



PhD position: Serial crystallography for the determination of new hybrid structures

A PhD position is available at the Institut des Matériaux Poreux de Paris (IMAP), Ecole Normale Supérieure and ESPCI-Paris. The project is funded by the ANR project Serial-X-Energy in collaboration with the Institut Lavoisier de Versailles (ILV, Université de Versailles Saint-Quentin) and Synchrotron SOLEIL.

Metal Organic Frameworks (MOFs) and PolyOxoMetalates (POMs) are crystalline materials at the forefront in the design of novel energy storage and conversion systems (electrochemical, heat, water splitting, hydrogen evolution, heat reallocation...). These systems play a strategic role in the development of efficient, sustainable and renewable energy resources. One of the major challenges associated with the discovery of crystalline materials is the determination of their structure, which is a prerequisite for understanding their properties. Conventional techniques based on single crystal or powder X-ray diffraction have inherent limitations (crystal size, difficulty in analyzing powder data). Therefore, we are seeking to adapt to hybrid materials a technique called "serial crystallography" that aims to determine structures by analyzing a set of microcrystals, in order to overcome the limitations of current techniques.

During the PhD, the synthesis and characterization of MOF and POM crystals of controlled size and optimized crystal quality will be carried out. In a first step, known solids will be selected to benchmark the technique, which will further be used to elucidate the structure of new materials synthesized by the PhD candidate. Structural characterizations by serial crystallography will be carried out on the PROXIMA 2A beamline at Synchrotron SOLEIL.

Applicants for this position shall be highly motivated and must possess a strong background in coordination or solid-state chemistry. Experience in structure resolution by X-Ray diffraction will be greatly appreciated. Candidates shall speak French or English fluently. Applicants are invited to submit an email including a cover letter, CV with a publication list and two or more references letters.

Contacts:

Dr. Antoine Tissot – antoine.tissot@ens.fr

Dr. Christian Serre – christian.serre@ens.fr