



Edital nº ATAc-IAG/044/2022

CALL FOR ONE FACULTY POSITION IN THE DEPARTAMENTO DE GEOFÍSICA OF THE INSTITUTO DE ASTRONOMIA, GEOFISICA E CIÊNCIAS ATMOSFÉRICAS - UNIVERSIDADE DE SÃO PAULO, BRAZIL

The Dean of the Instituto de Astronomia, Geofísica e Ciências Atmosféricas of the Universidade de São Paulo (IAG/USP), São Paulo, Brazil, invites applications for a full-time tenure-track position. The call will be open for a period of 60 (sixty) days, from **November 21st, 2022** at 8:00 AM (UTC -3, Brasilia time) up to 5:00 PM on **January 20th, 2023**. This position number 1244051 comprises full-time dedication to research and teaching, level MS-3, RDIDP, and the non-negotiable entry-level annual salary (MS-3 level) is R\$ 180.322,87 plus benefits, relative to March 2022, at the Departamento de Geofísica, in the area of "Potential Field Methods", under the terms of art. 125, paragraph 1, of the General Rules of USP. A detailed description of the program for the examinations is presented as follows:

List of Topics:

1. Theory of gravitational and magnetic potential; the definition of force, potential, properties of potential; characteristics of the Earth's gravity and magnetic fields;
2. Gravity acceleration measurements, techniques, and equipment; absolute, relative, and satellite measurements; terrestrial, marine, and airborne measurements; global geopotential models;
3. Geomagnetic field measurements, techniques, and equipment, terrestrial measurements, airborne and satellite surveys; global geomagnetic models;
4. Definition of gravity and magnetic anomalies; solution of Laplace's equation for the gravitational and magnetic fields in Cartesian (local studies) or spherical coordinates (regional or global); Representation of the gravitational and magnetic fields in Fourier series, Fourier transform and spherical harmonics; Potential field transformations;
5. Application of gravimetry and magnetic methods in exploration of natural resources, tectonic and geodynamic studies;
6. Forward and inverse problems in potential methods; estimation of subsurface physical properties for the study of the planet's internal structure on a local, regional and global scale;
7. Application of new procedures and methods, with open software, in the interpretation of gravity and magnetometric data, taking into account recent technological and computational developments;



8. Definition of geoid and its determination; geoid anomalies; current stage of geoid models, accuracy and resolution;
9. Usefulness and importance of geoid models in physical geodesy (GPS positioning) and geodynamics (mantle convection and lithospheric deformation studies);
10. Definition of stress and deformation; use of geodetic data (GNSS, Regional and Local Geodetic Networks) for studies of lithospheric deformation;
11. Isostasy, flexure and dynamic topography: studies through variations from the Earth's gravity field.

Disciplines

AGG0669 - Gravity and Magnetism for Mineral Resources and Crustal Studies: Elements of the Earth's gravity field: characteristics and measurements. Clairaut's Theorem; international formula for the gravity acceleration; gravity anomalies; measurement of gravity field elements: gravimeters, terrestrial, aerial, satellite, and marine measurements, gravity survey; gravity effect of simple bodies: point mass, sphere, and extended bodies, and gravity anomaly ambiguity, Gauss's Law, Poisson's Theorem, pseudoanomalies. The density of Earth's materials: density of Earth's interior, the density of rocks, density measurements; gravity anomalies, separation and enhancement; simple techniques and modeling of gravity anomalies sources. The Earth's magnetic field: characteristics and variations; magnetic effect of dipoles and single bodies, ambiguity of the magnetic anomaly, combination of gravity and magnetic potentials. Geomagnetic models. Magnetization of rocks and minerals, magnetic susceptibility, and measurements of magnetic properties. Magnetic data acquisition: magnetometers, terrestrial, airborne, satellite, and marine measurements, magnetic survey; magnetic anomalies, separation, and enhancement. Interpretation: interpretation parameters, simple techniques, and modeling of magnetic anomalies sources. Study cases.

