Mines Saint-Etienne
Microelectronic Center of Provence

Junior Professor Chair - 2023 campaign
Open position of Associate Professor (Maître de confer*ences*) in on-board microelectronic systems – 3 years

Supporting establishment/organization: IMT- Mines Saint-Etienne
Name of School Director : Jacques FAYOLLE
Site concerned : Campus Provence – Gardanne (13)
Project name : embedded microelectronic systems
Keywords : Chemistry of Materials; Microbatteries; Junior Professor Chair Embedded systems
Target duration of the project : 3 years
Body tenured : Professor at the Institut Mines Télécom
Scientific theme : Chemistry of materials or microelectronics

Mines Saint-Etienne (MSE), one of the graduate schools of *Institut Mines Télécom*, the #1 group of graduate schools of engineering and management in France under the supervision of the Ministry of the Economy, Industry and Digital Technology, is assigned missions of education, research and innovation, transfer to industry and scientific, technological and industrial culture.

MSE consists of 2,400 graduate and postgraduate students, 480 staff, a consolidated budget of €46M, three sites on the Saint-Etienne campus (Auvergne Rhone-Alpes region, Lyon Saint-Etienne metropolitan area), a campus in Gardanne (SUD region, Aix Marseille metropolitan area), a site in Lyon within the digital campus of Auvergne Rhone-Alpes Region, six research units, five teaching and research centres and one of the leading French science community centres (La Rotonde €1M budget and +40,000 visitors per year). The Times Higher Education World University Ranking ranked us for 2022 in the 251-300 range for Engineering and Technology. Our work environment is characterised by high Faculty-to-Student, Staff-to-Faculty and PhD-to-Faculty ratios, as well as comprehensive state-of-the-art experimental and computational facilities for research, teaching and transfer to industry.

The Microelectronics Center of Provence (CMP) is located in Gardanne (Bouches-du-Rhône, 13). It is one of five training and research centers of MSE. It consists in four departments including the Flexible Electronics Department (FEL) in which the position of lecturer in embedded microelectronic systems is open. The FEL department is composed of 25 people, including 8 teacher-researchers, 1 engineer and 16 postdoctoral researchers and doctoral students.

Since 2005, the FEL department has been interested in research activities on hybrid electronic systems. Most of the work is carried out around communicating electronic systems fabricated on flexible substrates. We aimed at developing objects able to stay in contact with environment, having a certain energy autonomy, and capable of communicating with a wireless sensor network. This research thematic is directly related to the Internet of Things. At the technological level, research is carried out in the clean room of the Center in partnership with the Micropacks and IDFab technological platforms. The fields of application have impact in all sectors of society, in conjunction with sensor networks (medical patches for patient monitoring, abandoned sensors for the environment), advanced human-machine interfaces, etc.

The research thematic that are addressed have naturally led the FEL department to be interested in the relationship between structure and properties of materials as well as the role of interfaces in microelectronic devices. We have also acquired internationally recognized expertise in advanced processes for flexible and stretchable electronics thanks to several cutting-edge technologies. Our skills in materials, device production, and heterogeneous integration ensure a good balance between fundamental and applied research.

The junior professor chair is intended for researchers in the first part of their career, with strong potential for supervising and leading a research team, as well as the ability to participate in national, European or international projects. This recruitment system is part of the research programming law. The terms of this recruitment are taken pursuant to Decree No. 2021-1710 of December 17, 2021 relating to the junior professor chair contract.

1) Candidate profile and assessment criteria

The candidate should hold a PhD degree in the field of chemistry of materials or in Microelectronics (section 33 or 63 of the French CNU).
A French CNU habilitation in section 33 or 63 will be considered but is not mandatory.
Specific skills and/or experience in the following fields will also be considered for this position: teaching activities in material science and/or microelectronics.
The position will strengthen and develop our research and teaching outreach in the field of electrochemical energy storage for the fabrication of new devices like batteries and supercapacitors on flexible substrates for low-power electronics. Using new technologies, the candidate will have to pursue a world-class **research activity that will cover fabrication, characterization, and integration of microbatteries to improve autonomy of on-board electronic systems.**

A significant experience in teaching in the aforementioned fields at under-graduate or post-graduate cycle levels will be appreciated.

Command of the English language is essential. Given the School's international development projects, a significant international experience is strongly favoured. Otherwise, an international mobility with a foreign partner institution should be carried-out during the three years following recruitment.

Given the guidelines mentioned above, several characteristics will be important assets:

- Interest for teamwork and willingness to elaborate one's research project in this context,
- Interest in industrial relations, transfer and innovation
- appeal for interdisciplinarity and multi-discipline collaborations
- Practical common sense, openness and intellectual curiosity
- The quality of oral and written communication

2) Missions

The research and teaching activities will be carried out on the **Provence** campus. Occasional involvement in the other campus' activities is possible and encouraged. Associated transport and accommodation costs will be covered if necessary.

Teaching

The teaching mission comprises lectures, tutoring, and lab –based courses, along with the tutoring of projects and internships/work experiences, principally in the degrees of the Engineering program ISMIN (Ingénieur Spécialité Microélectronique et Informatique) and the international program Hybrid Electronics of the Master Master Nanosciences et Nanotechnologies co-accredited with Aix-Marseille University. The candidate will have to cover a large spectrum among teaching in material sciences and in microelectronics.

