

ANNOUNCEMENT FOR THE AWARD OF A RESEARCH FELLOWSHIP

Title: Numerical simulation of the flow of molten polymers in extrusion dies with advanced finite volume methods – Research Fellowship for Bachelor's Degree (Licenciado); 1 vacancy

Reference: 20/ECUM/CMAT/2026 – HipMoS4C

A call for applications is now open for the attribution of one grant of Research Fellowship for Bachelor's Degree within the scope of the I&D project “**HipMoS4C – High-Performance Modelling and Simulations for Companies**”, of the University of Coimbra in partnership with the University of Minho (2023.16854.ICDT), funded exclusively by National Funds through Foundation for Science and Technology, I.P., under the following conditions:

Scientific Area: Computational mechanics; Scientific computing; Polymer processing.

Recipient category: Bachelor's Degree holders in Mechanical Engineering, Materials Engineering, Polymer Engineering, Aerospace Engineering, Computer Engineering, Physics, or related fields, enrolled in an academic degree course (Integrated Master's, Master's, or Doctorate) or a non-academic degree course integrated into the pedagogical project of a Portuguese higher education institution.

Requirement for granting the fellowship:

- The applicants may apply without prior enrolment in an academic degree course or non-academic degree course. The requirement to enrol in an academic 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 enrolment in an academic degree course or non-academic degree course, issued by a Higher Education Institution, indicating, respectively, the academic year or its duration (start and term), will be contracted.

Applicants' eligibility: Applicants who meet the conditions set out in article 9th of the Research Grant Regulations, no. 950/2019, of 16-12-2019, of FCT I.P. are eligible.

Nationals or citizens of other European Union member states, third-country nationals, stateless persons, and citizens with political refugee status are eligible to apply for this call.

Applicant eligibility requirements:

- a) **Mandatory requirements:** applicants must hold, at the time of application, a Bachelor's Degree in the area requested in the call for applications or a related area and proven experience in computer programming languages (e.g., C/C++, Fortran, Python, and MATLAB).
- b) **Preferred factors:** having carried out work in the scientific area of the project and consolidated knowledge in CAD/CFD software (e.g., SolidWorks, Ansys, Moldex, and OpenFOAM), Linux operating systems, and reading, writing, and speaking technical English.

Workplan and objectives to be achieved:

The work to be carried out will consist of the investigation and development of numerical simulation techniques for the flow of molten polymers in extrusion dies using advanced finite volume methods in an industrial context, applied to thermoplastic profile extrusion problems. The focus will be on the implementation and validation of non-Newtonian fluid rheological models of industrial relevance using a computational library in Fortran developed within the scope of the project.

The project will be carried out collaboratively, guided by the following progressive objectives:

- Familiarisation and implementation of non-Newtonian fluid rheological models in incompressible formulations of industrial relevance.
- Preparation of geometries and meshes for industrially relevant case studies in the thermoplastic profile extrusion process.
- Verification and validation of the implementations carried out and execution of scalability studies in high-performance computational architectures.
- Contribution to the preparation of technical reports, scientific publications and other means of disseminating the project results.

Applicable legislation and regulations: Research Fellow Statute (EBI), approved by Law no. 40/2004 of August 18, in its current wording and FCT Research Fellowship Regulation, approved by Regulation no. 950/2019, published in the Diário da República, 2nd series, of December 16, 2019, in its current wording, and Scientific Research Fellowship Regulation (RBIC) of the University of Minho, approved by order no. 4998/2025, published in the Diário da República, 2nd series, no. 81, of April 28, 2025, amended and republished through amendment statement no. 634/2025/2, published in the Diário da República, 2nd series, no. 132, of July 11.

Host/Contracting institution and scientific supervision: The work plan will be carried out at the Institute of Polymers and Composites of the School of Engineering of the University of Minho, located on the Azurém Campus, Guimarães, under the scientific guidance of Ricardo Daniel Pereira da Costa, Junior Researcher at the Institute of Polymers and Composites of the School of Engineering of the University of Minho, and João Miguel Amorim Novais da Costa Nóbrega, Associate Professor at the Department of Polymer Engineering of the School of Engineering of the University of Minho, and the coordination of António José Vilela Pontes, Associate Professor at the Department of Polymer Engineering and Director of the Institute of Polymers and Composites of the School of Engineering of the University of Minho.