AGG0431 - Geophysics of South America: Part I: Context of the South American Plate. Oceanic and continental lithosphere. Craton. Moving tracks. Patagonia. The Andes. Basins. Oceanic portion. Part II: Paleomagnetism. Heat Flow. Magnetotelluric Data. The thickness of the crust and lithosphere globally and in South America. Earth tide. Geoid. Gravimetry. Magnetometry. Seismicity of South America and the Nazca Plate.

AGG5722 - Introduction to Global Tectonics: Formation, structure and chemical composition of the Earth. Internal dynamic processes. Plate tectonics theory. Earth's shape and dimensions. The Earth's gravity field and the distribution of mass anomalies. Earth's magnetic field. Paleomagnetism and the movement of lithospheric plates in the past. Contextualization of modern seismology, Propagation of elastic waves inside the Earth. Seismic velocities and the 1D and 3D Earth's velocity structure. World seismicity. Focal mechanisms. Geophysical and geological characterization of the oceanic and continental lithosphere. Geophysical study of tectonic provinces.



Bibliography

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- Hofmann-Wellenhof, B., Moritz, H., (2006). Physical Geodesy, Springer, Vienna.
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The concurs will be disciplined by Brazilian constitutional principles, notably that of impersonality, as well as by the provisions of the Statute and General Regulations of the Universidade de São Paulo and the Regulations of IAG/USP.

1. Applications must be submitted exclusively via the website <https://uspdigital.usp.br/gr/admissao> in the period stated above. Applicants must submit an application letter addressed to the Director of IAG/USP, containing his/her personal data and the Department's knowledge area for which he/she is applying, accompanied by the following documents:

I - Detailed Curriculum Vitae (memorial) outlining the candidate's experience, list of published papers, academic activities, and any complementary information that enables the evaluation committee to assess the merits of the applicant in the specific field of this announcement, and associated documents supporting the information provided (the registration system will request independent digital files for memorial and supporting document(s)). A detailed memorial is the presentation of a reflexive analysis of the



candidate's academic formation, professional experiences, publications, and other information concerning academic and professional life, indicating motivations and meanings;

II - proof that the candidate holds a Ph.D. degree awarded by USP, recognized by it, or of validity in Brazil;

III - For Brazilian male applicants, proof of discharge from military service;

~~IV - For Brazilian applicants, a copy of the voter identification card;~~

V - For Brazilian applicants, an Electoral Acquittance Certificate or Detailed Certificate issued by the Electoral Court less than 30 days from the beginning of the application period;

~~VI - certificate of vaccination against Covid-19 (at least two doses or only one if from Janssen) and the first booster dose.~~

VII - Identity document, in the case of foreign applicants, CRNM/RNE (or request protocol), or passport.

VIII - Research proposal, limited to 20 double-spaced pages, excluding cover, summary, and references, using font size 11, in digital format, written in Portuguese or English.

§ 1st – Supporting documents of the memorial referred to, in item I, such as models, works of art, or other materials that cannot be digitized, shall be presented until the last business day preceding the beginning of the public competition.

§ 2nd - Links to Dropbox, Google Drive, or any other website whose content can be altered by the applicant will not be accepted as supporting documents.

§ 3rd - For the purposes of item II, defense minutes without homologation information will not be accepted when the Ph.D. granting title depends on this procedure within the issuing Educational Institution. The applicant must be aware that, in this case, the absence of homologation proof will imply the rejection of the application.

§ 4th - Applicants already working at USP as professors are exempted from requirements III and IV, provided that they have complied with them at the time of their initial contract.

§ 5th - Foreign applicants are exempted from requirements III, IV, and V, and must prove that they are in a regular situation in Brazil.

§ 6th – An appointed foreign applicant may only take office if holding a temporary or permanent visa, which grants the holder permission to exercise remunerated activities in Brazil.

