

## **ANNOUNCEMENT FOR THE AWARD OF A RESEARCH FELLOWSHIP**

27/ECUM/CFUM/2022; 2 vacancies)

A call for applications is now open for the attribution of 2 (two) research grant(s) within the scope of the R&D project UIDB/04650/2020, financed by national funds of the Physics Center of the Universities of Minho and Porto (CF-UM-UP) of University of Minho), through the Foundation for Science and Technology (FCT), under the following conditions:

**Scientific Area:** Optometry and Vision Sciences

**Recipient category:** Students enrolled in an Integrated Master's degree or a Master's degree course in the areas of Optometry and Vision Sciences or other areas that fit into the projects described below.

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

**Candidates profile:** The candidate must have a profile that fits the research activities foreseen in the research project(s) to which is applying. The 6 (six) projects that are in the competition are listed below and where the target audience for each project is also presented.

**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:** It is intended that the fellows collaborate in the research activities of the CFUM-UM-UP, integrating one of the projects whose description and respective supervisors are indicated below. Candidates must mention up to 2 (two) references of projects they are applying for, in descending order of preference, chosen from among the following 6 (six) proposals:

**Project BII2022-1:** Automated grading of the degree of bulbar hyperemia from digital photographs.

**Supervisor(s):** João M.M. Linhares - <https://sites.google.com/view/jlinhares>

**Target:** Students of the Degree in Optometry and Vision Sciences.

**Description:** The degree of hyperemia in the bulbar conjunctiva is usually assessed by comparing the eye under analysis with images of different degrees of hyperemia graded on severity scales. The purpose of this work is to evaluate the degree of hyperemia from images obtained by the user (selfies), or from third-party photos. Images of

bulbar conjunctiva will be processed and analyzed in order to automatically grade the amount of red existing in the bulbar conjunctiva.

**Other relevant information** This work will be carried out at the Color Science Laboratory (<https://sites.google.com/view/csl-uminho/>). Interest in using image processing software and, eventually, knowledge of programming language will be necessary.

## References

Otero, Carles, Nery García-Porta, Juan Tabernero, and Shahina Pardhan. "Comparison of Different Smartphone Cameras to Evaluate Conjunctival Hyperaemia in Normal Subjects." *Scientific Reports* 9, no. 1 (February 4, 2019): 1339. <https://doi.org/10.1038/s41598-018-37925-5>.

**Project BII2022-2:** Validation of stereopsis measuring equipment in distance vision

**Supervisor(s):** Jorge Jorge, [jorge@fisica.uminho.pt](mailto:jorge@fisica.uminho.pt)

**Target:** Students of the Degree in Optometry and Vision Sciences.

**Description:** The assessment of stereopsis is traditionally done in near vision. In recent years, there has been a need to rigorously and accurately assess stereopsis in distance vision, particularly in high competition athletes. The equipment used are mostly computer applications that show great variability and are not independently validated.

It is intended to prospect the tests available on the market for the evaluation of stereopsis in distance vision, compare and validate the different tests for the measurement of stereopsis.

**Project BII2022-3:** Evaluation of the structure of the meibomian glands in a young population

**Supervisor(s):** Madalena Lira e João Linhares, [mlira@fisica.uminho.pt](mailto:mlira@fisica.uminho.pt)

**Target:** Students of the Degree in Optometry and Vision Sciences.

**Description:** The Meibomian glands are found in the lower and upper eyelids and their main function is to produce the largest component of the lipid layer of the tear film. There are several intrinsic and extrinsic factors that can cause morphological or functioning changes in these glands, giving rise to Meibomian Gland Dysfunction, which has been identified as the main cause of Dry Eye in the evaporative type.

The objective of this work is to use Meibography to observe the anatomy of the Meibomian glands and obtain information on the percentage of glandular loss in a young population.

The images of the Meibomian glands will be obtained using the non-invasive equipment ICP MGD (SBM Sistemi, Italy) whose operation is combined with the use of a tablet. The photographs obtained can be recorded in the equipment's memory for later evaluation. It is in the brand's software and on the tablet itself that the analysis of the Meibography images is carried out in terms of the loss of the area of the Meibomian glands, but also the subjective evaluation of other morphological issues, such as tortuosity, thickness, etc. of the Meibomian glands.

**Other relevant information:** All equipment is available in the Physics Department.

**Project BII2022-4:** Variations in pupil diameter during basic and specialized optometric measurements

**Supervisor(s):** Rute J. Macedo Araújo, José M. González Méijome, rjfmaraujo@fisica.uminho.pt

**Target:** Students of the Degree in Optometry and Vision Sciences.

**Description:** The study aims to evaluate temporal variations in pupil diameter during visual acuity measurement, measurements of visual disturbance under dim light conditions with the Light Disturbance Analyzer and during retinal electrophysiology measurements (multifocal ERG).

Temporal variations in pupil diameter will be measured with the AlgiScan pupillometer (IDMED - Marseille, France) which allows real-time measurements of pupil diameter over 60 seconds of acquisition. Measurements of baseline pupil diameter (mm), pupil diameter variation (% and mm), velocity (mm/s) and latency (ms) will be analyzed. Measurements will be performed in only one eye (randomly selected) of 20 subjects while the contralateral eye fixes the stimulus of the measurement to be performed.

