



Edital nº ATAc-IAG/012/2024

CALL FOR ONE FACULTY POSITION IN THE DEPARTAMENTO DE ASTRONOMIA 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 90 (ninety) days, from **August 16th, 2024, at 8 a.m., to November 14th, 2024, at 5 p.m. (GMT -3)**. This position number 1245384 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\$ 201.486,61 plus benefits, relative to May 2024, at the **Departamento de Astronomia**, in the field of **Astronomy**, Specialty **Astrophysics related to major projects**, 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:

AGA0215 Fundamentals of Astronomy: (1) Mechanics of the Solar System: Observing the sky. Orbits and gravity. (2) Structure and Formation of the Solar System: Planets. Minor bodies and Trans-Neptunian objects. Formation of the Solar System. Exoplanets. (3) Earth & the Moon: Earth's rotation. Seasons. Phases of the Moon. Tides. Eclipses. (4) Radiation: Nature of light. Electromagnetic radiation. (5) Spectra: Structure of the atom. Formation of spectral lines. Doppler effect. (6) Telescopes and Detectors: Telescopes. Optical detectors and instruments. Infrared. Radio telescopes. Space astronomy. (7) The Sun: Atmosphere. Activity. Solar cycle. Solar interior. Energy production. (8) Stars: Brightness. Color. Spectral classification. HR diagram. Binary stars. (9) Distances: Parallax. Distance scales. Variable stars. (10) Stellar Evolution: Evolution after the Main Sequence. Red Giants. Planetary Nebulae. (11) Compact Objects: End of life of high-mass stars. Neutron stars. Pulsars. Black holes. (12) Our Galaxy: Interstellar medium: Components. Star formation. The Milky Way: Structure. Rotation curve. Galaxy mass. Galaxy formation. (13) Normal and Active Galaxies: Types of galaxies. Properties of galaxies. Active galaxies. Gravitational lenses. (14) Structure of the Universe: Distribution of galaxies in space. Galaxy evolution. Dark matter. (15) Cosmology: Age of the Universe. Models of the Universe. Big Bang. Inflating universe.

AGA0414 Observational Methods in Astrophysics I: Telescopes. Properties of CCD Detectors. Basic image reduction techniques. Atmospheric effects on astronomical observations, extinction, and seeing. Basics of Aperture Photometry. Spectroscopy. Radio Astronomy. Space satellites.

The contest will be ruled 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 exclusively submitted using the website <https://uspdigital.usp.br/gr/admissao> in the period stated above, and the candidate must fill in the requested personal data and attach 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, an Electoral Acquittance Certificate or Detailed Certificate issued by the Electoral Court less than 30 days from the beginning of the application period;

V - Official identity document.

VI - Research project, which should be presented observing, when applicable, the Guidelines for the Presentation of Dissertations and Theses of USP – ABNT. The textual elements of the internal part of the project (Introduction, Development, and Conclusion) should occupy a maximum of 20 pages in digital format. The project can be 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 changed by the applicant will not be accepted as supporting documents.

§ 3rd - For 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 and IV 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 - 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.

§ 9th - 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.

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

§ 11 - Upon registration, the candidate who self-identifies as black, brown, or Indigenous shall indicate his/her interest in participating in the differentiated scoring system provided for in item 12 and its paragraphs of this Notice.

§ 12 - To be entitled to the bonus for self-declared black and brown candidates, the candidate must have phenotypic traits that characterize him/her as black, black, or brown.

§ 13 - The self-declaration as black or brown made by the candidate who expresses his/her interest in participating in the differentiated scoring system will be subject to confirmation through a hetero-identification board.

§ 14 - In the event of non-confirmation of self-declaration of racial affiliation, the candidate will be disqualified from the competition, and if appointed, may be subject to the annulment of their admission to the public service or employment, following an administrative procedure in which they are guaranteed the right to due process and a full defense, without prejudice to other applicable sanctions.

§ 15 - To confirm the self-declaration of the Indigenous candidate, the Administrative Registry of Indigenous Birth (RANI), or in its absence, the Administrative Registry of Indigenous Birth (RANI) of one of their parents, shall be required at the time of registration.

§ 16 - Exceptional situations may be evaluated by the Inclusion and Belonging Council, which may confirm the candidate's self-declaration as Indigenous through a combination of a memorial and an ethnic affiliation statement signed by chiefs, tuxauas, Indigenous community leaders, associations, and/or representative organizations of Indigenous peoples in their respective regions, under the penalties of the law.

§ 17 – The current regulations for presenting documents related to self-declaration as Black, Brown, and Indigenous, as well as for their verification, are available on the website of the General Secretariat of USP (<https://secretaria.webhostusp.sti.usp.br/?p=12343>).

