

Post-doctoral employment description:

### **Enhanced Data Mining Tools development for Atom Probe Tomography**

Supervisor: François Vurpillot (Pr) / Gerald Da Costa (IR CNRS)

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Deadline for application : July, 10<sup>th</sup> 2022 (send CV+ motivation letter)

Laboratory: GPM / UMR CNRS 6634

Location: Instrumentation Dep. UMR CNRS 6634 Technopole du Madrillet, Institut des materials, 76800 Saint Etienne du Rouvray

Industrial partner: CAMECA (Genevilliers / France and Madison / USA)

Employer Institution: University of Rouen (Salary dependant of the applicant experience)

Duration: 1 year with 1year extension. (from September 2022 to August 2024)

### **Candidate profile:**

The candidate (man or woman) must have a Phd in physics, electronics, instrumentation or related disciplines and a keen interest in academic research in an industrial development environment. A possible experience (projects, internships, etc ...) in the field of scientific instrumentation, software development in instrumentation would be appreciated. The candidate will be supervised by specialists in scientific instrumentation, physics, and materials science. The candidate must have an excellent level in English (frequent meetings with our industrial partner).

### **Subject of the postdoc :**

The tomographic atom probe is a quantitative nano-analysis tool that allows us to image in three dimensions a small volume of a metal sample at the atomic scale. This instrument was developed in the lab 30 years ago. It is now an indispensable tool in materials science whether in the fields of micro-electronics (development of integrated system, physical cause analysis of their failures...), energy and metal materials industrial purposes (automotive, aeronautics, nuclear industry ...). This instrument is commercialized by CAMECA (> 100 machines installed worldwide). The basic principle of this technique is the field evaporation of atoms of a sample, and detection of these emitted particles in the form of ions by a high-performance detector. The detector converts the impact of an ion into a coordinate (X, Y) and flight time. Since 1993, several generations of detector for atom probe has been developed by the instrumentation team, with each generation a technological leap that allowed improving significantly the performances of the instrument and the increase in dataset sizes (up to 10<sup>9</sup> atoms). Extracting useful information from probed dataset is the ultimate goal of this nano-analysing tool.

This post-doctoral research project (collaboration with CAMECA) proposes

1/ Development of new fast and efficient data mining algorithms dedicated to APT datasets.

2/Integration of algorithms in the CAMECA opened AP Suite extension Infrastructure. For this aim, frequent discussion with CAMECA lab is necessary.