Fellowship duration: The grant will take place for a period of 3 months, with a provisional starting date in September of 2026. The fellowship grant may, eventually, be renewed up to the maximum limit of 8 months.

Amount of the research grant: The amount of the grant corresponds to €1090.98/month, according to the FCT scholarship value table for Portugal (<https://www.fct.pt/financiamento/programas-de-financiamento/bolsas/>) and the University of Minho's Scientific Research Scholarship value table, updated annually by decision of the Management Board.

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 benefits: Reimbursement of Voluntary Social Insurance, if the applicant chooses to receive it, corresponding to the 1st level of discounts (for research grants with a total duration of 6 months or higher) and personal accident insurance.

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

Selection panel: Maria Teresa Mesquita da Cunha Machado Malheiro (chair of the Jury), Associate Professor at the Department of Mathematics of the School of Sciences of the University of Minho, Ricardo Daniel Pereira da Costa (full member), Junior Researcher at the Institute of Polymers and Composites of the School of Engineering of the University of Minho, João Miguel Amorim Novais da Costa Nóbrega (full member), Associate Professor at the Department of Polymer Engineering of the School of Engineering of the University of Minho, and Gaspar José Brandão Queirós de Azevedo Machado (alternate member), Assistant Professor at the Department of Mathematics of the School of Sciences of the University of Minho.

Should the chair of the Jury be unable to attend, they shall be replaced by the first full member, with the alternate member being appointed to replace the full member.

Criteria and procedures for applications assessment and selection: The evaluation of applications will focus on the criteria "Applicant merit" and "Applicant interview" according to the sub-criteria and corresponding weightings, on a scale of 1 to 5 points, presented below:

- A. Applicant merit (MC), with a weighting of 70%, according to the following sub-criteria:
- A1: Academic career (reflecting the classifications of academic degrees), with a weighting of 30%.
 - A2: Personal curriculum (reflecting the scientific and professional history), resulting from the evaluation of the indicators mentioned above as preferential factors for curriculum evaluation, with a weighting of 70%.

The final classification of the "Applicant merit" criterion will be obtained by applying the following formula:

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

Applicants ranked up to the top 5 positions, who obtain a minimum score of 3,5 in the "Applicant merit" criterion, will be admitted to the interview phase.

- B. Applicant interview (EC), with a weighting of 30%, according to the following sub-criteria:
- B1: Interpersonal skills, with a weighting of 33%;
 - B2: Demonstrated knowledge in the area of the project, with a weighting of 33%;
 - B3: Motivation, with a weighting of 17%;
 - B4: Language skills, with a weighting of 17%.

Each of these sub-criteria is valued according to the following levels:

- High – 5 points;
- Good – 4 points;
- Sufficient – 3 points;
- Reduced – 2 points;
- Insufficient – 1 point.

The final classification of the "Applicant interview" criterion will be obtained by applying the following formula:

$$EC = (B1 \times 0,33) + (B2 \times 0,33) + (B3 \times 0,17) + (B4 \times 0,17).$$

The final classification (CF) of the applicants will then be obtained by applying the following formula:

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

The Jury may decide not to award the Scholarship if none of the applicants achieves a final score higher than 3,5.

Note: 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. Applicants who do not comply with one of these provisions, the Jury will assign "0" in the classification of the Bachelor's and/or Master's degree course. Applicants will be evaluated on the remaining parameters.

Application deadline and submission: The call for applications is open for a period of 10 working days from the date of publication on the Euraxess portal.

Applications must be submitted by email to bolsas@ecum.uminho.pt, indicating the reference number of the call in the subject line, **20/ECUM/CMAT/2026 – HipMoS4C**. Only applications submitted within the established deadline and accompanied by the following documents will be accepted:

- a) Applicant's updated *curriculum vitae*;
- b) Certificates of the academic degrees obtained or, if applicable, the applicant's declaration of honour that the applicant has completed the degrees required in the call by the application deadline. For degrees obtained abroad, the proof of recognition of the academic degrees and the proof of the conversion of the respective final classification to the Portuguese classification scale must be presented, or, alternatively, a declaration of honour from the applicant. This declaration must attest to facts that occurred prior to the application. In the event of a discrepancy between the information contained in the declaration and the documentation submitted for the purposes of contracting the scholarship, only the information contained in the latter will be considered. If it is found that the documents proving the academic degree and diploma, or their recognition under the terms of Decree-Law no. 66/2018, of August 16, do not correspond to the classifications awarded in the assessment of the academic career and may consequently alter the applicant's ranking, the scholarship will not be contracted;
- c) Motivation letter;
- d) Other documents that the applicant considers relevant to the evaluation process.

