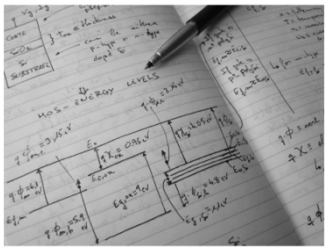

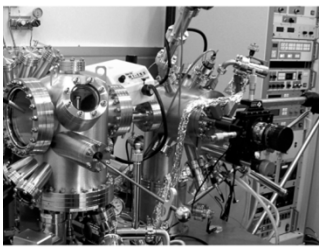

Materials Physics Center
Centro de Física de Materiales

Centro de Física de Materiales - CFM is a joint centre by the University of the Basque Country - UPV/EHU and the Spanish Research Council - CSIC. The centre brings together several outstanding teams who develop frontier research using state-of-the-art facilities.

CFM's headquarters is located at Ibaeta Campus in San Sebastian, within walking distance from several institutions also committed to explore physics and material science, both at fundamental and applied levels. Altogether, we represent a thrilling international community devoted to innovation and discovery at the very edge of science.

PhD Studentships

At CFM we are committed to provide future generations with the best opportunities to join the research community and develop high profile careers.

This is a unique occasion to work in an intellectually stimulating environment in close interaction with all our scientific staff, a large group of postdoctoral researchers and a wide network of international, world-class visitors.

We are currently seeking for bright, highly motivated students who will be able to make the best out of this opportunity. Candidates must show problem solving skills, as well as will to find and develop original and innovative solutions in unexplored domains of physics and material science. They are expected to integrate and contribute to all phases of scientific activity, from pure research to communication in international journals and conferences.

Next Deadline for Submission of Candidatures: 30th June 2015

Call is open for allocating 3 PhD studentships. Each studentship will cover a period of three years, including a salary of 15 972 € (before taxes) during the first year, with subsequent smooth increases over the next two. The studentship will also include a budget (allocated to the research group) covering research and training expenses. Studentships are funded by the Research Association MPC - Materials Physics Center.

PhD studentship will only be granted to successful candidates whose PhD project will be formally registered at the University of the Basque Country UPV/EHU before 30th June 2015 for the PhD contract to be continued.

Details about the available topics are provided in the following pages., together with general information on the application and evaluation processes.

http://cfm.ehu.es/

CSIC
Consejo Superior de Investigaciones Científicas

MPC
MATERIALS PHYSICS CENTER

eman ta zabal zazu
UPV EHU

Materials Physics Center
Centro de Física de Materiales

PhD Studentship Application Process

Interested candidates must send a CV, including an academic transcript with the marks obtained in the degree, and a brief statement of motivation.

Reference letters are welcomed but not essential. A letter of acceptance/support signed by the supervisor of the project is required.

Please provide clear contact information and specify which is the research topic or topics you are applying for.

All documents must be sent to **mpc@ehu.es**

PhD Studentship Evaluation Process

Applications will be evaluated by a Committee designed by the CFM Direction Board. The following criteria will be applied (scoring weights are indicated in parentheses):

- CV of the candidate (65%)
- Adequacy of the candidate's technical background to the research line to which he/she is applying for 30%)
- Reference letters (5%)

Only applications received before the deadline (30th June 2015 at 17:00 CEST) will be evaluated. Evaluation results will be communicated to the candidates soon after.

Positions will only be filled if qualified candidates are found. If this is not the case, the deadline for submission of applications may be extended.

Available Topics for PhD

- **The list of available topics is shown in the following pages.** Only three positions will be selected among all applications to any of these topics.

- You can apply for several topics simultaneously.

- When applying, please quote the reference(s) number (s) of the topic you are interested in.

- If you have specific questions, or need further information on an specific topic, please get in touch directly with the contact person indicted in each topic description.

- For any general queries on the selection process, contact mpc@ehu.es.

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Reference: PhD/2015/1

Synthesis of complex soft nano-objects via single chain technology

Contact person: José A. Pomposo (josetxo.pomposo@ehu.eus)

The focus of the PhD student s research will be the construction and characterization of complex soft nano-objects synthesized via single chain technology by starting with well-defined polymer precursors synthesized by modern controlled radical polymerization techniques (ATRP, NMP, RAFT polymerization) and by employing innovative intrachain folding/collapse methods to tune the compaction of the soft nano-objects towards bioinspired globular constructs. The candidate will have the unique opportunity to carry out his/her PhD Thesis at the frontier between chemistry, physics and biology in the "Polymers & Soft Matter Group" - PSMG.

