LABORATÓRIO DE INSTRUMENTAÇÃO
E FÍSICA EXPERIMENTAL DE PARTÍCULAS

ANNOUNCEMENT FOR THE OPENING OF AN INTERNATIONAL SELECTION TENDER PROCEDURE FOR DOCTORATE HIRING PURSUANT TO ARTICLE 23 OF DECREE-LAW NO. 57/2016 OF 29 AUGUST, UPDATED BY THE LAW Nº 57/2017, OF 19TH JULY

1. In its meeting of 8th January 2018, the LIP Board of Directors deliberated the opening of an international selection tender for seven vacancies of doctorate to perform duties as researchers in the scientific area of Experimental Particle Physics, under a non-fixed term work contract, for the maximum duration of six years, pursuant to the dispositions of article 23 (1) and (4), updated by the Law nº 57/2017, of 19th July and to the Labour Code, under its current reading. The activities will be carried out at LIP nodes in Lisbon, Coimbra and Braga.

2. Applicable Legislation

   - Decree-Law no. 57/2016 of 29th August, which approved the doctorate hiring regime destined to stimulate scientific and technological employment for all knowledge areas (RJEC), updated by the Law nº 57/2017, of 19th July
   - Labour Code approved by Law no. 7/2009 of 12th February, under its current Reading
   - Regulatory Decree nº 11-A/2017, of 29th December

3. Pursuant to article 13 of RJEC, the tender selection panel shall be formed by:

   Position 1: President of the jury, Professor Mário Pimenta and Members of the jury, Professor Teresa Peña and Doutora Catarina Quintans

   Position 2: President of the jury, Professor Mário Pimenta and Members of the jury, Professor Pedro Assis and Doutora Inês Valino

   Position 3: President of the jury, Professor Mário Pimenta and Members of the Jury, Doutora Patrícia Gonçalves and Doutor Dalmiro Maia

   Position 4: President of the jury, Professor Isabel Lopes and Members of the Jury, Professor Filipa Borges and Professor Henrique Araújo

Position 5: President of the jury, Professor Rui Marques and Members of the Jury, Professor Isabel Lopes and Professor Henrique Araújo

Position 6: President of the jury, Professor Rui Marques and Members of the Jury, Doutora Patrícia Conde Muiño and Professor Francisco Del Aguila

Position 7: President of the jury, Professor Mário Pimenta and Members of the Jury, Doutor José Guilherme Milhano and Professor Néstor Armesto

4. Workplace shall be at LIP nodes in Lisbon, Coimbra and Braga, as specified below.
5. Monthly remuneration to be paid is the one defined by article 15 (1) of the Law nº 57/2017, of 19th July, corresponding to level 33 of the Single Salary Table, approved by Order no. 1553-C/2008 of December 31st, i.e. 2.128,34 Euros.
6. Any national, foreign and stateless candidates who hold a doctorate degree in Physics or related scientific area and a scientific and professional curriculum whose profile is suited for the activity to be performed can submit their applications. In the event the doctorate degree was awarded by a foreign higher education institution, the degree must comply with the provisions of Decree-Law no. 341/2007 of 12th October, and all formalities established therein must be fulfilled by the deadline for applications.
7. General tender admission requirements are specified in the previous section.
8. Pursuant to article 5 of RJEC, selection is to be made based on candidate scientific and curricular career evaluation and public demonstration by the candidates whose application is considered admissible, and that will take place in the node of LIP specified in each position. Concerning the positions 4 and 5, the date for the public presentation will be on 09th July 2018. For the remaining positions, the dates for the public presentation will be communicated to the candidates at least ten working days in advance.
9. Scientific and curricular career evaluation of the seven positions focuses on relevance, quality and currentness:
    a) of scientific, technological production in the last five years, deemed most relevant by the candidate;
    b) of research activities, applied or based on practical work, developed in the last five years, deemed most impactful by the candidate;
    c) of knowledge extension and dissemination activities developed in the last five years, namely under the scope of the promotion of culture and scientific practices, deemed most relevant by the candidate;
    d) of the activities of management of science, technology and innovation programmes, or the experience in observing and monitoring the scientific and technological, or higher education system in Portugal or abroad.

10. The five-year period mentioned above can be extended by the panel, if requested by the candidate, whenever the suspension of scientific activities is reasoned by socially protected grounds like paternity leave, long-term serious illness, and other legal situations of unavailability to work.

