

## Call for Applications for a Doctoral Scholarship – Neutrino Group

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5 Jun 2023

### Job Information

Organisation/Company	LIP - Laboratório de Instrumentação e Física Experimental de Partículas
Department	Coimbra
Research Field	Physics » Applied physics
Researcher Profile	First Stage Researcher (R1)
Country	Portugal
Application Deadline	6 Aug 2023 - 17:00 (Europe/Lisbon)
Type of Contract	Temporary
Job Status	Full-time
Hours Per Week	35
Offer Starting Date	1 Sep 2023
Is the job funded through the EU Research Framework Programme?	Not funded by an EU programme
Reference Number	Financiamento de Unidades de I&D – LIP/50007_Neutrino Group
Is the Job related to staff position within a Research Infrastructure?	No

### Offer Description

LIP opens a call for applications for a Doctoral Scholarship in the domain of experimental particle physics and applications.

The grant will be funded by the Foundation for Science and Technology (FCT) under the Collaboration Agreement "Financiamento do Plano Plurianual de Bolsas de Investigação para Estudantes de Doutoramento", signed between the FCT and LIP, R&D Unity No. 50007.

PhD studentships will be granted to applicants that fulfil the requirements to join a study cycle towards a PhD degree, and wish to develop research work in particle physics or related domains at a Portuguese University, hosted by LIP, without prejudice to the work being carried out in collaboration with more than one institution. The research activities must be integrated in LIP's activity plan and strategy.

Working Program and Supervision:

The work plan will be carried out in the framework of the activities of the LIP neutrino physics group in the SNO+ experiment. The LIP-SNO+ group is actively involved in the characterization of the detector radioactive backgrounds, measurement of antineutrino interactions, search for neutrinoless double beta decay, measurement of the solar neutrino fluxes and detector calibration. The group has also several data analysis leadership roles.

The successful candidate will participate in the development of physics event reconstruction algorithms aiming to improve the particle identification and discrimination capabilities of the experiment. In a first stage the candidate will develop event classifiers and algorithms that will take into account the correlations

in space, time, and energy between events, as a way to identify and discriminate between background and physics events of inter-est.

The candidate is expected to use machine learning instrumentation to develop event classifiers that can be used

to discriminate different background sources. In a later stage, it is aimed to use the full timing information of the events in the analysis, to identify underlying patterns that will allow to:

- (a) Discriminate the Cherenkov and scintillation components, to improve the separation of neutrinoless double beta decay events and solar neutrino events;
- (b) Identify scattered light components to improve identification of multi-site events, which are typical of gamma rays: the signature of most radioactive backgrounds.

In a later stage of the fellowship, the candidate is expected to integrate one of the various physics analyses of the SNO+ experiments, such as the background characterization of the detector, the measurement of the anti-neutrino interactions, the search of the neutrino less double-beta decay, the measurement of the solar neutrino fluxes. By making use of the event reconstruction tools implemented earlier, the candidate is expected to take a leading role in this analysis and further improve the physics reach of the experiment.

The scientific orientation of the candidate will be ensured by Dr. Nuno Barros.

#### Admissibility Requirements:

Under the conditions set out in Article 9 and Paragraph 1 of Article 14 of FCT Regulations for Studentships and Fellowships, are eligible as applicants:

- o Portuguese citizens, or citizens of other European Union member states;
- o third-country citizens;
- o stateless persons;
- o beneficiaries of refugee status.

To apply for a PhD studentship it is necessary:

- o To hold a bachelor's or master's degree in the scientific areas defined in the call announcement or in related areas;
- o Not to have benefited from a PhD or a PhD in industry studentship directly funded by FCT, regardless of its duration;
- o To be a citizen permanently and usually living in Portugal, in case the work plan of the requested studentship proceeds, entirely or partially, in foreign institutions (in case of both in Portugal and abroad or exclusively abroad studentships); this requirement is applicable to both national and foreign citizens;
- o Not to hold a doctoral degree.

#### Duration:

The duration of the grant is annual, renewable up to a maximum of four years and may not be awarded for periods of less than three consecutive months.

