

ANNOUNCEMENT FOR THE AWARD OF A RESEARCH FELLOWSHIP

Title: (Research Fellowship; 1 vacancy)

A call for applications is now open for the attribution of one grant of Research Fellowship within the scope of the R&D project MicroCoolPav - Coaxial Microfibers incorporated with Phase Change Materials for Cool Pavements (Microfibras Coaxiais Incorporadas com Materiais de Mudança de Fase para Pavimentos Rodoviários), Centro de Física das Universidades do Minho e do Porto EXPL/EQU-EQU/1110/2021, financed by national funds through Foundation for Science and Technology, I.P. (FCT – Fundação para a Ciência e a Tecnologia) under the following conditions:

Scientific Area: Materials Engineering, Materials Sciences, Physics, Civil Engineering and Physics Engineering.

Recipient category: PhD students and masters students enrolled in non-academic degree courses.

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 (start and term).
- Enrollment in non-certified courses (without curricular units) will not be considered as proof of enrollment.

Candidates profile:

- a) Mandatory requirements: hold an integrated master's degree, a master's degree or be enrolled in a PhD degree in Materials Engineering, Materials Sciences, Physics, Civil Engineering and Physics Engineering;
- b) Contracting requirements, such as indicating doctoral or non-academic degree courses enrolment; proof of academic qualifications completed at the deadline for applications, including those resulting from academic degree recognition processes;
- c) Preferential factors: research experience, especially in topics relevant to the MicroCoolPav project as explained below in "Work plan and objectives to be achieved:", and, demonstration of knowledge in processing, functionalization and characterization of polymeric materials and experience in morphological and mechanical characterization techniques of composite materials.

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: The work to be developed is inscribed in the activities of the R&D project MicroCoolPav - Coaxial Microfibers incorporated with Phase Change Materials for Cool Pavements, EXPL/EQU-EQU/1110/2021, of the Centro de Física das Universidades do Minho e do Porto, financed by FCT, IP. This project aims to produce asphalt pavements with thermoregulation properties due to the presence of coaxial microfibers containing phase change materials. It is in compliance with the Goals 9, 11 and 12 of the 2030 Agenda for Sustainable Development. By proposing an innovative method to control the temperature of asphalt pavements, this project seeks to contribute for the foundation of climate-resilient urban infrastructures. The reduction of Urban Heat Islands impacts will provide environmental, social and economic advances, once it directly impacts the well-being of citizens. Indeed, the decrease of the temperature of asphalt pavements will offer a higher thermal comfort to urban areas. This impacts on the electricity consumption, once the exacerbated heat caused by high temperatures requires the use of equipment's such as air conditioners. Consequently, this project impacts not only the production of roads with an extended life span, but also in the overall urban infrastructure by reducing pollution and energy demand. In addition, by including a recycling alternative (the reuse of cotton wastes from textile industries as source for the synthesis of cellulose acetate, applied as sheath material in the fabrication of the coaxial microfibers), this project will assure less impacts to the environment, thus ensuring the sustainability component.

The selected candidate will develop research work on the following tasks of the project: Task 2 - Materials Screening for the production of PCF (Phase Changing Fibers) - The main goal of this task is to determine the best PCM (Phase Changing Materials) and sheath material combination, in order to provide the required thermal properties to the PCF, for the subsequent application in asphalt mixtures. This will be assessed via several characterization techniques and the evaluation of the solubility of the core and sheath materials, in water and other solvents. It is expected that the best solvents and solution concentrations for CA, CA_t and PCM materials to be determined in this task. CA_t will be synthesized in house and is expected to present a high degree of substitution (ranging from 2.3 to 2.8), considering that this property is crucial for the solubility and thermal resistance of the CA. Also, as the chosen core/sheath materials must undertake the temperature in which the asphalt mixture is manufactured and compacted (c.a. 160°C), it is expected that the thermal resistance of these materials to be verified via TGA and DSC analysis; Task 3: Coaxial PCF production and characterization - The main goal of this task is to produce the coaxial PCF applying the materials defined in Task 2. To reach this goal, the ideal conditions for the production of the PCF regarding materials concentrations as well as the influence of the wet-spinning parameters will be evaluated. The main expected result is the optimization of the PCF production parameters. Also, the characterization here proposed for PCF, may provide crucial information about the fibers. Digital images and SEM will provide information about PCF's overall structure, size, and uniformity; FTIR analysis will confirm the PCM incorporation within the fibers; TGA, DSC and DMA analysis will provide information about PCF's thermal and mechanical resistance, as well as the reversibility of PCM; Task 4: Functionalization and Assessment of the LHTS Asphalt Mixtures - This task aims to functionalize and characterize the asphalt mixtures with the PCF in order to provide LHTS capability in order to obtain a cooler asphalt pavement for the mitigation of UHI. At the end of the final task, it is expected that the functionalized asphalt mixture with LHTS capability can mitigate UHI via the inclusion of coaxial PCF, which will reduce the temperature amplitude and fluctuation of the composite material and, consequently, contribute to unravel aspects related to the environmental and sustainability. Mechanical improvements are also expected.

