Portugal, in order to understand the evolution over time, using data from official landings from the purse seine fleet. In order to achieve this objective, it will be necessary to develop a graphical application in the R environment (e.g. Shiny package), to quickly visualize the main spatial and temporal characteristics of the data referring to the landings of the captured fish.

[Projeto BII2022-B] Coloring of triangle-free simple planar graphs

Supervisor: Assis Azevedo (assis@math.uminho.pt)

Description: Knowing that the problem of deciding whether a graph admits a 3-coloring is NP-hard, it is natural to look for classes formed only by graphs under these conditions. An answer to this question is given by the well-known Grötzsch theorem which says that a triangle-free planar simple graph can be colored with 3 colors. Dvorak, Kawarabayashi and Thomas presented a linear time algorithm for this coloring. The planarity condition cannot be removed, as shown by the so-called Grötzsch graph, which is triangle-free, but needs 4 colors to be colored. In 1955, Mycielski defined a construction that allowed him to show that there are triangle-free graphs with arbitrarily large chromatic numbers.

[Projeto BII2022-C] Constrained extrema and applications

Supervisors: Altino Santos (afolgado@utad.pt), Catarina Avelino (cavelino@utad.pt)

Description: Optimization appears as one of the central themes in some mathematics curricular units, since problems of obtaining maxima and minima arouse great interest due to their wide applications. Based on the theoretical support foundation, it is intended to study different approaches to this type of problems and provide the relation of concepts. Applications will also be analyzed by modeling and solving real-life problems.

[Project BII2022-D] Math flashes

Supervisors: Fernando Miranda (fmiranda@math.uminho.pt), M. Irene Falcão (mif@math.uminho.pt)

Description: Some essential mathematical concepts are complex or tend to involve subtleties that make them difficult for young math students to understand. The aim of this project is to use dynamic computation to shed new light on some of these concepts. The aim of the project is to use the Mathematica system to build interactive objects that allow, through their manipulation, to clarify fundamental mathematical notions and results.

[Project BII2022-E] LCA- Logarithms, Congruences and Applications

Supervisors: Eurica Henriques (eurica@utad.pt), Luís Roçadas (roçadas@utad.pt)

Description: Euler, an 18th-century mathematician, is considered by many to be one of the greatest mathematicians of all times, not only for his interest in so many subjects but also for the vast legacy he left. Euler's closeness to the Bernoulli family and Goldbach will certainly be related to his interest in infinitesimal calculus and number theory. In this research project we propose to deepen some of the themes studied by him, namely logarithm of negative numbers; Fermat's little theorem, Euler's generalization and applications to the RSA code.

[Project BII2022-F] Linear regression models with correlated errors

Supervisor: Arminda Manuela Gonçalves (mneves@math.uminho.pt)

Description: The main goal of this study is to analyze and evaluate, in the context of classical decomposition models associated with multiple linear regression models, statistical models of time series applied to real environmental data. In particular, the impact of temporal autocorrelation (typically present in environmental data series) will be studied in the models in order to incorporate an autoregressive structure.

[Project BII2022-G] The fundamental group of the circle

Supervisor: Lucile Vandembroucq (lucile@math.uminho.pt)

Description: Two loops (closed continuous paths) in a subset X of \mathbb{R}^n are homotopic if one can be continuously deformed into the other without leaving X . The fundamental group of X is the set of homotopy classes of its loops equipped with the concatenation law. The aim is to study the first non-trivial example of this fundamental concept of Algebraic Topology. In particular, it will be shown that the fundamental group of the circle is isomorphic to the additive group \mathbb{Z} . Notable applications of this result include a proof of the Fundamental Theorem of Algebra and the Brouwer Fixed Point Theorem in dimension 2.

[Project BII2022-H] The cross product of \mathbb{R}^7

Supervisor: Ana Cristina Ferreira (anaferreira@math.uminho.pt)

Description: The cross product of two vectors of \mathbb{R}^3 is a well-known concept and it is easy to understand the dependency of the space being three dimensional. When questioned, students usually say that it is not possible to define a product with similar features in other dimensions, however this is not true. It is also possible to define a cross product in \mathbb{R}^7 . In this project, the student is expected to analyze the properties that a product should have to be considered a cross product and also to investigate the relation of such products with the composition algebras of quaternions and octonions.

