

Recruitment Associate/full professors School year 2012-2013

Short profile	Power Electronics for energy storage		
Category	Associate Professor	Job number	613
Posted	26-1		
Field of expertise	Section 1 : 63		
	Section 2 : --		
Position available	Sept 1st, 2012		
School to which the position is attached	Ense ³		
Associated Research lab	G2ELab		
Location	Grenoble		
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Grenoble INP, Grenoble Institute of Technology has been training engineers, and PhDs, and developing outstanding international research for the past hundred years. As a public Higher Education Institution and a leader in innovation, it is one of the preferred partners of the industrial world. As a cofounder of MINATEC, and an active member of Grenoble Innovation University, it is involved in international projects. Grenoble INP, Grenoble Institute of Technology is made up of approximately 1100 staff (administrative and academic), 6 engineering schools, 5400 students and 32 Research labs.

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School to which the position is attached

Ense³ – Energy, Water and Environment is part of Grenoble Institute of Technology. Owing to its outstanding scientific environment and its pioneering activities linked with hydroelectricity, Grenoble has always been in the forefront of the development of new technologies in the field of energy and water management. Taking full advantage of this background, the Ense3 school trains high-level engineers and PHDs able to take up the challenges associated with the new energy order, with the increasing demand of water, both in quantity and quality, and with the sustainable development and country planning.

Ense³ is composed of more than 1000 students (engineer and Master degrees), 100 permanent teaching staff, 350 temporary teachers (from research labs or industry), 50 persons as technical support

This school is very close from industry and research, as illustrated by technological platforms (PREDIS, IEE, ...), used by the three partners (Industry, Research and teaching). This is the key point to insure up-to-date learning programs, adapted to industry needs and including the most recent technological evolutions.

Ense³ is open to the world and its challenges, promoting international mobility of the students as well as various origins.

www.ense3.grenoble-inp.fr

Teaching experience

Teaching in the "Energy systems and associated Markets" and "Electrical Engineering" departments: Power Electronics, Energy Conversion lab works, Basic Electrical Engineering for Bachelor degree (Electrical machines, transformers, Power Electronics).

Contribution to the internationalization of the school, proposing English lectures, for the Ense³ departments or the International Master "Electrical Engineering for Smart Grids and Buildings".

The Associate Professor will be involved in the new apprenticeship program launched by the school in 2012.

He will be in charge in the management of a Power Electronics Platform from PREDIS centre, and involved in the C-VELEC (Electrical Vehicle association)

Associated research lab

The Grenoble Electrical Engineering Laboratory covers the whole spectrum of the electrical engineering science, from materials to systems, from processes to actuators, from micro systems to large power systems, from production to usage of electrical power.

The research carried out in G2Elab ranges from long term research up to collaborative research supported by a strong involvement in partnerships with large companies and SMEs. With more than 100 permanent staff, 110 PhD and 50 Masters, G2Elab appears as a major actor both nationally and internationally in these areas.

Throughout its history, G2Elab has been driven by simple guidelines: expand its expertise, capitalize on its research, develop new concepts and transfer knowledge to companies, relying on an intimate knowledge of materials and a proven capability to model and simulate devices of Electrical Engineering. Its activities are focused in the areas of power grids, power electronics, electric actuators, electrostatic processes and micro systems.

www.g2elab.grenoble-inp.fr

Research experience

Energy storage is a key point of energy challenge. Among the various possible solutions (electromechanical, electrochemical, ...), there is always the need of high efficiency conversion, allowing the interface between the storage device and the electrical main. As an example, the Battery Management System, used to insure the charge and discharge of every battery cell; these power electronics topologies are also used for photovoltaic applications. Another illustration is the inertial storage, with the need of high frequency conversion, related to the high speed used.

The constraints for the power electronics converters are a High Efficiency, an easy integration to the storage device and to the electrical main, as well as low realization costs

The research activity will thus consist in exploring very high efficiency high performances converter topologies, and may be developed in any of the following direction:

- use of « wide gap » components, especially regarding cooling and EMC
- research of topologies suitable for integration techniques
- développement of multifunctionnal capabilities (charge/discharge/motorisation/active filtering/network front end,...) and modularity.

Details of the position, specific requirements and responsibilities

None

Languages

English, French preferred but not mandatory

Key Words

Electrical engineering, Electronics, Electrical technology, Energy technology