Instituto de Física
Universidade Federal do Rio de Janeiro

Call for Applications for the Physics Graduate Program at UFRJ

Selection Process for Admission to the Postgraduate Program in Physics at IF-UFRJ (Master's and Doctorate) in the 2026-1 Academic Semester

1. PREAMBLE

1.1. The Graduate Program in Physics at the Physics Institute of the Federal University of Rio de Janeiro hereby publishes the regulations for the selection process for admission to the Master's and Doctoral programs in Physics.**1st semester of 2026**.

1.2. Students selected under the terms of this Call for Applications will begin their academic activities in the Physics Graduate Program on a date to be determined by the Graduate Studies Council (CEPG) of UFRJ. Classes will be held during the day.

1.3. The Graduate Program in Physics at UFRJ has CAPES and CNPq scholarships, which will be distributed to selected candidates according to scholarship availability, respecting the ranking order in the selection process and the affirmative action policy described in this Call for Applications, as well as the eligibility rules of the funding agencies. Scholarships from other sources may also be available.

1.4. The selection process will consist of two phases.**each with its own registration period**:

1.4.1. Written exam;

1.4.2. Examination/analysis of academic transcripts and curriculum vitae.

1.5. The website for the Graduate Program in Physics is available at: https://pos.if.ufrj.br/pt .

1.6. Electronic correspondence addressed to the Graduate Program in Physics should be sent to: pos@if.ufrj.br .

1.7. The Secretariat of the Graduate Program in Physics is located at:

Federal University of Rio de Janeiro / Institute of Physics, University City
Technology Center, Block A, 3rd floor, room 329
Telephone: 3938-7271

2. REGISTRATION FOR THE SELECTION PROCESS

2.1. Registration for the first phase of the selection process (written exam) will be open during the period of **13/08/2025 to 17/09/2025**and must be done electronically through**EUF PLATFORM**, accessible at the address http://www1.fisica.org.br/~euf ,**for the EUF 2-2025 exam**All the necessary documentation for registration.

At this stage it will be listed on the EUF PLATFORM.

2.2. Applications for the second phase of the selection process (interview/analysis of academic transcripts and curriculum vitae) must be submitted electronically through the website of the Unified Physics Graduate Program Examination of Rio de Janeiro.**(UNIPOSIRIO)**, accessible at the addresshttps://uniposrio-fisica.cbpf.br ,**for the 2026-1 edition.**The registration period will be announced on this website and will begin after the written exam results are released. All documentation required for registration at this stage will be listed on the UNIPOSRIO website.

2.2.1. The minimum scores required for Master's and Doctoral candidates to register for the second phase will also be published on the UNIPOSRIO website. If a candidate obtains a score lower than the minimum required for their chosen course, they will be eliminated from the selection process.

2.3. Candidates holding a bachelor's degree in Physics or a related field from an institution recognized by the Graduate Studies Council (CEPG) of UFRJ and/or MEC (CAPES) may participate in the selection process. For doctoral candidates, it is also necessary to have obtained a Master's degree in Science (Physics or related fields) from an institution recognized by the Graduate Studies Council (CEPG) of UFRJ and/or MEC (CAPES). Candidates for the Direct Doctorate are exempt from the requirement of obtaining a Master's degree in Science (Physics or related fields).

2.4. Candidates holding a bachelor's degree, issued by an institution recognized by the Graduate Education Council (CEPG) of UFRJ and/or MEC (CAPES), in Physics or a related field who demonstrate excellent performance in the selection process for admission to the Master's program may be invited to directly enter the Doctoral program, upon detailed recommendation from the Selection Committee. In this case, the candidate will be classified for both the Master's and Doctoral programs, and must choose only one of the courses at the time of enrollment.

2.5. Candidates who do not hold an undergraduate degree (or a master's degree, if applicable) at the time of registration may substitute it with an official declaration of course completion or, at the discretion of the Selection Committee, with proof of enrollment in the final semester of a course with expected completion, accompanied by a complete academic transcript.

2.6. The Graduate Program in Physics at UFRJ prioritizes supporting its experimental research areas and, therefore, will reserve one in three available places for candidates who wish to work in these areas. This reservation will be based on prioritization in the ranking order. Candidates must indicate during the interview whether they intend to pursue their graduate studies in one of our experimental areas, specifying which one and which researcher(s) from the Program they wish to be supervised by. Prior contact with potential supervisors is recommended to learn about the activities they carry out. If, after enrolling in the course, the student decides not to work in an experimental area, they will lose their priority in receiving a scholarship.

2.7. Registration for the phases of this selection process implies the candidate's acknowledgment and acceptance of all conditions stipulated in this Notice.

3. RESEARCH AREAS

3.1. The Graduate Program in Physics at the Federal University of Rio de Janeiro offers the opportunity to conduct studies and activities in various research areas, leading to Master's and Doctoral degrees in Science (Physics).

3.2. Research Areas and Lines: Astrophysics
and Astroparticle Physics

Astrophysics, Cosmology and Gravitation:
Astroparticles

Atomic, Molecular and Optical Physics
Atomic Collisions and Interactions with Atoms, Molecules, and Solids;
Spectroscopy of the Interaction of Atoms and Molecules with Matter; Optics and Quantum Information

Condensed Matter Physics
Experimental Condensed Matter Physics:
Condensed Matter Theory

Elementary Particle Physics, Nuclear Physics, and Field Theory
Experimental Particle Physics
Nuclear Physics
Theory of Particles and Fields

Medical and Biological Physics
Theoretical Physics Methods Applied to Biology and Medicine;
Experimental Methods in Physics Applied to Biology and Medicine

3.3. On the Program's website (https://pos.if.ufrj.br/pt It is possible to verify the professors involved in each research area. All permanent faculty members of the Physics Graduate Program can carry out the activity of academic supervision of students.

