Donostia International Physics Center

DIPC POST-DOCTORAL POSITIONS

The Donostia International Physics Center DIPC is currently accepting applications for post-doctoral appointments. This is a unique opportunity for highly motivated junior researchers with a recent PhD degree in physics or related fields to join some of the DIPC high-profile research teams.

Interested candidates please send an updated CV, a brief statement of interest, and contact information to postdoc@dipc.org. Reference letters are welcome but not indispensable. The particular position(s) to which the candidate is applying should be stated as well. Although candidates are encouraged to contact the project supervisors to know further details about the proposed research activity, please be aware that the application will be evaluated only if it is submitted directly to the email address mentioned above (postdoc@dipc.org).

Next review of applications is scheduled for February 29th 2016. Applications must be received before this date and 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 (40%)
- Adequacy of the candidate's scientific background to the project (40%)
- 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 duration of the appointment will be 1 year. The appointment could be renewed for a second year, subject to performance and to the availability of funding.

The salary will be 32000 euros per year before taxes.

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JOB OPENINGS

- ***Time-Dependent Density-Functional Theory beyond the Local-Density Approximation***

  Contact person: J.M. Pitarke (jm.pitarke@ehu.eus). Reference: 2015/7.

  Time-Dependent Density Functional Theory (TDDFT) is heavily used nowadays for the investigation of ground-state properties (by using the fluctuation-dissipation theorem) and optical properties of many-electron systems. Nevertheless, many of the existing implementations rely on the use of an adiabatic local-density approximation (LDA).

  The goal of this project is to go beyond the LDA by constructing fully non-local exchange-correlation (xc) kernels that should allow for the description of many-electron systems of practical interest, such as organic conjugated polymers, strongly-correlated materials, and quasi two dimensional systems.

- ***Model calculations of solid organic/inorganic interfaces.***
  Contact person: D. Sánchez-Portal (sqbsapod@ehu.eus). Reference: 2016/1.

  Work in this project will focus on exploring the electronic properties of complex organic/inorganic interfaces by combining *ab initio* theoreticalstudies (using both DFT and GW calculations) with the electron dynamics computed using effective Hamiltonians parametrized from those *ab initio* results. We want to tackle the electron dynamics at organic/inorganic interfaces with special attention to the formation and dissociation of excitons in organic layer on TiO_2 surfaces. This is part of an international collaboration between the group of Dr. D. Sánchez-Portal at the DIPC in San Sebastián and the group of Prof. Dr. Stephan W. Koch in Philipps Universität at Marburg.

  Candidates should hold a PhD in theoretical or computational physics or chemistry and must have a strong background on electronic structure calculations, quantum many-body theory, as well as high expertise in computational work.

- ***Computational Solid State Spectroscopy***
  Contact person: E. Krasovskii (eugene.krasovskii@ehu.eus). Reference: 2016/2.

  We seek a post-doc with a background in computational or theoretical solid state physics to work in the general area of solid state spectroscopy. The successful candidate will be involved in one or more of the following projects:

  1) Development of an efficient computational method for the response function of realistic crystals including surfaces. We are interested in one-particle and collective electronic excitations (plasmons) at the surface layer for novel layered materials, especially in materials with strong spin-orbit coupling, e.g. topological insulators. An important application is the inclusion of the total electric field at the surface into the perturbation operator of the photoemission theory.

  2) Development of an ab initio metod for angle and spin-resolved photoemission at low photon energies, taking into account a realistic electric field distribution at the surface. The realization will be based on the existing augmented-plane-wave method and computer code for electron scattering by surfaces.

  3) Transient phenomena in photoemission: Development of a consistent theory of time-resolved attosecond photoemission from solids. The aim is to establish a relation between the electronic structure of the crystal and the streaked photoelectron spectra and construct a computational method to simulate the electron dynamics in a time-dependent electric field.