§ 18 - For item III, the documents listed in article 209 of Federal Decree No. 57,654/1966 will be accepted. Male candidates who have reached the age of 45 (forty-five) by December 31st



of the previous year to the opening of registrations are exempt from providing these documents.

§ 19 - 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 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.

§ 3^o - In the evaluation of the tests by the judging committee, the expressed purpose for creating the position (granting of the teaching position) to which this competition is intended will be taken into account, as available in the annex to this notice.

4. The written exam, which will deal with a matter of general and doctrinal order, will be carried out under 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 - 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 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. At the end of the evaluation of the written exam, each candidate will receive a final score from each examiner, taking into account the possible application of differentiated scoring according to item 12 of this Notice.
6. Only the successful candidates in the first phase will participate in the second phase.
7. 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 the following:
- 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.
8. The teaching exam will be public, with a minimum duration of forty and a maximum of sixty minutes of lecture, and will be based on the syllabus of the aforementioned area of knowledge, following Article 137 of the General Regulations of USP.
- I - then 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, to draw the topics and conduct 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.

9. 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, at most 60 (sixty) minutes for all examiners and 60 (sixty) minutes for the candidate.

10. 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 and the potential application of differentiated scoring according to item 12 of this notice.

11. Exam grades may range from zero to ten to the first decimal place.

12. Differentiated scoring will be applied to black, brown, and indigenous candidates, as specified herein.

§ 1st - The calculation formula for the differentiated scoring to be assigned to black, brown, and Indigenous candidates in all stages of the public competition is:

$$PD = (MCA - MCPPI) / MCPPI$$

Where:

- PD is the differentiated score to be added to the grades of all black, brown, or Indigenous candidates who expressed interest in participating in the differentiated scoring.

- MCA is the average score of the open competition among all candidates who scored, excluding those disqualified, i.e., those who did not reach the minimum score mentioned in items 4 and 14 of this Notice. "Open competition" refers to all candidates who scored and did



not declare themselves as black, brown, or Indigenous, as well as those who, having declared themselves as such, chose not to participate in the differentiated scoring.

- MCPPI is the average score of the PPI competition among all candidates who scored, excluding those disqualified.

§ 2nd - The formula for applying the differentiated scoring to the final grades of black, brown, and Indigenous candidates in each stage of the public competition is:

$$\text{NFCPPI} = (1 + \text{PD}) * \text{NSCPPI}$$

Where:

- NFCPPI is the final grade in the stage of the public competition, after the application of differentiated scoring, which will determine the candidate's ranking in the competition stage, limited to the maximum score specified in the notice. At the end of the public competition stage, the final grade becomes the candidate's simple grade.

- NSCPPI is the simple grade of the beneficiary candidate, to which the differentiated scoring will be applied.

§ 3rd - The calculations referred to in paragraphs 1st and 2nd of this item must consider two decimal places and fractions equal to or greater than 0.5 (five-tenths) must be rounded to the next whole number.

§ 4th - The differentiated scoring (PD) provided in this item applies to all eligible beneficiaries, i.e., those who have achieved the minimum performance established in the competition notice, considering the simple grade for this purpose.

§ 5th - If there are no beneficiaries of differentiated scoring among the eligible candidates, the differentiated scoring will not be calculated.

§ 6th - The differentiated scoring will not be applied when, in the calculation formula for differentiated scoring (PD), MCPPI (average score of the PPI competition) is higher than MCA (average score of the open competition).

13. The result of the contest will be proclaimed by the examining committee immediately after its conclusion, in a public session.
14. To be eligible, candidates must achieve a minimum final grade of seven from most examiners.
15. Each examiner will nominate the candidate he/she graded the highest.
16. The candidate receiving the most nominations by the Examining Committee will be indicated for an appointment.
17. The effective appointment to the position depends on a medical examination conducted by the State's Department of Medical Skills (DPME), under Article 47, VI, of Law No.10.261/68.



18. The appointment of the teacher approved in the contest, as well as the other resulting measures, will be ruled by the terms of Resolution USP No. 7271/2016.
19. The teacher in RDIDP must maintain an exclusive employment relationship with USP, under the terms of article 197 of the General Rules of USP.
20. 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.
21. The candidate will be summoned for tenure by the São Paulo Official State Gazette.
22. Further information, as well as the rules of the public competition, are available to those interested in the Academic Affairs Assistance of the IAG/USP, by e-mail: atac-iag@usp.br.



