PROJECT OVERVIEW

2025-2026

For partners and sponsors

ESO

ESTACA SPACE ODYSSEY

Summary

Our Team

Aerospace Engineers in the making

ESTACA Students

The ESTACA is a french Top-School for transports engineering, and more specifically Aerospace engineering.

ESTACA
ECOLE D'INGENIEURS

Our activities

- Sounding rockets, experimental rockets, stratospheric balloon, mini-rockets, cansats
- 140 members for approximately 15 rockets each year !

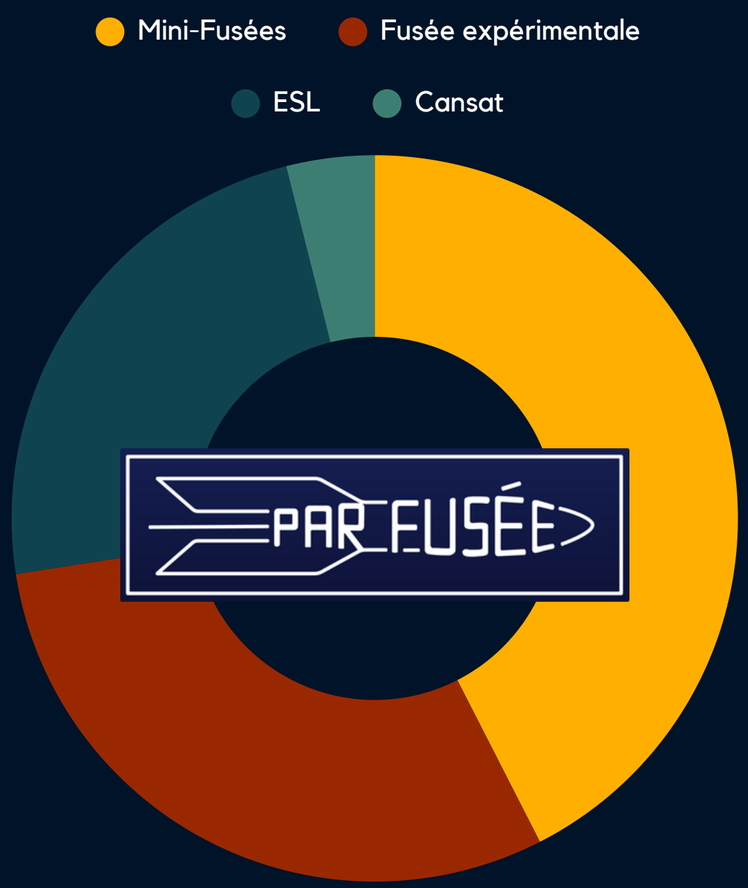
Space enthusiasts since 1992

We launch our rockets at a French launch campaign, called C'Space, in partnership with CNES (French Space Administration).

Our members participate in their projects during the school year, from September to June and launch in July at the C'Space.

Students from the 1rst to the 5th year can join and contribute to our projects.

Associative work enables the students to apply what they learn in a fun and stimulating way.



Breakdown of members by project for 2024–2025

From 1992...

... to 2025

NOTABLE PROJECTS

STRIVING FOR GREATNESS

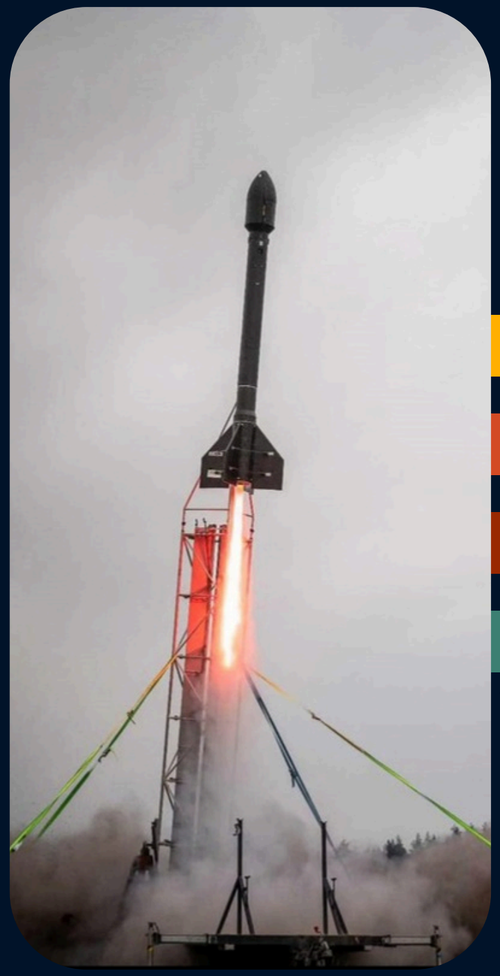
BERTHA

The bigger the better

2019-2023

This project aimed to transport an experiment that studied space debris : ODDS.
To spare enough space to launch an experiment this size, we had to create the biggest rocket ever launched at our annual launching campain.