The teaching assignments could also involve other Engineering and Masters of Science programmes, doctoral studies, as well as professional and vocational training programmes.

The successful candidate will be actively involved with the teaching teams in charge of the courses cited above. The design of new activities and the development of innovative teaching methods, in particular related to digital technology, will be an integral component of the teaching mission.
The candidate should be able to carry out the teaching assignments and possibly deliver MOOCs in English.
A minimum number of hours must be completed yearly. Course design, supervision and team management activities are included in the teaching hours log.

Research

In regards with the thematic autonomy of on-board microelectronics, the following missions will be assigned and addressed in the FEL department of the CMP.
- The candidate will have to collaborate with the associate professors of the group and develop original research works combining material sciences and microelectronics for overcoming major challenges of the future industry, the sustainable development, and the Internet-of-Things
- He/she will have to work closely with French and foreign industrial partners who have strong expectations in the manufacture and integration of new safe and efficient energy storage microdevices.
- The candidate will have to be able to initiate collaborations at national and international levels.
- He/she will have to participate in the leadership of national and European research projects.
- He/she will also propose collaborations with the academic world as well as international cooperations.
- He/she will have to participate in the supervision of doctoral and Master's students.

These missions will be performed on Campus G. Charpak Provence in Gardanne (13)

3) ***Candidate assessment criteria:***

The main evaluation criteria are (non-comprehensive list):

- Significant teaching experience (development of digital courses, reference works…) in the previously mentioned fields, at under-graduate or post-graduate level, along with development of new teaching methods.
- Capacity to reinforce the research outreach of Mines Saint-Etienne in the electrochemical storage of energy for microelectronic applications
- Capacity to successfully integrate and contribute to the group, centre and research unit project
- Scientific production: number, quality and impact of peer-reviewed original research papers, book chapters or conference proceedings indexed in international electronic databases such as, e.g.: Scopus, Web of Science, PubMed, Nature Index, arXiv.org …, contribution to and animation of national and international workgroups or research communities,
- Partnership-based research: direct industrial partnerships, collaborative research, support to start-ups …,
- International partnerships,
- Initiate and lead new projects
- Good command of the English language, significant international experience

- Capacity to obtain the French accreditation to supervise research qualification (*Habilitation à Diriger des Recherches*) in the five to seven years following the candidate's recruitment

4) Recruitment Conditions

Fixed-term contract as junior professor of public law for 3 years as a senior lecturer in IMT management. Remuneration will be set according to the profile of the candidate, according to the rules defined by the management framework of the Institut Mines Télécom. Holder of a doctorate or equivalent Executive profile, full-time, open to contractual people or to holders on secondment under contract.

Desired start date: 1st june 2024.
The position is based on the G. Charpak Provence Campus in Gardanne (13).
The position is open to all with, upon request, accommodations for candidates with disabilities. Occupation: Professor at the Institut Mines-Télécom 6)

Advantages: - Teleworking (to be validated with n+1) possible from 6 months of seniority - 49 days of annual leave (leave + RTT) - Public transport costs covered up to 50% - Sustainable mobility package - Staff hostel (sports, cultural activities, CE advantage on leisure and conviviality time)

5) Application procedures

The application file should include:

- An application cover letter
- A curriculum vitae outlining teaching activities, research work and where appropriate, relations with economic and industrial sectors (maximum 10 pages)
- Recommendation letters, at the discretion of the candidate,
- A copy of the Doctorate diploma (or PhD),
- A copy of an identity document

These documents should be submitted on the platform RECRUITEE by **22th march 2024** at the latest : https://institutminestelecom.recruitee.com/o/chaire-de-professeur-junior-maitre-de-conferences-en-systemes-microelectroniques-embarques

Candidates selected for an interview will be informed rapidly. Part of the interview will be held in English. Cover letters, CVs and application files written in English will be accepted, but applicants will have to demonstrate in their application file their operative ability to communicate in French with students, fellow faculty members and the school administration. For those invited to be interviewed, the same will be expected in oral form and tested by the selection committee.

Interviews are expected to take place at Gardanne, between 08th April and 12th April 2024.

Candidates selected for an audition will be informed as soon as possible. Part of the exchanges will be carried out in English. As part of its Equality, Diversity and Inclusion policy, the École des Mines de Saint Etienne is an employer concerned about fair treatment between applications. Only candidates previously selected on file by the commission will be summoned to the hearing.

In accordance with the procedure for recruiting lecturers (contractual IMT Management Executives), this hearing will take place in two parts: - Presentation of the candidate (15 min.): achievements and project to develop activities in the School: training, research and transfers to economic actors (industry, business, etc.) - Free exchange between the candidate and the members of the jury (30 min.) to assess the candidate's scientific and general knowledge - Part of the exchanges will be in English.

Associated financing

The chair will be funded by the ANR in the amount of €200k (including at least €120k in payroll for a collaborator – post-doc, doctoral student or support staff). The recruited person will receive a monthly

net remuneration of between 2650 and 3250 euros. The salary will be set at the time of finalization of recruitment and based on the professional experience of the selected person.

6) Further information

For further information concerning the position, contact:

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Useful links :

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

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

https://www.imt.fr/

Protecting your data:
https://www.mines-stetienne.fr/wp-content/uploads/2018/12/Informations-des-candidats-sur-les-traitements-de-donn%C3%A9es-personnelles.pdf