4. NUMBER OF VACANCIES

4.1. Twenty-five (25) places will be offered for the Master's course and twenty-five (25) places for the Doctoral course for entry in the 1st semester of 2026 in the Postgraduate Program in Physics at UFRJ, with the following distribution in each course: 18 places for general competition (AC), 5 for Black, Brown and Indigenous people (PPI) and 2 for people with disabilities (PcD). Candidates wishing to compete for places reserved for PPI and PcD (affirmative action) must submit a specific form to the Program (Annex II, III or IV), in accordance with the instructions described in this Notice.

4.2. There is no pre-defined number of vacancies for each of the research areas, which can be freely chosen by the selected candidates.

5. Affirmative Action Policy

5.1. In accordance with CEPG Resolution 118/2022, in addition to the places reserved for affirmative action (PPI and PcD) indicated in item 4.1, the Postgraduate Program in Physics informs that:

5.1.1. Applicants opting for affirmative action will compete simultaneously for both affirmative action positions and general admission positions, according to their ranking in the selection process.

5.1.2. Applicants applying through affirmative action who are ranked within the number of places offered for general competition will not be counted towards filling the places reserved for affirmative action.

5.1.3. In the event of withdrawals by approved candidates for affirmative action positions, the unfilled position will be filled by another candidate from the same group, according to the ranking order.

5.1.4. If there are not enough approved candidates to fill the affirmative action positions, the remaining positions will be reassigned to another affirmative action category. If there are still no other affirmative action positions available, they will be allocated to the general competition and filled by other approved candidates, according to their ranking.

5.1.5. For the purpose of encouraging students to remain in the Program, for every 5 (five) calls per course (Master's and Doctorate) for pre-registration with scholarships granted by funding agencies, at least 1 (one) must be allocated to candidates opting for affirmative action, according to the order of classification.

5.1.6. For specific parenting situations, in the case of applicant mothers who have had children through adoption and/or pregnancy in the last five years, counting from the date of publication of this Notice, a compensatory action will be promoted, with the application of a fixed correction factor (1.05) to the score of the analysis of school records and curriculum, if the maximum value has not been reached in this aspect.

5.1.7. Candidates wishing to participate in this selection process through affirmative action policies must submit a specific form (Annex II, III, IV and/or V), duly completed and signed, including supporting documentation if applicable, to the Program via email (pos@if.ufrj.br), during the registration period for the second phase.

6. THE SELECTION PROCESS

6.1. The selection process will consist of two phases:

6.1.1.THE**first phase**The test, which is both eliminatory and classificatory, will consist of the following:**Unified Examination for Graduate Programs in Physics (EUF) 2-2025**, assessing knowledge about Physics, with multiple-choice questions.

6.1.2.THE**second phase**will take place within the scope of**Unified Examination for Graduate Programs in Physics in Rio de Janeiro (UNIPOSRIO) 2026-1**and will consist of: a) Oral examination (of a classificatory nature);

b) Analysis of academic record and curriculum (of an eliminatory and classificatory nature).

6.2. The written exam in the first phase will cover undergraduate-level Physics content. Information regarding the exam (registration fee, possibility of fee waiver, exam locations, accommodations for people with disabilities, exam syllabus and recommended bibliography, correction criteria, instructions for the day of the exam, deadline for appeals, schedule, among others) is available in Annex I (EUF 2-2025 Notice).**It should be noted that the written exam will be conducted in a single stage, on the day<u>October 8, 2025</u> From 2 PM to 6 PM, in person.**The exam result will be assigned a grade between 0 (zero) and 10 (ten), rounded to two decimal places.

6.3. For the written exam, candidates may request the reuse of a score obtained in a previous edition of the EUF, UNIPOSRIO, or the GRE Physics Test, provided it was taken within the last 3 years. Candidates wishing to exercise this right must follow the guidelines that will be published on the UNIPOSRIO website during the registration period for the second phase of the selection process.

6.4. The interview and analysis of academic records and curriculum vitae will be conducted on a date and at a location to be announced on the UNIPOSRIO website. Candidates who are not in Rio de Janeiro on the day of the interview will participate in the second phase remotely, according to instructions to be published on the UNIPOSRIO website.

6.5. The oral examination will be conducted by at least two members of the Selection Committee and will cover the candidate's academic background and clarifications regarding the written exam. The examination will be graded between 0 (zero) and 10 (ten). The examinations will be recorded.

6.6. The Selection Committee will assign a single grade from 0 (zero) to 10 (ten) to the academic record (considering performance in the courses taken) and the curriculum vitae (taking into account mainly academic training, intellectual and technical production, and other research activities) submitted by the candidate. Lattes curricula will also be accepted. Candidates with a grade lower than 5.0 (five) will be eliminated from the selection process.

6.7. Candidates who fail to attend the oral examination, as scheduled on the UNIPOSRIO website, will receive a grade of 0 (zero) for both the oral examination and the analysis of their academic record and curriculum vitae.

6.8. The candidate may be asked to submit their curriculum vitae during the interview.

6.9. The Selection Committee will consist of four professors from the permanent staff of the Graduate Program in Physics.

7. CLASSIFICATION AND FINAL RESULT

7.1. Each candidate's final grade will be the arithmetic mean of the grades obtained in the different stages of the selection process:

a) Written exam EUF 2-2025;

b) Argument;

c) Analysis of academic records and curriculum vitae.

7.2. Candidates will initially be ranked in descending order of their final score, calculated with hundredths of a point precision. In case of a tie, the tie-breaking criteria will follow this order:

a) Highest grade in the written exam;

b) Higher degree of analysis of academic record and curriculum vitae;

c) Higher degree in argumentation.