70 kg
4,4 m



E S L
PROGRAM

ESTACA SPACE LAUNCHER

Our most ambitious project

OVERVIEW

ESTACA SPACE LAUNCHER

Sounding rocket and hybrid engine *2023-2028*

This is the association's most ambitious project, and we have to explore new technologies and face new challenges to carry it out.

Reaching 32,000 m is technically new for the association as we have to rethink every single subsystem for these harsh conditions.

Project specifications

+120
Members

- 2 divisions : Rocket and Rocket Engine
- 4 teams per division

32 000 m
Target Altitude

- ✅ 2025 : 3000 m
- 2027 : 9000 m
- 2029 : 32 000 m

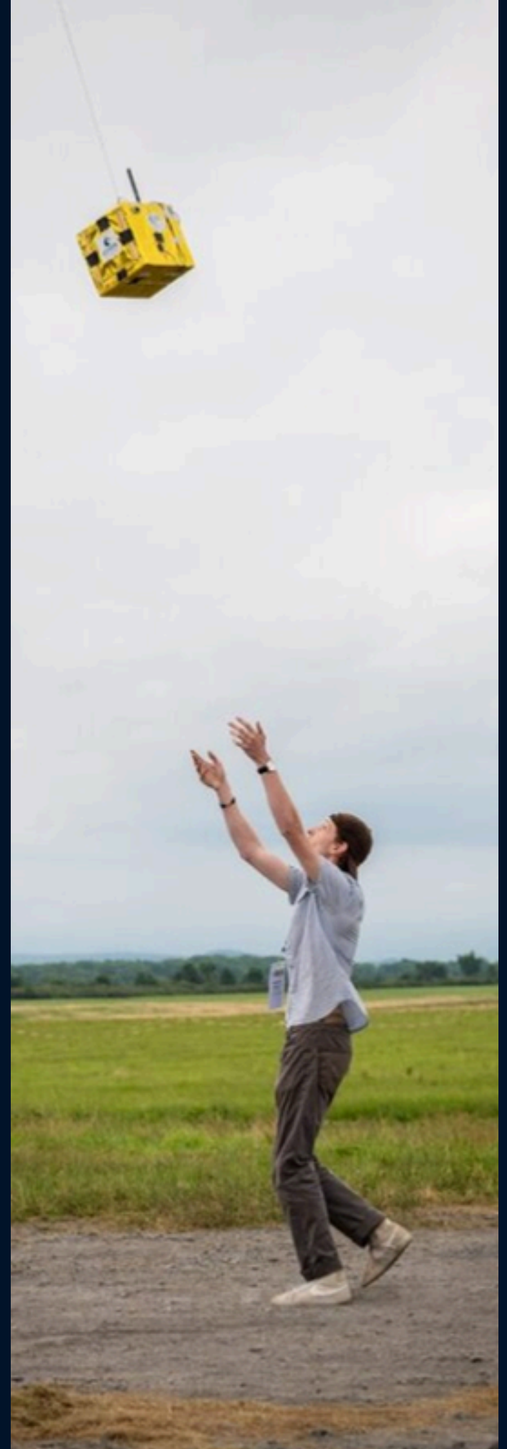
3
Rockets

- 3 iterations of the Rocket
- 3 iterations of the Engine

IT ALL BEGINS WITH A DREAM

We have reached the stratosphere with a balloon.
Help us make it with our very own rocket and engine !

Earth's curvature; Picture taken from our stratospheric balloon, 32 kilometers high



We develloped a successful rocket engine in 2019 named Aurora in collaboration with ArianeGroup.

After making a biliquid engine, a new technological challenge for us was to develop a Hybrid engine...

