

ANNOUNCEMENT FOR THE AWARD OF A RESEARCH FELLOWSHIP

Title: Postdoctoral Research Fellowship – 3D-PRC; 1 vacancy

Reference: 3D-PRC – 00775300 – BIPD-01/2026-CMEMS (1)

A call for applications is now open for the attribution of 1 (one) postdoctoral research fellowship, within the scope of the R&D project **“3D-PRC Development of 3D Printing Customized and Sensorized Low-Cost Phantoms for Radiotherapy Treatment”**, reference **COMPETE2030-FEDER-00775300**, funded by the **Foundation for Science and Technology | FCT, through the Innovation and Digital Transition Program | Compete 2030, Competition for R&D Projects in All Scientific Domains**, under the following conditions::

Scientific Area: Mechanical Engineering.

Recipient category: The BIPD is intended for PhD holders in the field of Mechanical Engineering or related fields, who cumulatively meet the following requirements.

Requirement Requirements:

- Hold a doctoral degree obtained within the three years prior to the date of application for the scholarship;
- Have conducted the research work that led to the awarding of the doctoral degree at an institution other than the host institution;
- The research activities do not require postdoctoral experience;
- Not exceed, with the signing of the contract in question, including possible renewals, a cumulative period of three years in this type of scholarship, whether consecutive or intermittent;
- Not have previously held a postdoctoral scholarship contract with the same R&D Unit. Once the BIPD Contract is terminated, a new scholarship contract cannot be signed between the same host institution and the same scholarship holder.

Candidates who do not cumulatively meet the requirements described will be excluded.

* This includes different R&D Units, even if they are based in the same Organic Unit (UOEI) of UMinho (paragraphs 4 and 5 of article 4 of the University of Minho Scientific Research Grant Regulations).

Applicants' eligibility: Candidates who meet the conditions set out in Article 9 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 competition.

Candidate eligibility requirements:

- a) PhD in Mechanical Engineering.
- b) Proficiency in multiscale modeling, including the development and validation of analytical, numerical, and experimental models, formulation of physical-mathematical models, and integration of multiphysics phenomena applied to engineering.

- c) Experience in integrating modeling, prototyping, and experimental validation, including prototype design and fabrication, definition of experimental methodologies, mechanical, physical, and functional characterization of materials and devices, as well as instrumentation, sensor integration, acquisition, and processing of experimental data.
- d) Knowledge of scientific programming (Python, MATLAB, C/C++, LabVIEW, or equivalent), applied to numerical simulation, experimental automation, data acquisition, and processing.
- e) Knowledge in medical image processing, namely computed tomography (CT) images, anatomical segmentation, three-dimensional reconstruction, and development of customized anatomical models.
- f) Ability to integrate knowledge from different scientific areas, promoting the transfer of physical principles between distinct domains, ensuring theoretical coherence, experimental validation, and critical analysis of the limitations and uncertainties of the developed models.
- g) Demonstration of scientific autonomy, ability to plan and execute research activities, define objectives and performance indicators, continuously validate results, and integrate simulation, fabrication, instrumentation, and data analysis methodologies in multidisciplinary teams.
- h) Participation in R&D projects, scientific production (articles, conference papers, and other publications), and other technical-scientific activities relevant to the objectives of the 3D-PRC project will be valued.

Workplan and objectives to be achieved: The work plan consists of supporting the development of low-cost customized phantoms for radiotherapy applications, using additive manufacturing technologies and sensor integration.

The research fellow will be involved in the following activities:

- Development and optimization of polymeric and composite material formulations aimed at mimicking the physical, mechanical, thermal, and radiological properties of biological tissues, using multiscale simulation techniques and theoretical models.
- Development of materials compatible with additive manufacturing processes, including the 3D printing of anatomical structures and radiotherapy phantom components.
- Physicochemical, mechanical, thermal, and functional characterization of the developed materials, including the assessment of their stability, homogeneity, and reproducibility.
- Evaluation of the radiological and dosimetric properties of the developed materials, namely density, radiation attenuation, and equivalence to different biological tissues.
- Production and optimization of test specimens, samples, and phantom components for the experimental validation of the developed material formulations.
- Processing, analysis, and interpretation of computational and experimental data, supporting the optimization of material formulations and the validation of the developed materials.
- Participation in the experimental validation of the phantoms, through the comparison of material characterization results, computational simulations, and dosimetric measurements.
- Preparation of technical reports, scientific publications, and presentation of project results at scientific meetings and conferences.

Note: The work plan should aim at consolidating the scientific training of the research fellow in the framework of the course conferring a degree or academic diploma.

Applicable legislation and regulations: Research Fellow Statute (EBI), approved by Law n.º 40/2004 of August 18, in its current wording and FCT Research Fellowship Regulation, approved by Regulation n.º 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 n° 4998/2025, published in the Diário da República, 2nd series, n° 81, of April 28, 2025 Amended and republished through amendment statement no. 634/2025/2, published in the Official Gazette, 2nd series, no. 132, of July 11.