#### Applicable Legislation:

All missing aspects from this Call will follow the FCT Regulations for Studentships and Fellowships available at:

<https://dre.pt/application/conteudo/127238533>

and the Research Fellowship Holder Statute available at:

<https://dre.pt/application/conteudo/124256707>

## Requirements

<b>Research Field</b>	Physics
<b>Education Level</b>	Master Degree or equivalent

#### Skills/Qualifications

Only candidates who have completed the cycle of studies leading to a Bachelor's or Master's degree by the end of the application period will be admitted.

Experience with scientific computing and software, liquid scintillator based detectors and neutrino interactions is valued. Knowledge of particle interaction with matter and radioactive decays is highly valued. Knowledge in advanced analysis tools and algorithms is highly recommended.

Fluent in English

#### Specific Requirements

The candidates should provide a clear demonstration of the ability to carry out a research program and skills for experimental work.

<b>Languages</b>	ENGLISH
<b>Level</b>	Excellent
<b>Research Field</b>	Physics
<b>Years of Research Experience</b>	1 - 4

# Additional Information

## Benefits

The selected applicant will be awarded monthly stipends and supplementary support, which may include tuition fees, relocation costs, travel awards and health insurance, whenever applicable, as detailed in the FCT Regulations.

[https://www.fct.pt/wp-content/uploads/2023/02/Tabela-de-Valores-SMM\\_202...](https://www.fct.pt/wp-content/uploads/2023/02/Tabela-de-Valores-SMM_202...)

## Eligibility criteria

Requirements:

Only candidates who have completed the cycle of studies leading to a Bachelor's or Master's degree by the end of the application period will be admitted. In order to comply with the foreseen applicable Portuguese legislation regarding the recognition of foreign qualifications, all the rights inherent to academic degrees granted by foreign higher education institutions is duly recognised to the holders of these degrees. This recognition is subject to the presentation of the academic degrees recognition and conversion of the final grade to the Portuguese grading scale, requested to the Dean of a public Portuguese University, the Head of a Public Polytechnic Institute or the Director-General for Higher Education; or by the presentation of the recognition/equivalence, registered by a public higher education institution. For further information: <http://www.dges.gov.pt>.

Candidates who do not yet have their degree certificate may present a declaration of honor, stating that they have completed the necessary qualifications for the purposes of the call by the end of the application deadline. The granting of the scholarship will depend on the presentation of all the documents. For candidates with diplomas issued by foreign institutions the academic degrees recognition and conversion of the final grade to the Portuguese grading scale or the presentation of the recognition/equivalence will be required for the granting of the scholarship.

The presentation of the degree certificates in the application form is determinant for evaluation purposes, namely to calculate the score of A1, a sub-criterion of the Merit of the Applicant. In case of academic degrees obtained abroad, only degrees with the respective records of recognition/equivalence and conversion to the Portuguese grading scale will be considered to calculate the score of A1 sub-criterion (minimum grade = 0 if no recognition).

## Selection process

The candidates formalize their application by sending the following documents (mandatory) by email to [bolsas@coimbra.lip.pt](mailto:bolsas@coimbra.lip.pt):

- One CV file in pdf format (indicating contacts, full address, ID card/passport number)
- One Motivation Letter file in pdf format;
- One PDF file containing certificates of all the academic degrees obtained, with the final average grade and marks in all subjects
- One PDF file containing the academic degree recognition and conversion of the final grade to the Portuguese grading scale or the presentation of the recognition/equivalence, registered by a public higher education institution.
- Two reference letters

Evaluation takes into account two criteria:

Criterion A - Merit of the Applicant

The criterion A, which has a 50% relative weight to the final score, is evaluated based on two sub-criteria:

A1. Academic career, with a relative weight of 20% in the Merit of the Applicant.

The academic career sub-criterion is calculated according to the final classification stated in the academic degree certificate, submitted in the application form, according to Table 1: i) Graduate + Master / Integrated Master; ii) Graduate degree only; or iii) Master degree only. (See Table 1 and Table 2 available in the PT version of the call)

Although it is not mandatory to submit degree certificates for the admission to the call, documental evidence of the classifications obtained in the academic degrees is mandatory for the evaluation of the sub-criterion A1.

In case no valid academic degree certificate is submitted, the sub-criterion A1 will be scored ze-ro (A1 = 0).

