

Environmental Engineering / Civil Engineering
Modeling in mechanics and transfer phenomena
Material Design and behavior / Corrosion

Laboratoire des Sciences de l'Ingénieur pour l'Environnement (LaSIE)

The Laboratory of Engineering Sciences for the Environment is a Joint Research Unit (UMR 7356 La Rochelle Université – CNRS) whose themes concern the transfer of mass and energy in materials and inhabited spaces, covering large scales of space and time. Bringing together a wide range of skills in the field of environmental engineering (mathematics, physics, civil engineering, chemistry and mechanics), the LaSIE analyze the durability and protection of materials, structures and infrastructures, subject to environmental constraints. The Laboratory also works to improve the thermal, the comfort and indoor air quality in buildings.



Director — **Xavier Feaugas**

Permanent research staff — **60**

Phd student — **64**

Permanent technical assistant staff — **16**

Staff on research project — **28**

— 4 teams

- ▶ Durability, Microstructure, protection and coatings (DMPR)
- ▶ Mathematical and numerical methods for transfer phenomena (M2N)
- ▶ Sustainable buildings and cities: energy and quality of environments (BVD)
- ▶ Transfers, degradation and recovery of materials (TDVM)

Discipline — Engineering

development of a product, a space, an energy, by integrating them throughout its life cycle.

Durability

Study of the mechanical and environmental constraints related to wet, saline and aggressive environments (maritime environment) in research on materials and coatings.

Energy of buildings and quality of indoor air

Study of energy of buildings

and systems, the improvement of the quality of indoor air in inhabited spaces and the energy transition in buildings (renewable energies and positive energy buildings).

Global approach

Approach from the atom to the material and from the building in its environment. The Laboratory's work ranges from the development of mathematical tools to patent applications and patenting, as well as numerical and experimental simulations.



— Societal challenges

Eco-design

Inclusion of environmental impacts in the design and



– Research Network

The LaSIE supports the research group «Differential and mechanical geometry» and the international research group «Multi-Physics and Multi-scale Couplings in Geo-environmental Mechanics» and participates in more than 5 structures of this type. It shares a joint laboratory with Tipee (Technological & Innovative Platform for Environmental Efficiency) and a joint laboratory with ENERBAT and EDF R&D (French National Electricity company) on energy efficiency in cities (4evLab).

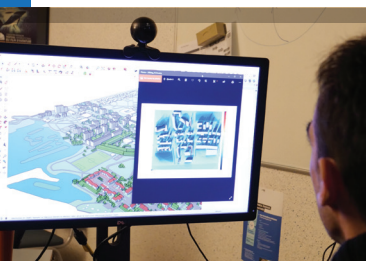
The Laboratory is associated with the research of several French universities and engineering schools including the University of Technology of Compiègne (UTC), the École normale supérieure (ENS), the National School of Mechanics and Aerotechnics (ENSMA), the University of Burgundy. The Laboratory also works with many foreign establishments such as the Royal Military School in Brussels, the National Autonomous University of Mexico, the Federal University of Rio de Janeiro (UFRJ), the Norwegian University of Science and Technology in Trondheim (NTNU) etc.



– Expertise Achievements

The Laboratory coordinated the establishment of Tipee, an interregional technological structure bringing together 15 partners through a public-private consortium. LaSIE carries out several European and ANR projects (National Research Agency), it is among other involved in the projects: CITEE - «Innovative Components for Building Envelopes», EQLORE - «Environmental Performance of the Neighborhood - from Occupant to Energy Network» or HECO- «From heating to cooling: tracking of charges for heat treatment».

The structuring of all the experimental and modeling techniques into platforms and technical platforms of the Laboratory, enables it to respond to very varied requests from the socio-professional world. In particular, the environmental electronic microscopy platform is a benchmark like the many multi-scale permeation arrangements. Via advanced analysis platforms (X-ray crystallography, aging chambers, spectroscopy, etc.) and the innovative modeling tools at its disposal, the Laboratory provides services to several regional, national and international research centers and companies.



Training

MASTER IN CIVIL ENGINEERING

- **course Building Engineering: managing and integrating energy efficiency and renewable energies (IB-GI3ER)**
- **course Building Engineering: new techniques for construction and rehabilitation (IB-TNCR)**

MASTER IN MATERIALS SCIENCE AND ENGINEERING

– Partnerships Collaborations



The LaSIE work is carried out in partnership with several national public establishments such as the Scientific and Technical Center for Building (CSTB), the Environment and Energy Management Agency (ADEME), the Energy Commission atomic (CEA), The National Agency for Radioactive Waste Management (ANDRA), The French Institute of Sciences and Technologies of Transport, Development and Networks (IFSTTAR) etc.

Collaborating with nearly twenty major French groups (including Lafarge, GDF Suez, EDF, Areva, Airbus, SAFRAN, Vallourec, Ariane Group, Naval Group, ARCELOR-MITAL, Aubert & Duval etc.), the Laboratory also maintains close relations with companies in the region (including CRITT Agro-Alimentaire de La Rochelle, Exoson, Galva Atlantique, Alstom etc.).



CONTACT

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