7.3. Following this first classification stage described in item 7.2, taking into account the decision of the Program's Deliberative Committee to allocate one in three vacancies primarily to students who will dedicate themselves to experimental research projects, the classification order defined in the previous item will be altered when necessary, in order to guarantee that one-third of the vacancies are primarily allocated to candidates who declare in the interview their intention to work in these areas. This process will be carried out as follows: if among the first three positions there is not at least one experimental candidate, the highest-ranked experimental candidate in the sequence of classification will move to the third position, maintaining the other relative positions among the candidates. Then, considering the new classification obtained, if among the first six positions there are not at least two experimental candidates, the highest-ranked experimental candidate in the sequence will be moved to the sixth position. This process will be repeated for each group of three vacancies, among the classified candidates. If there are no more experimental candidates classified from a certain point in the ranking to maintain the criterion of one in three vacancies, then from that point the ranking will remain unchanged.

7.4. Candidates who, according to the ranking defined in item 7.3, fill the number of vacancies offered will be selected for admission to the Master's and Doctoral courses of the Graduate Program in Physics, also observing the affirmative action policy adopted by the Program.

7.4.1. The Selection Committee, at its discretion and after consulting the Graduate Program Coordination

In Physics, the admission of students in numbers exceeding the number of places offered may be authorized, respecting the order of classification.

7.5. The candidates' rankings and grades can be viewed on the Program's website after the results are published on the UNIPOSRIO website.

7.6. Appeals regarding the results of the second phase of the selection process should be submitted by email (pos@if.ufrj.br), containing the justifications for the request, up to 1 (one) day after the publication of the result on the UNIPOSRIO website. Appeals will be judged by the Selection Committee and, if accepted, a new list with the ranking and grades of the candidates will be published on the Program's website.

7.7. Candidates selected for admission to the Master's and Doctoral programs in Physics, as per item 7.4, will be contacted by email to complete pre-registration for the corresponding course within 45 days of the publication of the results on the UNIPOSRIO website. They will also be informed if they have been awarded a scholarship. Candidates who do not complete their pre-registration within the timeframe indicated by email will be considered to have withdrawn, and another candidate will be called to fill the vacancy created by the withdrawal, according to the ranking order and in accordance with the affirmative action policy.

8. SCHEDULE

8.1. First phase (full schedule in Annex I)

13/08/2025 to 17/09/2025: registration period for the written exam
08/10/2025: application of the EUF 2-2025 exam
29/10/2025: release of grades

8.2. Second phase and announcement of the selection process results.

Dates will be announced on the UNIPOSRIO website, accessible at the following address:http:// uniposriofisica.cbpf.br

8.3. Call for pre-registration

Within 45 days of the results being published on the UNIPOSRIO website.

9. GENERAL PROVISIONS

9.1. The Selection Committee may postpone the dates and extend the deadlines stipulated in this Notice. Any changes must be published on the Program's website at least two business days in advance of the new dates.

9.2. There will be no second round of admissions at any stage of the selection process.

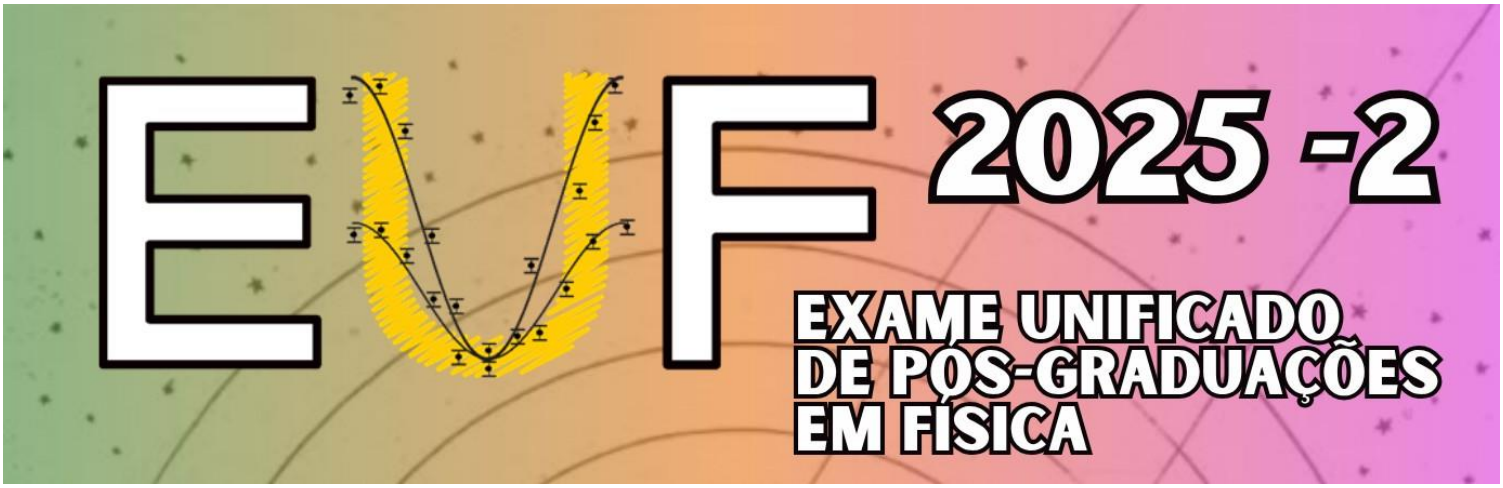
9.3. Any matters not covered in this Notice will be resolved by the Deliberative Committee of the Graduate Program in Physics.

Rio de Janeiro, August 13, 2025.