To apply the scoring system presented in Table 1, it is mandatory to submit the following documents form:

- a) Academic degree certificates, indicating the final grade and, if possible, the final classification of the disciplines completed. Applicants with post-Bologna education shall present both 1st and 2nd study cycles academic degree certificates or an integrated master certificate, while applicants with pre-Bologna education should present the graduate and/or master degree certificates. It should be noted that a certificate of curricular units does not substitute the submission of a degree certificate including the degree's final grade required to the sub-criterion A1 calculation.
- b) In case of foreign academic degrees it is mandatory to submit the recognition of such degrees and the conversion of the respective final grade to the Portuguese grading scale, to guarantee the principle of equal treatment to applicants with national and foreign academic degrees.

A2. Personal curriculum (reflecting the scientific, professional and academic career, when applicable, and the applicant's motivation to proceed with this study cycle) with a relative weight of 30% in the Merit of the Applicant.

Criterion B – Adequacy of the candidate's experience to the working program with a relative weight of 50%

Final classification =  $(0.2 \times A1) + (0.3 \times A2) + (0.5 \times B)$

For purposes of tiebreak, the final ranking list will be based on the scores assigned to each of the evaluation criteria in the following order: criterion B, criterion A. All applications will be graded from 0 (zero) to 100 (maximum) in each of the two evaluation criteria.

Applicants whose application is scored with a final grade lower than 60 points will not be eligible for studentship granting.

## Disability Bonuses

Applicants that state a degree of disability equal to or above 90% shall have a bonus of 20% on criterion A – Merit of the Applicant.

Applicants that state a degree of disability equal to or above 60% and under 90%, shall have a bonus of 10% in this criterion.

The degree of disability should be duly proven by submitting, in the application form, the document Atestado Médico de Incapacidade Multiuso (AMIM), issued according to the Decree-Law no. 202/96, of 23 of October, in its current version.

## Members of the Jury:

1. Dr. José Maneira, LIP (Panel Chair)
2. Dr. Sofia Andringa, LIP;
3. Prof. Patricia Conde Muiño, LIP and IST;
4. Dr. Alexandre Lindote, LIP.

## Disclosure of results :

The results of the evaluation will be communicated to the applicants by email, and the conclusion of the process will be published on the LIP website. In case of a negative decision, applicants dispose of a period of 10 days in which to oppose the decision in a preliminary hearing, as stated in articles 121 and following of the Code of Administrative Procedure. The panel's final decision will be taken after analysis of the applicant's arguments and the candidates notified. In case of disagreement, the candidates have a period of 15 working days to contest the decision. A final appeal may also be lodged with the highest body of the funding entity (FCT) within a period of 30 working days after the announcement of the jury's final classification.

## Additional comments

### Funding:

The scholarship contracts will be signed with FCT. The attribution of grants is conditional on the presentation of all required documentation and on the admission of the candidate by the Institution granting the academic degree, as well as subject to the availability of FCT funds. The lack of any of the necessary documents to complete the contracting procedure implies the expiration of the studentship granting and conclusion of the process; applicants have up to 6 months after the disclosure of the provisional granting to present all of the listed documents. The scholarship awarded by FCT under this contract will be financed by funds from the Portuguese State Budget and, when applicable, by funds from the European Social Fund through the Operational Program (PDQI).

### Equality and non-discrimination Policy:

We are committed to promoting equality and preventing discrimination, and welcome applications of all qualified candidates irrespective of their age, disability, gender, marital status, pregnancy, maternity, gender identity, race, colour, nationality, ethnicity or national origin, sexual orientation, religion or belief, social background or culture or trade union membership.

### Website for additional job details

<https://www.lip.pt/?section=about&page=recruitment>

## Work Location(s)

Number of offers available	1
Company/Institute	LIP Coimbra-Portugal
Country	Portugal
City	Coimbra
Postal Code	3004-516
Street	Rua Larga, Depto Fisica Univ.Coimbra

## Where to apply

E-mail [bolsas@coimbra.lip.pt](mailto:bolsas@coimbra.lip.pt)

## Contact

City	Coimbra
Website	<a href="http://www.lip.pt">http://www.lip.pt</a>
Street	Departamento de Física da Universidade de Coimbra, Rua Larga
Postal Code	3004-516
E-Mail	<a href="mailto:seclip@coimbra.lip.pt">seclip@coimbra.lip.pt</a>
Phone	239833465