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GRENOBLE
INP
UGA

IRD
Institut de Recherche
pour le Développement

UGA
Université
Grenoble Alpes



UMR 1509

Institute for Environmental Geosciences (IGE)

Management

Emmanuel Cosme, Director
Thomas Condom, Deputy Director
Thierry Faug, Deputy Director
Isabelle Ruin, Deputy Director

Key figures

- 190 permanent staff
- 140 contract staff

Keywords

- Glaciology
- Hydrology
- Oceanography
- Mechanics
- Atmospheric and environmental sciences
- Risks

Mission and objectives

Joint research unit (UMR) run by the CNRS, Université Grenoble Alpes, INRAE, IRD and Grenoble INP, the Institute for Environmental Geosciences (IGE) is one of the main laboratories of Grenoble Observatory for Sciences of the Universe (OSUG).



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IGE studies regional climates, how the planet functions and how it is evolving in terms of pollution, global changes and risks for society. This research combines glaciology, hydrology, oceanography, mechanics, atmospheric and environmental sciences, and interdisciplinary sciences with SSH and/or socio-economic stakeholders. Historically, IGE has carried out its research in regions with significant societal and environmental issues: the poles, the tropics and mountainous areas.

Beyond the scientific subjects that it studies, IGE is committed to, and active in, changing how we work, be it in respect of the environment, ethics or inclusiveness.



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IGE teams

- CHIANTI: Atmospheric Chemistry
- CRYODYN: Glaciers and Ice Sheets Dynamics
- C2H: Climate, Cryosphere and Hydrosphere
- ECRINS: Gravity risks and Cryosphere in Mountains
- HMCIS : HydroMeteoroology, Climate and Society Interactions
- HYDROSYSTEMS : Water, Soils, Sediment, Quality
- ICE3: Ice Core, Climate and Chemistry
- MEOM: Multiscale Oceanic Flow Modeling
- MEOcean : Ensemble Modeling of the Ocean
- PHYREV: Hydrological Processes for Vulnerable Waters Resources
- OPERA : Open computational earth and climate science research
- IMPER : Thoughtful impact, controlled footprint

Observatories

- SNO AMMA-CATCH (IR OZCAR)
- SNO Draix-Bléone (IR OZCAR)
- SNO GLACIOCLIM (IR OZCAR)
- SNO OHMCV (IR OZCAR)
- Digital code ELMER-Ice
- SNO CLAP (IR ACTRIS)
- Digital code NEMO
- LTSER Zone Atelier du bassin du Rhône
- LTSER Zone Atelier Alpes

Partnership facilities

- LMI NEXUS
- LMI REZOC
- LMI LECZ-CARE
- LMI WATER HI-MAL
- IRN ANDES-C2H



Research and observations

IGE, structured into nine research teams backed up by three local support services (administrative, IT and technical), is a collective of more than 300 people whose main objectives are to:

- improve fundamental understanding of the climate system and its variability, particularly in tropical, polar and mountain regions;
- better understand the physical and biogeochemical processes in superficial situations (water/snow/ice, ocean, soil, atmosphere) and at their interfaces;
- refine our capabilities in pre-operational forecasting, projection of climate change and the effects of anthropisation and the risks they present for society.

Our research is based on long-term observations in different environments. and within OSUG we coordinate or take part in several national observation services accredited Terre&Univers (Earth&Universe) by the CNRS.

Lastly, IGE is part of a strategy aimed at strengthening North-South partnership activities in research, training and knowledge transfer to society by virtue of the IRD tools – International Joint Laboratories (LMI) and International Research Network (IRN) – in which we participate.

Collaboration and expertise

IGE carries out research into the prevention of natural risks in mountainous areas (avalanches, windblown snow, torrential floods and lava flows, falling blocks, risks of glacial origin) and provides expert assessments. It contributes to risk evaluation and decision support in the context of rapid and marked environmental change in conjunction with the French Ministry of Ecological Transition (Directorate of Risk Prevention) and local authorities.

Our main local academic partners are the laboratories in the OSUG and FED3G federations, each of which has a Labex, the computer science, mathematics and data science laboratories (GIPSA, LJK), as well as PACTE laboratory.

Most of our many national partners are in the Priority Research Programmes and Infrastructure (PEPR) OneWater (Water as a common good), TRAACS (Climate modelling), IRIMA (Science of risk) and FairCarboN (Carbon cycle), in which IGE is very heavily involved.

Scientific facilities

We host unique facilities and platforms including:

- a platform with nine cold rooms at between 0 and -25°C for studying ice and snow materials and for sample analysis,
 - a Drone platform for new uses in earth sciences,
 - an analytical platform combining two technical support facilities: AirOSol (air, water and soil quality) and PANDA, for analysing ice core samples,
 - the Flow Structure and Risks facility (EOR) for multi-scale experimental investigation of rapid slippage,
 - the "Plateforme Française de Forage Glaciaire" (F2G) for drilling into and taking core samples from glaciers.
- We have our own computing resources, but we also use those of the research support unit GRICAD and other national facilities.

Teaching

IGE staff teach, train and transfer knowledge to as many people as possible, either through teaching university courses or through communication and knowledge dissemination activities.

Our lecturer-researchers teach mainly at the UGA Faculties of Science (DLST, Phitem) and University Institute of Technology (IUT1), and also at the UGA Grenoble-INP Graduate School of engineering Energy, Water and Environmental sciences (ENSE3).



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