ESL-1

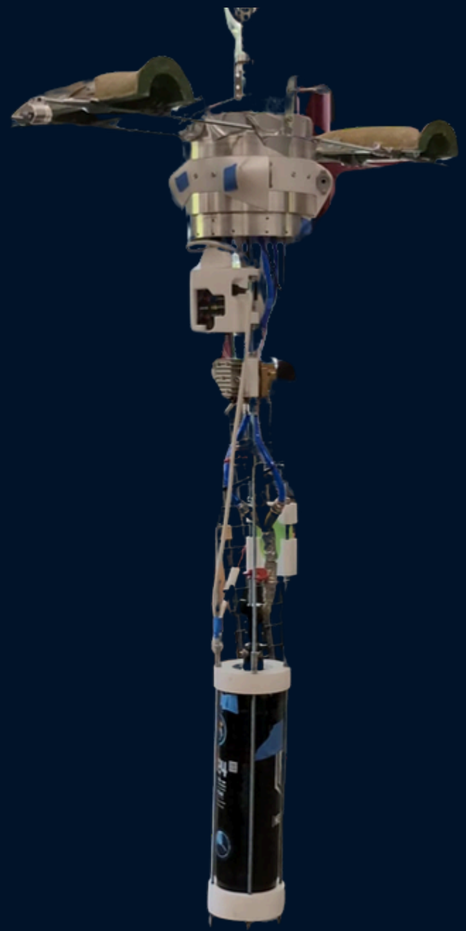
Sounding Rocket
2023-2025

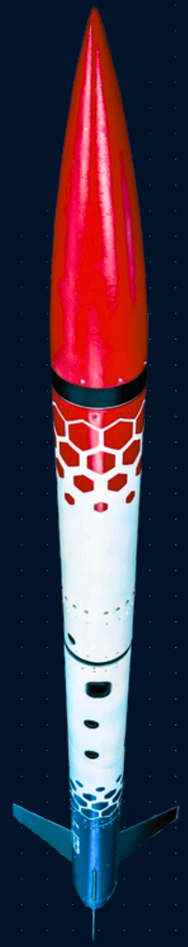
As the first rocket of the ESL program, ESL-1 offers the opportunity to try out new technologies never used before in the association.

The objective was to reach 3000 m with a COTS Engine.

34 kg
4,0 m

Cesaroni Pro-98 engine





ESL-1

Sounding Rocket
2023-2025

The C'Space 2025 launch campaign was a great success for ESL-1 with a spectacular nominal flight which marks an important milestone for the team.

This success represents a promising first step towards an ambitious objective : beat the french student altitude record !

ESL-1 X NARVAL

The best of both worlds

2023-2025

"Narval" is an RCS controlled rocket, i.e. the rocket can self induce or correct its spin on the roll axis by gas ejection. The technical complexity comes with the use of custom made nozzles to optimize the available thrust.

In order to fit new requirements from our launching site, we have decided to move the RCS experiment from Narval to ESL.

We are now working on the integration of Narval in the new rocket following more severe requirements, a new size and mass and a lot more thrust.

NAGA-02

Hybrid Engine

2024-2026

NAGA-02 is our second hybrid rocket engine. Unlike its predecessor wich used liquid H202 and solidh paraffin, this new engine uses liquid NO2 to propell our future rockets.

More thorough tests are planned to confirm the final design of NAGA-02. It will then be integrated to the rocket.

What’s Next ?

2025

Proof of concept

- Launch of ESL-1 during the C’Space campaign with a COTS

Completed !