Form of publication/notification of results: The results of the evaluation are published in a single list by final score obtained, posted in a visible and public place at the host unit, as well as by email to all applicants, attaching, for this purpose, the minutes of the Jury's deliberations, within a maximum period of 90 working days from the deadline for submission of applications.

Applicants are informed, at a preliminary hearing, in accordance with articles 121st and 122nd of the Administrative Procedure Code, of the likely outcome of the final decision, and may comment within 10 working days of this notification.

The waiver of the hearing for interested parties must be justified in accordance with article 124th of the Administrative Procedure Code.

An appeal may be lodged against the final decision within 15 working days, or an appeal may be lodged with the highest executive body of the funding entity within 30 days, both after the respective notification (no. 6 of article 12th of the FCT Research Grant Regulations).

Within 10 working days of notification of the grant award, the applicant must declare their acceptance in writing. In case of non-acceptance, the next highest ranked applicant will be notified immediately.

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 31/12/2026.

Fellowship contractualization: The scholarship is awarded through the signing of a contract between the University of Minho and the scholarship recipient, in accordance with point 2.4 of the Rules for the Award and Management of Scholarships https://www.fct.pt/wpcontent/uploads/2022/03/Normas_de_Atribuicao_de_Bolsas_2021.pdf and the draft contract in Annex II of the University of Minho's Scientific Research Scholarship Regulations.

The contract can only be signed after receipt of all the documentation required for the type of scholarship, which must occur within a maximum period of 6 months, including proof of academic degrees or diplomas, as well as enrolment in academic degree courses or non-academic degree courses, as applicable.

Once all the documentation has been received, the contracting entity has 60 working days to sign the scholarship contract. Once received by the scholarship holder, the contract must be returned, duly signed, within 15 working days.

Term and cancellation of fellowship contracts: Without prejudice to the other grounds laid down in the University of Minho's Scientific Research Scholarship Regulation and in the Research Fellow Statute, the scholarship will cease on completion of the contracted work plan, as well as on expiry of the period for which it was granted or renewed.

The **final report** must be submitted to the scientific advisor, in accordance with the defined objectives and evaluation criteria, no later than 60 working days after the end of the scholarship and must be drawn up in accordance with Annex I of the Regulations (RBIC) of the University of Minho.

Non-discrimination and equal access policy: University of Minho actively promotes a policy of non-discrimination and equal access, so that no applicant may be privileged, benefited, harmed or deprived of any right or exempt from any duty due, namely, to ancestry, age, sex, sexual orientation, marital status, family status, economic situation, education, social origin or condition, genetic heritage, reduced working capacity, disability, chronic illness, nationality, ethnic origin or race, territory of origin, language, religion, political or ideological convictions and trade union membership.

Declaration of Honor

Academic qualifications

I, (full name), applicant for the vacancy for the award of a (type of scholarship), within the scope of the project (name or reference of the project), published on the Euraxess portal, with the reference (ref. notice), declare on my honour that I have completed the academic degree of (academic degree), qualifying for the type of scholarship in the call, namely the course (designation), by the (University conferring the degree), on the date XX/XX/XXXX, with a final average of XXXXX values on the YY scale.

As it is not possible for me to present proof of qualifications until the end of the call, I declare that I undertake to present the aforementioned certificate at the conclusion of the scholarship contract, in the event that I am selected for the vacancy in the call.

As this is true, I hereby date and sign this declaration.

(Place), (date).

(Full name)

NOTE: The declaration may only attest to facts that occurred prior to the application.

In the event of a discrepancy between the information contained in the declaration and the documentation submitted for the purpose of contracting the scholarship, only the information contained in the latter will be taken into account.

Declaration of Honor

I, (full name), bearer of identification document number (XXXX), applicant for a research grant (type of grant), within the scope of the project (name or reference of the project), published on the Euraxess portal, with the reference (ref. call for proposals), declare on my honour that (I have not received any research grants to date / I have received the following research grants) under the Research Grant Holder Statute.

University	Financing Entity	Project	Type of Grant	Duration	Start	Term

As this is true, I hereby date and sign this declaration.

(Place), (date).

(Full name)