



PSL 

PERSEE

## RECRUITMENT OF A RESEARCH ASSISTANT (TENURE TRACK) IN ENERGETICS

**“Optimization of the energy systems of the future for a safe,  
effective and decarbonized energy transition”**

**DEADLINE FOR APPLICATION SUBMISSIONS - 16 APRIL 2023**

**Institution:** Mines Paris – PSL (Ecole Nationale Supérieure des Mines de Paris)  
**Posting:** Center for processes, renewable energies and energy systems (PERSEE)  
1 Rue Claude Daunesse, 06904 Sophie Antipolis, France.

To develop its research and teaching activities in the field of smart grids, Mines Paris - PSL is opening a position for a Research Assistant in the field of Energy.

Initially a fixed-term contract, this position is aimed at a young researcher (M/F) with a taste for multidisciplinary work at the interface of fundamental research and industry. The successful candidate will have the opportunity to work closely with academic partners and will participate in the team’s ongoing or future projects. They will have the opportunity to develop collaborative research projects and publish in the best international journals and conferences. They will also have the possibility of defining and co-supervising a PhD thesis subject during their first year working at the Centre (directed by a member of the Center with a habilitation to supervise research (HDR)); the successful candidate will also help be involved in the supervision other doctoral students in the team.

This position is intended to **evolve into a permanent position within two years as part of a Tenure Track procedure**. Candidates can find a description of this procedure on the Mines Paris - PSL website, at the address: <https://www.minesparis.psl.eu/Ecole/Recrutement/Travailler-a-Mines-Paris-PSL/>

### 1. RESEARCH AT Mines Paris – PSL

Mines Paris - PSL is a French public establishment with a scientific, cultural and professional vocation that comes under the Ministry for Industry, and a founding member of the University of Paris Sciences and Letters (PSL). Since the School’s creation in 1783, it has trained high-level engineers capable of solving complex problems in a wide variety of fields. Along with its training activity, Mines Paris - PSL develops research covering a very broad field of scientific disciplines. The 18 Research Centers are organized into 5 departments: Earth and Environmental Sciences, Energy and Processes, Mechanics and Materials, Mathematics and Systems and, Economics, Management and Society.

The research undertaken at Mines Paris - PSL aims both at academic excellence and socio-economic impact. This targeted research model is developed in close interaction with the socio-economic sphere: private and public sector companies, public institutions and administrations. Mines Paris - PSL is the first school in France in terms of volume of contractual research, supported by ARMINES, the Mines Paris Foundation or Mines Paris - PSL. This original positioning has enabled the School to expand its teams (by recruiting researchers on permanent contracts using its own resources via the contractual research association ARMINES) and allows it to maintain unique experimental and digital platforms whose quality is recognized by its partners.

Located in the heart of Paris, Mines Paris brings together all areas of knowledge, innovation and creation. Ranked among the top 50 universities in the world, PSL trains researchers, artists, engineers, entrepreneurs and managers while fostering awareness of their social, individual and collective responsibility.

## 2. THE PERSEE CENTER

The PERSEE Center is one of the 4 Research Centers at the Energy and Processes Department (DEP) of Mines Paris - PSL. Its field of expertise concerns new energy technologies (NTE) and renewable energies (EnR). PERSEE's research strategy is based on a "micro/macro" approach ranging from (nano)materials to energy systems. It is built around three structuring themes: i) materials and components for energy, ii) sustainable energy conversion and storage processes and technologies, and iii) renewable energies and smart electrical systems. The associated research is conducted by the groups MATPRO ("Materials and Processes for Energy"), TeP ("Thermochemistry and Plasmas") and ERSEI ("Renewable Energies and Intelligent Electrical Systems"). The PERSEE Center is also very active in education and training. It actively participates in the civil engineering program at Mines Paris - PSL and in the Energy Master's degree program at PSL. The Center is also in charge of the international Specialized Masters, ENR and ALEF, which it created in respectively 2002 and 2007.

The PERSEE Center is located in the science and technology park of Sophia Antipolis, in the south of France near the cities of Nice, Cannes and Antibes. Around 50 people work at PERSEE, which currently has 21 permanent staff, including 10 teacher-researchers.

The position to be filled concerns the ERSEI group. The location is Sophia-Antipolis.

ERSEI works on developing methods and tools that allow the optimal integration of decentralized electricity production (featuring renewable energies, storage, electric vehicles a.o.) in energy systems and electricity markets. The research activity of the group is divided into two main themes. The first is based on the development of advanced short-term forecasting methods for various applications in electrical systems (i.e. forecasting of renewable energy production, consumption, dynamic line rating capacity, etc.). The second focuses on the modelling, management and planning of power systems. This involves designing innovative approaches for the predictive management and planning of power systems to optimize the integration of renewable power plants, considering, among other things, the uncertainties inherent in their production but also the different storage options, the flexibility of demand, the integration of electric vehicles, and the deregulated context of electricity markets. These issues are at the heart of the concept of smart grids.

