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

Title of the PhD project: Multiple Photoionization of metallic vapors

Project description

The PhD candidate will join a team which is specialized in the study of multiple photoionization of atoms and molecules using synchrotron radiation. For that purpose, an efficient experimental set-up: 'HERMES' (High Energy Resolution Multi Electron Spectrometer) was developed. It is a magnetic bottle time-of-flight spectrometer capable of detecting in coincidence and analyzing in energy all the electrons emitted in the full 4π solid angle. Among our recent achievements, detailed description of Auger decays in molecules [1] and atoms [2], and characterization of the weak double K-shell ionization channel in simple molecules [3] can be mentioned. Another important application of our method is to give, indirectly, information on the core ionization of ions and their Auger decay [4]. Such information is of primary interest for plasma physics and for characterization and diagnostic of plasmas. It is almost impossible to obtain directly the Auger electron spectra of ions by experiments on ion beams; but these Auger spectra can be revealed here in the core-valence double ionization path of the neutral element.

The PhD project will consist in developing the present experimental set-up in order to have access to the study of metallic vapors (such as alkaline or alkaline-earth elements). This will be done at the laboratory with a pulsed He lamp test facility, before performing experiments on synchrotron (SOLEIL). The existing oven gave yet first results on Potassium and Rubidium atoms. It must be improved to enable the study of more heat-resistant species such as Li. A further development will be the detection of residual multiply charged ions in coincidence with electrons. We expect especially results on the inner-shell ionization and Auger decays of a variety of atomic ions.

[1] F. Penent, et al Phys. Rev. Lett, 106, 103002 (2011)
[2] J. Palaudoux et al accepted in PRA (2015)
[3] M. Nakano et al PRL 110, 163001 (2013) & 111, 123001 (2013)
[4] S.-M. Huttula et al Phys. Rev. Lett. 110, 113002 (2013)

Requirements for the candidate:

This project is essentially experimental. 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 experimental skills will be highlighted in the application.

Location and starting date :

The PhD host will be "Laboratoire de Chimie Physique Matière et Rayonnement", LCP-MR, Université Pierre et Marie CURIE (UPMC), Paris VI. The PhD will start on Oct 1st 2015.

The application should be sent by e-mail to the following contacts:

Francis PENENT E-mail: francis.penent@upmc.fr
Pascal LABLANQUIE E-mail: pascal.lablanquie@upmc.fr
Jérôme PALAUDOUX E-mail: jerome.palaudoux@upmc.fr

Applications with CV, statement of motivation, copies of degree diplomas and grades, two reference letters, and copies of any previous research-related work. Deadline is May 31st 2015.