FELIPE ARRUDA DE ARAÚJO PINHEIRO Coordinator
of the Postgraduate Program in Physics at UFRJ

ANNEX I

EUF Notice 2-2025



NOTICE

The Coordination Offices of the Graduate Programs in Physics at the following institutions:

Physics Institute – USP
São Carlos Institute of Physics – USP; Gleb Wataghin Institute of Physics – UNICAMP; Institute of Theoretical Physics – UNESP
Federal University of ABC – UFABC Federal University of São Carlos – UFSCar Federal University of Rio Grande do Sul – UFRGS Federal University of Minas Gerais – UFMG Federal University of Pernambuco – UFPE Federal University of Rio Grande do Norte – UFRN Fluminense Federal University – UFF
Brazilian Center for Physics Research – CBPF Federal University of Rio de Janeiro – UFRJ State University of Rio de Janeiro – UERJ Pontifical Catholic University of Rio de Janeiro – PUC-Rio

They announce the opening of registrations and establish rules for the

Exame Unificado de Pós-Graduações em Física– EUF 2-2025

The individual result of the Unified Physics Graduate Examination (EUF) may be used as part of the selection process for admission to Physics Graduate Programs at the following Brazilian universities and institutions associated with the EUF:

IAG - Institute of Astronomy and Geophysics of USP, São Paulo, SP; ITA - Technological Institute of Aeronautics, São José dos Campos, SP; INPE - National Institute for Space Research
UDESC - State University of Santa Catarina, Joinville, SC; UEL - State University of Londrina, PR
UEPG - State University of Ponta Grossa, Ponta Grossa, PR; UESC - State University of Santa Cruz, PROFISICA, Ilhéus, BA; UFABC - Federal University of ABC, Santo André, SP
UFAM - Federal University of Amazonas, AM
UFES - Federal University of Espírito Santo, Vitória, ES UFG - Federal University of Goiás, GO
UFJF – Federal University of Juiz de Fora, MG
UFLA - Federal Universities of Lavras, MG
UFMG - Federal University of Minas Gerais, Belo Horizonte, MG; UFMT - Federal University of Mato Grosso, Cuiabá, MT
UFPA - Federal University of Pará, Belém, PA UFPE - Federal University of Pernambuco, Recife, PE
CBPF - Brazilian Center for Physics Research, Rio de Janeiro, RJ;
UERJ - State University of Rio de Janeiro, Rio de Janeiro, RJ
UFPR - Federal University of Paraná, Curitiba, PR; UFRN - Federal University of Rio Grande do Norte; UFRGS - Federal University of Rio Grande do Sul, RS;
UFSC - Federal University of Santa Catarina, SC
UFSCar - Federal University of São Carlos, São Carlos, SP.

UFSM - Federal University of Santa Maria, RS;
UFU - Federal University of Uberlândia, MG;
UNESP - São Paulo State University, IGCE, Rio Claro, SP; UNESP - São Paulo State University, IFT, São Paulo, SP; UNICAMP - University of Campinas, IFGW, Campinas, SP
UNILA - Federal University for Latin American Integration, Foz do Iguaçu, PR;
UNICSUL - Cruzeiro do Sul University, SP
UNIFEI - Federal University of Itajubá, MG; USP - University of São Paulo, FFCLRP, Ribeirão Preto, SP;
USP - University of São Paulo, IFSC, São Carlos, SP

USP - University of São Paulo, IFUSP, São Paulo, SP;
UFRJ - Federal University of Rio de Janeiro, Rio de Janeiro, RJ; PUC-Rio - Pontifical Catholic University of Rio de Janeiro, RJ
UFF - Fluminense Federal University, Niterói, RJ; UFBA - Federal University of Bahia, Salvador, BA; UNIFAL - Federal University of Alfenas, Alfenas, MG

UFV - Federal University of Viçosa, Viçosa, MG; ON - National Observatory, Rio de Janeiro, RJ; UFPI - Federal University of Piauí, Teresina, PI.

Detailed information regarding the Unified Physics Graduate Examination relevant to this edition.**EUF 2-2025** will be made fully and exclusively available via the internet, through**EUF PLATFORM**accessible at the address http://sbfisica.org.br/v1/euf/ .

Only through the Platform can the candidate, among other things, access this notice, register, and submit any relevant requests/demands. They will also have access to a dedicated portal (see access instructions at the end of this notice) where their personal data, proof of registration, and exam scores, among other things, will be available. All requests will be answered by the coordination team only through the EUF Platform and in accordance with the event schedule detailed below in this notice.

1. REGISTRATION

1.1 Registration will be open from the day**August 13 to September 17, 2025**These must be done via the EUF Platform, at the following link:https://euf.ifi.unicamp.br/EUF/listarevento.aspx?22025EUF At the time of registration, the candidateYou will choose the language of your exam., deciding between Portuguese or English.

1.1.1 Registration for those who request itFEE EXEMPTION customer serviceSPECIAL NEEDS or request forNEW TEST LOCATIONS Applications can only be submitted AFTER the application process has been completed with the EUF Coordination. Therefore, candidates must wait for a response before registering.

1.2 The EUF registration fee, amounting to R$ 100.00, must be paid only by credit card or bank slip (it cannot be paid by scheduling), according to the instructions on the registration page.Under no circumstances will this fee be refunded. .

1.3 The candidate is responsible for knowing and respecting the banking hours (regarding payment processing) where the payment is made, whether in person (bank branches, lottery outlets or other locations for receiving payment slips) or virtually (internet or ATMs).

1.3.1**ATTENTION:**In the case of credit card payments, the candidate must enter their card details immediately after completing their personal registration. That is, after entering personal data (name, document, address, etc.), the candidate will be immediately directed to the Cielo page, where they can enter their card details; this process cannot be done in two parts.

1.3.2 The registration fee must be paid by credit card by September 17, 2025.

1.3.3 Payments by bank slip can be made until September 18, 2025.

1.3.4 Registration Fee payments made on the last day that are inconsistent with the aforementioned schedules, resulting in the bank processing of the payment on days after September 18, 2025, will result in the non-approval of said registration.

1.3.5 Under no circumstances will SBF process any payment record with a date later than that stipulated in the Schedule of this Notice.

1.4 The preliminary list of candidates registered for EUF 2 will be released on September 30, 2025. 2025. Candidates who have completed their registration but are not on the list must contact us by October 2, 2025, through the Contact - EUF Coordination option available on the EUF Platform, to regularize their situation. The final and approved list of registered candidates will be published on October 6, 2025.

ATTENTION: Monitor the status of your registration until your payment is confirmed and review the information submitted to check for possible errors, such as test location, chosen language, and registration approval. Applications submitted outside of the established deadlines will not be considered.