Reference: PhD/2015/2

"On surface polymerization"

Contact person: Lucia Vitali (lucia.vitali@ehu.eus)

The PhD candidate will join the Spectroscopy at atomic scale group at the Material Physics Center. The group focuses its research activity on the understanding of the physical and chemical phenomena occurring at local scale on surfaces. Our main research tools are scanning probe techniques (as scanning tunneling microscopy and spectroscopy as well as atomic force imaging) in ultra-high vacuum (UHV) at temperatures down to 1 Kelvin.
We are looking for an enthusiastic and self-motivated person able to enjoy scientific work working independently as well as in team. He/she will join the project called "On surface polymerization"
Aim of this work is to investigate new chemical reaction processes leading to molecular polymerization on surfaces. More specifically, reactions as Ullmann, Stille, Suzuki ect, which are known to lead to molecular polymerization on solution will be characterized on surface in ultra-high-vacuum (UHV) using heat and the supporting surface to promote the polymerization. While Ullmann reaction of molecules with Br or I ending groups has been successfully demonstrated on metallic surfaces, the others have been less explored. Here, the viability of these will be studied. The surface preparation and characterization will be done in UHV.
The successful candidate must have a university background in physics or in chemical physics, holding a master degree. In depth understanding of surface science is desirable. Programming languages (Labview, Mathlab) are preferable.

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Reference: PhD/2015/3

"Electromagnetic interaction of fast electron probes with nanostructures“

Contact person: Javier Aizpurua (aizpurua@ehu.es)

The "Theory of Nanophotonics Group" seeks for a candidate to develop theoretical research on the interaction of fast electron beams and novel nanosamples that present complex electromagnetic excitations, such as in dielectric particles, phononic materials, complex metallic antennas, and 2D electron materials. A study of the electron energy loss spectra, as well as novel effects and forces induced at the samples will be proposed in this research project. The research will be developed in close collaboration with the experimental groups of Prof. Rainer Hillenbrand at CIC nanoGUNE in Donostia, and Prof. Phil. Batson at Rutgers University in the US.
Experience in solving Maxwell equations in complex electrodynamical environments will be very valuable for such a position. In particular, the candidate should have:
- A degree at the level of Master in Physics or Physics-related topics (finished or to be finished before the end of the year).
- Experience or willingness to learn numerical methods to solve mathematical problems arising from the Physical descriptions of a problem.
- Experience or strong interest in Maxwell's equation solvers.
The candidate is expected to start his/her research work in September 2015.

Reference: PhD/2015/4

Glassy dynamics of nanostructured polymers by experiments and molecular simulations

Contact person: Daniele Cangialosi (swxcacad@ehu.es)

The glass transition in nanostructured polymers has received enormous attention during the last two decades. Investigations in this field have been promoted by the interest in achieving new insight on the glass transition phenomenon. Furthermore, nanostructured polymers enable numerous technologies in which miniaturization is paramount. It is now well established that systematic negative deviations of the glass transition temperature (Tg) exists in numerous nanostructured polymers. Furthermore, the most recent advancements in the field suggest that the amount of free interface is a key parameter in determining the magnitude of such deviations.
The Polymers and Soft Matter Group at the CFM has been increasingly active in the last years on the topic of the glass transition in nanoscale confinement. The aim of the present project is to systematically study the effect of free surface on the glass transition of polymer nanostructures in a variety of configurations. These may range from thin films, to nano-objects with varying aspect ratio. This can be done exploiting the synergy between experiments and molecular simulations. In the former case, several aspects of the glass transition in different configurations; e.g. thin films, nanospheres and other more complex geometries; will be explored employing a new generation calorimetry, allowing accessing cooling/heating rates as high as several thousands kelvin per second, and broadband dielectric spectroscopy. In parallel, the capability of molecular simulations will be exploited to design well defined geometries of nanostructuration. The systematic simulation of simplified models of nanostructured glass-formers will provide a general picture on the role of the free surface on the glass transition. The universal microscopic mechanisms controlling the former picture will be discrimated from the information extracted from the simulations, which provides direct access to the molecular motions. We look for a young, highly motivated candidate interested in problems of soft matter physics, and particularly in combining both experimental and simulation work. The applicants should have an MSc in Physics or Chemistry. Skills on programming will be highly esteemed.