 # 2681

Public Notice - International Selection Procedure

PhD Scientific Researcher Recruitment

FCiências.ID/2018/DL57/IDL/6

FCiências.ID - Associação para a Investigação e Desenvolvimento de Ciências, through its Chairman of the Board of Directors, hereby announces the opening of an international call for the recruitment of a scientific researcher with a PhD degree, within the scope of **S-LoTTuSS Scalable Low-cost Tandem Tunnel junctions for Silicon Solar, PTDC/CTM-CTM/28962/2017**, in the form of an employment contract with an uncertain term, according to the Portuguese Labour Code and Decree-Law No. 57/2016, of August 29th, as amended by Law No. 57/2017, of July 19th, and complementary legislation.

I - Admission Requirements

Portuguese nationals, foreign and stateless persons may submit applications to this selection procedure, provided they hold a doctoral degree[1] in Physics, Chemistry or Materials Science and have expertise in the area of photovoltaic energy production:

a) The PhD must have been granted at least 1 year ago.

b) Demonstrated scientific and/or professional experience in the area of Materials for PV energy production

[1] Applicants with doctoral degrees obtained in foreign countries need, in accordance with Decree-Law No. 341/2007, of October 12th, as regulated by Government Order No. 227/2017, of July 25th, to be registered as holders of a doctoral degree, with all inherent entitlements. Applicants to whom, under the terms of Decree-Law No. 283/83, of June 21th, equivalence or recognition of the degree of Doctor has been granted are also valid. The registration / recognition /equivalence request date must be prior to the application deadline and submitted with the documents requested at point X.4.IV of this public notice. The presentation of the registration / recognition /equivalence certificate is mandatory for contract signature.

II. Applicable Law

1. Decree-Law No. 57/2016, of August 29th, in the wording conferred on it by Law No. 57/2017, of July 19th (RJEC), taking also into account the provisions of Regulatory Decree No. 11-A/2017, of December 29th;
2. Portuguese Labour Code, as approved by Law No. 7/2009, of February 12th, in its current version (CT);
3. Administrative Procedure Code, as published in Decree-Law No. 4/2015, of January 7th, in its current version (CPA).

III. Work Plan

Participation will be in two of the project's activities.

Activity 2: Tunnel junction formation by inline CVD

This activity will include all the developments necessary for the successful production of tunnel junctions, namely:

Development of fast in-line atmospheric pressure CVD of thin polysilicon films on silicon cell wafers, and

Development of a low-cost and safe in-situ phosphorous doping for the polycrystalline film.

This will include:

Activity 2.1 Reactor development

Two main strategies will be explored.

(1) the film is formed in a single step, with the required crystallinity and doping, or

(2) deposition and crystallization (and doping) are decoupled into two stages; in the first the Si material is deposited, and subsequently, at a second irradiation intercept, it is processed into the (poly)crystalline phase.

Activity 2.2 Doping

To achieve the high phosphorous doping densities without recourse to something similar to the proximity rapid thermal annealing, in-situ doping is the only viable strategy. Given the problems highlighted with standard techniques a source of elemental P_4 will be designed and tested in the new reactor.

Activity 2.3 CVD tunnel junction growth

Search and explore the CVD and thermal processing conditions required for the thin film production - with the prerequisite that it be fast and scalable. This will start immediately using the present reactors, but new reactors will later be certainly required. The research team has extensive knowledge in what is arguably the more difficult task of achieving relatively thick ca 200 micron thick silicon films.

Activity 3 Materials and devices characterization

The films resultant from CVD will be characterized in three ways.

The crystalline structure and morphology will be determined by glancing angle XRD, and standard and high resolution SEM.

The doping characteristics by sheet resistance, electrochemical capacitance and SIMS.

Finally, the I-V tunnelling characteristics of the n++/p++ on c-Si junctions.

IV. Composition of the Jury

In accordance to article 13 of the RJEC, the members of the jury are:

- President – Killian Lobato
- 1st Evaluator – João Serra
- 2nd Evaluator - José Silva
- 1st Alternate Evaluator – Miguel Brito
- 2nd Alternate Evaluator – Guilherme Carrilho da Graça

V. Place of work

Work will be developed at the facilities of Research Center Institudo Dom Luis, in Campo Grande, Lisbon, Portugal.

VI. Contract Duration

The full-time employment contract with an uncertain term is expected to start on April 2019, and will last until the Work Plan referred to in section III is completed. It will have an expected duration of 30 months, with a maximum duration of 6 years, including an initial experimental trial period of 30 days.

VII. Monthly Allowance

The gross monthly salary entitle is stipulated in clause 1 of article 5 of the Regulatory Decree No. 11-A/2017, of December 29th, corresponding to level 33 of the Consolidated Table of Allowances, as approved by Government Order No. 1553-C/2008, of December 31st, being 2,128.34 Euros, plus holiday and

Christmas allowances, as well as food allowance, in value and conditions for workers with a legal relationship of employment under the Labour Code.

