

Call for applications for PhD position in the laboratory of excellence, labex Plas@Par

Title of the PhD project: Spectroscopic study of silicon hydride molecular ions

Project description

Molecular ions created in laboratory or astrophysical plasma has attracted considerable attention. In particular, charged molecules containing silicon (SiH^+ , SiH_2^+ , SiH_3^+) are of interests in :

- microelectronics for semiconductor and solar cells manufacturing.
- astrophysics where knowledge of the molecular lines of these species are used to study temperature and pressure fluctuations and flow in the photosphere.

The PhD project consists of studying, ab-initio, the spectral properties of small molecular ions (SiH^+ , SiH_2^+ , SiH_3^+ , CH^+ , CH_2^+ , CH_3^+), relevant in astrophysics and microelectronics. These simulations will be performed with standard quantum chemistry packages but also with home-made codes specifically designed for the description of the electronic structure and the dynamics of excited quantum systems. A part of the project will be dedicated to the development of new methodologies and original codes. Knowledge of a programming language is necessary.

This study will be performed in close-collaboration with an experimental group working on the synchrotron facilities SOLEIL (J-M Bizau, D. Cubaynes) and a team in University of Dublin (E. Kennedy, J. P. Mosnier, P. Van Kampen). First measurements on SiH^+ , SiH_2^+ , SiH_3^+ have already been performed.

Requirements for the candidate:

The candidate is expected to hold a M.Sc. or equivalent degree in Physics or Physical chemistry, or to obtain her/his degree by the starting date of the position. Previous education and relevant experience on the topics of the PhD project as well as computing skills, such as knowledge of Fortran language should be highlighted in the application.

The PhD that will be hired will have also a background on theoretical chemistry and knowledge in computational chemistry or physics. He/She will develop also the necessary model formulation based on initial physical models.

Location and starting date

The PhD position will be performed at the “Laboratoire de Chimie Physique Matière et Rayonnement”, LCPMR, Université Pierre et Marie CURIE (UPMC), Paris VI.

Contacts:

Stéphane CARNIATO (Professor), E-mail: stephane.carniato@upmc.fr

Nicolas Sisourat: (Maître de Conférences), E-mail: nicolas.sisourat@upmc.fr

The application should be sent preferably by e-mail to: stephane.carniato@upmc.fr