§ 7th - Upon registration, applicants with special needs must submit a request for the necessary conditions being provided during the examinations.



~~§ 8th – Concerning the requirement of item VI, with the exception of the provisions of § 9th, the following will be accepted as proof:~~

~~1. A physical certificate of vaccination issued by the country where the candidate received the vaccine;~~

~~2. Brazilian Certificate of vaccination against Covid-19, available in the Conecte SUS Cidadão app or webpage (<https://conectesus.saude.gov.br/home>);~~

~~3. Digital certificate of vaccination against Covid-19, available at Poupatempo Digital;~~

~~4. Certificate of vaccination or passport issued by a public system, whose authenticity can be tracked.~~

~~§ 9th – Exceptionally, if the candidate is exempted from receiving vaccines against Covid-19 for medical reasons, he/she must present documentation that proves the exemption. The documentation will be analyzed by the competent administrative bodies of the University, and the application will be rejected if the documentation does not provide enough information for the intended waiver.~~

§ 10 - It is the sole responsibility of the applicant to verify the order of the uploaded files at <https://uspdigital.usp.br/gr/admissao>. Be aware that uploading files in a different order will imply a rejection of the application.

§ 11 - It is the sole responsibility of the applicant to verify the integrity (front and back) and readability of the uploaded files, being the candidate aware that, if he/she does not remedy any irregularity in uploading an incomplete or illegible document during the registration period, the application will be rejected.

§ 12 – By no means, extra documents will be accepted once the period of application is closed.

§ 13 - 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.

2. The Board of Academic Affairs of IAG/USP will judge and announce the formal acceptance of the applications.

Sole paragraph - The examination of the candidates will take place within 30 to 120 days, after the formal acceptance of the applications (counting from the date of publication in the São Paulo State Official Gazette).

3. The examination of the candidates will be carried out according to objective criteria, in two phases, and graded by each member of the Examining Committee:

1st phase (eliminary) - written exam (weight 1).



2nd phase - I) Analysis and public examination of the memorial (weight 5);

II) Teaching exam (weight 2);

III) Public defense of the research proposal (weight 2).

§ 1st - The call for candidates to take the exams will be published in the São Paulo State Official Gazette.

§ 2nd - Candidates who present themselves after the scheduled time will not be allowed to take the exams.

~~§ 3rd - According to article 5th from Portaria GR 7687/2021, amended by Portaria GR 7835/2022, it is mandatory to present the certificate of vaccination against Covid-19 (complete vaccination schedule, that is, at least two doses or only one if from Janssen) and the first booster dose, in all activities developed at the University's campus, being eliminated candidates that not follow this regulation.~~

I - First phase: Written Exam - Eliminary

4. The written exam, which will deal with a matter of general and doctrinal order, will be carried out in accordance with the provisions of art. 139 and its single paragraph of the General Regulations of USP.

I - The examining committee will prepare and announce a list of ten topics, based on the program detailed above, 24 (twenty-four) hours before the drawing of the topic, being permitted to require candidates to carry out other activities related to the concurs during this period;

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 on the claim and if necessary, replace the topics under objection;

III - after drawing the topic, the non-extendable period of five hours of the exam begins;

IV - in the interval of sixty minutes, after the drawing, it will be allowed to consult books, periodicals, and other bibliographic documents;

V - the notes made during the consultation period may be used during the course of the exam, and should be written on initialed papers by the examining committee and attached to the final text;

VI - the written exam, which will be read in public session by the candidate, will be copied and delivered to the members of the examining committee when the session is opened;

VII - each exam will be evaluated, individually, by the members of the examining committee;



VIII - candidates who obtain, from the majority of the members of the examining committee, a minimum score of 7 (seven) will be considered qualified for the 2nd phase;

IX - the examining committee will present, in public session, the scores received by the candidates.

