



# GEC GEOSCIENCES AND ENVIRONMENT LABORATORY

Laboratoire Géosciences et Environnement



EA 4506

12 teacher-researchers

7 doctoral and postdoctoral researchers

GEC conducts research in geosciences, focusing particularly on tectonics (geodynamics and petrophysics) and geomechanics, and in the environmental field, using a multiscale approach to the deformation and alteration of rocks in a broad sense.

This research has also led to technological advances in many areas, from geological storage to eco-materials.



## KEYWORDS SCIENCE

- Tectonics
- Geodynamics
- Petrophysics
- Geomechanics

## KEYWORDS APPLICATIONS

- Geological storage
- Geothermal energy
- Environment
- Eco-materials
- Heritage

## KNOW-HOW · SKILLS · EXPERTISE · SPECIFIC FEATURES

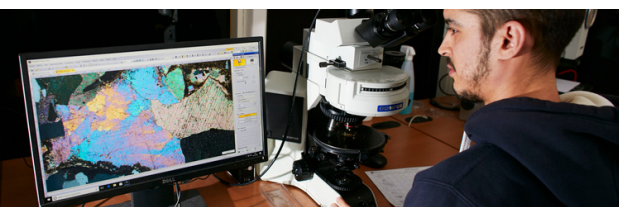
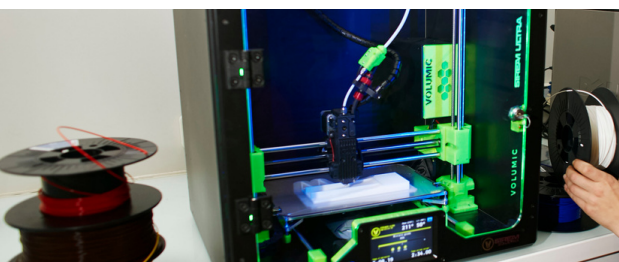
- ▣ Multiscale approach to deformation in sedimentary rocks
- ▣ Mechanical analysis, digital simulation, and analogue modelling in structural geology
- ▣ Geological storage: stress, deformation, and petrophysical properties
- ▣ Methods for protecting heritage stones exposed to the elements and climatic variations
- ▣ Thermal properties and environmental impact of building materials, development of new eco-materials

## EQUIPMENT

- U-Maker platform: 3D solutions for geoscience education and science outreach
- I-MAT platform: SEM with EDX and Raman spectroscopy, confocal microscope, atomic force microscope
- Anisotropy of Magnetic Susceptibility (AMS) measuring equipment
- Isothermal Remanent Magnetisation (IRM) measuring equipment
- Minolta Spectrocolorimeter, Surface Moisture Meter, Sclerometer
- P and S wave velocity measuring equipment
- Electrical conductivity measuring equipment
- Porosity and capillarity measuring equipment
- Permeability measuring equipment
- Equipment for measuring deformation and physical measurements under stress
- Optum G2+3 geotechnical modelling software

## APPLICATIONS AND INDUSTRIAL SECTORS

- Geological storage and reservoirs: geothermal energy, hydrocarbon storage, waste storage, CO2 storage, etc.
- Eco-materials: raw earth based materials, phase change materials
- Protection, conservation, and restoration of heritage stones



## PATENTS · SOFTWARE

- ▣ **1 active patent**  
Phase Change Material (PCM)
- ▣ **2 software programs / codes filed**  
Simulation of sediment deformation

## INDUSTRIAL PARTNERSHIPS · SPIN-OFFS

- ▣ **5 industrial collaborations per year**  
TOTAL, swisstopo, BPE Lecieux
- ▣ **SATT maturation project**  
Phase Change Material (PCM)