ANNEX I – JUSTIFICATION FOR THE CONCESSION OF THE TEACHING POSITION

Current Status of the Department/Area

Research activities in the Department of Astronomy encompass areas grouped into: Planetary Systems, Stars, Milky Way, Galaxies, Cosmology, Plasmas, High Energies, Astrochemistry, Astrobiology, Dynamics, Fundamental Astronomy, Multi-Messenger Astronomy, Instrumentation, and Astronomy Education. Each research group linked to one of these major themes pursues several lines of investigation.

The teaching area has expanded in the Department with the implementation of the Bachelor's degree in Astronomy in 2009 and the Professional Master's in Astronomy Education in 2013. The Bachelor's program, which has a high demand in entrance exams, averaging 20 applicants per spot in recent years, is the largest in its field. In the past two years, over 50% of incoming students completed the Bachelor's degree in Astronomy (above the average for Exact Sciences programs). The Professional Master's aims to meet the social demand for qualified educators to work in secondary and higher education, as well as in cultural dissemination centers such as planetariums and science museums. Its implementation complements the Department's postgraduate teaching activities. The introduction of these new programs increases the need for faculty who can teach the new courses, along with those already offered in academic postgraduate education.

The Department's faculty consists of 34 PhD professors, with 28 on RDIDP (all tenured) and 6 senior professors. The distribution of tenured faculty members across different career levels is not balanced: 6 (21,4%) assistant professors, 12 (42,9%) associate professors, and 10 (35,7%) full professors. Several colleagues have repeatedly expressed their intention to retire soon, as the average age of the Department's faculty is 60 years (median of 63 years). Considering the entire faculty, between 2024 and 2030, 11 professors will retire due to the mandatory retirement age (75 years): 4 full professors, 6 associate professors, and 1 assistant professor. On the other hand, in 2024/2025, we expect the arrival of one assistant professor (already approved in a public examination), and we currently have one open position (applications open until September 2024) for one assistant professor.

Overall Objective of Hiring the Professor

The goal of hiring a new faculty member is to maintain the department's excellence, particularly in research, teaching, and outreach. Considering the faculty members who have left the department in recent years and the anticipated retirements in the near future, it is essential to renew our faculty. In addition to high-level research (about 100 articles published annually in high-impact international journals), management of large projects, and Cultural and Outreach activities, we offer a Bachelor's degree in Astronomy, academic graduate programs, and a Professional Master's, as well as various courses offered to other USP units. To sustain our activities, it is crucial to hire faculty who can contribute to cutting-edge research areas of interest to the Department, teach at both undergraduate and graduate levels, and engage in Cultural and Outreach initiatives. The purpose of this hire is to secure a faculty member who specializes in Astrophysics related to major projects that are led or involve the participation of faculty members from the Department of Astronomy.



Individualized Plan

Teaching - Goals

The future faculty member will be involved in both Undergraduate and Graduate programs associated with the Department of Astronomy. Due to recent retirements and the prospect of additional mandatory retirements, it is necessary to replenish our faculty to ensure that we can continue offering both mandatory and elective courses, some of which are available to students in the humanities and biological sciences. This position should be advertised in a way that attracts a large number of high-caliber candidates, with the aim of selecting a faculty member who can teach a variety of our courses at both the Undergraduate and Graduate levels.

Research and Innovation - Goals

The future faculty member will contribute to one of the cutting-edge areas considered strategic for the Department of Astronomy, conducting research and supervising graduate students. In the short to medium term, the future faculty member is expected to submit research grant proposals and maintain a publication rate in high-impact international journals, consistent with the results achieved by 20 of our faculty members who are CNPq productivity fellows. In the medium to long term, this faculty member should lead their own research group, establishing national and/or international collaborations.

Culture and Extension – Goals

The Department of Astronomy offers various extension courses (e.g., Astronomy: An Overview, Astronomy for High School Physics Teachers, Introduction to Astronomy and Astrophysics, Astronomy for Seniors) as well as coordinates outreach and scientific dissemination projects (e.g., Astrominas, Cecilia). The future faculty member will initially participate in one or more extension activities and, in the medium to long term, is expected to coordinate and propose new Cultural and Outreach activities.

Expected Impact of Hiring

The short-term impact expected is to have a new faculty member who can teach in the Bachelor's degree in Astronomy and the Graduate programs. Additionally, the future faculty member will be expected to utilize instruments associated with our major projects funded by FAPESP, which are part of our Institutional Academic Plan: ASTRI Mini-Array, CTA, CUBES (VLT), GMT, LLAMA, MOSAIC (ELT), SOUTH POL. Since its inception, the Department's Astronomy Program has maintained excellence in the course, with the highest evaluation from CAPES. The faculty member should advance cutting-edge science and publish it in high-impact journals, train master's and doctoral students, and contribute to the international integration of the students. Management and coordination of large-scale projects are also anticipated for the new faculty member in the medium to long term.

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.