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 December 9th 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

- ***Molecular dynamics of Al protein interactions***

  Contact person: X. López (xabier.lopez@ehu.es) Reference: 2016/14.

  Aluminium is one of the most used metals in our societies and its use has profound implications for biological media. Computational methods help in predicting the possible toxic effects of this metal in what is so-called the aluminium age. Molecular dynamics simulations is widely used nowadays for the structural prediction of biomolecules, The goal of this project is to use MD and QM simulations, to determine the structure and dynamics of key biological molecules in their interaction with aluminium. In particular,polypetides with common sequences present in neuro-fibrilary tangles will be considered. The theoretical predictions will be compared with available experimental data.

- ***Dynamic properties of concentrated solutions of single chain nanoparticles***

  Contact person: A. Alegria (angel.alegria@ehu.eus) Reference: 2016/15.

  During recent years the PSMG have devoted an intense activity to the investigation on the single-chain nanoparticles (SCNPs), covering the synthesis, the structures and the properties of these entities. Among the various interesting aspects of such SCNPs that are important, one is the similarity established between the behavior of SCNPs and that of intrinsically disordered proteins. This fact suggests that concentrated solutions of SCNPs can be a suitable system to investigate the effect of molecular crowding on the dynamical properties of these systems. This opens the possibility of designing artificial microenvironments imitating many of the general physical and chemical aspects of cellular environments. Particularly, concentrated SCNPs/water solutions would allow investigating the behavior of the so-called hydration water and its relation with the SCNP (model protein) dynamics. Furthermore, the SCNP dynamics itself may change dramatically in crowding environments, as compared with the more diluted state, which potential consequences in the catalytic properties of sparse SCNPs.

  According with the typical time scales of the molecular processes involved, this subject will be investigated by dielectric spectroscopy, covering a broad frequency range and over a broad temperature interval. When necessary, the obtained results will be complemented with neutron scattering experiments, providing spatial information.

  Taking all the above into account, we are looking for a highly motivated candidate with a good background in polymer based materials, relaxation methods and experience in dielectric spectroscopy. The main task to be developed during the project is investigating the dynamical properties of selected SCNPs/solvent systems by dielectric spectroscopy techniques.

- ***Atomistic description of Surface-Enhanced Raman Spectroscopy***

  Contact person: Javier Aizpurua (aizpurua@ehu.es) Reference: 2016/17.

  Plasmonics is boosting a variety of surface-enhanced molecular spectroscopy techniques. Among them, Surface-enhanced Raman spectroscopy (SERS) has reached submolecular resolution in special plasmonic cavity configurations. We seek to describe theoretically the Raman signal from single organic molecules located in plasmonic cavities, where the inhomogeneous illumination of the plasmonic local field is fully considered. To that end, both classical and quantum mechanical models need to be developed.
  The candidate for this position needs to be skillful in solving classical electrodynamical equations. He/She will also need to have knowledge on atomistic descriptions both within classical approaches as well as within quantum chemistry to develop the theoretical methodology and perform the calculations of the Raman signal in plasmonic configurations.