11. Each candidate shall only apply to one position, in line with the description of each position and in accordance with the specific criteria which are defined below:

Position 1: Experimental Physicist to work in the "Partons and QCD" and HADES groups

Venue of the public demonstration: Lisbon

The research work of the candidate will be developed in the LIP group participating in the COMPASS experiment at CERN. He/she will contribute in the analyses of the COMPASS data collected in 2015 and 2018, of pion induced Drell-Yan events from a transverse polarized proton target. Namely, he/she will be responsible for developing a new method for physics processes classification of physics processes, using deep neural networks and machine learning techniques, applied to the polarization and azimuthal asymmetry studies. This method shall lead to the optimization of the statistical uncertainties of these COMPASS measurements. He/she will also contribute to the planning and specific feasibility studies of the Drell-Yan related physics programme of a new fixed target experiment proposed for the M2 beamline at SPS/CERN.

Additionally, the candidate will also do research integrated in the LIP group collaborating in the HADES experiment at GSI. He/she will participate in the analysis of the 2012 data (Au+Au @1.25 A GeV), 2014 (pion induced reactions), and of future data taken by HADES, from 2018 on. Namely, he/she will be responsible for the studies involving machine learning techniques applied to the dilepton mass spectrum, supervised and unsupervised, in order to understand the in-medium properties of hadrons.

Position 2: Experimental Physicist to work in the AUGER Group

Venue of the public demonstration: Braga

The candidate will carry on his/her work integrated in the LIP group which is involved in the study of astroparticles, namely showers of ultra-high energy cosmic rays. The candidate will join the team that participates in the Pierre Auger Observatory and will focus on the study and measurement of the muonic component of the showers using RPC-type detectors, as well as the study of the response of the various detectors used in the Observatory. The candidate will also integrate the MARTA team that is implementing a small network of detectors at the Pierre Auger Observatory and will assume responsibilities in the analysis of the results to be obtained.

Position 3: Experimental Physicist in the LIP Research Group "Space Radiation Environment and Effects"

Venue of the public demonstration: Lisbon

The candidate will join the LIP Research Group "Space Radiation Environment and Effects", which is dedicated to the study of the radiation environment in space and the development of applications to measure, predict and mitigate the effects of particle fluxes affecting satellites and manned and unmanned space missions around the Earth or heading to other locations in

the solar system. The candidate should be a proficient user of the Geant4 simulation toolkit, an expert in data analysis of space particle and radiation detectors, and should also have experience in student supervision.

Position 4: Experimental Physicist to work in the Gaseous Detectors Group

Venue of the public demonstration: Coimbra

The candidate will join the LIP-Coimbra group involved in the study of gaseous detectors, which is presently part of the NEXT collaboration. He/She is expected to play an active role in the ongoing experimental activities of the group, namely the development of innovative gaseous detectors and experimental systems to measure gas parameters properties relevant to their performance. He/She will also be involved in the tasks committed to the group in the framework of international collaborations in which it participates. The candidate is expected to have deep knowledge in Monte Carlo simulations and in the modelling of relevant physical processes occurring in radiation detectors.

Position 5: Experimental Physicist to work in the Dark Matter Group (LUX-LZ)

Venue of the public demonstration: Coimbra

The selected candidate will be integrated in the LIP Dark Matter Group that is dedicated to the direct detection of dark matter in the form of WIMPs. At present this group is part of the international collaborations LUX and LUX-ZEPLIN (LZ). The candidate's activities will include the coordination of the experimental and simulation studies regarding backgrounds in the LZ experiment and the study of neutrinoless double beta decay in xenon isotopes with the LZ detector. He/She will also participate in the investigation of other rare decays of Xe isotopes with the LZ detector and contribute to the development of signal analysis modules. Thus, the candidate should be familiar with liquid xenon detectors for low background experiments.

Position 6: Experimental Physicist to work in the ATLAS Group

Venue of the public demonstration: Coimbra

The candidate will be integrated in the ATLAS Portuguese team, focusing his activities in the study of the properties of the top quark and in the calibration of the hadronic ATLAS calorimeter TileCal. In particular, the candidate will be responsible for the development of analysis methods to measure rare decays of the top quark such as the decay to a W boson and an s quark, or the search for flavour changing neutral current in top quark decays. It is foreseen that 30% of his/her time will be dedicated to the analysis of the TileCal calorimeter data and to the improvement of the calibration procedures.

Position 7: Experimental Physicist to work in the Phenomenology Group

Venue of the public demonstration: Lisbon

The selected candidate will integrate the Phenomenology Group at LIP, the group dedicated to phenomenological aspects of particle and astro-particle Physics. Specifically, he/she will join the team focusing on studies of the quark-gluon plasma produced in ultra-relativistic heavy ion collisions. The activities of the candidate will emphasise the development Quantum

Chromodynamics in regimes of high temperature and high density in particular in what relates to the understanding of jet development within the quark-gluon plasma and the opportunities for the use of such jets as probes of the properties of the quark-gluon plasma. The work will necessarily involve the development of Monte Carlo event generators for jet dynamics within the quark-gluon plasma, their use for the identification of novel observables sensitive to specific quark-gluon plasma properties, and studies of the feasibility of measurement both in current experimental programmes (RHIC and LHC) and future facilities (HE_LHC, FCC).

