Postdoctoral fellow position on

« Fiber microbatteries for wearable electronics »

at Ecole Nationale Supérieure des Mines de Saint-Etienne fixed-term contract of 12 months (renewable once)

The École Nationale Supérieure des Mines de Saint-Étienne (Mines Saint-Etienne), a school of the Institut Mines Télécom (IMT) under the auspices of the Ministry of Economy and Finance, is entrusted with missions encompassing education, research, innovation, industry-oriented knowledge transfer, and the promotion of scientific, technical, and industrial culture.
Mines Saint-Etienne comprises 2,400 engineering students and researchers in training, 400 staff members, a consolidated budget of €46 million, three sites on the campus of Saint-Étienne (Loire) covering approximately 26,000 m², a Aix-Marseille Provence George Charpak Campus in Gardanne (Bouches-du-Rhône) spanning around 20,000 m², six research units, five training and research centers, and a center for scientific, technical, and industrial culture known as La Rotonde.
Mines Saint-Etienne has development projects in Lyon, particularly on the Digital Campus in the Auvergne-Rhône-Alpes region, and maintains numerous international collaborations.

The Aix-Marseille Provence George Charpak Campus and the Flexible Electronics Department (FEL). The research activities of Flexible Electronics Department are dedicated to the development of technological bricks adapted to the achievement of flexible or/and stretchable electronic components for applications in smart electronics (human machine interface, IoT, smart sensing, bio robotic/mimetic…).
Fabrication of autonomous, thin, flexible and conformable devices spread the research from nanomaterials, energy harvesting and storage to heterogeneous integration on flexible/stretchable substrates. The project will take benefit of microfabrication and characterization facilities made available by the 660m² clean room, the technological platform “MicroPackS” and research platform “ID-Fab”.

The thematic area we aspire to support and enhance is the « Microbatteries for wearable applicatiobs ». Amidst the rise of wearable technologies, there's a growing focus on microbattery research and development globally. Smart electronic textiles, in particular, demand features and battery designs beyond the capabilities of traditional technologies. This has opened avenues for innovation and introduced a new facet to the global battery research landscape. Sectors such as Internet of Things (IoT), healthcare (skin patches, medical sensors, medical diagnostic devices), and smart cards could be impacted. Soft microbattery technology is still in its early stages, requiring the integration of expertise from various scientific domains like microelectronics, materials science, electrochemistry, polymer, and inorganic chemistry to address technical challenges. Despite being a relatively new topic, it holds potential implications for the future. A recent development includes a concept for stretchable fiber Li-ion microbatteries and its application to woven powerbanks for smart textiles.

To contribute to the achievement of this very ambitious goal, Mines Saint-Etienne is recruiting a postdoctoral researcher on a fixed-term contract of 12 months (renewable once) in ”Fiber microbatteries for wearable electronics”.

1. Applicants profile :

The candidates will support and strengthen the theme 'Wearables Microbatteries'. They should hold a doctorate, typically in applied material science, specifically in electrochemistry applied to energy storage. Postdoctoral experience, particularly with an international background, will be advantageous. The candidate must demonstrate scientific skills in one or both of the following areas:

- Electrochemistry
- Microbattery technology, including fabrication, analysis, and optimization

Proficiency in electronics and one or more programming languages (Python, etc...) will be highly valued.

2. Missions :

The postdoctoral fellow will have to investigate new tracks to optimize the in-line fabrication process and achieve the integration of the micropower sources for practical applications :

- Fabrication of coaxial fiber battery according to existing process in the lab
- Fabrication process optimization to fit in line production
- Microbatteries analysis and optimization
- In relation with our milliner partner, evaluate the fiber suitability with woven process to achieve a textile powerbank.

3. Evaluation criteria :

- Capacity to strengthen the research theme of « Modélisation et Analyse Géométrique d'Images »,
- Ability to integrate into the project of the team, center, and research laboratory,
- Scientific output: quality and quantity of publications in A-ranked journals,
- Scientific skills as described in section 1

4. Why join us?

The Mines-Telecom Institute is characterized by:
https://www.youtube.com/watch?v=m39m6hdNC48

- a scientific environment of excellence,
- a group with entities throughout France.

Mines Saint-Etienne is distinguished by:
- a Aix-Marseille-Provence campus that constitutes an ecosystem of training/ research/ support for economic development unique in the SUD Region, at the service of digital sovereignty and microelectronics,
- leading experimental and numerical means,
- an important contractual research activity (€11 million/ year of Research and Innovation contracts), mainly with industrial partners, and cooperative platforms with industrialists,
- a commitment to the Sustainable Development Goals confirmed by international rankings (55th in the world for the fight against climate change),
- 25% international students, member of the T.I.M.E. network and the European University EULIST,
- A Technical and Industrial Scientific Culture Centre – La Rotonde - which multiplies its impact on society (> 50,000 visitors per year),
- The possibility of partial teleworking,
- 49 days off and RTT.

5. Recruitment Conditions :

CDD public law
Remuneration according to the rules defined by the management framework of the Institut Mines Télécom.
The position is open to all with, on request, accommodations for candidates with disabilities.
The missions will be carried out on the Campus Aix-Marseille Provence de Gardanne (13) of Mines Saint-Etienne
The duration of the insured contract is a fixed-term contract of 1 year
Desired start date: April 1, 2024

- Fixed-term public contract (CDD) with a duration of 1 year, renewable once.

- Full-time position.
- Remuneration according to the rules defined by the management framework of the Institut Mines Télécom.
- Desired start date: 2nd quarter 2024.

6. Application Procedures :

To apply:

Applications should include:
- A letter of application,
- A curriculum vitae listing teaching activities and, possibly, research work, relations with the economic and industrial world (10 pages maximum),
- At the discretion of candidates, letters of recommendation,
- Copy of ID

Applications must be submitted on the RECRUITEE platform by 17 February 2024 at the latest.

Deposit URL: https://institutminestelecom.recruitee.com/o/post-doctorante-ou-post-doctorant-fiber-micro-batteries-for-wearable-electronics-cdd-12-mois

The selection process is expected to take place in late February 2024.
Candidates selected for an audition will be informed as soon as possible. Part of the exchanges will be in English.

As part of its Equality, Diversity and Inclusion policy, the École des Mines de Saint Etienne is an equal treatment employer.

7. For More Information

For any inquiries regarding the position, please contact:
Dr. Roger DELATTRE – Assistant Professor FEL Department
E-mail: roger.delattre@emse.fr

For any administrative information, please contact:
Servane ARRES, Gestionnaire des Ressources Humaines
E-mail: servane.arres@mines-stetienne.fr

Liens utiles :

https://www.mines-stetienne.fr/

https://www.youtube.com/watch?v=QUeuC5iQiN0

https://www.imt.fr/

La protection de vos données :
https://www.mines-stetienne.fr/wp-content/uploads/2018/12/Informations-des-candidats-sur-les-traitements-de-donn%C3%A9es-personnelles.pdf