

**Information for Applicants in the process of admission to the Doctoral Program
(Academic Certification of Research Sufficiency, or CASI, for the acronym in Spanish)
of the Graduate Program in Physical Sciences (PCF) at UNAM**

1. Some time *before* the dates for filling out the online application, the applicant must contact the prospective doctoral advisor, to express her/his interest in pursuing doctoral work under the latter's tutelage. The advisor must be listed in the Advisor Roster (Padrón de Tutores) of PCF in the knowledge field of interest (CC, for the acronym in Spanish), and must be authorized by PCF's Academic Committee as a *doctoral* advisor.
2. If the prospective advisor decides to support the applicant, the two must interact in several meetings (online or in person), in order for the advisor to put forward **an original research project in a topic of current interest, capable of leading to a *single* publication in an indexed journal**. (It is NOT necessary to plan out the entirety of the doctoral work to be performed, since such planning would be evaluated a couple of years later, in the Doctoral Candidacy Examination.)
3. The advisor must explain to the applicant the essential ideas of and motivation for the project, supplying appropriate bibliography. The applicant will be responsible for digesting that bibliography to assimilate the antecedents of the project, and understand its essence and value to the international community. (It is NOT expected that the applicant will start working on the project prior to the admission exam.)
4. On the established dates for online registration, the applicant will upload to DGAE's online application system a 1-2 page "proposal for a topic to be developed", i.e., a very brief description of the project that she/he intends to present and defend during the exam. This *proposal* must have the features described in the instructions that accompany the call for admissions, and must include in particular the signed approval of the advisor. The Admissions Subcommittee will review this proposal and notify the applicant if it is accepted, if modifications are recommended, or if it is rejected. Proposals submitted by applicants whose prospective advisor is not yet authorized as a doctoral advisor will not be accepted.
5. Some weeks later, the applicant will submit by email a longer and more detailed description of the project, a "protocol" in 12-point font that is 8-10 pages long (not counting the bibliography). This *protocol* must include the elements enumerated in the instructions of the call for admissions, and must consider the possible modifications mentioned in the preceding paragraph. The final version of the protocol must contain the signed approval of the advisor. It is important that the protocol delineate a concrete strategy for conducting the research that will lead to a first publication. Depending on the nature of the research, this strategy may be enunciated in a few sentences, described in a timetable, or perhaps laid out in some other form. The inclusion of a timetable is optional, except for experimental projects within an international collaboration, in which case it is indeed crucial to clearly identify how the applicant's project fits within the plans and global timeline of the collaboration.
6. **At the beginning of the *protocol*, the applicant must identify the two Introductory Courses of the CC on which the evaluation of the oral exam will be centered** (see point 10 below).

7. The exam's objective is to assess whether the applicant meets the following 3 requirements:
 - i) She/he has the **potential and commitment needed to carry out research** leading to completion of a doctoral degree of reasonable quality under international standards;
 - ii) She/he demonstrates **sufficient knowledge of the field (CC) or subfield (sCC)** in which she/he intends to specialize. Naturally, her/his knowledge of the CC or sCC must be properly backed up by an adequate control of the *pertinent* concepts of basic physics.
 - iii) She/he has an **assigned project that is well posed** and can be expected to lead to a first indexed publication (JCR or Scopus).
8. The jury will be composed of 3 or 5 members, all but perhaps one from the chosen CC, and with no participation of the prospective advisor (or coadvisor).
9. The applicant must be present at the exam's location (physical or virtual) at the time and date that will be notified to her/him by email.
10. The oral exam will consist of 3 portions:
 - a. **Oral presentation of the applicant with a MAXIMUM duration of 20-25 minutes.**

