LE STUDIUM RESEARCH FELLOWSHIP

– LAVOISIER PROGRAMME – ARD 2020

(Open to international experienced researchers)

Research Field: Electrochemical storage of energy

CONTEXT

To convert the European Union Smart Specialisation concept into a regional strategy, the region Centre-Val de Loire has launched the Ambition for Research and Development 2020 (ARD 2020) LAVOISIER (LAboratory with a VOcation for Innovation of the Safety and Industrialization of Renewable Energy) Programme under the leadership of the CEA Le Ripault and supported by LE STUDIUM Loire Valley Institute for Advanced Studies for the attraction and recruitment of international experienced researchers and scientific animation.

The LAVOISIER programme is dedicated to research and technology transfer in the field energy materials It focuses on the development of two main areas: the production and storage of hydrogen and materials and assemblies of energy materials designed for energy conversion and the storage of electrical energy.

The LAVOISIER Programme is targeting researchers who embody, in their profile, the three key words that drive the research values of LE STUDIUM: Curiosity, Imagination and Intuition. As a fellow of this progamme and LE STUDIUM Loire Valley Institute for Advanced Studies (http://lestudium-ias.com) the successful candidate will be part of an outward looking and highly stimulating pluri-disciplinary scientific and cultural environment.

The successful candidate will benefit from the international scientific environment of Region Centre Val de Loire and work under the leadership of the PCM2E Laboratory, University of Tours, France.

SCIENTIFIC RESEARCH

The PCM2E research group has distinctive research strengths in new materials, electrolytes formulations and energy devices combining experimental, theoretical and computational chemistry. A principal added value of the appointee will be to provide leadership within the PCM2E group, representing its research expertise, skills, interests, and fostering a team spirit helping the group to capitalize on its strengths and maximize the impact of its activities. More precisely, the appointee will join a dynamic group of researchers and will provide a novel vision and/or research strategy, which will be discussed during brain-storming sessions, to tackle issues associated to the above-mentioned project.

Electrochemical systems that can efficiently store and deliver energy on demand have gained significant interest in the market of mobile electronic devices such as smart phones, laptops, etc. As technology continues to evolve and energy consumption increases, as does the demand for improved alternative energy sources and energy storage systems. In particular for electrochemical energy storage systems, efforts are being made to develop technologies which offer higher power and energy densities, higher operating voltages, improved cycling stability, enhanced safety, and lower initial life cycle costs. Electrochemical systems must also accommodate the growing interest in electric vehicles (EVs). To date, Li-ion batteries have

proven to be an efficient energy source for portable electronics, however their energy density of is too low (150 $Wh \cdot kg^{-1}$) to meet the demands of key markets such as transport and grid energy. They are also plagued with safety issues mostly surrounding the volatile electrolyte material. This project aims to design, formulate and characterize new safer electrolytes (non-flammable, non-volatile and stable over a wide range of temperature, chemically and electrochemically stable). More particularly, within this project novel classes of ionic materials (like Ionic Liquids and/or polymer electrolytes), alternative solvents, and electrolyte additives (e.g. Flame retardant) will be investigate in order to improve safety of Li-ion batteries.

MISSION OF THE RESEARCH SCIENTIST

Research fellow is expected to advance its subject nationally and internationally and to contribute to maintaining the PCM2E laboratory as a national centre of excellence through research and publication, networking and consultancy. Research fellow is required to undertake the duties outlined below:
Key responsibilities:

- To carry out internationally outstanding research for the above-mentioned project
- To disseminate this research through articles in journals of international standing, monographs and other appropriate forms of dissemination, including national and international conference presentations
- To play a leading role with involved researchers in the project in developing novel research strategy related to the proposed project
- To supervise research students, and, as appropriate, post-doctoral researchers and other support staff associated to the above-mentioned project
- To support, comply with, and contribute fully to research plans and policies of the project team
- To perform experiments and to develop advanced materials and methods for the project

ESSENTIAL SKILLS AND EXPERIENCE

The successful candidate will be a dynamic research leader with a proven track record of internationally leading research evidenced by publications, esteem and funding. We welcome applications from candidates with research interests in all areas of electrochemical energy storage including advanced electrochemical characterizations, electrolytes (liquid and polymers electrolytes), room temperatures ionic liquids (design, synthesis, characterization), electrodes materials, interface characterizations and so on. The successful applicant will also be expected to take on supervising responsibilities commensurate with the position, and to be able to demonstrate the ability to carry out activities to a high standard. Senior researcher profile with:

  - publications and significant international networks;
  - ability to mobilize the literature and to build a testable hypothesis;
  - research experience in the field of study, able to innovate and interact with diverse stakeholders including industry;

- Proven ability to control the whole chain of research from the definition of the problem to the communication of results, both for academic, industrial R & D and non-academic audiences;
- Experience and motivation for team work and ability to establish fruitful scientific exchange with researchers and actors of different technical and scientific cultures;
- Strong Experience and background in applied electrochemistry and electrochemical storage
- Strong Experience in electrolytes and/or materials characterizations
- Able to initiate new projects in the field of electrochemical storage (beyond Li-ion, e.g. Li-S, Na-ion)
- Strong organizational and time management skills - able to prioritize work, manage time effectively and deliver results on time;
- Excellent written and verbal communication skills, including the ability to make clear and concise presentations and prepare compelling grant proposals.

CONDITIONS OF ELIGIBILITY

The fellowship is intended to attract an experienced international researcher in possession of a doctoral degree and a minimum of five years of full-time research experience, preferably ten.

- Applicant researchers must be national or long-term resident of a country other than France, ie. having spent a period of full-time research activity of at least 5 consecutive (without breaks in research) years in a country other than France.
- Applicant researchers must also comply with the following mobility rule: not having resided or carried out their main activity (work, etc.) in France for more than 12 months in the 3 years immediately prior to the deadline of application. Compulsory national service and/or short stays such as holidays are not taken into account.

CONDITIONS OF EMPLOYMENT

The position is based in Tours, France and offers a contract of one year.

The successful candidate will be welcomed into the LAVOISIER network and LE STUDIUM faculty of foreign research fellows in the region Centre-Val de Loire. Researchers will be provided with the necessary means of work (laboratory facilities, office, telephone, internet, access to databases, computer tools, etc ...).

The scientific working languages are French and English.

Entitlements detailed in the French labour contract of employment include:

- a personal salary
- rental costs of a fully furnished apartment for the applicant and her/his family. Utilities (water, heating, electricity, tax) have to be paid by the fellow.
- Affiliation to the French social security protection scheme and a contribution to a private medical protection scheme for all health costs complementing the French basic social security protection
- Working hours, vacation and travelling expenses are bound by the same regulation as those effective for the personnel of the hosting laboratory
- Access to administrative assistance by a member of LE STUDIUM operational team.

CONDITIONS OF APPLICATION

Online application via LE STUDIUM platform: **Apply section**

The deadline for application is **20th September, 2018.** Applications will be reviewed as they come in. Positions are expected to be filled in the 3rd quarter of 2018.

The application will consist of three elements:

- A completed online LE STUDIUM application form with personal information and details of track records ;
- A curriculum vitae of maximum two pages including information not in the online application;
- A motivation letter.

Upload documents as pdf files.