2. EXEMPTION FROM THE REGISTRATION FEE:

2.1 Applicants whose monthly family income is up to one and a half minimum wages per person may apply. exemption from the registration fee.

2.2 Exemption requests must be submitted via the EUF Platform between August 13th and 10th. September 2025.

2.3 Only exemption requests accompanied by supporting documentation will be accepted, such as:

i)Proof of registration in the Single Registry for Social Programs of the Federal Government;

ii) Income Tax Return: A copy of the Income Tax Return and proof of submission for all family members who file a return;

iii)A copy of proof of receipt of social benefits, among other documents.

2.4 The results of exemption requests will be communicated to applicants via the EUF Platform by [date]. The deadline for applications is September 12, 2025, at which point the candidate must proceed with the registration process, which must be completed by September 17, 2025.

2.5 Request your fee waiver at:https://euf.ifi.unicamp.br/EUF/listarevento.aspx?22025EUF

2.6 Candidates who do not obtain an exemption from the registration fee will have their registration approved only after... The SBF has received confirmation from the bank that your registration fee has been paid.

3 TEST LOCATIONS

3.1 The exam will be held simultaneously at the locations indicated on the registration page. The candidate must Choose only one of these locations when you register.Once the registration is approved, the candidate will not be able to change the location selected for taking the Exam.

3.2 Candidates wishing to request a new test location abroad or in locations not available must submit this request via the EUF Platform between August 13 and September 4, 2025. The organization will make efforts to make the suggested location available by September 12, 2025. By this deadline, the candidate must check on the EUF Platform to see if the requested new location has been made available.Only register after receiving a response. .

3.3 Requests to change test locations after registration must be made officially through the Platform if the candidate has already registered at another location. If the requested location has not been made available by the registration deadline, this will be the official indication that the exam cannot be administered at the requested location. In this case, the candidate must select one of the available locations if they are still interested.

3.4 **ATTENTION:** Exchange requestslanguage andtest location Applications must be submitted by September 30, 2025..

4. SERVICES FOR PEOPLE WITH SPECIAL NEEDS

4.1 Candidates with special needs should request assistance through... From the EUF Platform, between August 13th and September 10th, 2025, you must indicate the location where you intend to take the exam. If you are unable to attend, the organization will notify you with explicit justifications.

4.2 **ATTENTION:**Registration should only be completed AFTER receiving a response from the EUF Coordination, which should occur by [date].

September 12, 2025.

4.3 The registration process has a deadline of September 17, 2025, for all candidates, including those who requested a fee waiver, requested accommodations for special needs, or requested new test locations.

5 OF THE TESTS

5.1 The selection exam will be conducted in only one stage, on the day**October 8, 2025**, from 2pm at 6pm (Brasilia time), at the locations announced on the EUF Platform.

5.2 Candidates may take the exams at one institution and apply for selection in Postgraduate Programs at other institutions.

5.3 Candidates must arrive at the test location with the following documents:photo ID andblue or black pen.

5.4 The exam will consist of 40 multiple-choice questions.

5.5 The candidate must transfer their chosen answers to an automatic answer sheet.

5.6 The answer sheet will be read automatically for grading, therefore the use ofblue or black penIt is mandatory.

5.7 The use of calculators and other electronic equipment, such as cell phones, tablets, computers, smartwatches, and agendas, will not be permitted.

5.8 A table containing some formulas and physical constants will be provided for use during the exams. No other form of reference is permitted.

6 OF THE EXAMINATION PROGRAM

6.1 The exams will cover five general areas of the Physics Graduate Programs, namely,

i) Classical Mechanics;
ii) Electromagnetism;
iii) Modern Physics;
iv) Quantum Mechanics;
(v) Thermodynamics and Statistical Physics.

The topics for each area to be evaluated and the recommended bibliography are as follows:

i. CLASSICAL MECHANICS

Newton's Laws.
One-dimensional motion.
Linear oscillations.
Motion in two and three dimensions.
Newtonian gravitation.
Calculus of variations.
Lagrange's and Hamilton's equations.
Central forces.
Particle systems. Non-
inertial frames of reference.
Rigid body dynamics.
Coupled oscillations.

Bibliography:
· JB Marion and ST Thornton, Classical Dynamics of Particles and Systems, 4th Edition, Harcourt, 1995.
KR Symon, Mechanics, 3rd Edition, Addison-Wesley, 1971.

D. Halliday, R. Resnick, and J. Walker, Fundamentals of Physics, 8th edition, Vols. 1 & 2, LTC/Wiley, 2008
H. Moysés Nussenzveig, Basic Physics Course, 4th edition, Vols. 1 & 2, Blucher, 2002.
TWB Kibble, Classical Mechanics, Imperial College Press, 2004.
AP French and MGEbison, Introduction to Classical Mechanics, Chapman and Hall, 1987.
RA Becker, Introduction to Theoretical Mechanics, McGraw-Hill, 1954.
D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, LTC, 2012.

ii. ELECTROMAGNETISM

Electrostatic fields in vacuum and in dielectric materials.
Solving the Poisson and Laplace equations.
Magnetic fields, standing currents, and non-magnetic materials.
Induced electromotive force and magnetic energy.
Magnetic materials.
Maxwell's equations.
Propagation of electromagnetic waves.
Reflection and refraction.
Radiation.
Electromagnetism and relativity.