VIII. Evaluation of applications

1. Failure to comply with the Admission Requirements implies the non-admission of candidates in absolute merit.

2. According to article 5 of the RJEC, the selection of the candidates approved in absolute merit will rely on the evaluation of their scientific and curricular achievements in the last five years, taking into consideration the quality and relevance of the scientific production, and the professional activity indicated as more relevant by the candidate, for the project.

3. The final classification of candidates is given on a scale of 0 to 100%.

4. Evaluation of the relative merit of candidates, will rely on the following criteria:

    a) Participation in relevant scientific projects in the area – 30%;
    b) Scientific publications in the area – 30%;
    c) Pedagogical and outreaching activities, in particular in the context of promoting scientific practices, organization of courses, seminars and conferences, in the area - 10%;
    d) Assessment of the references provided by the candidate - 20 %;
    e) Interview, if deemed necessary by the jury – 10%.

5. The jury may decide to interview the three best ranked [in criteria a) to d) of paragraph 4)] candidates, for clarifications and improved explanations of curricular elements.

6. The jury shall deliberate by means of a roll-call vote based on the evaluation criteria.

7. Minutes of the jury meetings are drawn up, summarizing all relevant elements considered by jury members, as well as their individual votes and justifications.

8. After completion of the evaluation process, the jury will draw up a ranking of successful candidates with their classifications.

9. Hiring will be decided by the Chairman of the Board of Directors of FCiências.ID, based on the final jury recommendation.

10. The evaluation results will be published on the website of the FCiências.ID ("Concursos" tab). The candidates will be individually notified of the evaluation results by e-mail sent to the address indicated in the "Personal Data" section of the submitted form.

11. With the notification referred to in paragraph 10, the hearing phase of interested parties referred to in Article 121 *et seq.* of the CPA will begin, and last for ten working days.

12. The possible pronouncement of the candidate in a prior hearing must be addressed to the President of the jury and submitted in writing to fciencias.id@fciencias-id.pt. The President of the jury will convene a jury's meeting to produce the final decision, within thirty working days.

13. Within five working days of the final jury decision, the Board of Directors Chairman of FCiências.ID will approve it and the candidates will be notified.

14. The communication between FCiências.ID and the candidates will be electronic and will comply with the following rules:

    a) At the time of electronic submission of any document - namely in the case of paragraph no 11 - the candidates must generate proof of "sent message".
    b) FCiências.ID will send an email message acknowledging documents received to the email address used by the candidates, within two working days.

c) In case of absence of a confirmation receipt by FCiências.ID – showing the possibility of technical problems that should neither be the responsibility of the candidate nor FCiências.ID - the candidates should contact FCiências.ID, with the proof referred to in point (a), to ensure delivery and proper receipt of the documents concerned.

IX. Compliance with public policies

1. FCiências.ID actively promotes a policy of non-discrimination and equal access, so that no candidate can be privileged, benefited, disadvantaged or deprived of any right or exempt from any duty due to, inter alia, 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 beliefs and trade union membership.

2. Under the terms of D.L. No. 29/2001, of February 3, a disabled candidate has a preference in equal classification, which prevails over any other legal preference. Candidates must declare their respective degree of disability, the type of disability and the means of communication / expression to be used in the selection process, under the terms of the above-mentioned diploma.

X. Submission of Applications

1. The present call will be open from 26/12/2018 to 09/01/2019.

2. The application and all the required documents may be submitted in Portuguese or English.

3. Applications will be submitted online, through the electronic platform of FCiências.ID (http://concursos.fciencias-id.pt).

4. On the electronic platform, applicants will complete a *mandatory* section on Personal Data [name, address, date of birth, contact email, nationality and scientific identifiers] and upload files with the documents listed below:

   i. Detailed curriculum vitae - *mandatory*;
   ii. A motivation letter clearly demonstrating that the candidate has an adequate profile for the position and fully complies with the Admission Requirements - *mandatory*;
   iii. Up to five publications relevant for the objectives of the Work Plan - *mandatory*;
   iv. Digital copies of documents proving formal academic degrees (PhD) and/or other scientific and professional qualifications - original documents must be provided in case of actual recruitment- *mandatory*;
   v. Other documents that candidates consider relevant for the assessment of their scientific merit, or to declare the personal situation in the cases covered in section IX-2 of this Notice - *optional*.

5. By decision of the Chairman of the Board of Directors of FCiências.ID, candidates who do not submit the documents identified in paragraph 4 will not be admitted to the call. In case of doubts, the Chairman may also invite candidates to substantiate specific data or statements with official supporting documents, before accepting the candidates' submission.

This Public Note was approved by the jury on 19th December 2018