Master internship (M2) in plasma-surface interaction (experiment):
gas scattering, adsorption, absorption, desorption

A Master (M2) internship is available in the « Plasma-Surface » group of the « Physics of Ionic and Molecular interactions (PIIM) » laboratory at Aix-Marseille University (France). The internship will be part of a project aiming to understand how scattering, adsorption, absorption and desorption of hydrogen isotopes on/in/from tungsten materials is influenced by surface impurity adatoms (oxygen and nitrogen).

The selected candidate will use a new ultra-high vacuum surface science apparatus (AMU-PSI) equipped with three different gas sources (a supersonic molecular beam, a radical beam and an ion beam), various surface analysis tools (AES, LEED), several mass spectrometers and an innovative laser induced temperature programmed desorption (LID-TPD) to perform kinetic measurements. The internship goal is to use this setup to understand the underlying dynamics of deuterium adsorption and desorption on clean and partially oxidized tungsten surfaces.

The internship will contribute to the WHeSCI project, funded by AMIDEX and the ANR. The WHeSCI project seeks to describe the plasma-wall interactions in ITER, the international project that aims to demonstrate the technological and scientific feasibility of fusion energy with the Tokamak design (www.iter.org). In particular, WHeSCI will focus on the study of interactions between fusion fuel (deuterium (D) and tritium (T)) and ashes (helium (He) and neutron) with the walls of the exhaust of the reactor (the divertor made of Tungsten, W). The induced material properties modifications are indeed critical for the reactor operation and safety and the successful operation of ITER requires a detailed understanding of the plasma-wall interactions.

Strong willingness for experimental science is sought after. Applications are to be addressed to Régis Bisson (regis.bisson@univ-amu.fr) and Thierry Angot (thierry.angot@univ-amu.fr) with a CV and details of previous experience.

The Plasma-Surface group of the PIIM lab is a contributor in the Euratom research and training programme through the EUROfusion consortium. Aix-Marseille University (AMU) is the biggest University in France and one of the four “Initiative d’excellence IDEX” French Universities.

The Plasma-Surface group: http://piim.univ-amu.fr/Presentation-111

The AMU-PSI setup: http://piim.univ-amu.fr/AMU-PSI-PS-615

Advisor webpage: http://piim.univ-amu.fr/BISSON-Regis

The WHeSCI project: http://piim.univ-amu.fr/amidex/whesci/