



# pLore

## Introduction



2022-2023

# What is EPFL Xplore?



A team...

EPFL Xplore is a **student association** from the Swiss Federal Institute of Technology of Lausanne (Switzerland) whose aim is to **build Martian rovers** to participate in **international competitions**.

...learning by doing...

Our members are putting theoretical knowledge into practice and working together on a large-scale project. They are learning important skills such as **teamwork, communication and project management**.

...and letting ideas grow!

At EPFL Xplore, we **start from ideas and build upon them**. We foster environments where people are free to have their own approach in solving complex problems.

# EPFL Xplore in numbers

The project started in [September 2020](#) with its first project: [Project Argos](#).

Currently working on its 3<sup>rd</sup> rover, the team has established a strong presence in the robotics community both in Switzerland and abroad.



80+ students

The team is made of [Bachelor](#), [Master](#) and [PhD](#) students from various sections of EPFL.



3 schools

While [EPFL](#) is the primary school involved, students from [UNIL](#) and [ECAL](#) are participating as well.



125'000+ CHF

Thanks to the support of our partners, we are able to acquire the funds necessary [to participate](#) in international competitions.



45'000+ hours

The members can either work on the project as part of [credited projects](#) or during their [free time](#).

# Supervision & Mentoring

As a complex initiative, the project relies on the **supervision and mentoring of several organizations**.



■ eSpace  
EPFL Space  
Center

On the academic side, Xplore is supervised by systems engineers at the EPFL Space Center, providing support in project organization and finance. The project also involves numerous professors and laboratories of the school through collaborative research projects.



In addition to academia support, we are thrilled to benefit from the input of NASA and ESA engineers. By participating in our design reviews, they help us improve our rovers over the years and allow us to get a glimpse of what it is like to work in the space sector.

## Argos Project (2020-2021)



The Argos Project marked the [beginning of EPFL Xplore's mission](#) to build Martian rovers for international competitions. From project kick-off in September 2020 to mission completion after a wonderful [first attempt at the European Rover Challenge](#) in September 2021, Argos has proven that a team of dedicated students can go from nothing to having [an operational exploration rover](#) in less than a year.



## Astra Project (2021-2022)



Following on the steps of the Argos project, Astra's objective was to [set the foundations of the next generation of Xplore's rovers](#). Thought of as the [first of many iterations on the same and unique platform](#), this rover was designed with the aim of being as modular as possible.

That year, after another successful participation in the European Rover Challenge, Astra [set new standards in technological precision and robustness](#).



# Missions

To participate in the competitions, the teams need to **show technological as well as managerial readiness** with respect to several tasks.



## Science

As for most missions on Mars, our goal is to conduct **in-situ scientific experiments**.

The data gathered will then help us verify our hypothesis regarding the composition of the soil.



## Maintenance

Thanks to its robotic arm, the rover **handles a control panel** made of switches and buttons. The arm's precision is the key to the success of this task.



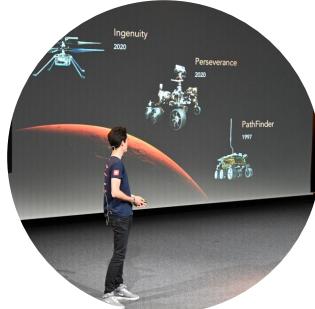
## Navigation

Another aspect of Martian missions is mapping. The rover will therefore be given waypoints on the terrain and will need to **autonomously reach these targets**.



## Probing

To simulate monitoring the soil properties, the rover is once again called to place probes in the terrain.



## Presentation

In addition to the technical missions, the competitions ask for a detailed **presentation and documentation** of the project and its development.



# Awards

The team already took part twice in the [European Rover Challenge](#) and was awarded several prizes among international teams from 4 continents.

ERC 2022 (64 team)



Overall



Navigation

ERC 2021 (58 teams)



Overall



Science



Probing

# Outreach & PR Activities

In parallel to the technical team, the management, communication and logistical teams are working together to **increase the external visibility and impact of the project.**

Events	Social Media
<p>Educational Workshops</p> 	<p>2 Series 30K+ views</p> 
<p>Public Events</p> 	
<p>Design Presentations</p> 	<p>200+ Posts</p>

# Future Associative Projects

1

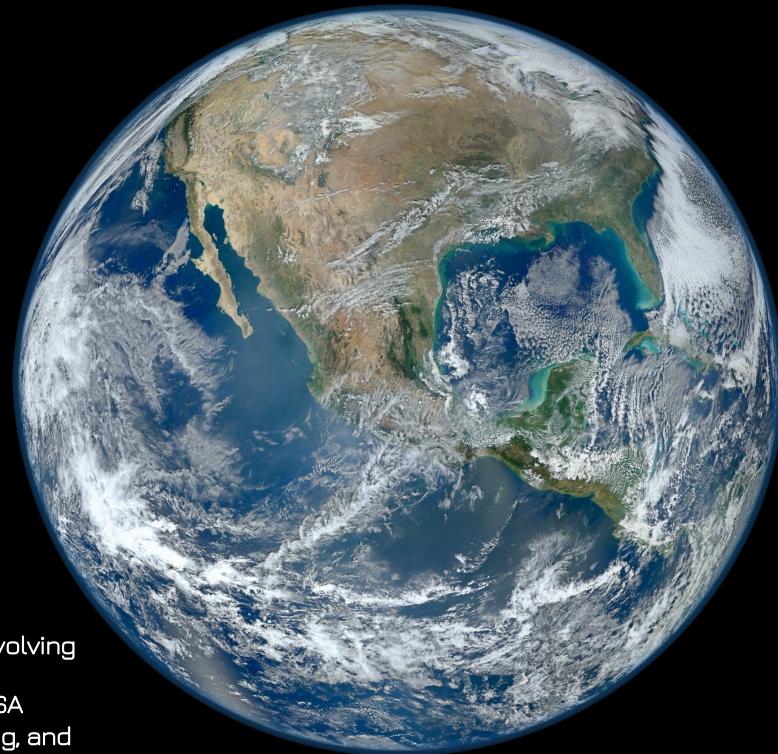
Keep pushing the  
limits of research...

Each year, our project benefits from new collaborations with EPFL laboratories. Our goal is to develop a fully autonomous platform by the mid-year 2023 based on our experience gained from participations in international competitions.

2

...and stay aware of new  
challenges...

With the expansion of the space sector, multiple actors of the domain are now involving the academia to develop technologies. We believe that projects such as the NASA Payload Challenge are only the beginning, and we are now ready to answer these calls for proposals.





## Spin-off Potential

3

...to reach for the stars.

Thanks to the experience gained from the competitions and the insight that it provided us with regards to the Space Sector, a team is focusing on finding solutions to expand the project beyond the association.

Driven by our passion for space, we wish participate in the development of space technologies through spin-offs in the years to come.



# EPFL maxon

