months UNIVERSITÉ DE ROUEN NORMANDIE

GPM Groupe de Physique des Matériaux

INSTITUT CARNOT ESP

3D Atomic Resolution Electron Tomography for Embryonic Zeolites

The GPM (Groupe de Physique des Matériaux, Université Rouen Normandie, CNRS) is recruiting a post-doctoral research associate for the development and application of 3D atomically resolved Electron Tomography approaches to nanometric embryonic zeolites. The provisional starting date is the 1st of April 2021 or earlier for a duration of 9 months.

Project description: 3D NanoZET is a joint project between GPM Rouen and LCS Caen and deals with the development of TEM-based three dimensional multiscale methodologies for the characterization of ultra-small porous zeolites designed for petro-chemistry. The reduction of the crystallite size and a close control of the porous network generates an increment of the external active surface of a zeolite and require specific protocols for synthesis and characterization. The main targets of this project articulates on the controlled synthesis and detailed characterization of nanocrystals in an effort to achieve materials with suitable catalytically performances. As the microstructure is one of the key-parameters defining the materials catalytic performances, the emphasis is put on the fine characterization of the crystals microstructure under 3D in terms of their critical size, porous network and chemical composition. Owing to its ability to probe small volumes with the atomic resolutions, the electron tomography in a TEM under different working modes will be adapted to these nanostructures which are particularly sensitive to electrons irradiation, by using several approaches: the low-tension and low dose modes, corroborated with the use of fast camera for the data acquisition.

Profile: The post-doctoral fellow will be in charge with the realisation of the 2D and 3D characterization using an analytical double corrected TEM installed on the Genesis platform at GPM. He/she will participate to the definition of experimental protocols for the 3D characterization of beam-sensitive materials, in terms of data acquisition and treatment. The candidate should have a phD in materials sciences, applied physics or chemistry, or a related discipline. A fluent knowledge of English and/or French is a pre-requisite. The successful candidate will be highly motivated, creative, with demonstrated abilities to work in a collaborative environment. Prior experimental and practical background in Transmission Electron Microscopy and electron tomography will be strongly appreciated.

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