5. Only the successful candidates in the first phase will participate in the second phase.

II - Second phase: PUBLIC EXAMINATION OF THE MEMORIAL, TEACHING EXAM, AND PUBLIC EXAMINATION OF THE RESEARCH PROPOSAL

Public Examination of the Memorial

6. The evaluation of the memorial, expressed by a global grade, including argument and evaluation, should reflect the merit of the candidate.

Sole paragraph – the grading of the memorial 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 other university honors.

Teaching Exam

7. The teaching exam will be public, with a minimum duration of forty and a maximum of sixty minutes of lecture.

I - the examining committee, based on the program detailed above, will organize a list of ten topics, which the candidates will know immediately before drawing the topic;

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 on the claim and if necessary, replace the topics under objection;

III - the drawing of the topic will be done twenty-four hours before the teaching exam, and the candidate is waived during this period;

IV - the candidate can use the teaching material that he/she deems necessary;

V - if necessary, the candidates will be divided into groups of a maximum of three, observing the order of registration, for the purpose of drawing the topics and conducting the exam.

VI - When the 60th minute of the exam is reached, the examining committee will interrupt the candidate.



VII - If the lecture finishes before reaching 40 minutes, the examining committee will assess a zero score to the candidate in the teaching exam.

Public Defense of the Research Proposal

8. The public defense of the research project aims to assess the scientific knowledge and previous experience on the topic proposed by the candidate, the clarity of the candidate's answers to the examining committee questions; the adequacy of the proposal to the aforementioned area of knowledge, in addition to its originality and feasibility.

I - for the public defense of the research proposal, the candidate must make a presentation of, at most, 15 (fifteen) minutes of the proposal;

II - the defense will be carried out in the form of a dialogue, not to exceed 60 (sixty) minutes for all examiners and 60 (sixty) minutes for the candidate.

Second Phase Trial

9. At the end of the assessment of the exams, each candidate will receive from each examiner a final grade, which will be the weighted average of the grades awarded by him/her in both phases, observing the weights set out in item 3.
10. Exam grades may range from zero to ten to the first decimal place.
11. The grade obtained by the candidate approved in the written test will compose the final average of the second phase, weighing 1.
12. The result of the contest will be proclaimed by the examining committee immediately after its conclusion, in a public session.
13. To be eligible, candidates must achieve a minimum final grade of seven from the majority of examiners.
14. Each examiner will nominate the candidate he/she graded the highest.
15. The candidate receiving the most nominations by the Examining Committee will be indicated for an appointment.
16. 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.
17. The appointment of the teacher approved in the contest, as well as the other resulting measures, will be ruled by the terms of Resolution No. 7271/2016.
18. The teacher in RDIDP must maintain an exclusive employment relationship with USP, under the terms of article 197 of the General Rules of USP.



19. The public competition will be valid immediately and will be proposed for appointment only to the candidate indicated for the position announced by this call.

20. The candidate will be summoned for tenure by the São Paulo Official State Gazette.

20-A. Proof of vaccination against Covid-19 (complete vaccination schedule, i.e. one dose of Janssen immunizer or two doses of other immunizations) and the first additional dose, pursuant to Ordinance GR No. 7687/2021 and subsequent amendments, is required for holding the position.

21. Further information, as well as the rules pertaining to the public competition, are available to those interested in the Academic Affairs Assistance of the IAG/USP, located at Rua do Matão, 1226, 304ADM, Cidade Universitária / São Paulo, from 9:00 AM to 12:00 PM and from 2:00 PM to 4:00 PM, or by e-mail: atac-iag@usp.br.

22. Information about the research fields in the Departamento de Geofísica is available on the Internet, at the following electronic address: <https://www.iag.usp.br/geofisica/pesquisa-em-geofisica>

Note: For the production of legal effects of the present document in the Federative Republic of Brazil an attached version issued in Portuguese is required. In the event of a conflict between the English and Portuguese versions, the Portuguese version will prevail.