Specifically, the scholarship holder's activities will be focused, above all, on:

- Synthesis of cellulose derivatives using recycled materials;
- Thermochemical characterization of phase change materials;
- Production and characterization (morphological, mechanical and thermochemical) of coaxial fibers with incorporation of phase change materials;

Formulation and development of bituminous mixtures with the incorporation of coaxial fibers with the incorporation of phase change materials

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 das Universidades do Minho e do Porto (CF-UM-UP) of the School of Science of the University of Minho, located in the towns of Guimarães (Campus de Azurém) and Braga (Campus de Gualtar) and at the Centro de Ciência e Tecnologia Têxtil (2C2T), Campus de Azurém in Guimarães under the scientific supervision of the Professor/Doutor Joaquim Alexandre Santos Almeida Oliveira Carneiro (co-PI), Prof. Aux. and Investigadora Auxiliar at the Centro de Ciência e Tecnologia Têxtil (2C2T) Doutora Helena Prado Felgueiras (project member).

Fellowship duration: The grant will take place for a period of 3 months renewable up to a maximum of 6 months within the duration of the project with a provisional starting date on March 2023.

Amount of the research grant: The value stipend (Monthly Maintenance Allowance) is 1104,64 euros 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 23st of each month, through bank transfer to the Bank Identification Number of the fellow identified in the contractualization process.

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: President: Manuel Filipe Pereira Cunha Martins Costa, Assistant Professor, Department of Physics, School of Sciences, University of Minho;

Effective Members: Joaquim Alexandre Santos Almeida Oliveira Carneiro, Assistant Professor, Department of Physics, School of Sciences, University of Minho and Elisabete Fraga de Freitas, Assistant Professor, Department of Civil Engineering, School of Engineering, University of Minho;

Substitute Members: Graça Maria Barbosa Soares, Assistant Professor, Department of Textile Engineering, School of Engineering, University of Minho and Helena Prado Felgueiras, Auxiliary Researcher (PhD), Department of Textile Engineering, School of Engineering, University of Minho.

The first effective member will substitute the President of the selection panel in case of impediment, being nominated 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)¹:

Applicant Merit - AM (70%):

- a) Academic path (considering the classifications of academic degrees), with a weighting of 50%;
- b) Personal curriculum (considering professional and scientific background), with a weighting of 40%
- c) Motivation letter, with a weighting of 10%.

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

$$MC=(a*0,5)+(b*0,4)+(c*0,1)$$

The Jury may consider necessary to call the Candidates classified in the first 4 positions on MC for an interview. If implemented the Interview phase the Jury will proceed with the evaluation of the following sub-criteria:

B. Interview – ENT (30%) :

B.1: Interpersonal skills (30%);

B.2: Demonstrated knowledge in the tender area (40%);

B.3: Motivation (20%);

B.4: Language skills (10%).

The Jury also decided to evaluate the Interview, according to the following levels:

- High – 5 values;
- Good – 4 values;
- Sufficient – 3 values;
- Reduced – 2 points;

¹ If a second evaluation method is fixed – Interview, it may not have a weighting higher than 40%, according to no. 1 of article 12° of UMinho regulation;

The jury shall define whether all candidates are interviewed or identify the criterion to be applied to a set of candidates to be interviewed and its valuation (*for instance, selection of candidates ranked between the 1s and 4th position in the evaluation list of APCC*).

- Insufficient – 1 value.

The classification of the Interview (ENT) will be obtained by applying the following formula:

$$ENT=(B1\times 0.3) + (B2\times 0.4) + (B3\times 0.2) + (B4\times 0.1)$$

Reference table for defining the score for Sub-criterion A.1 - Academic path

<i>Licenciatura + Master</i> (pre or post-Bolonha) Master Integrated (300-360 créditos)		<i>Licenciatura - 180 credits</i> (pre or post-Bolonha)		Master (90-120 credits) (pre or post-Bolonha)
Pontuação A1	Classificação	Pontuação A1	Classificação	Pontuação A1
5,0	≥ 17	3,5	≥ 17	3,0
4,5	16	3,0	16	2,5
4,0	15	2,5	15	2,0
3,5	14	2,0	14	1,5
3,0	< 14	1,5	< 14	1,0

The final classification (CF) will be the Candidate Merit (MC) if the Interview phase is not implemented:

$$CF=MC$$

In case the Interview phase is implemented, the final classification (CF) of Candidate Merit (MC) and Interview (ENT) will be obtained by applying the following formula:

$$CF=(MC\times 0,7) + (ENT\times 0,3)$$

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 honour 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 evaluation results project, based on the minutes, will be sent to candidates via email, pursuant to article 12 of the FCT RBI and article 13 of the UMinho RBIC.

If the result is unfavourable to the granting of the requested scholarship, 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, addressed to the Pro-Rector for Research and Projects, 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 03/03/2023.

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 considered. 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.

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

Applications must be formalized, mandatorily, by sending an application letter accompanied by the following documents: *curriculum vitae; certificate of qualifications or declaration of the candidate (if applicable); motivation letter; other documents considered relevant to the assessment of the scientific and professional path.*

Applications must be sent by email to bolsas@ecum.uminho.pt, indicating the reference of the call for applications, 09/ECUM/CFUM/2023 – MicroCoolPav, in 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 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 doctoral degree or its recognition in Portugal, under Decree-law no. 66/2018 of august 16th].

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 began 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.

Note: The information above required should be submitted in the Euraxess Portal², in the fields reserved for those purposes³.

² The USRH acts as administrator of University of Minho – Human Resources profile. After registration of the employee/researcher/teacher as individual user in the Euraxess, the USRH can add the individual user through the email as "member" of the entity "University of Minho", allowing the user to publish the fellowship announcements in the Euraxess Portal.

³ The FCT ended with the previous validation of the fellowships announcements. The R&D units must strictly follow the Rules for granting and managing research fellowships (2021).