Host/Contracting institution and scientific supervision: The work plan will be developed at the Centre for Mechanics and Materials Technologies and Unit of Environmental Biotechnology of the University of Minho (MEtRICs -UMinho), located on the Campus de Azurém, Guimarães, under the scientific guidance of Maria Cândida Lobo Guerra Vilarinho, and the coordination of Professor Luís Miguel Valente Gonçalves, Director of the Center for Electromechanical Microsystems of the University of Minho (CMEMS-UMinho).

Fellowship duration: The grant will take place for a period of 12 months, with a provisional starting date on the September 2026. The fellowship grant may, eventually, be renewed up to the maximum limit allowed by the project and/or applicable legislation.

Amount of the research grant: The amount of the grant corresponds to 1 901,00 €/month, according to the table of values of the Research scholarship of the University of Minho, updated annually, as decided by 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 components of the research grant: Define other components of the scholarships, as provided for in Article 18° of the FCT Research Scholarship Regulations (RBI).

Other benefits: Reimbursement of Voluntary Social Insurance, if the candidate chooses to receive it, 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 5° of the Research Fellow Statutes and applicable regulations.

Composition of the Selection Committee: The jury is composed of:

- a) President of the Board:** Doctor Maria Cândida Lobo Guerra Vilarinho, Associated Professor, Department of Mechanical Engineering, University of Minho;
- b) Effective member:** Doctor Pedro Filipe Lima Marques, Assistant Professor, Department of Mechanical Engineering, University of Minho;
- c) Effective member:** Doctor Francisco Carrusca Pimenta Brito, Assistant Professor at the Department of Mechanical Engineering at the University of Minho;
- d) Substitute Member:** Doctor Margarida Maria Macedo Francesko Fernandes, Auxiliary Researcher, Centre for MicroElectroMechanical Systems (CMEMS-UMinho), University of Minho;
- e) Substitute Member:** Doctor Sara Cristina Soares Madeira, PhD Researcher, Centre for MicroElectroMechanical Systems (CMEMS-UMinho), University of 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 0 to 5 values (or another scale)¹:

¹ If a second evaluation method is fixed – Interview, it may not have a weighting higher than 40%, according to n° 4 of article 11° of UMinho regulation;

Applicant Merit - AM (100%):

- a) Academic path (considering the classifications of academic degrees), with a weighting of 30%;
- b) Personal curriculum (considering professional and scientific background), with a weighting of 40%;
- c) Motivation letter, with a weighting of 30%.

Note: Other assessment criteria may be applied as deemed relevant.

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

$$MC=(a*0,30) +(b*0,40) +(c*0,30)$$

A positive evaluation is required for the granting of the scholarship.

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. 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.

Application deadline and submission: applications will be accepted for a minimum period of 10 working days after the publication of the notice on the European Scientific Mobility Portal Euraxess.

Applications must be submitted by email to oscar.carvalho@dem.uminho.pt, indicating the reference number of the competition in the subject line. Only applications submitted within the established deadline and accompanied by the following documents will be accepted:

- a) Updated curriculum vitae of the candidate;
- b) Certificates of qualification for the academic degrees obtained or, if applicable, a declaration of honor from the candidate stating that they completed the degrees required in the call for applications by the end of the application period (not applicable to research initiation scholarships).

For degrees obtained abroad, the registration of recognition of the academic degrees and the registration of the conversion of the respective final classification to the Portuguese classification scale must be presented, or, alternatively, a declaration of honor from the candidate.

This declaration must attest to facts that occurred prior to the application. In situations of 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 considered. If it is found that the documents proving the academic degree and diploma, or their respective recognition under Decree-Law No. 66/2018, of August 16, do not correspond to the classifications assigned in the evaluation of the academic path and may, consequently, alter the candidate's ranking, the scholarship contract will not be finalized;

- c) Letter of motivation;

Note: The jury may request other documents that it considers relevant to the evaluation process.

Form of publication/notification of results: The results of the evaluation are published in a single list (in alphabetical order or by final score obtained), posted in a visible and public place in the host unit, as well as by email to all candidates, 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.

The jury shall define whether all candidates are interviewed or identify the criterion to be applied to a set of candidates to be interview and its valuation (for instance, selection of candidates ranked between the 1s and 4^a position in the evaluation list of MC (candidate merit)). The jury may adjust the weightings (the assessment must be substantiated in as much detail as possible, in a clear and consistent manner).

Candidates are informed, at a preliminary hearing, in accordance with Articles 121 and 122 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 124 of the CPA.

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 (Article 12(nº6) 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 31/10/2026.

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 enrollment in non-degree study cycles or 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 of the University of Minho.

Non-discrimination and equal access policy: Universidade do Minho actively promotes a policy of non-discrimination and equal access, so that no candidate 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), candidate 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 honor that I have completed the academic degree of (academic degree), qualifying for the type of scholarship in the competition, 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 competition, 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 competition.

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), candidate 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 honor 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)