

TENURE-TRACK FACULTY POSITION IN PHYSICS INSTITUTE OF PHYSICS, UNIVERSITY OF SÃO PAULO, BRAZIL

Announcement IF-13, 2018

Announcement of an open tenure-track faculty position at the Institute of Physics, University of São Paulo, Brazil, Level MS-3, RDIDP (Full-time dedication to teaching and research) in the Department of Mechanics and Materials Physics.

The Director of the Institute of Physics of the University of São Paulo, Professor Marcos Nogueira Martins, invites applications for a full-time tenure-track faculty position in the field of **Materials at the Nanoscale** to be appointed in 2019. Eligible candidates should have a Ph.D. and postdoctoral research experience. Applicants should possess an outstanding potential to establish an independent research program and a commitment to teach undergraduate and graduate courses in Portuguese, 2 years after appointment. This position comprises full-time dedication to research and teaching, level MS-3, RDIDP. Salary is R\$10,670.76, non-negotiable. The position nº 1233904 at the Department of Mechanics and Materials Physics is open for applicants for 90 days, from **June 15th, 2018, at 12:01 a.m. to September 12th, 2018, at 11:59 p.m. (GMT -3, Brasilia time)**. The following is the detailed description of the program for the examinations:

Quantum Physics (4302311): 1. Evidences for the atomic description of matter. 2. Experimental evidences for the quantization of electromagnetic radiation: the black body radiation problem, specific heat of solids, photoelectric effect, Compton Effect, electron-positron production and annihilation. 3. The Rutherford model and the problem of atomic stability, Bohr model. 4. Electromagnetic radiation, particle-wave duality. X-ray and electron diffraction. The De-Broglie hypothesis and particle wave duality. 5. Postulates of quantum mechanics. 6. Wave packets, group velocity and uncertainties relations. 7. One-dimension time dependent Schrödinger equation. Stationary solutions of the Schrödinger equation in one-dimension and constant potentials. 8. Three-dimension Schrodinger equation. Particle in a box. Degenerescency. 9. Schrödinger equation for central fields and the radial solution in the case of the hydrogen atom in quantum mechanics.

Introduction to Solid State Physics (4300402): 1. Crystal structure. 2. X ray diffraction and reciprocal lattice. 3. Crystal binding. 4. Crystal vibrations, phonons and thermal properties. 5. Free electron Fermi gas. 6. Energy bands. 7. Semiconductor crystals. 8. Metals and Fermi surfaces. 9. Optical processes. 10. Magnetism. 11. Superconductivity.

Applications

1. Applications must be submitted exclusively via the link <https://uspdigital.usp.br/gr/admissao> during the period stated above. Applicants must download, sign and submit the available application form addressed to the Director of the Institute of Physics, containing his/her personal data and the Department for which he/she is applying, accompanied by the following documents:

- I - Detailed Curriculum Vitae (.pdf), outlining his/her experience in the specific field of the opening, list of published papers, activities related to the field of application, a research project and any complementary information which enables assessing the merits of the applicant;
- II - Proof of a PhD degree with national validity, or accredited by the Institute of Physics of the University of São Paulo;
- III – For Brazilian male applicants, proof of discharge from military service;
- IV – For Brazilian applicants, copy of voter identification card;
- V – For Brazilian applicants, proof of vote in the last election (both turns), or proof of payment of the respective fine or proper justification.

- 1.1. An applicant already appointed at USP is exempted from the requirements III, IV and V, if these requirements were met during his/her appointment.
- 1.2. Foreign applicants are exempted from the requirements III, IV and V. Instead, he/she must submit a copy of the identity pages of the passport.
- 1.3. An appointed foreign applicant may only take office if holding a temporary or permanent visa, which grants to the holder permission to exercise remunerated activities in Brazil.
- 1.4. Upon registration, foreign applicants may submit a written request to take the application exams in English. The contents of the examinations conducted in English or in Portuguese will be identical.
- 1.5. Upon registration, applicants with disabilities or special needs must submit a request for the necessary conditions being provided during the examinations.
- 2. The General Committee of the Institute of Physics will judge and announce the formal acceptance of the applications.
 - 2.1. The examination of the candidates will take place within 30 and 120 days, after the formal acceptance of the applications.
- 3. The two-stage examination of the candidates will consist of the following exams.
 - 1st stage (eliminative): a written exam on one of the topics described above – weight 3.
 - 2nd stage:
 - i) Analysis and Public examination of the Curriculum Vitae – weight 4.
 - ii) Teaching exam (public lecture on one of the topics described above) – weight 3.
 - 3.1. The list of eligible applicants will be published in the São Paulo State Official Gazette.
 - 3.2. Candidates who arrive late to the exams will be ineligible to proceed.