Bibliography:
DJ Griffiths, Introduction to Electrodynamics, 3rd Edition, Prentice-Hall, 1981.
D. Halliday, R. Resnick, and J. Walker, Fundamentals of Physics, 8th edition, Vols. 3 & 4, LTC/Wiley, 2008
H. Moysés Nussenzveig, Basic Physics Course, 4th edition, Vols. 3 & 4, Blucher, 2002.
JR Reitz, FJ Milford, RW Christy, Fundamentals of Electromagnetic Theory, 3rd Edition, Campus Publisher, 1982.
RK Wangsness, Electromagnetic Fields, Wiley, 1986.
EM Purcell, Berkeley Physics Course, Electricity and Magnetism, Edgard Blücher,
JB Marion and MA Heald, Classical Electromagnetic Radiation, Brooks/Cole (1995).
D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, LTC, 2012 .

iii. MODERN PHYSICS

Fundamentals of special relativity.
Relativistic particle mechanics. Light propagation and Newtonian relativity.
Michelson-Morley experiment.
Postulates of the special theory of relativity. Lorentz transformations.
Causality and simultaneity.
Relativistic energy and momentum.
Thermal radiation, the blackbody problem, and Planck's postulate.
Photons and the corpuscular properties of radiation.
Rutherford's model and the problem of atomic stability.
Bohr's model.
Boltzmann distribution of energy.
Atoms, Molecules, and Solids.

Bibliography:
R. Eisberg and R. Resnick, Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles 2nd Edition, Wiley, 1985.
D. Halliday, R. Resnick, and J. Walker, Fundamentals of Physics, 8th edition, Vol. 4, LTC/Wiley, 2008
H. Moysés Nussenzveig, Basic Physics Course, 4th edition, Vol. 4, Blucher, 2002. Tipler
and R.A. Llewellyn, Modern Physics. 3rd Edition, LTC, 2003.
W. Rindler, Introduction to Special Relativity, Oxford Univ. Press, 1991.
AP French, Special Relativity, WW Norton (1968).
ST Thornton and A. Rex, Modern Physics for scientists and engineers, Brooks Cole, 2005.
RA Serway, CJ Moses and CA Moyer, Modern Physics, Brooks Cole, 2004.
J. Leite Lopes, Introduction to the Atomic Theory of Matter, Ao Livro Técnico, 1959.
HM Nussenszveig, Basic Physics Course IV, (chapter 6), Edgard Blücher.
D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, LTC, 2012.

iv. Quantum Mechanics

Introduction to the fundamental ideas of quantum theory.
The mathematical apparatus of Schrödinger's quantum mechanics. Formalization of Quantum Mechanics. Postulates. Heisenberg's description. The one-dimensional harmonic oscillator.
One-dimensional potentials.
The Schrödinger equation in three dimensions. Angular momentum.
Central forces and the hydrogen atom.
Spinors in non-relativistic quantum theory.
Addition of angular momentum.
Time-independent perturbation theory.
Identical particles.

Bibliography:

DJ Griffiths, Introduction to Quantum Mechanics, 2nd edition, Pearson, 2004.
C. Cohen-Tannoudji, B. Diu, F. Laloë, Quantum Mechanics, Vols. I and II, 1st Edition, Wiley, 1977.
S. Gasiorowicz, Quantum Physics. Guanabara Dois, 1979.
E. Merzbacher, Quantum Mechanics 3rd Edition, Wiley 1997.
RH Dicke and JP Wittke, Introduction to Quantum Mechanics, Addison Wesley, 1961.
I. Levine, Quantum Chemistry, Prentice-Hall, 1991.

v. THERMODYNAMICS AND STATISTICAL PHYSICS

Thermodynamic systems.
Variables and equations of state, PVT diagrams.
Work and the first law of thermodynamics.
Mechanical equivalent of heat.
Internal energy, enthalpy, Carnot cycle.
Phase changes.
Second law of thermodynamics and entropy.
Thermodynamic functions.
Practical applications of thermodynamics.
Kinetic theory of gases.
Statistical description of a physical system.
Microcanonical ensemble.
Canonical ensemble.
Classical gas in canonical formalism.
Grand canonical ensemble.
Quantum ideal gas.
Fermi ideal gas. Bose-Einstein condensation.

Bibliography:

SRA Salinas - Introduction to Statistical Physics. Edusp, 1998.
F. Reif. Fundamentals of Statistics and Thermal Physics. 1st edition. McGraw Hill, 1965.
D. Halliday, R. Resnick, and J. Walker, Fundamentals of Physics, 8th edition, Vol. 2, LTC/Wiley, 2008.
H. Moysés Nussenzveig, Basic Physics Course, 4th edition, Vol. 2, Blucher, 2002.
FW Sears and GL Salinger. Thermodynamics, Kinetic Theory, and Statistical Thermodynamics; 3rd Ed. Addison Wesley.1975.
HB Callen, Thermodynamics, Wiley, 1960
R. Kubo, Statistical Mechanics, North-Holland, 1965
MW Zemansky - Heat and Thermodynamics, Guanabara Dois Publishing, 1978.
D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, LTC, 2012.

7. CHALLENGING THE NOTICE

7.1 Any objection to any aspect of this Notice must be posted on the EUF Platform within the deadline of until3 days after its publication Provided it is properly substantiated and submitted by an identified sender, the argument will be analyzed by the Organizing Committee.

7.2 Appeals will not be accepted:

i) without a clear and detailed explanation of the reasons for the appellant's disagreement;

ii) filed after the deadline.

7.3 Once the deadline for submitting appeals has passed, the Organizing Committee will proceed to... analysis of these, forwarding to the appellants the response regarding their possible acceptance or, if applicable, their rejection.

7.4 In cases where the request is denied, the response will include a substantiated opinion regarding the lack of merit of the appeal.

7.5 In the event that the issue that formed the basis for the request to challenge the Public Notice is found to be relevant. EUF, the Organizing Committee will take the necessary steps to correct the Notice.

8. CHALLENGING ISSUES

8.1 The EUF exam papers, as well as the preliminary answer key, will be available on the platform by24 hours after the At the end of the exam, to assist the candidate with any questions regarding the exam questions/answers.

8.2 Any objection to any aspect of the EUF must be posted on the EUF Platform within a period of up to72 hours after The release of the exam papers and the preliminary answer key. Provided that the argument is properly substantiated and sent by an identified sender, it will be analyzed by the Organizing Committee.

