



## JUNIOR R&T ASSOCIATE IN 3D CORRELATIVE MICROSCOPY FOR HYDROGEN MAPPING IN SOLIDS

**Fixed term contract (30 months) | Fulltime/40h | Belvaux**

### Context

As a key player in research and innovation in Luxembourg, the Luxembourg Institute of Science and Technology (LIST) is active in the domains of materials, the environment and IT. As an RTO (Research and Technology Organisation) and with its interdisciplinary impact-driven approach, LIST contributes to the development of Luxembourg's economy and society. The Materials Research and Technology Department (MRT) translates cutting-edge materials research into applicable technology, with about 150 collaborators. For this, the department cultivates close relationships and joint projects with both academic and industrial partners, and contributes to Luxembourg's and Europe's innovation agenda in Materials Research and Technology.

The Advanced Instrumentation for Ion Nano-Analytics (AINA) group of the MRT department at the LIST is renowned for developing innovative nano-analytical techniques for materials characterization and life science applications. During the past few years we have been developing in particular a Secondary Ion Mass Spectrometry (SIMS) add-on system for the Helium Ion Microscope (HIM) and for a Transmission Electron Microscope (TEM) as well as an Atomic Force Microscopy (AFM) system that we integrated in our NanoSIMS, allowing the advantages of high spatial resolution with high sensitivity chemical information to be combined. The research activities of the AINA group cover fundamentals, instrument development and applications.

### Description

In this context, we are launching the project MEMPHIS which aims at developing nano-analytical methods for multiscale mapping of hydrogen distribution in solids with case studies in steels, hydrogen-storage materials and semiconductors. The project is in cooperation with TU Delft. The objective of the project is to understand the mechanisms by which hydrogen dramatically alters materials properties with direct proofs from 3D high-resolution hydrogen mapping combining Transmission Electron Microscopy (TEM) imaging & diffraction analysis, Secondary Ion Mass Spectrometry (SIMS) and in a few selected cases Atom Probe Tomography (APT).

The post-doctoral researcher will take a main role in the microstructural, crystallographic and chemical characterization of the group of samples mentioned above. In consultation with the project leader, the post-doctoral researcher will design and perform relevant experiments, analyse and interpret the results, write scientific articles and disseminate the results in international conferences.

### Profile

#### Education

- PhD in Materials Science and Engineering or related disciplines

#### Competencies

- Transmission Electron Microscopy and Diffraction analysis mandatory
- Interest in metallurgical and materials engineering is required
- Familiarity with correlative image treatment methods and algorithms
- Knowledge in Secondary Ion Mass Spectrometry would be a strong advantage
- Excellent communication, flexibility, organizational and interpersonal skills with team-oriented mind-set

#### Language

- Fluency in English (scientific exchanges) is mandatory

**Job reference:** MRT-2019-055

#### Application file:

- A CV
- A motivation letter

**Apply online:** [MRT-Job offer](#)

### Your working environment

#### The research department

The Materials Research and Technology department (MRT) focuses on two key enabling technologies: nanotechnologies and advanced materials, and investigates research questions related to transducing materials and actuators, photocatalysis and energy harvesters, transparent electronics and smart nanocomposites, point-of-care and drug delivery, modelling and design of structures and multifunctional composites, bio-based polymers and composites, adhesion and compatibilization of fibres/matrix, process engineering and advanced manufacturing.

> [LIST.lu/MRT](#)

The Luxembourg Institute of Science and Technology (LIST) is a mission-driven Research and Technology Organisation (RTO) that develops advanced technologies and delivers innovative products and services to industry and society. Located at the heart of Luxembourg's vibrant Research and Innovation Campus in Esch-Belval, LIST can ideally connect its over 500 specialists in materials, the environment and IT with virtually all of Luxembourg's other main research players such as the University of Luxembourg, LIH, LISER, Technoport, Luxinnovation and the National Research Fund. **LIST.lu**

The LIST is committed with equality of opportunities and gender balance