THE LORRAINE UNIVERSITY IS RECRUITING
JUNIOR PROFESSORSHIP CHAIR

Present throughout Lorraine (the two metropolises of Metz and Nancy and 10 towns and conurbations in the region), the Lorraine University, which has been awarded the HR Excellence in Research (HRS4R), label since 2017, places its expertise at the service of knowledge production and sharing. Committed to raising the level of education of its citizens, it relies on an intensive research dynamic (I-Site Lorraine Université d'Excellence perpetuated in 2021), both fundamental and applied.

62000 students

+ de 7100 employees

+ de 4000 research lecturer or lecturing and research personnel

60 laboratories and 43 training centers

A budget of nearly €682m

Decree n° 2021-1710 of 17 December 2021 relating to the junior professorship contract provided for by article L. 952-6-2 of the Education Code and Body in which the person concerned is destined to be appointed: University Professor.	
Decree n° 2021-1710 of 17 December 2021 relating to the junior professorship contract provided for by article L. 952-6-2 of the Education Code and by article L. 422-3 of the Research Code.	
Working time: 100%	CNU Section: 63
Publication profile (title of the contract and the position concerned): Superconductivity and energy efficiency for the transport of tomorrow	Starting date: no later than 12/31/2025
Department/University: Faculty of Science and Technology	Location: Vandœuvre-lès-Nancy
Laboratory: GREEN	Location: Vandœuvre-lès-Nancy

VALUES OF THE LORRAINE UNIVERSITY

universality

creativity

reflexivity

solidarity

responsibility

www.univ-lorraine.fr

Job profile and EURAXESS

Job profile (maximum two-line summary of the profile in English):

The person recruited to the Professorship will support technological developments through the controlled use of superconducting materials in devices for electrical energy conversion or transmission.

Euraxess research fields (see coding table in the annexed documents):

Electrical engineering, 3D modelling, Electromagnetism, Applied physics, Electrical technology, Energy technology

Teaching profile:

The subject of energy efficiency and electrical energy conversion is studied in a number of courses at the University of Lorraine, both in engineering schools and in faculties and IUTs, from bachelor's to master's degrees.
The Faculty of Science and Technology is the ideal place to host this chair, given its EEA master's degree in Electrical Energy, which prepares specialists in the field of electrical networks and energy conversion. The person will therefore be recruited within the Electronics and Electrotechnology Department of the Faculty of Science and Technology to teach in the field of electrical energy in the broadest sense.
Ultimately, the creation of new modules or even courses on the theme of superconductor applications in the fields of electrical energy, low-carbon transport and fusion will meet a growing training need for the technicians, engineers and researchers of tomorrow. With the creation of a superconducting cable test platform, new practical work could also be offered as part of the ORION project "Daring to do research during training ".
Finally, the candidate will need to have practical teaching experience and be truly motivated to teach. Generally speaking, he or she will be involved in (i) training students, (ii) monitoring learning outcomes, (iii) supervising projects, (iv) developing new teaching methods (ICT) and (v) continuously improving the range of courses on offer.

Department/University: Faculté des Sciences et Technologies

Keywords: Electrical energy, energy efficiency, superconductors, multiphysics modelling

Research profile:

The scientific project aims to demonstrate the technological maturity of superconductors for transport applications. The deployment of this technology meets several industrial challenges linked to: increasing electrical power, improving efficiency and reducing pollutants (CO2, NOx).
There is also a need to broaden the range of applications and uses of superconductivity and cryogenics. For example, without being exhaustive, the use of low-temperature power electronics or the design of superconducting busbars merit in-depth study.
The activities of the person recruited could therefore be developed along the following 3 axes:

1) Superconducting cables: development of new functionalities and a better understanding of operating modes for integration into railway systems.

2) Superconducting motors: increasing efficiency and torque densities to meet the needs of the aerospace industry.

3) Electrical conversion chain: integrating superconductors and components operating at cryogenic temperature to improve efficiency and propose solutions for the transport of the future (air, land or sea).