8.3 In the event of a question being annulled in the EUF, the annulled question will count as correct for all candidates, regardless of the language and/or exam.

8.4 Appeals will not be accepted:

i) without explaining the reasons for the appellant's disagreement;

ii) filed after the deadline.

8.5 Once the deadline for submitting requests to challenge questions has passed, the Organizing Committee will proceed to analyze them, forwarding to the appellants the response regarding their possible acceptance or, if applicable, their rejection.

8.6 In cases where the request is denied, the response will include a substantiated opinion regarding the lack of merit of the appeal.

9. CORRECTION OF EXAMS AND PUBLICATION OF RESULTS

9.1 The tests will be automatically graded through the platform in accordance with the Official Answer Key. The

9.2 preliminary answer key will be available on the EUF Platform within 24 hours after the end of the test. exam.

9.3 The official answer key will be available on the EUF platform by October 29, 2025.

9.4 Each candidate will be assigned a final grade from 0 to 10, rounded to the nearest two decimal places. decimal, reflecting your performance on the exam.

9.5 Starting October 29, 2025, the final exam results will be posted on the candidate's portal on the EUF Platform, through which they can access proof of the grades obtained in the exam.

10. GRADE REVIEW

Single paragraph: Since the exam questions are objective in nature, there will be no period for reviewing grades.

11. USE OF RESULTS

11.1 Each Associated Graduate Program will use the results of the Examination for the selection and ranking of candidates according to its own criteria.

11.2 Acceptance or rejection into one program does not imply acceptance or rejection into another.

11.3 Associated Programs must access the EUF Platform and extract an individualized and certified record of the grades obtained by the candidate seeking admission to their Program.

12. APPLICATION OF THE TESTS

12.1 The examination will consist of a test, administered on the day**October 8, 2025.**

12.2 Candidates must arrive at the test location at least 30 minutes in advance for document verification and to sign the attendance list, carrying photo identification.

12.3 The answer sheet shouldIt must be filled in with a blue or black ink pen. because they will be read by an automated system.

12.4 Answers in the question booklet will not be considered.

12.5 The exam will last (04) four hours starting at 2pm (Brasília time).

12.6 No consultation of any material other than that contained in the exams will be permitted.

12.7 The use of calculators or any other electronic equipment, such as cell phones and agendas, will not be permitted.

12.8 Entry to the room will not be permitted after 60 minutes from the start time of the exams.

12.9 Leaving the room permanently will only be permitted after 90 minutes have elapsed from the start time of the exams.

12.10 Candidates may only go to the bathroom after 90 minutes have elapsed from the start time of each exam and must be accompanied by a room supervisor.

12.11 The exam, as well as the answer sheet, will be collected by the person responsible for administering the exam in each room.

13 OF THE EVENT SCHEDULE OF THIS NOTICE

STAGE / EVENT	START DATE	CLOSING DATE
REGISTRATION PERIOD	**August 13, 2025**	**September 17, 2025**
Last day to pay the registration fee.		**September 18, 2025**
Applications for exemption from registration fee.	**August 13, 2025**	**September 10, 2025**
Requests for NEW TEST LOCATIONS	**August 13, 2025**	**September 4, 2025**
Requests for SPECIAL NEEDS ASSISTANCE	**August 13, 2025**	**September 10, 2025**
Responses to exemption requests	**August 13, 2025**	**September 12, 2025**
Responses to requests for NEW TEST LOCATIONS	**August 13, 2025**	**September 12, 2025**
Responses to requests for SPECIAL NEEDS SERVICES	**August 13, 2025**	**September 12, 2025**
Publication of the PRELIMINARY LIST OF REGISTERED PARTICIPANTS	**September 30, 2025**	
TIME FRAME FOR LANGUAGE AND LOCATION CHANGE	**September 30, 2025**	
Deadline for APPROVAL OF REGISTRATIONS	**October 2, 2025**	**April 9, 2025**
Publication of the FINAL LIST OF APPROVED APPLICANTS	**October 6, 2025**	
APPLICATION OF THE TEST	**October 8, 2025**	
Announcement of the PRELIMINARY ANSWER KEY	**October 9, 2025**	
Deadline for CHALLENGING QUESTIONS - DAY 1	**October 8, 2025**	**October 11, 2025**
Disclosure of the NOTES	**October 29, 2025**	
Publication of the OFFICIAL ANSWER KEY	**October 29, 2025**	
Disclosure of the CORRECTION CRITERIA	**October 29, 2025**	

14. GUIDELINES FOR ACCESSING THECANDIDATE PORTAL ON THE EUF PLATFORM

14.1 Initially, the candidate must register for the exam athttp://sbfisica.org.br/v1/euf/ By entering all the requested information, you must register a password that will allow you access to your Portal.

14.2 After completing the registration, access the EUF Platform again and click the button.ACCESS , available in the upper right corner of the page, by entering your details ofLOGIN andPASSWORD Upon logging in, the candidate will have access to their registration confirmation and all other information generated during the EUF 2/2025 process that pertains to them.**Check your receipt CAREFULLY.**And in case of inconsistent data, contact the EUF coordination team via the EUF platform!

14.3 If there are technical problems during or after registration, users should try using other internet browsers and always enable pop-ups.

14.4 All information pertaining to EUF 2-2025 will be available on the portal, and all communication between candidates and the EUF coordination must be conducted exclusively through the EUF PLATFORM.

15 GENERAL PROVISIONS

15.1 The Brazilian Physics Society – SBF – will be responsible for processing and verifying registration payments.

15.2 Registration in the EUF does not imply that the candidate is automatically registered in any of the

Postgraduate programs associated with the exam.

15.3 The candidate must register separately for the Postgraduate Programs of the Institutions of their interest.

15.4 Applications to the Programs must be submitted according to the specific rules of each Program and within the deadlines required by them. This information will be available on the Graduate Studies Services pages of each Institution/Program, as well as information on scholarship opportunities. EUF does not offer any type of financial aid.