## 3. JOB DESCRIPTION

### Research

The ideal candidate will have demonstrated their ability to develop academic work in the field of power systems. Depending on his/her skills, the candidate will work on developing the second core theme of the ERSEI group as described above, by considering various fundamental aspects related to the development of advanced modeling approaches for future energy systems as part of the low-carbon transition. These models should in part be based on optimization and data-science techniques and consider the numerous types of energy systems currently emerging in the frame of the low-carbon transition (e.g. smart-homes, virtual power plants, hybrid renewable-energy/storage/H2 power plants, micro-grids, energy communities, fleets of electric vehicles, "energy islands", innovative territories involved in the transition policy, etc.). The synergies between the different energy vectors (electricity, gas, heat, mobility, etc.) should be studied to consider the long-term evolution towards integrated multi-energy systems. This modelling will constitute a solid basis for the development of methods for i) predictive operational management (time frames of minutes to days ahead), and ii) long-term planning of these future systems (including the sizing of investments). Interactions with electricity markets, the numerous uncertainties, and the availability of different data sources (i.e. "open data") will be considered.

The corresponding research activity could potentially include an experimental part concerning the research projects developed and the teaching activities to be carried out. This part could in particular concern the "micro-grid" experimental platform (based on a real-time electrical grid simulator) currently under development at the Center.

### Education

Initially, the recruited person will participate in the courses that the PERSEE Center is involved in, and in particular the Civil Engineers program at Mines Paris - PSL (e.g. the "Evolution of the electrical system in the context of the energy transition" specialized course, the "Energy Transition" research term, or the "Machines and Energy" option). In addition, they will participate in the evolution of the courses of PERSEE Center's Specialized Masters.

### Attributes of the candidate

The position is aimed at a researcher who has graduated from a university or a "Grande Ecole" with a doctorate in energy, or modeling of low-carbon systems, or electrical engineering, or applied mathematics, or data science. Significant experience is highly desirable in one or more application areas, such as, prospective study of low-carbon

systems, optimization methods, electricity markets, modeling of multi-energy systems, and modeling of the various key sectors of the energy transition (buildings, transport, renewable energies, smart grids, etc.). Candidates should gradually demonstrate their ability to extend their initial research activity in this sphere.

A post-doctoral period or a stay at a research center or institution other than that in which they pursued their doctorate, and preferably in a different country, will be highly appreciated.

Candidates must demonstrate their ability to work in a team, their potential to develop their research activities in collaboration with the other researchers of PERSEE Center and other French and foreign research teams, and sufficient autonomy to develop their own research activity in connection with the themes described above.

The successful candidate will be required to seek external resources through partnerships with various players in the industrial and academic worlds and to actively collaborate in setting up and coordinating projects at national and international levels.

Fluency in spoken and written French and English is essential.

#### **4. APPLICATION**

Applications must include the following items (if possible in a single pdf file):

- a detailed résumé (CV)
- a cover letter
- a list of studies and publications
- the research project proposed, based on the candidate's experience and in relation to the priorities of the ERSEI group described above and his/her project for involvement in the teaching activities of the School
- PhD thesis (link to pdf) and the reports of the rapporteurs/assessors and other reports related to the defense (if available)
- if possible, three letters of recommendation should be sent to us directly by referees chosen by the candidate. Failing this, the file should include at least the names and contact details of three scientific personalities who may be asked to give an opinion on the candidate's work and skills.

**The file must be sent, no later than April 16, 2023, to the following address:**

**Centre PERSEE – Mines Paris-PSL  
1 rue Claude Daunesse  
CS 10207  
06904 SOPHIA ANTIPOLIS CEDEX  
For the attention of M. Georges Kariniotakis,**

**And/Or by email to: [georges.kariniotakis@minesparis.psl.eu](mailto:georges.kariniotakis@minesparis.psl.eu)  
with a copy to: [sophie.pierini@minesparis.psl.eu](mailto:sophie.pierini@minesparis.psl.eu)**

Applications will be examined by a jury comprising representatives of the School and external eminent scientists. The candidates chosen during the pre-selection process will be invited to present their background, their work and their scientific project in front of this jury.

For more information, candidates may contact Mr. Georges Kariniotakis, Head of the ERSEI group at PERSEE and/or the Human Resources Department at Mines Paris.