

+ PROJECTS

IPGS is involved in many projects at regional, national and international scales.

IPGS teams also develop some transverse research projects:

The transverse theme "Water" aims to study hydro-dynamics in the context of underground flow and to build models at different scales in time and space. The study of seismic behavior of faults at different time scales are the focus of the transverse theme "Fault behavior and seismic hazard".

The transverse theme 'Rhine graben' focuses on the study of pollution, water quality, seismic



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risk assessment, and geothermal energy. This research theme is part of the French-German project on the imagery of Rhine graben faults financed by Interreg.

The aim of the transverse theme "Africa" is to study seismotectonics, seismic hazard, lithosphere dynamics and mechanics on the African continent.

IPGS is part of the Realise network (Réseau Alsacien des Laboratoires en Ingénierie et Sciences de l'Environnement), which aims to structure regional environmental research.

Long-term future investments

IPGS is the project leader of the laboratory of excellence G-EAU-THERMIE PROFONDE, which aims to improve the knowledge of deep geothermal reservoirs and to develop techniques to enable exploitation of this sustainable resource.



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IPGS researchers are also involved in Equipex (Equipment of Excellence) projects in seismology and geodesy (Resif-Core), in hydrology and geochemistry (Critex) and in gravimetry (Miga).

Photos credits:

1. Mongolia, Gobi-Altay range, the 4 December 1957, earthquake of Mw=8.1: The distance between the two persons shows the 6.5 meters of horizontal slip © A. Schlupp
2. FG5 absolute gravimeter #206 designed by Micro-g LaCoste and installed at Wankama, Niger, during the operation phase of the Ghyraf project sponsored by the ANR © B. Luck
3. Err detachment (Alps), one of the tLégende he detachment faults which allowed the transition from rifting to seafloor spreading in the Tethys ocean 160 Ma ago © G. Manatschal
4. Hydrostatic cell for water/gas permeability of rocks under confining pressures up to 50 MPa © T. Reuschlé
5. Induced seismicity following the stimulation of the GPK2 well at the EGS site at Soultz-sous-Forêts © M. Calo
6. Air lift for hydrological deep reconnaissance © M. Bano
7. Soultz geothermal plant © GEIE Soultz

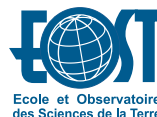
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Conception : S. Miller (DALI Unistra), V. Bertrand - Réalisation : V. Bertrand, © EOST Mars 2015
3-D shear-wave velocity anomalies in the whole-mantle as imaged by multiple-frequency tomography © C. Zaroli



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INSTITUTE OF PHYSICS OF THE EARTH OF STRASBOURG

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IPGS is a joint research unit of EOST (School and Observatory of Earth Sciences) under the supervisory authority of the CNRS and the University of Strasbourg. Research themes developed at IPGS are focused on several fields of geophysics and geology. Our aim is to better understand how the Earth works.

+ RESEARCH

The laboratory is organized into 4 research teams.

Global dynamics and active tectonics —

This research team works on global dynamics, the internal structure of Earth and other planets, spatial and time-related potential field variations, lithosphere deformation, seismic fault mechanisms, and subsurface deformation.

Themes

- Earth rotation variations, Earth core movement, elastic gravitation deformation
- Magnetic and gravimetric fields variations
- Tectonics sources of deformation linked to the seismic cycle
- Geomorphological processes and gravitational hazards

Disciplines: Geomagnetism, gravimetry, geodesy, active tectonics, geomorphology, paleoseismology

Objects of study: Regional sites (in Africa and the Mediterranean area), Landslides in France, Polar sites, data from EOST's observatories (gravitational instabilities, geodesy, gravimetry, seismology and magnetism).

Examples of applications: Water resources, landslides, melting of the ice caps.



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Lithosphere and sedimentary basin dynamics —

This research team aims to study the interactions between the deep Earth and the processes active at the surface, linking tectonics (deformation, isostasy, exhumation...) and surface processes (erosion/sedimentation, climate forcing).

Themes

- Sequence stratigraphy of non conventional sedimentary systems
- Processes controlling rifting and sea-floor spreading
- Rheology and petrology of the lithosphere

Disciplines: Geology, geophysics, structural geology, sedimentology, petrology, tectonics.

Objects of study: Sedimentary basins, lakes, paraglacial cratonic platforms, present day and ancient rifted margins (Atlantic, Alps, Pyrenees), Mid Ocean Ridges (Southwest Indian Ridge), Central Asia orogenic belt, Variscan and Panafrican orogeny.

Examples of applications: Reservoir engineering, sequential stratigraphy modeling, interpretation of deep-water rifted margins.



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Experimental geophysics —

This research team focuses on multi-scale imagery of geological structures, monitoring of fluid motion, formation and deformation of geological structures in reservoirs, and rheology of faults.

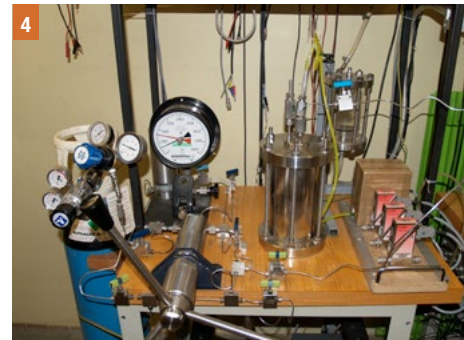
Themes

- Seismic and electric imagery of the crust
- Deformation and failure modes
- Rock-fluid interactions

Disciplines: Geomechanics, transport properties, seismic and electromagnetic methods, fluid and granular system mechanics.

Objects of study: Aquifers, reservoirs, La Soutte river basin/watershed, active faults, rocks (limestone, sandstone, granite, volcanic rocks, clay, sand), liquefaction instabilities.

Examples of applications: Hazard management, water resources, waste storage, depollution, mining prospection.



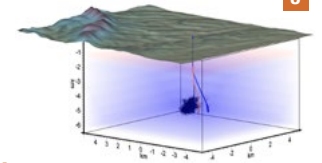
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Seismology —

This research team studies natural seismic sources and their resulting waves. It undertakes many methodological developments in both fundamental and applied research, allowing new insights to be obtained regarding various objects of study.

Themes

- Earth structure, seismic imaging
- Seismic sources
- Seismic hazard



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Disciplines:

Seismology, seismic tomography, signal analysis, inverse methods, seismo-tectonics.

Objects of study: Earth's crust, lithosphere, asthenosphere, and deep mantle on both regional (France, Gulf of Corinth, Japan, Turkey, Himalaya, Antarctica) and global scales, using in particular data from the EOST and Geoscope observatories.

Examples of applications: Earth models, seismic hazard assessment, deep geothermal energy, tsunami warning.

+ EDUCATION

IPGS researchers contribute to education in Earth and environmental sciences for Bachelor and Master degrees, and within EOST's Geophysics engineering school. They also supervise Master students' research projects.

PhD students of the doctoral school of Earth and environmental sciences may perform their doctoral research within IPGS.

The IPGS in numbers: The number of people totals 140, including scientists, teachers, Phd students, post-docs, technical and administrative personnel.