Federal University of Rio de Janeiro Institute of Physics
Postgraduate Program in Physics

ANNEX II

SELF-DECLARATION

I, _____, RG or passport no. _____I declare that I am ( ) Black ( ) Brown and I choose to register for the process. selective admission to the ( ) Master's ( ) Doctorate in Physics course, during the academic period from 2026-1, participating in the affirmative action policy described in the respective Notice of Graduate Program in Physics at the Federal University of Rio de Janeiro.

I also declare that I am aware of Article 10 of CEPG Resolution 118/2022, reproduced below.

Next:

> Art. 10. Os optantes autodeclarados pretos e pardos serão submetidos ao procedimento de heteroidentificação, após o processo seletivo e previamente à matrícula no programa, por uma comissão específica, instituída pela UFRJ na forma da lei, para que não haja desvio da finalidade da política de ações afirmativas.
>
> § 1º A comissão de heteroidentificação será institucional, seguindo calendário amplamente divulgado e terá seu funcionamento regularizado de acordo com o estabelecido pela Resolução Consuni nº 24/2020.
>
> § 2º Além de atender aos critérios de diversidade de raça, gênero e, preferencialmente, naturalidade, a comissão de heteroidentificação deverá ser composta de cinco (05) membros e deverá ser representativa dos três segmentos da universidade, com pelo menos um (01) docente, um (01) discente e um (01) técnicoadministrativo.
>
> § 3º Excepcionalmente, em casos de editais extraordinários de acesso aos Programas de Pós-graduação *Stricto Sensu* e impossibilitados de enquadramento no calendário estabelecido pela comissão de heteroidentificação, os programas poderão requisitar à mesma uma data específica para o procedimento de heteroidentificação de seus candidatos.
>
> § 4º As pessoas pretas e pardas que optarem por concorrer às vagas destinadas às ações afirmativas, ainda que tenham sido aprovadas na ampla concorrência, deverão se submeter ao procedimento de heteroidentificação.

I assume full responsibility for the consequences, including legal ones, of...

This is a self-declaration.

Location and date: _____

Signature: _____

Federal University of Rio de Janeiro Institute of Physics
Postgraduate Program in Physics

ANNEX III

SELF-DECLARATION

I, _____, RG or passport no. _____I declare that I am indigenous and choose to register for the selection process for admission to the ( ) Master's ( ) Doctorate in Physics course, in the academic period of 2026-1, participating in the affirmative action policy described in the respective Postgraduate Program Notice Bachelor's degree in Physics from the Federal University of Rio de Janeiro.

I also declare that I am aware of Article 11 of CEPG Resolution 118/2022, reproduced below. Next:

> Art. 11. No caso de optantes indígenas, a confirmação da autodeclaração se baseará na apresentação de carta assinada por liderança ou organização indígena, indicando o vínculo à comunidade indígena a qual o optante pertence, além de seu memorial, relatando sua trajetória (formação escolar, outros cursos, atuação junto à comunidade ou em movimentos, experiência profissional etc.), com menção à comunidade específica a qual está identificado, devidamente registrada pela Fundação Nacional do Índio ou órgão equivalente.

I assume full responsibility for the consequences, including legal ones, of...

This is a self-declaration.

Note: attach to this document the letter indicated in Article 11 of CEPG Resolution 118/2022.

Location and date: _____

Signature: _____

Federal University of Rio de Janeiro Institute of Physics
Postgraduate Program in Physics

ANNEX IV

SELF-DECLARATION

I, _____, RG or passport no. _____I declare that I am a person with a disability (PwD) and choose to register on selection process for admission to the ( ) Master's ( ) Doctorate course in Physics, in academic period of 2026-1, participating in the affirmative action policy described in the respective Call for applications for the Graduate Program in Physics at the Federal University of Rio de Janeiro.

I also declare that I am aware of Article 12 of CEPG Resolution 118/2022, reproduced below.

Next:

Art. 12. No caso de optantes com deficiência, a confirmação da autodeclaração se baseará na apresentação de laudo médico, original e cópia, expedido por profissional especialista na área, atestando a espécie e o grau ou nível da deficiência elencada no Anexo 01, nos termos do Art. 5º do Decreto nº 5.296/04 (classificação das deficiências), da Lei nº 12.764/12 (lei de ingresso para pessoas com deficiência) e das Súmulas STJ 377/2009 e AGU 45/2009, com expressa referência à Classificação Internacional de Doenças (CID), informando também o seu nome, documento de identidade (RG) e número de CPF.

a) O Laudo Médico deverá ser legível a fim de possibilitar a sua plena leitura, contendo data, assinatura e carimbo profissional com o número de inscrição no Conselho Regional de Medicina (CRM).

b) Os optantes com deficiência visual deverão anexar laudo médico, especificando a CID – Classificação Internacional de Doença e a acuidade visual conforme Escala de Snellen.

c) Os optantes com deficiência auditiva deverão anexar laudo médico, especificando a Classificação Internacional da Doença (CID) e o exame de audiometria.

I assume full responsibility for the consequences, including legal ones, of...

This is a self-declaration.

Note: Attach to this document a copy of the medical report indicated in Article 12 of CEPG Resolution 118/2022.

Location and date: _____

Signature: _____

Federal University of Rio de Janeiro Institute of Physics
Postgraduate Program in Physics

ANNEX V

SELF-DECLARATION

I, _____, RG or passport no. _____I declare that I meet the specific parenting situation described in Call for applications for the Graduate Program in Physics at the Federal University of Rio de Janeiro.

I am entering the academic year of 2026-1 and I choose to enroll in the selection process for the course.

of ( ) Master's ( ) Doctorate participating in the corresponding affirmative action.

I assume full responsibility for the consequences, including legal ones, of...

This is a self-declaration.

Note: Please attach a copy of the document proving your specific parenting situation.

Location and date: _____

Signature: _____