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 May 15th 2010. 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 salary will be 32000 euros per year before taxes.

JOB OPENINGS

- ***TDDFT study of the energy loss of swift ions in solids***

Post-doctoral position, contact person: Andrés Arnau (andres.arnau@ehu.es). Reference:2009/15.

The candidate will use first-principles methods based on time dependent density functional theory (TDDDFT) to study the electronic excitations produced by the passage of swift ions through different kind of solids. The main goal is to understand and explain the observed different behaviours for slow ions in metals, semiconductors and insulators. One of the most challenging aspects is the description of the so called threshold effect and its relation with the existence of energy band gaps in the excitation spectrum. In particular, protons, antiprotons and He projectiles will be considered as projectiles, while Al, Au, Si, Ge and LiF as targets. Some steps in the development of the methodology will be also need to complete the project.

- ***Theoretical studies of electronic transport in nanostructures***

Post-doctoral position, contact person: Sebastián Bergeret (sebastian_bergeret@ehu.es). Reference:2010/1.

The candidate will study transport and equilibrium properties of hybrid structures consisting of superconducting (S), normal (N) and ferromagnetic (F) metals. Research will be carried on one or some of the following research lines: 1) study of the dynamics of the triplet component in S/F junctions; 2) Electron cooling in S/N nanostructures; 3) Non-local transport in superconductors. The candidate should have a good background in quantum field theory, superconductivity and in non-equilibrium physics.

- ***Ab-initio calculation of dielectric response at the surface***

Post-doctoral position, contact person: Eugene Krasovskii (eugene_krasovskii@ehu.es). Reference: 2010/2.

The candidate will develop a computational method and computer code to calculate the full dielectric function of crystals with surfaces. The method will be based on the augmented plane wave formalism of the band structure theory. The aim is to be able to describe electronic excitations at the surface for a wide range of materials, in the first place noble metals and transition metal compounds. The expected outcome of this project will be the calculation of the response of the crystal to incident light in order to include the total electric field at the surface into the perturbation operator of the photoemission theory.

- ***Inelastic Quantum Transport Properties of Nanoscale Objects***

Post-doctoral position, contact person: Thomas Frederiksen (thomas_frederiksen@ehu.es).Reference: 2010/3.

The candidate will be working on theoretical investigations of quantum transport properties in nanoscale objects, like carbon nanotubes, graphene, and molecules. The project includes a methodological development based on Keldysh formalism that deals with electron-phonon interaction effects in a situation where the nanoscale object is strongly driven out of equilibrium (high-bias voltage). The natural outcomes of the project will be: (i) to probe transport regimes where the adiabatic Born-Oppenheimer approximation breaks down, like in carbon based nano-materials when the voltage is larger than the typical strongly-coupled optical phonon mode energy. (ii) to investigate electromechanical properties of nanoscale carbon-based resonators, following recent experimental achievements [1,2]. The aim of the study will be to determine the dependence of the quality factor with disorder and electron-phonon interactions, a question of great interest for designing efficient force/mass nanoscale detectors.

[1] B. Lassagne et al., Science 325 (5944) 1107 (2009).
[2] G. A. Steele et al., Science 325 (5944) 1103 (2009).