12. Evaluation criteria are the following:

- Evaluation of the CV of the candidates, namely their scientific merit and research capabilities as demonstrated by the diffusion of the scientific results achieved and by the participation on research projects in scientific fields relevant for the proposed work program.
- Suitability of the research activity plan to the functions described for each position and in accordance with the specific criteria defined in point 11.
- The quality of the public demonstration given by the candidate paying special attention to the former items.

Each member of the panel will value the three criteria for each candidate, taking into account the requirements of the duties to be performed, the adequacy of previous experience, his/her relationship to the relevant areas and sub-areas, and his/her experience in the development, implementation, operation and coordination of infrastructures and systems of scientific data processing.

The assessment of the scientific and curricular career is expressed on a numerical scale from 0 to 100. It will take into account the four elements specified in point 9 with particular relevance to research activities, applied or based on practical work.

The evaluation of the research activity plan is expressed on a numerical scale from 0 to 100 and will take into account its suitability to LIP scientific programme.

The evaluation of the public demonstration is expressed on a numerical scale from 0 to 100 and will take into account the skills demonstrated by the candidates during the presentation, as well as their answers to the questions put by the jury.

The score of each jury member is obtained by the following assessment: 50% for the scientific and curricular career evaluation, 40% for the activity plan and 10% for the public demonstration.

The final classification of each candidate is obtained by the sum of the jury scores divided by the number of the jury members. In the event of a tie, the chairman of the jury shall have the casting vote.

13. Candidate final classification system shall be given based on a numerical scale from 0 to 100.

14. The panel shall deliberate by means of roll-call vote justified under adopted and disclosed selection criteria, with no abstentions allowed.

15. Minutes of panel meetings shall be executed and shall include a summary of all occurrences of said meeting, as well as of all votes casted by the members and respective reasoning, and shall be provided to candidates whenever required.

16. After selection criteria application, the panel shall prepare a sorted list of approved candidates and respective classification.

17. Panel's final decision shall be validated by the leader of the institution, who is also in charge of deciding about the hiring.

18. Application formalization shall be made by sending:

    a) Motivation letter addressed to the President of LIP, including announcement identification
    b) Detailed Curriculum Vitae;
    c) Certificate or diploma copy;
    d) Proposal of a Research Activity Plan (maximum 2500 words) in line with the position to which the candidate is applying for;
    e) Other documentation relevant for the evaluation of qualifications in a related scientific area.

    Candidates shall submit their application files and supporting documentation, preferably in a digital form, in PDF format, via email to recrutamento@lip.pt, in person at Av. Prof. Gama Pinto, nº 2, 1649-003 Lisboa, during working hours, or by post to the same address. When submitted by post, applications must be sent by registered post with acknowledgement of receipt sent until the last day of application deadline, which is hereby set on 02nd July 2018, 17:00 (Lisbon time).

19. All candidates who formalise their applications in an improper way or fail to prove the requirements imposed by this tender are excluded from admission. In case of doubt, the panel is entitled to request any candidate to present further documentation supporting his/her statements.

20. False statements provided by the candidates shall be punished by law.

21. Both admitted and excluded candidate list and final classification list shall be posted at Av. Prof. Gama Pinto, nº 2, 1649-003 Lisboa, published in the website of LIP: http://www.lip.pt and all candidates shall be notified by email with delivery receipt.

22. Preliminary Hearing and Final Decision Deadline: Pursuant to article 121 of the Administrative Procedure Code, after notified, all candidates have 10 working days to respond. Panel's final decisions are pronounced within a period of 90 days, from application deadline.

23. This tender is exclusively destined to fill these vacancies and can be terminated at any time until approval of final candidate list, expiring with the respective occupation of said vacancies.

24. Non-discrimination and equal access policy: LIP actively promotes a non-discrimination and equal access policy, wherefore no candidate can be privileged, benefited, impaired or deprived of any rights whatsoever, or be exempt of any duties based on their ancestry, age, sex, sexual preference, marital status, family and economic conditions, instruction, origin or social conditions, genetic heritage, reduced work capacity, disability, chronic illness, nationality, ethnic origin or race, origin territory, language, religion, political or ideological convictions and union membership.

25. Pursuant to Decree-Law no. 29/2001 of 3 February, disabled candidates shall be preferred in a situation of equal classification, and said preference supersedes any legal preferences. Candidates must declare, on their honour, their respective disability degree, type of disability and communication/expression means to be used during selection period on their application form, under the regulations above.