



LABORATÓRIO DE INSTRUMENTAÇÃO E FÍSICA EXPERIMENTAL DE PARTÍCULAS

RESEARCH GRANT (MASTER) ANNOUNCEMENT

Research Grant (Master) for participation in the project PTDC/FISPAR/4300/2020, SWGO: the wide-field gamma-ray observatory at the Southern hemisphere

Job description:

LIP opens a call for selection of fellows for one Research Grant (Master) for participation in the project PTDC/FIS-PAR/4300/2020, SWGO: the wide-field gamma-ray observatory at the Southern hemisphere with financial support through national funds (Portuguese State Budget), under the following conditions:

Requirements:

Masters in Data science and Computer engineering, Physics, Physical Engineering or equivalent. The candidate must be enrolled in a course granting a higher academic degree or in a non-academic degree course.

Preference criteria:

Experience in software development with Python, C and/or C++, good knowledge of Linux systems and machine learning algorithms. Knowledge on particle physics in particular on very-high-energy gamma-ray experiments will be favoured.

Work plan:

The SWGO project aims to design the next-generation wide field-of-view gamma-ray observatory able to survey and monitor the Southern Hemisphere sky.

Our group is developing a water Cherenkov detector (WCD) with four PMTs which has a high physics performance having a single-layered detector and a reduced water depth. This concept is expected to excel in performance while maintaining a reasonable cost. To be able to distinguish between gamma and hadron induced showers, the correct tagging of muons is essential. One of the ideas is to use the PMT signal asymmetry and the complex signal time structure to identify these particles within the overwhelming electromagnetic shower particles. This technique as shown to have a large potential for showers with energies of 1 TeV. However, to be used in SWGO it is necessary to extend it to lower energies, where the event statistics is lower, and to higher energies, where the electromagnetic contamination is expected to be large.

The selected candidate will use state-of-the-art simulations and analyses the PMT signals with machine learning techniques to identify the presence of muons in the WCD station.

Legislation:

A fellowship contract will be celebrated according to the “Regulations for Research Grants of the Foundation for Science and Technology” in force, (<https://dre.pt/application/conteudo/127238533>) and to the Status of Scientific Research Fellow (Lei no 40/2004 de 18 de Agosto, and its successive amendments).

Duration:

The fellowship has a duration of 3 months, with a foreseen starting date on June 2021, and can be extended for 3 more months.

Work Place:

The grant holder will carry out the research activity at LIP in Lisbon, Portugal, in the SWGO group and under the scientific supervision of Dr. Ruben Conceição.

Amount:

The monthly amount of the grant 1.104,64€ is in accordance with the values stipulated in the “Regulations for Advanced Training and Qualification of Human Resources” of FCT in force: (https://www.fct.pt/apoios/bolsas/docs/Tabela_Valores_SMM_LOE_2021.pdf). This amount will be paid on a monthly basis through a bank transfer to the grant holder's bank account.

Evaluation: The members of the jury will take into consideration the CV (50%), research experience in the required field (50%).

Members of the Jury: Prof Mário Pimenta, Dr Bernardo Tomé, Dr Ruben Conceição

Advertising / notification of results:

The results of the evaluation will be communicated by email through a list sorting the candidates, according to their attributed mark; in case of disagreement, the candidates have a period of 10 working days to contest the decision, as provided for in the Code of Administrative Procedure in a preliminary hearing. At the end of this period, the arguments presented will be analysed by the jury committee, which will simultaneously communicate the final decision to all the candidates who submitted allegations. The final results of the shortlisted applicants will be communicated by e-mail. In case of disagreement, the candidates have a period of 15 working days to contest the decision.

Application deadline:

From 31st May to 15th June 2021 (17:00 - Lisbon time). Applicants should submit a curriculum vitae, diploma and a list and grades of university courses and other relevant documents for the evaluation.

Contact:

LIP

Av. Prof. Gama Pinto, n. 2, 1649-003 Lisboa, Portugal

Tel.: 210 493 611

Ofélia Janeiro

e-mail: ofelia@lip.pt