The profile we are looking for in the field of superconductors and their applications in the mobility of the future is perfectly in line with the institution's strategy. The challenges are also industrial, and the University of Lorraine and the GREEN laboratory have already succeeded in positioning themselves in several flagship projects involving superconductivity:

- As part of the France2030 programme, the "SuperRail" project supported by the SNCF plans to install two superconducting cables linked to the tracks at Montparnasse station in 2024.
- The PEPR Supra-Fusion project, in which we are developing an experimental platform to assess the performance of conductors and coils for both research and industrial applications.
- In Europe, as part of HORIZON 2020, with the "IMOTHEP" project, led by ONERA, which aims to evaluate the potential of hybrid electric propulsion and in particular superconductivity as a solution for improving aircraft efficiency and thus reducing fuel consumption.

Laboratory name: Groupe de Recherche en Energie Electrique - GREEN

Keywords: Electrical energy, energy efficiency, superconductors, multiphysics modelling

Additional information

- Requirements for applicants:
  - Hold a doctorate or an equivalent degree (upon recognition by UL Scientific Committee).
- The list of supporting documents to be attached to the application:

Your application file, consisting of the application form entered online, must include the following items:

- ✓ An official identity document with a photography;
- ✓ A document certifying that you hold a PhD, or an equivalent degree (whose equivalence must be recognized by the University of Lorraine Scientific Committee);
- ✓ The PhD examination report, or a certificate from the institution stating that no examination report has been drawn up;
- ✓ An analytical presentation of the works, books, articles, achievements and activities related to the profile of the Junior Professorship Chair tenure-track position in question, mentioning those that the candidate intends to present at the audition;
- ✓ A copy of each of the works, books, articles and achievements mentioned in the analytical presentation and which the candidate intends to present at the audition, not exceeding six documents.

Administrative documents written in whole or in part in a foreign language must be accompanied by a translation into French, the conformity of which the candidate certifies on his or her honor. The translation of the analytical presentation is compulsory and the works, books, articles and achievements in a foreign language must be accompanied by a summary in French. Otherwise, the application will be declared inadmissible.

Candidates who are or have been for less than eighteen months a teacher-researcher at a level equivalent to that of the post to be filled, in a higher education institution in a country other than France, must indicate this status.

Applications must be submitted on the Galaxie platform (FIDIS module) according to the calendar available on the University of Lorraine website.
Any application incomplete by the above-mentioned deadline will be declared inadmissible.

Only those candidates who have been selected by the recruitment committee on the basis of their applications will be invited to the audition.

*When searching for positions, Junior Professorships will be distinguished from others by the recruitment article (CPJ).

How auditions are organized

- The audition of candidates by the selection committee may include a work placement (decree no. 84-431 of June 6, 1984), in the form of a lesson or research presentation seminar. This experience is not open to the public.

Professional situation:
☐ yes (with public audition ☐ yes ☐ no) ☒ no

In the form of:
☐ of lesson(s)
☐ research presentation seminar
☐ meetings (with students or teachers/researchers/researchers of the research or teaching unit in which the post is open)

- The position for which you are applying is likely to be located in a “restricted area” within the meaning of article R 413-5-1 of the penal code. If this is the case, your appointment and/or assignment can only take place after authorization of access issued by the head of the establishment, in accordance with the provisions of article 20-4 of decree n°84-431 of 6 June 1984.

Joining the Lorraine University, means sharing its values and benefiting from is working conditions

