Engineer / Post Doc
High-TRL Optical-Electron/Ion Microscope Integration

femto-st SCIENCES & TECHNOLOGIES

Job description
Researchers of the Institute FEMTO-ST recently filed a patent for an innovative technology for combining a wide-field optical microscope to an ion or electron one. We are now seeking an **engineer or post-doc** to lead both the development of a **high-TRL prototype and its commercial valorization,** with the prospect of **founding a start-up** and taking high-level responsibilities.

Your responsibilities will be to:
• design, simulate and optimize the optical layout based on the patented concept, and contribute to the associated intellectual properties,
• implement a prototype that can be adapted on an ion or electron microscope via its standard ports (TRL 5-6),
• develop the software interface synchronized with the electron/ion microscope,
• contribute to identify and engage industrial partners for co-development,
• define the strategy for a commercial exploitation of the technology.

What we offer
A competitive salary and full access to FEMTO-ST's state-of-the-art expertise and facilities, including the privileged access to a dedicated scanning electron microscope for developing and testing the technology.
A startup founding pathway with a tremendous growth potential, and the possibility to take high level responsibilities (e.g. as a CEO or CTO).
A dedicated technology-transfer support with a strong regional commitment for the valorization of that technology, including technical assistance from the FC'Innov foundation and market-analysis and investment-seeking support from SATT Sayens.

Desired qualification and skills
• PhD, MSc or Engineer's degree in Physics or Optics, or a related field.
• Proven experience (e.g. for postdocs) or academic training (e.g. for junior engineers) in optical design.
• An entrepreneurial mindset and a strong interest in technology transfer.
• Some experience with software interfacing, SEM/TEM or FIB operation and/or with off axis parabolic mirror utilization is a plus.

A world on the technology
Combining an ion/electron imaging technique (SEM, TEM, or FIB) with an optical-microscopy line for photoluminescence, cathodoluminescence, or Raman spectroscopy is at the core of fast-growing industries linked to biology, semiconductor and nano-optoelectronics, battery, and micro-nanofabrication and quantum technologies.

Existing solutions fall into two main families, each with significant drawbacks:

Simple optical add-ons (usually a parabolic-mirror retrofit).
Pros: High numerical aperture, easy to install on existing instruments, low cost.
Cons: Strong alignment constraints; geometric aberrations appear as soon as the beam moves off-center, limiting the usable field of view to essentially a single pixel.

High-end fully integrated systems.
Pros: Excellent optical quality, large field of view, full versatility for optical analysis.
Cons: Only with SEM, require a complete co-development of the electron/ion and optical paths, costing at least €1 M, cannot be retrofitted onto existing microscopes, and lock the user to the manufacturer's hardware.

The technology to be developed merges the advantages of both approaches. It takes the form of a compact, retrofit-compatible add-on in which the optical aberrations are corrected exactly. It thus delivers the optical performance of a fully integrated system while remaining inexpensive and flexible enough to be mounted on existing SEM/TEM/FIB equipment.

How to Apply

Please submit the following documents to mayeul.chipaux@femto-st.fr:

1. A detailed CV.
2. For postdoc candidate, a list of academic achievements and publications.
3. A cover letter that outlines your motivations and relevant experience.
4. One or two reference letters or contact details of referees.

Applications will be considered until position is filled

Contact details and information links :
For any question about the position or the project, please contact Prof. Mayeul CHIPAUX at mayeul.chipaux@femto-st.fr.

Institute FEMTO ST, department of optics
FC' INNOV
SATT Sayens

Institution: Institute FEMTO-ST
Location: FEMTO-ST, Optics dpt. Besançon, France
Project type: Tech-transfer/valorization
Start date: As soon as possible
Initial contracts: 12 months
Planned extensions: depending on achieved results