2025-27

Improving the technology

- ESL-2 launched with the NAGA-02 engine

2027-29

Reaching our objective

- Launch of ESL-3 at a private launchpad with the NAGA-03 engine

FUSEX PROGRAM

EXPERIMENTAL ROCKETS

For more in-depth research

EXPERIMENTAL ROCKETS

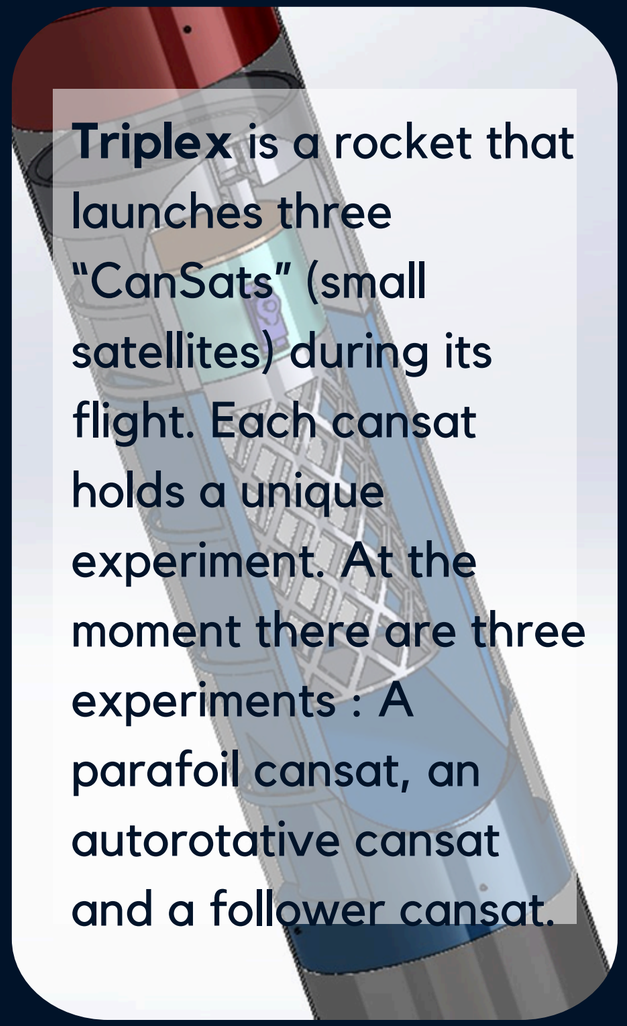
2025-2026

The **AURA** project aims to analyze the flow around a FusEx during launch. The objective is to study certain areas initially through CFD (Computational Fluid Dynamics) studies and then compare them with the results obtained during the C'Space launch campaign.

LANDER is an experimental rocket designed to perform a vertical landing using deployable legs triggered by sensors. The parachute will be ejected by the nose cone to ensure a controlled descent. Scheduled for C'Space 2027, a terminal gas braking system may be integrated.

The **SPECTRA** project carries two experiments: one dedicated to studying the airflow around the fins using pressure sensors, and the other focused on an innovative recovery system that combines simplicity and efficiency.

EXPERIMENTAL ROCKETS



Triplex is a rocket that launches three “CanSats” (small satellites) during its flight. Each cansat holds a unique experiment. At the moment there are three experiments : A parafoil cansat, an autorotative cansat and a follower cansat.

Triplex

2023-2025

The C’Space 2025 launch campaign was a great success for Triplex as well, with a nominal flight for the rocket and its 3 CanSats

MINIF PROGRAM

MINI-ROCKETS

Our most popular and educational projects

MINI-ROCKETS

This kind of rocket is the most popular amongst our youger members. They are a great way to teach them how to make a rocket from scratch. Everything is homemade : the body, the nosecone, the electronics, the parachute...

These Mini-Rockets can fly up to 350 m high

Theseus - 2020

Theseus received the autograph of Arnaud Prost, reservist austronaut !