#### **Other relevant information**

All measurements will be carried out at the Clinical & Experimental Optometry Research Lab (CEORLab), where the researcher will have access to all the materials and equipment necessary to carry out the project.

**Project BII2022-5:** Influence of  $\kappa$  angle on corneal topography measurements

**Supervisor(s):** José M. González Méijome, Rute J. Macedo Araújo, rjfmaraujo@fisica.uminho.pt

**Target:** Students of the Degree in Optometry and Vision Sciences.

**Description:** When performing a corneal topography, it is common for professionals to ask the patient to look at the center of the rings. However, due to the  $\kappa$  angle, the topographical measurement will appear off-center: the center of the Placido rings will not be aligned with the geometric center of the pupil. This misalignment can be corrected by asking the patient to look at the 1st or 2nd ring to the right or left and not towards the center of the sights. (1)

The aim of the present study will be to evaluate the differences in the most relevant topographic indices between measurements aligned with the geometric center of the cornea and measurements aligned with the visual axis. Two topographies will be made and the SAI, SRI, IS indices and simulation of the keratometric radii of curvature (SimK1, SimK2) will be evaluated.

(1) *How to optimize corneal topography settings for orthokeratology fitting. Sarah Singh. CLSpectrum October 2021*

#### **Other relevant information**

All measurements will be carried out at the Clinical & Experimental Optometry Research Lab (CEORLab), where the researcher will have access to all the materials and equipment necessary to carry out the project.

**Project BII2022-6:** Impact of virtual reality on the visual system

**Supervisor(s):** Sandra Franco, sfranco@fisica.uminho.pt

**Target:** Students of the Degree in Optometry and Vision Sciences.

**Description:** The growing popularity of virtual reality (VR) games has raised questions about their effect on the visual system, namely accommodation and convergence.

As is known, accommodation and vergence mechanisms are linked and occur simultaneously. The demand placed on these mechanisms by VR systems results in a decrease in visual performance due to the ocular discomfort that

arises. In addition, discomfort in stereoscopic visualization is caused by the need for rapid adaptation of the vergence system to a different distance from that required by the accommodation mechanism.

The aim of this study is to evaluate the impact of using these systems on the visual system, namely on ocular accommodation and on binocular vision parameters.

### **Other relevant information**

The candidate must have already completed the curricular units of Basic Optometry and Binocular Vision.

**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 Centre of Physics, School of Sciences of University of Minho, located in the campus of Gualtar, Braga, under the scientific supervision of the Professor/Doctor proponent of the project for which the candidate was selected.

**Fellowship duration:** The grant will take place for a period of 3 (three) months, with a provisional starting date on October 2022. The fellowship grant cannot be renewed.

**Amount of the research grant:** The value stipend (Monthly Maintenance Allowance) is 486,12 / 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:**

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.

Presidente: Maria Madalena da Cunha Faria de Lira, Prof. Auxiliar do Departamento de Física, membro do CFUM, Escola de Ciência da Universidade do Minho

Effective member: Sérgio Miguel Cardoso Nascimento, Prof. Associado do Departamento de Física, membro do CFUM, Escola de Ciência da Universidade do Minho

Effective member: Jorge Manuel Martins Jorge, Prof. Associado do Departamento de Física, membro do CFUM, Escola de Ciência da Universidade do Minho

Alternate member: Paulo Rodrigues Botelho Fernandes, Prof. Auxiliar do Departamento de Física, membro do CFUM, Escola de Ciência da Universidade do Minho

Alternate member: João Manuel Maciel Linhares, Prof. Auxiliar do Departamento de Física, membro do CFUM, Escola de Ciência da Universidade do Minho

**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 (70%):

- A1-Academic path (considering the classifications of academic degrees), with a weighting of 50%;
- A2-Personal curriculum (considering professional and scientific background), with a weighting of 30%
- A3-Motivation letter, with a weighting of 20%.

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

$$MC=(A1*0,5)+(A2*0,3)+(A3*0,2)$$

Candidates whose MC classification is lower than 3.50 are excluded, and the remaining candidates go on to the interview phase.

ENT - Interview, with a weighting of 30%

- B.1: Interpersonal skills (30%);
- B.2: Demonstrated knowledge in the contested area (40%);
- B.3: Motivation (20%);
- B.4: Language skills (10%).

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

$$\mathbf{ENT = (0.30 B1) + (0.40 B2) + (0.2 B3) + (0.1 B4)}$$

### **CF - Final Classification**

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

$$\mathbf{CF = 0.70 MCM + 0.30 ENT}$$

Candidates with a CF lower than 3.50 are excluded.

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.

***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 sent 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, 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 01/31/2023

**Application deadline and submission:** The call for applications is open for a period of 10 (ten) working days from the date of publication of the announcement on the Euroaxess 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](mailto:bolsas@ecum.uminho.pt), indicating the reference 27/ECUM/CFUM/2022 - UIDB/04650/2020 of the call for applications 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.

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 June 22.

**Note:** The information above required should be submitted in the Euraxess Portal<sup>1</sup>, in the fields reserved for those purposes<sup>2</sup>.

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<sup>1</sup> 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.

<sup>2</sup> 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).