

ANNOUNCEMENT FOR THE AWARD OF A RESEARCH FELLOWSHIP

Research Fellowship - 1 vacancy

48/ECUM/CFUM/2023 - EX2D

A call for applications is now open for the attribution of 1 grant of integrated master's or master's degree within the scope of the R&D project (QUEST2D - Excitations in quantum 2D materials, reference PTDC/FIS-MAC/2045/2021 financed by national funds through Fundação para a Ciência e a Tecnologia, I.P. /MCTES through PIDDAC, under the following conditions:

Scientific Area: Physics

Recipient category: It is intended for carrying out R&D activities by students enrolled in degree courses as integrated master's or master's in physics or physics engineering.

Requirement for granting the fellowship:

- The applicants may apply without prior registration in the course for which the fellowship is open. The requirement to enroll in a degree course or non-academic degree course will be verified on the date of contracting the fellowship;
- Only fellowships whose selected applicants present a valid proof of enrollment in a degree course or non-academic degree course will be contracted, according to the type of the fellowship, issued by the academic services of the Higher Education Institution, indicating, respectively, the academic year or its duration (star and term).

Candidates profile:

- a) mandatory requirements: degree in physics or physics engineering;
- b) contracting requirements: integrated master or master degree enrolment in the area of physics or physics engineering; proof of academic qualifications completed at the deadline for applications, including those resulting from academic degree recognition processes;
- c) preferential factors: previous experience in tight-binding modelling.

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).

Workplan and objectives to be achieved:

Calculate and analyze the band structure of selenene using the tight-binding model. Learn the DFT and wannierization technique to determine the tight-binding parameters.

Derive an effective low-energy model for the band structure of selenene. Compare what already exists in the literature. Use the previous model to calculate the effect of a one-dimensional periodic external potential on the band structure. Discuss how these depend on the various potential parameters.

Calculate the independent particle linear and non-linear optical response using a code (berry program) under development in the group. Calculate excitonic selenene levels using several levels of approximation.

Study the effect of substrates on the optical properties of selenene. In particular, and for this purpose, it will be necessary to characterize the surface of the various substrates, which will initially be silicon and a metal.

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 serie, 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 workplan will be carried out in the Centro de Física of University of Minho, located in the Campus de Gualtar, under the scientific supervision of the Professor Ricardo Pedro Lopes Martins de Mendes Ribeiro and Professor Nuno Miguel Reis Peres.

Fellowship duration: The grant will take place for a period of 12 months, with a provisional starting date on the October of 2023. The fellowship grant may eventually be renewed up to 6 more months, according to project execution and applicable legislation.

Amount of the research grant: The value stipend (Monthly Maintenance Allowance) is **930,98€** per month, 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 the Regulation of Scientific Research Fellowships of the University of Minho (RBIC), published in “Diário da República”, 2nd serie, 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 regulation.

Payment is made on the 23rd of each month, through bank transfer to the Bank Identification Number of the fellow identified in the contractualization process.

Other components of the research grant: Not applicable.

Other benefits: Reimbursement of Voluntary Social Security (Social Security contributions), corresponding to the 1st level of discounts (*for research grants with a total duration 6 months or higher*) and personal accident insurance.

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: (identify the selection panel President and the effective and substitute members, full name of all selection panel)

Presidente: Prof. Ricardo Pedro Lopes Martins Mendes Ribeiro, Professor Auxiliar com Agregação do Departamento de Física da Universidade do Minho;

Vogais efetivos: Prof. Nuno Filipe Silva Fernandes Castro, Professor Auxiliar do Departamento de Física da Universidade do Minho;

Prof. Nuno Miguel Machado Reis Peres, Professor Catedrático do Departamento de Física da Universidade do Minho;

The first effective member will substitute the President of the selection panel in case of impediment, being nominate the first substitute member in the place of the first effective member.

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

Applicant Merit - AM (100%):

- a) Academic path (considering the classifications of academic degrees), with a weighting of 70%;
- b) Personal curriculum (considering professional and scientific background), with a weighting of 30%

The final classification of the applicant's merit with the achieved through the following formula:

$$AM = (A1 \times 0,7) + (A2 \times 0,3)$$

CF - Final Classification

The Final Classification (FC) will be obtained by applying the following formula:

$$FC = AM$$

The academic degrees and diplomas documents, or their respective recognition when awarded by foreign higher education institutions are not mandatory in the application phase, being replaced by a declaration of honor of the candidate with the contents of academic results. The documents of academic qualification or respective recognition will be required in the contracting phase and must attest facts that occurred on a date prior to the application. In situations of divergence between the information contained in the declaration and the documentation submitted for contracting the grant, only the information contained in the latter will be consider. If the documents proving the ownership of the academic degree and diploma, or the respective recognition under the terms of Decree-Law No. 66/2018, of August 16, do not correspond to the classifications awarded in the evaluation of the academic path, which can change the candidate's ranking, the fellowship won't be contracted.

Notes: Applicants with degrees obtained abroad must present proof of recognition of qualifications in Portugal and conversion of the final classification obtained in them to the Portuguese classification scale or declaration under the terms indicated in the previous point. Candidates who do not comply with one of these provisions, the selection panel will assign "0" in the grade of the graduation and/or master course. Candidates will be evaluated on the remaining parameters.

Disclosure of results: The provisional results of applications, based in the selection panel minutes, will be send to the applicants by email until 90 working days from the applications deadline.

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 121 and 122 of the Code of Administrative Procedure (DL no. 4 / 2015 of January 7th).

Complaint and appeal procedures: The final results of the evaluation will be published through an ordered list (*alphabetically, by final grade obtained*), posted in a visible and public place of the host unit, as well as by email to all applicants, enclosing for that purpose, the minutes of the jury deliberations.

The selected candidate must inform its willingness to accept the grant, in writing. In case of rejection, the fellowship will be awarded to the next candidate in the ordered list of applicants.

The final decision can be contested within 15 working days, by sending to the President of the jury the corresponding claim. Interested parties may also submit an optional hierarchical appeal, in the terms of the number 3 of article 13 of Regulation of Scientific Research Fellowships of the University of Minho (RBIC).

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 10/01/2024.

Application deadline and submission: The tender is open for a period of 10 working days, counting from the date of publication of the advertisement on the Euraxess portal.

Applications must be formalized by sending an application letter with the following documents: curriculum vitae; qualifications certificate or declaration of the applicant; motivation letter; statement proving that meets the conditions for the grant typology, according to the application requirements; other documents important to the evaluation process).

Applications must be sent by email to **bolsas@ecum.uminho.pt**, indicating the reference of the call for applications in Subject: **48/ECUM/CFUM/2023 - EX2D**. 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 Série, 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 [including evidences of the academic degrees or diplomas and enrolment in degree courses or non-conferring courses, depending on the type of scholarship].

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

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

Term and cancellation of fellowship contracts: Without prejudice to the other causes provided the fellowship regulations (FCT and UMinho) 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 or renewed.

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 Série, no. 119, through dispatch no. 6524/2020 of 22-06-2020, ratified by ratification declaration no. 447/2021 of 22-06-2021.