



# MOUNTAINS IN A CHANGING WORLD

Summer program held in and around Grenoble in the French Alps  
Starting end of June/early July

## Welcome to Grenoble, capital of the French Alps

Dynamic, mountain-loving and sporty, with a rich and diverse heritage, Grenoble is nestled at the heart of three valleys. It is at the confluence of the **Drac** and the **Isere rivers**, where the **Chartreuse**, the **Vercors** and **Belledonne mountain ranges** meet. It is a metropolitan town with a population of half a million, where 20% of the population is associated with the University and its research, where businesses range from very traditional to high tech innovative small and medium enterprises. Here, at Université Grenoble Alpes, a large community of researchers, and project leaders **focus on Mountains** either as their central piece of observation terrain or on concepts applicable to it. Mountains are core to the DNA of our university community and we are proud to highlight that with this program, that we invite you to participate in.

## Come to a city that drives sustainable development

Grenoble has been designated **European Green Capital 2022** by the European Union for its strong commitment to social and environmental transitions.

## What to do in and around Grenoble

The program organizes a wide-ranging schedule of activities to help participants make the most out of their time at Université Grenoble Alpes and to take advantage of Grenoble's many varied cultural and nature-based offerings. Typical activities include:

- Free brass band, short-movie, street art, and music festivals
- Hikes from Grenoble to the surrounding mountain ranges
- Swimming and water-based activities (kayaking, paddle boarding, canoeing) in lakes
  - Visit neighboring towns such as: medieval Annecy & Victorian-style Aix-les-Bains, the UNESCO World Heritage Sites of Lyon and Avignon (city of the Popes), ...
    - Simply experience the French Art de vivre in sunny Grenoble!

### PRACTICAL INFORMATION

**Registration fee updated annually.** In 2025 the registration fee is **225 €**

### FIND OUT MORE:

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## Open to students from all disciplines (Community colleges, universities, professional training ...)

Over **two weeks**, you will see a story unfold. This story starts deep in the heart of the Earth, where powerful forces come to play, generating movement and disruption, where mountains are thrust up and are subjected to the effects of time, wind, water, and temperatures. On these mountains, flora and fauna have developed and adapted to harsh conditions, temperature ranges, extreme cold, radiations and low pressures. Humans have also made it their domain, captured water, settled along banks and in valleys as well as higher up. They have exploited trees, controlled water, wind and the sun for energy, fed on nature and created activities for their economic survival and enjoyment.

**Climate, population and political changes** have shaped and are continuously shaping physical, sociological, political and social environments. The recent acceleration of some of these processes questions us: **Where are we heading** as a complex interactive system made of living and inanimate elements? During these two weeks, we will tackle this question, by showing you the environment we live in and providing you with insight on how it came about and what it has undergone. Researchers from the University and guest lecturers invite you to discover these topics through various case studies. These studies will serve as the bases for the discussions and debates that you will actively participate in. At the end of the two-week program, you will have a better understanding of how mountainous environments respond to change and how living beings interact with these environments.



**Both in-class and in the field**, learn how the Alps arose and how plants and living beings in general adapt to change.

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# PROGRAM OVERVIEW

## Week 1: Setting up the background

We will take you **UP** (to the Bastille Fort in Grenoble, to the Lautaret Botanical Garden) to observe the surroundings, the landscape and to get a feel for the forces at play in mountains.

Geologists, geographers and biologists will walk you back in time to the movements that initiated the rise of the Alps. They will give you some keys to what you are seeing (plate tectonics, seismology, the Alpine orogenesis); you will learn how to see and describe these elements, how to analyze measured data, and how to look at the way mineral and living elements interact.

### During this week you will:

- Be provided with a research question to work on during the entire program
- Acquire basic knowledge on powers at play, seismology, geodynamics
- Map out the geological transect up to the Lautaret Pass
- Visit the University Botanical Garden at 2000 m altitude
- Get a feel for how the plant and animal kingdoms have adapted to high altitudes
- Be introduced to notions of alpine ecology and forestry

## Week 2: Introducing the Anthropocene or how mankind changes things

In the last ten thousand years, humans have started to settle in this area which has meant dominating and controlling nature to fit their needs. It is the era of “Anthropos (ἄνθρωπος)”.

But with Anthropos, come fast changes and resources that are diminished faster than they are created. The balance that existed in nature for millions of years has shifted in the last few hundred years leaving traces that can be seen and measured. This is why mountains are so important: they are extremely vulnerable to these changes.

### During this week you will:

- Meet the Anthropocene: why, what, when
- Be presented with some case studies: white coal, green coal, landslides, catastrophes, pollution of aquifers, adaptation of species and others
- Take a trip to Chamonix and observe the retreat of glaciers at the foot of the “Mont Blanc” and ride the Montnvers train to the famous “Mer de Glace”
- Study the need for some Heritage projects through the example of “Ice Memory”
- Listen to experts from the **Intergovernmental Panel on Climate Change (IPCC)**
- Present your results/ideas on the assigned research question



## Learning outcomes

- Understand why mountains are defined as complex systems
- Understand why mountains are vulnerable targets for change
- Identify changes that are threatening this environment
- Describe potential effects of change on mountains
- Give key remediation and mitigation perspectives
- Provide key trajectories for mountains facing changes

## Included field trips and outings

- Hike to the Bastille Fort to take a visual tour of the physical surroundings, landscape and urban development
- Take a 2-day field trip from Grenoble to Lautaret
- Observe the retreat of a glacier in Chamonix, at the foot of the Mont Blanc on a 2-day field trip
- Additional day trip to be determined (examples: Hike in Chartreuse or Vercors ranges)

## Assessment

- Upon arrival in the program, students will be placed into groups and will be given a specific research question.
- Group work time is scheduled throughout the program to work on these questions.
- At the end of the program, presentations (poster, video, debate, ...) will be made by students and assessed by a panel of judges.

## Certification

- A certificate will be provided to all participants summarizing the different learning outcomes and their evaluation.
- This program delivers 3 ECTS

**Pack your hiking boots & Take a deep breath,  
Come learn with us!**

## WARNING

During these field trips, you will do some hiking. Although, the hiking trails are of intermediate level, we remind you that it can be at high altitudes (above 2000 m) and hence requires adapted clothing and fitness conditions.

**Hiking shoes and warm wind and rain protective clothing are required.** Hikes will not exceed 4 hours per day (with stops) and will be of medium difficulty.