• **Our commitments, our values:** In 2016, the Lorraine University adopted a charter of values based on universality, creativity, reflexi- vity, solidarity and responsibility.
• **Our working conditions:** The Lorraine University has taken a number of steps to prevent psychosocial risks (appointing an occupational psychologist, setting up awareness-raising initiatives, introducing warning and listening systems). It was also a pioneer in the introduction of teleworking, which it continues to develop.
• **Dayli support:** Throughout your career at the Lorraine University, employees are supported by the institution in their professional lives (occupational health, disability). The university also offers its staff a range of assistance and support services designed to promote work-life balance and personal fulfilment. A social assistance service is also available to university staff to help them deal with difficult situations.
• **Equality - Diversity - Inclusion:** The Lorraine University Since 2015, the Group has developed a comprehensive equality - diversity - inclusion policy that goes beyond the framework of gender equality in the workplace, taking into account discrimination that goes beyond gender and adding six criteria: age, gender identity, sexual orientation, origin, religion and disability.
• **Attractiveness and cultural offering:** The Lorraine University offers a wide range of cultural, sporting and leisure activities to all its employees: more than 70 sporting activities are available, and there are venues dedicated to cultural activities (including the Espace Bernard-Marie Koltès - Conventional Stage of National Interest). Every year, more than 500 different cultural events are held throughout the region.

Department/University

Educational team:

URL Department: https://fst.univ-lorraine.fr/

Place(s) of work: Campus Aiguillettes - BP 70239 - 54506 Vandœuvre-lès-Nancy Cedex

Name of Department Chief: Kévin Berger Tel. of Department: 06 61 63 42 09

Email of Department Chief: kevin.berger@univ-lorraine.fr

Website: https://fst.univ-lorraine.fr/la-faculte/departement-electronique-et-electrotechnique

The Faculty of Science and Technology (FST) is located on a 25-hectare campus in the southern suburbs of Nancy. It also has a branch in Epinal. Within the University of Lorraine, this Training and Research Unit is part of the Collegium Sciences et Technologies. The FST comprises 11 teaching departments. It has 360 teaching and research staff, 120 technical and administrative staff and welcomes almost 4,000 students a year.

It offers 7 general bachelor's degrees, 7 professional bachelor's degrees and 15 master's degrees in life sciences, earth sciences, engineering sciences, physics, chemistry, computer science and mathematics. All masters degrees are backed by research laboratories associated with INRAE, CNRS or INRIA, 16 of which are located on campus.

The Department of Electronics and Electrical Engineering (DEE) employs around 25 people and offers a range of courses from BAC+3 (professional and general bachelor's degrees) to BAC+5 (master's degrees):

- A Licence SPI (Sciences pour l'Ingénieur) with three courses: 1-Embedded Electronics and Electrical Energy, 2-Signal Communications and Digital Systems, and 3-Digital Systems, Production, Networks, Biomedical Technologies;
- Two professional degrees: 1-Management of MV/LV Networks and Public Lighting and 2-Eco-Management of Renewable Energies;
- A Mater EEA (Electronics, Electrical Energy and Automation) with 4 specialisms: 1-Embedded Electronics and Microsystems (EMB) and 2-Intelligent Sensors and Micro-nano-technologies (CIM), 3-Control of Energy Efficiency (CEE) and 4-Electrical Energy (EE).

Research Laboratory

Place(s) of work: Vandœuvre-lès-Nancy

Name Laboratory Director: Nourredine Takorabet Tel. Laboratory Director: 06 34 61 28 65

Email Laboratory Director: noureddine.takorabet@univ-lorraine.fr URL Laboratory: https://green.univ-lorraine.fr/

The Nancy Electrical Energy Research Group (GREEN) is a research laboratory of the University of Lorraine which, since its creation, has been conducting research in the field of Electrical Engineering with a focus on energy aspects.

Two main themes characterize GREEN's research work:

- Applications of superconductors in Electrical Engineering
- Electromechanical conversion chains

Our laboratory is part of the "Energy, Mechanics, Processes, Products" (EMPP) scientific cluster at the University of Lorraine, which comprises 6 laboratories. It also holds the Institute CARNOT Icéel label.

GREEN is a host laboratory whose Doctoral School is IAEM-Lorraine (Computer Science, Automation, Electronics, Electrical Engineering, Mathematics).

Internationally, GREEN maintains an extensive and strong network of collaborations with historical partners such as Thailand, Japan, Algeria, Germany, etc. One illustration of this dynamic is the creation of the international laboratory IRP Electrical Engineering Thai-French Research Center with the Thai University KMUTNB in Bangkok.

To find out more about the work, please contact:

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