

## FIELD OF TRANSVERSAL SKILLS

*Technologies: Mechatronics, Energy conservation-Civil Engineering, Digital technologies*

## KEY WORDS

- Energy
- Environment
- Micro - nano sciences

## SECTORS

- Renewable energies
- Functional materials
- Membranes
- Microelectronics

## PRESENTATION

From the basic study on electrolytes to the modeling of an operating generator, the LEPMI teams (including the LMOPS, the Chambéry team at Université Savoie Mont Blanc) are aiming to increase knowledge in all fields involving the transport of charged species. The LEPMI is a member of the Labex CEMAM, the Institut Carnot (future energies) and the Plastipolis, Tenerrdis, Minalogic and Axelera competitiveness clusters.

## RESEARCH THEMES

LEPMI's research work is focused on 3 themes in which we aim to be a major partner in national and international research:

### • Energy

- Electrochemical storage and energy conversion (batteries, fuel cells, supercapacitors, photovoltaic)
- Design and development of functional materials (electrode, electrolyte) for electrochemical and photovoltaic systems
- Characterisation using hyphenated techniques (physical, electrochemical)
- Modeling, from the material to the system

### • Environment

- Active pollution control methods (bioreactor, molten salt reactors)
- Innovative waste and metal recycling processes
- Recycling processes with a view to reusing electrochemical generators
- Designing and modeling materials for environmental protection, particularly for controlling CO<sub>2</sub>
- Control methods, mainly through studying ion and gas sensors

### • Micro-nano sciences

- Developing nanostructured materials and nano-controlled surfaces
- Controlling nano-objects using innovative development techniques
- Understanding the influence of nanostructure on a material's properties

## KEY DATA\*

- **70** researchers and professors
- **25** administrative and technical staff
- **60** PhD students

\* Academic year 2014-2015

## SPECIFIC EQUIPMENT AND EXPERTISE

- Electrochemistry: catalysis and batteries
- Physical chemistry of materials and interfaces
- Synthetic chemistry
- Modeling and homogenisation
- Determining chemical structure

*Full list on the laboratory's website.*

## PhD STUDENTS SKILLS

- Physical or electrochemical characterisation
- Commercial properties
- Functional properties and durability
- Project management
- Teamwork
- Respecting commitments and time lines

## NETWORKS / PARTNERSHIPS

*LMOPS, Chambéry team (Université Savoie Mont Blanc)*

### Academic cooperations

- Case Western Reserve University (United States)
- Swiss Federal Institute of Technology in Zurich (Switzerland)
- Institut National Polytechnique de Lorraine (France)
- SINTEF (Norway)
- Twente University (Holland)
- ASTRE and MUST platforms of Université Savoie Mont Blanc

### Institutional cooperations

- Assemblée des Pays de Savoie
- The Atomic Energy Commission
- The Savoie Mont Blanc University Businesses Club
- Thésame

### Industrial cooperations

- Axane Air-Liquide
- EDF
- Nexans
- CEA
- Metravib
- ARAMCO (Saudi Arabia)

## INTERNATIONAL RELATIONS

- Trans-border cooperation with Turin Polytechnico (Master PTA)
- Collaboration with ETH Zurich (joint thesis work)