First stage: WRITTEN EXAM (Eliminative)

- 4. The written exam will consist of general and theoretical subjects.

- I – Based on the program described above, the Examining Committee will prepare and announce a list of ten topics at the beginning of the examination process.
 - II – Immediately after becoming aware of the examination topics, candidates may ask to replace one or more topics they understand not belonging to the program. The Examining Committee will decide the claim and if necessary, substitute the topics under objection.
 - III – At least 24 hours later, one topic of the list will be drawn and be the subject of the written exam. The 5-hour non-extendable period of the written exam starts right after the drawing.
 - IV – During the first hour of the exam, candidates may look up books, journals, and other bibliographical documents, and take notes.
 - V – Written notes can only be taken on paper sheets signed by the Committee and must be handed-in attached to the corresponding exam.
 - VI – Candidate's exams will be copied and supplied to the members of the Committee. The candidates will read the exam loud in a public session.
 - VII – The members of the Examining Committee will grade the exams individually.
 - VIII – Candidates who achieve a minimum grade of seven, from the majority of the examiners, are eligible for the second-stage examination.
 - IX – The Examining Committee will present the grades given to the candidates in a public session.
5. Only candidates approved in the first-stage are eligible to participate in the second stage.

Second stage: PUBLIC EXAMINATION OF THE CURRICULUM VITAE AND TEACHING EXAM

PUBLIC EXAMINATION OF THE CURRICULUM VITAE

6. The evaluation of the Curriculum Vitae includes a public examination graded by each member of the Committee.

Sole paragraph - The grading of the Curriculum Vitae must consider: I – the scientific, literary, philosophical, or artistic production; II - university teaching activities; III - services to the community; IV - professional or other activities, if applicable; V - degrees and university honors.

TEACHING EXAM

7. The public Teaching Exam consists of a 40 to 60-min lecture on a topic drawn from a list of topics. The lecture will begin 24 hours after the drawing.
- I – The Examining Committee will prepare and announce a list of ten topics within the program detailed above;
 - II – Immediately after becoming aware of the examination topics, candidates may ask to replace one or more topics they understand not belonging to the program. The Examining Committee will decide the claim and if necessary, substitute the topics under objection.
 - III – After drawing the topic, a 24-h period to prepare the lecture will start. The lecture will begin the next day, at the same time of the drawing. The candidate may not waive this deadline.
 - IV - Candidates may use and consult all materials he/she deems necessary.

Second-stage grading

8. After the exams, members of the Examination Committee will individually grade each candidate.
9. The grades may range from zero to ten, with one decimal place.
10. Each candidate will have a final grade given by each member of the Examination Committee. The final grade is calculated as a weighted average (according to the weights given in item 3) of the grades of each exam.
11. To be eligible, candidates must achieve a minimum final grade of seven from the majority of examiners.
12. Each examiner will nominate the candidate he/she graded highest.
13. The candidate receiving most nominations by the Examination Committee will be indicated for appointment.
14. The Examination Committee will publicly announce the results of the examination immediately after its completion.
15. The effective appointment to the position depends on a medical examination conducted by the State's Department of Medical Skills (DPME), pursuant to article 47, VI, of Law No.10.261/68.
16. Further information and relevant rules for the examination are available at the Academic Assistance Department of the Institute of Physics, University of São Paulo, and e-mail ataac@if.usp.br.

Legal provisions: Announcement IF-13, 2018, approved during the 539th Ordinary Session of the Institute of Physics Committee, held on 4/26/2018. Decree GR 6897, art. 125, paragraph 1, of USP's General Regulations and by the Rules of the Institute of Physics: Resolutions No. 4,087 of June 21, 1994, 4,265 of May 3, 1996, 5,367 of October 18, 2006 and 5,829 of April 4, 2010. Authorization for taking exams in English: paragraph 8 of art.135 of the General Rules. Two-stage examinations from which the first is eliminative: art. 139, and its sole paragraph, of the General Rules of the University of São Paulo. The joining to the faculty in the Full-Time Regime (RDIDP) is conditional upon the approval of the Special Work Regime Committee (CERT), in accordance with Resolution 7271/16 and other applicable rules, and implies in exclusive relationship with USP, under ARTICLE 197 of the General Rules.

São Paulo, June 4th, 2018.

Marcos Nogueira Martins
Director