BIBI

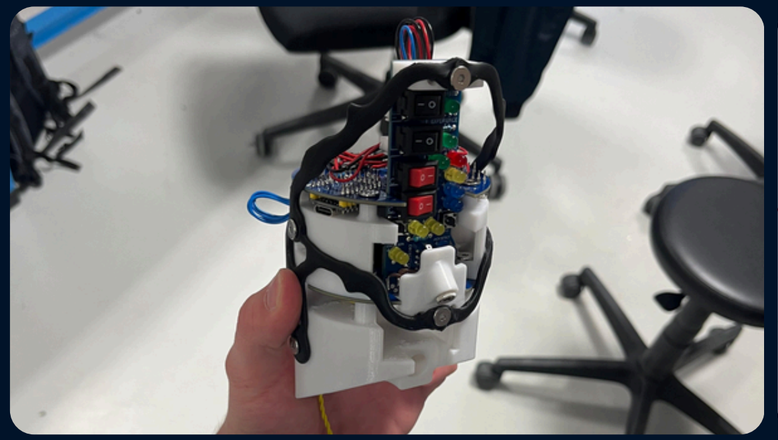
Bistage mini-rocket

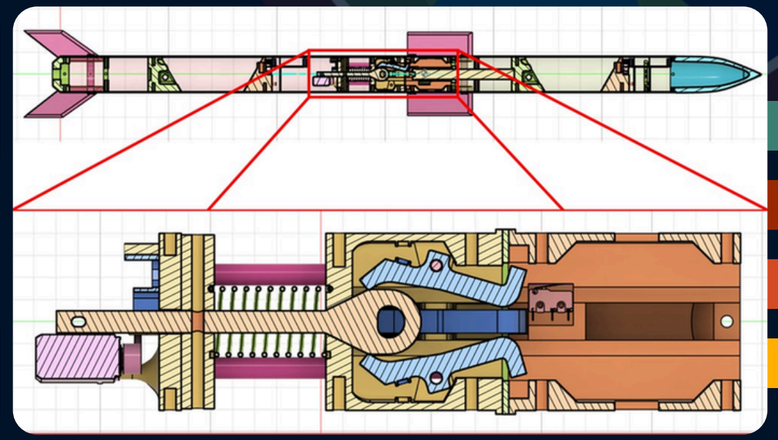
2024-2025

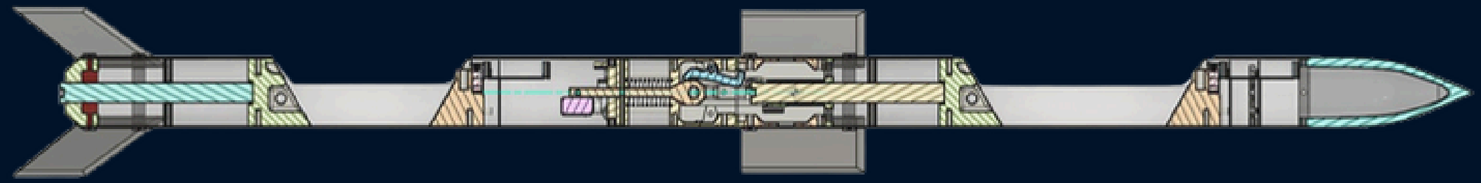
This ambitious project goes beyond the traditional training mini-rockets offered by the association.

Designed and led by fourth-year students, its goal is to develop and test an innovative interstage separation system, specifically tailored to the strict size and weight constraints of small-scale rockets.

As a true technology demonstrator, the rocket also features a cutting-edge avionics bay, equipped with high-performance LoRa telemetry and onboard cameras to capture live footage of the flight and separation.







BIBI

Bistage mini-rocket

2024-2025

C'Space 2025 was a real success for BIBI, with nominal flights for both stages of the rocket.

Moreover, the rocket received the **Best Mini-Rocket Award at C'Space 2025**, presented by Planète Sciences and CNES!

MINI-ROCKET LAUNCH CAMPAIGN

The year 2025 marked an important milestone for the Mini-Rocket program, with the launch of the first internal campaign at ESO!

The event was also broadcast live on Twitch for members who couldn't be there in person.

This year, five projects were launched, in addition to those sent to C'Space!

"Objectif Lune" - 2025

"Stratos" - 2025

MINI-ROCKETS

2025-2026

Big & Bang is a mini-rocket project whose nose cone, which is a Cansat, is ejected, films its descent, and lands using deployable legs. This project combines electronics and mechanics to provide comprehensive training in the design of both a rocket and a microsatellite.

TOTORO, inspired by the character of the same name, is a rocket equipped with a unique umbrella-shaped recovery system. This system will most likely be deployed using a linear actuator and will slow the rocket to a safe speed, just like a parachute.

CANSAT PROGRAM

CAN-SIZED EXPERIMENTS

An innovative and educative program

CANSATS

Can-sized experiments

A CanSat is an autonomous device whose objective is to simulate a microsatellite capable of conducting scientific experiments.

Generally cylindrical in shape, a CanSat is about the size of a soda can (or slightly larger) and is dropped from a height of 150 meters by a drone. In some cases, it can also be installed aboard a rocket to reach several hundred meters of altitude (such as the aformentionned Triplex rocket)

For this first participation in the competition, our CanSat team won the **Best Beginner CanSat Award at C'Space 2025!**

OTHERS

NON TECHNICAL PROJECTS

Teamwork makes dream work !

As the only space oriented association in our school, we try our best to federate all the Rocket enthusiast students around our projects. The ESO really contributes to the student life, whether it is as a technical association and as **a big family**.

ESO
ESTACA SPACE ODYSSEY

Communicating and sharing

As passionate people, sharing and vulgarizing is a big part of what we do. We regularly attend congresses or events to show and communicate about what we love.

PARTNERSHIP

HOW YOU CAN HELP US

PARTNERSHIP & CONTRIBUTION

Be a part of the adventure !

As a student association, donations and sponsorisation are what make us thrive. It's simple, we cannot do it without you !

Donations can be financial, material or intellectual. We benefit from your knowledge and experience.

By helping us, you are enabling the progress of the new generation of engineers and shaping the future of the French space industry.

Test bench, made in collaboration with ArianeGroup

Parachute fabric, gifted by Diatex

Carbon Sandwich Tubes, gifted by EOS Technologies

PARTNERS

They already trust us,
Why not you too ?

The partnerships we want to set up are a real relationship between the partner and us: we send out newsletters almost every month, invite them to some of our review meetings, our almost annual gala, our launches...

We can also propose meetings between professionals and students, which are always appreciated, to discuss projects or other matters.

Financé par la cvec

DIATEX

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ESTACA
ECOLE D'INGENIEURS

GO TRONIC
BOTIQUE ET COMPOSANTS ÉLECTRONIQU

LET'S WORK TOGETHER

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