This exposition must be based on the 8-10 page protocol previously submitted by email to PCF. Just like the protocol, its goal will be to describe a research project, chosen under the advisor's guidance, that can lead to a single publication in an indexed journal. The oral presentation will be accompanied by supporting slides, projected from the applicant's computer. It must be brief and to the point, and will NOT be interrupted by the jury, except to notify the applicant about the remaining time. If the 25-minute mark is reached, the applicant will be abruptly interrupted, thereby ending the presentation. The jury will take into account the clarity and organization of the exposition.
 - b. **Questions from the jury and discussion about the research protocol.** The expectation is for the applicant to demonstrate *sufficient* control of all of the concepts involved in the protocol and presented in the oral exposition.
 - c. **Questions from the jury about general ideas.** These questions *will prioritize the physical concepts underlying the project and the area in which the applicant intends to carry out her/his doctoral work.* At the end of this round of questions, the applicant will be asked whether she/he wishes to add to or clarify any aspect of her/his previous responses.

Important criteria for these questions are as follows:

Save for exceptional cases (e.g., interdisciplinary doctoral projects), to delimit and standardize the questions, they will be generated through the following procedure:

- **In consultation with her/his prospective advisor, each applicant will identify beforehand the 2 Introductory Courses of the CC or sCC in the 2019 curriculum of the Master's in Physics that are most directly relevant to her/his project, and will have declared them at the beginning of the protocol previously submitted to PCF. (In the CC of Condensed Matter and Nanosciences, one of the Introductory Courses must necessarily be Solid State Physics.) If the applicant does not identify her/his selected courses on time, the**

jury will choose those 2 that they consider to be closest to the proposed research subject. If the applicant and advisor both believe the project to have some exceptional characteristic that may require evaluation not mainly based on 2 Introductory Courses of the CC or sCC, the applicant must email their arguments (with cc to the advisor) to the person responsible for the CC as soon as possible, and one week before the exam at the latest.

- In the syllabi of those 2 Introductory Courses (available through PCF's website, at

<http://www.posgrado.fisica.unam.mx/TemariosFisica2019>

), the jury will limit itself to *general ideas* (not details) that the applicant really *needs* in order to carry out the proposed doctoral research. The evaluation will seek to verify that the applicant has *sufficient* grounding on these topics so as to not have delays in her/his research work. It will NOT be an exhaustive examination on the selected courses.

- Questions may be asked about the research work carried out by the applicant during her/his master's degree.
- Since the emphasis is on questions about general ideas that are *really necessary*, a *reasonable* performance of the applicant is expected even if she/he has not taken a formal course on the subject in question, or if she/he comes from a different institution, or even from a different CC. It is the applicant's responsibility to place herself/himself at the proficiency level required for *entry* into a doctoral degree in the desired CC or sCC. In all cases, the guiding criterion is to not admit candidates whose grounding is so deficient that it would inevitably lead to significant delay.
- Generally, the applicant's knowledge of basic physics will be evaluated *indirectly*, through the questions about the CC or sCC. However, if a clear need is detected for it, questions can also be asked about basic physics concepts *relevant* for the project.
- In the case of applicants coming from graduate programs other than PCF, informative questions may be asked about relevant aspects of the master's degree of the applicant, including clarifications about the content of courses.

11. The complete examination, from the beginning of the oral presentation, cannot last longer than 2 hours. It can end before that if the jury unanimously believes to have already gathered enough elements to meet the exam's objective.
12. Afterwards, the applicant will leave the room (virtual or physical) and will be asked to wait in a nearby location for the result of the examination, while the members of the jury jointly analyze the case. The applicant must bear in mind that this analysis will be detailed, and could therefore stretch out to 30 minutes or more.
13. At the end of the examination and the subsequent deliberation, the jury will inform the applicant about the result, and may provide some *general* feedback considered to be

pertinent. Per PCF's instructions, the jury is NOT allowed to discuss with the applicant details about specific questions or moments of the exam.

14. The result transmitted to the applicant by the jury **WILL NOT BE DEFINITIVE**. It is the *recommendation* that the jury will make to the person responsible for the CC, and to PCF's Academic Committee. This last body will make the final decision on admission or rejection. This decision will be communicated to the applicant by the Director of the Graduate Program (PCF's Coordinator), at the time and in the manner indicated in the call for admissions.