[Project BII2022-I] Orthogonality in Algebra and Geometry

Supervisor: José R. Oliveira (jmo@math.uminho.pt)

Description: In a Euclidean ambient space, a smooth vector bundle can be seen as a smooth mapping into the space of the self-adjoint and idempotent automorphisms of the ambient space that, to each point of the base space, corresponds to the orthogonal projection onto the fiber at that point. This characterization is still equivalent to the smoothness of the mapping into the Grassmann manifold of the ambient space of the fibers that, to each point of the base space, associates the fiber at that point. This work encompasses the study of both characterizations for smooth vector bundles in a Euclidean ambient.

[Project BII2022-J] Mathematical approaches applied to the study of cancer: a survey

Description: Regina de Almeida (ralmeida@utad.pt), Ana Paula Teixeira (ateixeir@utad.pt)

Work plan: Although cancer has always been a topic of interest to the scientific community, during the 21st century several research articles, where mathematical techniques play an important role in the analysis of tumors, were published. The aim of this project is to carry out a survey and characterize the different mathematical techniques already applied to the study of tumors, in order to understand what has been done and, thus, gain a better insight on the future research of this topic.

Applicable legislation and regulations: Research Fellowship Holder Statutes, approved by Law no. 40/2004 of August 18, in its current version published by Decree-Law no. 123/2019 of August 28; Regulation of Scientific Research Fellowships of the University of Minho (RBIC), published in "Diário da República", 2nd Series, no. 119, through dispatch no. 6524/2020 of 22-06-2020, ratified by ratification declaration no. 447/2021 of 22-06-2021 and Regulation of Research Studentships and Fellowships (RBI) of the Foundation for Science and Technology, I.P. - in force.

Host/Contracting institution and scientific supervision: The work plan will be carried out in the Centre of Mathematics (at the University of Minho or in its pole at the University of Trás-os-Montes e Alto Douro), under supervision of the member(s) of CMAT who proposed the work plan.

Fellowship duration: The grant will take place for a period of 2 months, with a provisional starting date on July 2022.

Amount of the research grant: The value stipend (Monthly Maintenance Allowance) is 446,12 euros, in accordance with the stipends values published by the Foundation for Science and Technology (FCT I.P.) in the country (Annex I – Monthly Stipends Values for the maintenance allowances of the FCT Regulation for Research Studentships and Fellowships and Annex II of UMinho's Regulation of Scientific Research Fellowships (RBIC), published in "Diário da República", 2nd Series, no. 119, through dispatch no. 6524/2020 of 22-06-2020, ratified by ratification declaration no. 447/2021 of 22-06-2021, according to the applicable rules.

Payment is made until the 23rd of each month, through bank transfer to the fellowship holder's NIB indicated in the contracting process.

Exclusivity regime: The grantee will perform the activities under exclusivity, as foreseen in article 5º of the Research Fellow Statutes and applicable regulations.

Selection panel:

President: José Carlos Soares do Espírito Santo, Auxiliary Professor, Department of Mathematics, School of Sciences, University of Minho

First effective member: Paula Maria Machado Cruz Catarino, Associate Professor with Habilitation, Department of Mathematics, University of Trás-os-Montes e Alto Douro

Second effective member: Carla Maria Alves Ferreira, Auxiliary Professor, Department of Mathematics, School of Sciences, University of Minho

First substitute member: Maria da Graça Pereira Soares, Auxiliary Professor, Department of Mathematics, University of Trás-os-Montes e Alto Douro

Second substitute member: João Miguel da Silva Oliveira, Post-doctorate fellow, CMAT

In case of impediment of the President, he will be substituted by the first effective member, or the second effective member in case of impediment by the first effective member, being the effective members substituted by the substitute members.

Criteria and procedures for applications assessment and selection: The applications assessment will focus on the candidate's merit, according to the following evaluation criteria, valued on a scale of 1 to 5 values:

Applicant Merit - AM (100%):

1. Academic path (considering the marks obtained in the Curricular Units of the degree in which the applicant is enrolled), with a weighting of 50%;
2. Personal curriculum (considering academic merit and skills, and professional and/or scientific background), with a weighting of 30%;
3. Motivation letter, with a weighting of 20%.

