Donostia International Physics Center

DIPC PhD STUDENT GRANTS

The Donostia International Physics Center DIPC is currently accepting applications for PhD students. This is a unique opportunity for highly motivated students, recently graduated from the University in physics or related fields, to develop a research career joining some of the DIPC high-profile research teams.

DIPC PhD grants last for just 12 months. An extension of the grant may be accepted just in some exceptional cases. DIPC PhD grants are intended to support the student during the first steps of his/her research career. Further financial aid to continue the PhD research project after this period should be obtained from other institutions.

Interested candidates please send an updated CV including an academic transcript with the obtained marks, a brief statement of interest, and contact information to phd@dipc.org. Reference letters are welcome but not indispensable. The particular PhD position(s) to which the candidate is applying should be stated as well.

Applicants are advised to hold, or be in the final year of a master's degree in physics, chemistry or material science.

Next review of applications is scheduled for April 20th 2018. Applications will be evaluated by a Committee designed by the DIPC board on the basis of the following criteria (with point weights indicated in parentheses):

- CV of the candidate (60%)
- Adequacy of the candidate's scientific background to the project (20%)
- Statement of interest and reference letters (10%)
- Others: Diversity in gender, race, nationality, etc. (10%)

Evaluation results will be communicated to the candidates soon after. Positions will only be filled if qualified candidates are found.

The DIPC could revoke its decision in case the candidate breaches the condition of joining before the deadline indicated in this call, proceeding in that case to grant the position to the next candidate based on the classification order, and provided that he has obtained a score higher than 50 (out of 100) in the evaluation of his candidature.

However, the selected candidate may keep the position if, in the opinion of the Evaluation Committee, he duly justifies the reasons why he can't join before the specified deadline, and as long as the project allows it.

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PhD OPENINGS

- Novel quantum phenomena in plasmonic systems

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Surface plasmons are optical resonances that can confine light at the nanoscale, leading to efficient coupling with nearby systems and applications in spectroscopy, microscopy or optoelectronics, among many other possibilities. They have thus become one of the key building elements in nanophotonics. Most studies focus on metals as the plasmonic material, and obtain the classical response by solving Maxwell's equation. However, a quantum treatment can be necessary to fully understand the possibilities of novel 2D plasmonic materials such as graphene and topological insulators and to reveal new phenomena, related for example with the coupling between the plasmonic modes and molecules.

The main objective of this theoretical thesis will thus be to use sophisticated quantum treatments, such as Time-Dependent Density Functional Theory (TDFFT) or ab-initio methods, to study new plasmonic materials, new excitations and other novel phenomena. This quantum framework can also be combined with more classical approaches. Many different systems could be studied, with an intriguing possibility being the analysis of a new type of strongly-confined plasmonic acoustic excitations on gold surfaces. Of special interest will be to understand the possibilities of the studied systems for a variety of applications, which may include spectroscopic studies of molecules, nanophotonic devices, quantum information or the modification of the molecular chemical properties.

The work will be theoretical, but the candidate is expected to contribute to collaborations with experimentalists whenever possible. The student is also expected to work closely with other theoreticians on topics closely related to the present work, as for example nanophotonics. ab-initio modeling or quantum information. The candidate should be willing to perform stays of up to several months with our collaborators worldwide if required by the progress of the thesis. A strong background on nanophotonics and on quantum modeling of materials will be particularly valuable.