



PhD position in advanced microscopy

Project:	In situ coupling of atom probe tomography and transmission electron microscopy
Location:	Groupe de Physique des Matériaux (GPM), Saint Etienne du Rouvray (France) http://gpm.univ-rouen.fr/fr
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Transmission electron microscopy (TEM) and atom probe tomography (APT) are ultimate characterization techniques enabling the inspection of materials at the atomic scale. These two microscopy techniques are currently used separately to provide correlative microscopy analyses of materials [1]. Whereas recent instrumental developments of TEMs allow combining high-resolution imaging with mapping of physical properties, APT remains the only techniques able to reconstruct volumes of materials with atomic sensitivity [2]. Nevertheless, APT suffers from artefacts which limit spatial resolution. A way to overcome its limitations would be to image APT specimens at the nanometre scale during their analysis in APT but this is not yet possible. A very challenging task would hence be to combine APT and TEM in a single instrument, in order to image APT specimens but also to access a much deeper and complete characterization of nano-objects [3].

Researchers of the GPM are working on the combination of atom probe tomography and transmission electron microscopy in a new instrument. They have raised a 2 million euros funding for this project, which includes a PhD position. The GPM has a long experience in the conception of Atom Probe Tomography and of its coupling with other techniques. This new project is a new major challenge for the group.

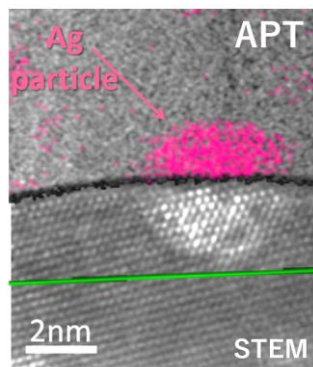
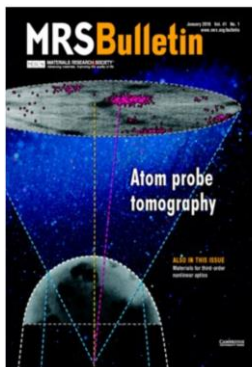


Illustration of correlative analysis of Ag-nanoparticles in aluminium by atom probe tomography and scanning transmission electron microscopy, highlighted in MRS Bulletin 41 (2016) [3].

Candidates should hold a MSc in Physics, Materials Science or other related areas. Previous experience in TEM and a background in characterization techniques will be considered, as well a knowledge in materials-beam interaction.

The duration of the position is 36 months, starting autumn 2021.

Interested candidates should send a CV, a letter of motivation and the names of 2-3 references to williams.lefebvre@univ-rouen.fr

[1] L. Mancini et al., The Journal of Physical Chemistry C 118 (41) (2014)

[2] W. Lefebvre-Ulrikson, F. Vurpillot, X. Sauvage, Book : *Atom Probe Tomography: Put Theory into Practice*, Academic Press (2016). ISBN: 9780128047453

[3] F. Vurpillot, W. Lefebvre et al. MRS Bulletin 41 (2016)