The final classification of the applicant's merit will be obtained through the following formula:

$$AM=(a*0,5)+(b*0,3)+(c*0,2)$$

Disclosure of results: The provisional results of the selection process, based in the selection panel minutes, will be sent to the applicants by email until 90 working days after the application deadline, according to article 12th of FCT's RBI.

If case of unfavourable results, the candidates have a period of 10 working days to comment, if desired, in a prior hearing to interested parties, pursuant to articles 121st and 122nd of the Code of Administrative Procedure (DL no. 4 / 2015 of January 7th).

Complaint and appeal procedures: The final results of the selection process will be published through a list ordered by final grade obtained, posted in CMAT's web portal, as well as by email to all applicants, with the minutes of the jury deliberations enclosed.

The selected candidates must inform their willingness to accept the grant, in writing. The fellowships are awarded starting from the candidate who obtained the higher grade. In case of rejection, the fellowship will be awarded to the next candidate in the ordered list of applicants. This process is repeated until all the six fellowships are attributed and/or the list of candidates is exhausted.

The final decision can be contested within 15 working days, by sending to the President of the selection panel the corresponding claim. Interested parties may also submit an optional hierarchical appeal, addressed to the Pro-Rector for Research Projects and Management, Professor Sandra Paiva.

Constitution of a selection reserve list: The applicants ranked in the next positions on the ordered list will be included in a selection reserve list, which can be used until 01/07/2022.

Application deadline and submission: The call for applications is open during 10 working days from its publication in the portal Euroaxess.

Applications must be formalized by sending an application letter with the following documents: curriculum vitae; certificate of the Curricular Units' marks; motivation letter.

Applications must be sent by email to candidaturas@cmat.uminho.pt and bolsas@ecum.uminho.pt, indicating the reference 22/ECUM/CMAT- UIDB/00013/2020 (BII) in the Subject. Applications submitted by other means will not be accepted.

Fellowship contractualization: The fellowship will be attributed by signing a fellowship contract between the University of Minho and the fellow, accordingly with the contract minute (annex IV of the Regulation of Research Fellowships of the University of Minho (RBIC), published in "Diário da República", 2nd Series, no. 119, through dispatch no. 6524/2020 of 22-06-2020, ratified by ratification declaration no. 447/2021 of 22-06-2021, as indicated in 2.4 of the FCT document: "Rules for Granting and Management of Grants within the scope of R&D projects, including infrastructure projects, the multi-annual financing program for R&D units and other FCT financing instruments (Version 2021)".

The contract may only be concluded after all the documentation required is collected, which must take place within a maximum period of 6 months.

Once all the documentation has been received, the contracting entity has a period of 60 working days to conclude the fellowship contract. Once received by the fellow, the contract must be returned duly signed within 15 working days.

The activities under the fellowship contract can only begin after proper authorization by the contracting entity.

End and cancellation of fellowship contracts: Without prejudice to the other causes provided the fellowship regulations (FCT and University of Minho) and in the Statute of the Research Fellow, the fellowship ends with the completion of the work plan, as well as with the expiration

date for which it was granted.

At the end of the fellowship, the grantee is obliged to present a Final Report of the work carried out, in accordance with the objectives and evaluation criteria defined with the scientific advisor, within 30 days after the end of the scholarship.

The final report must be prepared in accordance with Annex I of the Scientific Research Fellowships Regulation of the University of Minho (RBIC), published in “Diário da República”, 2nd Series, no. 119, through dispatch no. 6524/2020 of 22-06-2020, ratified by ratification declaration no. 447/2021 of 22-06-2021.

More Information

ADDITIONAL INFORMATION

Benefits

Please you can find the information in the Offer Description section

Eligibility criteria

Please you can find the information in the Offer Description section

Selection process

Please you can find the information in the Offer Description section

Web site for additional job details

<https://www.ecum.uminho.pt/pt/Investigacao/Paginas/Emprego-Cientifico.aspx>

REQUIREMENTS

Offer Requirements

Skills/Qualifications

Please you can find the information in the Offer Description section

Specific Requirements

Please you can find the information in the Offer Description section

Map Information



WORK LOCATION(S)

6 position(s) available at
Universidade do Minho
Portugal
Braga
Braga
4710 - 057
Campus de Gualtar

EURAXESS offer ID: 775503

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