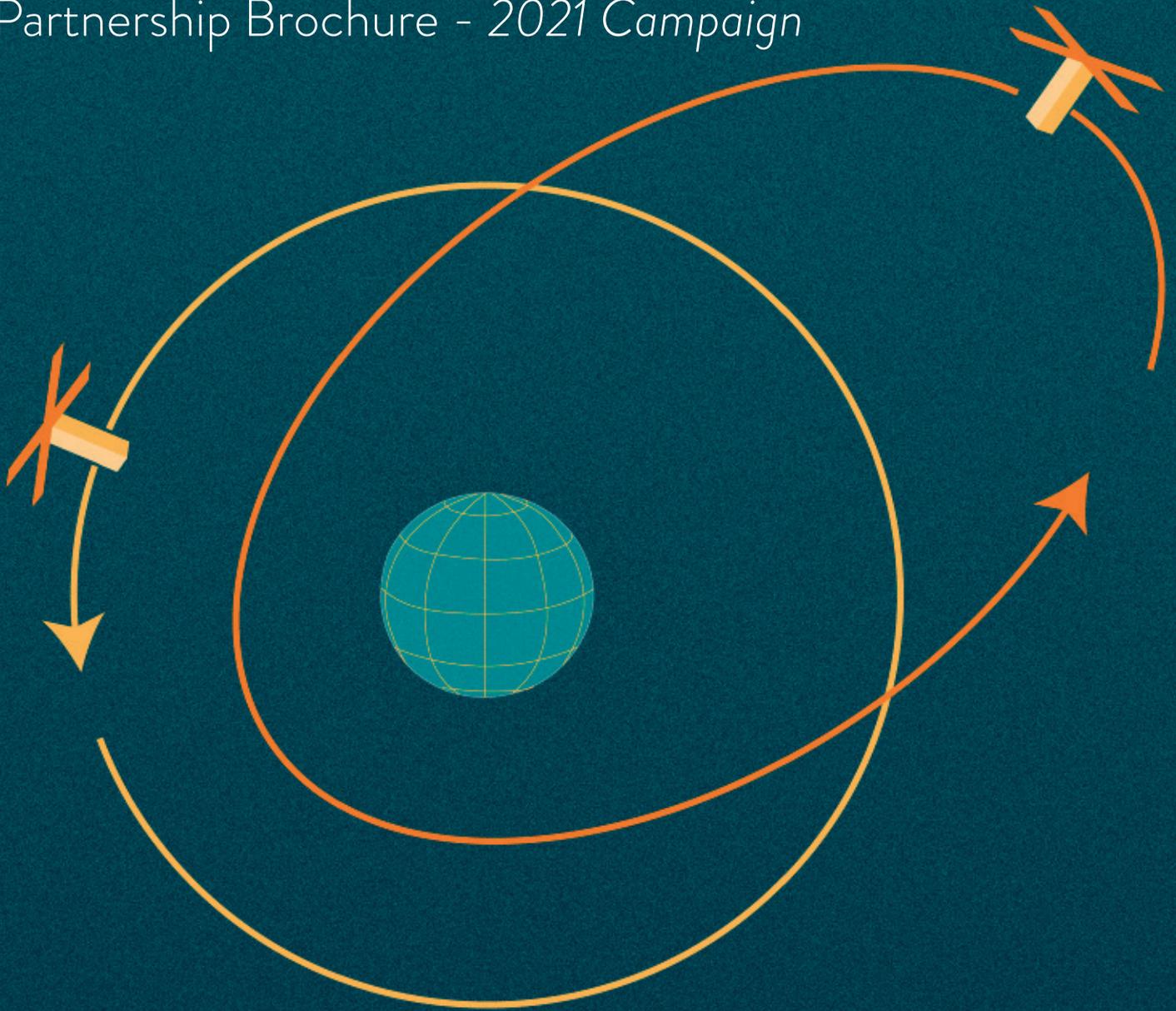




# CHESS Space Mission

Partnership Brochure - 2021 Campaign



haute école  
neuchâtel de la jura

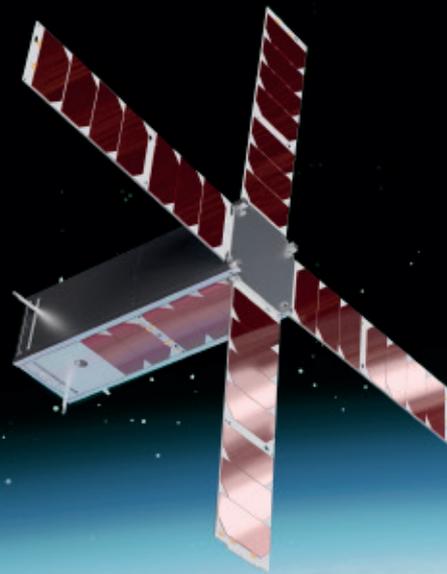


Lucerne University of  
Applied Sciences and Arts  
HOCHSCHULE  
LUZERN



# INSPIRE, EDUCATE, LEAD

The CHES mission aims to support Switzerland's lead in sustainable space initiatives and exoplanet research by flying two nanosatellites to analyze Earth's upper atmosphere, while training the next generation of ambitious engineers.





# A JOURNEY INTO SPACE...

**Students** and **experienced researchers** from **6** Swiss universities will design, build and fly 2 nanosatellites over the next 5+ years. They will be deployed on two separate orbits to measure the evolution of Earth's atmospheric composition.

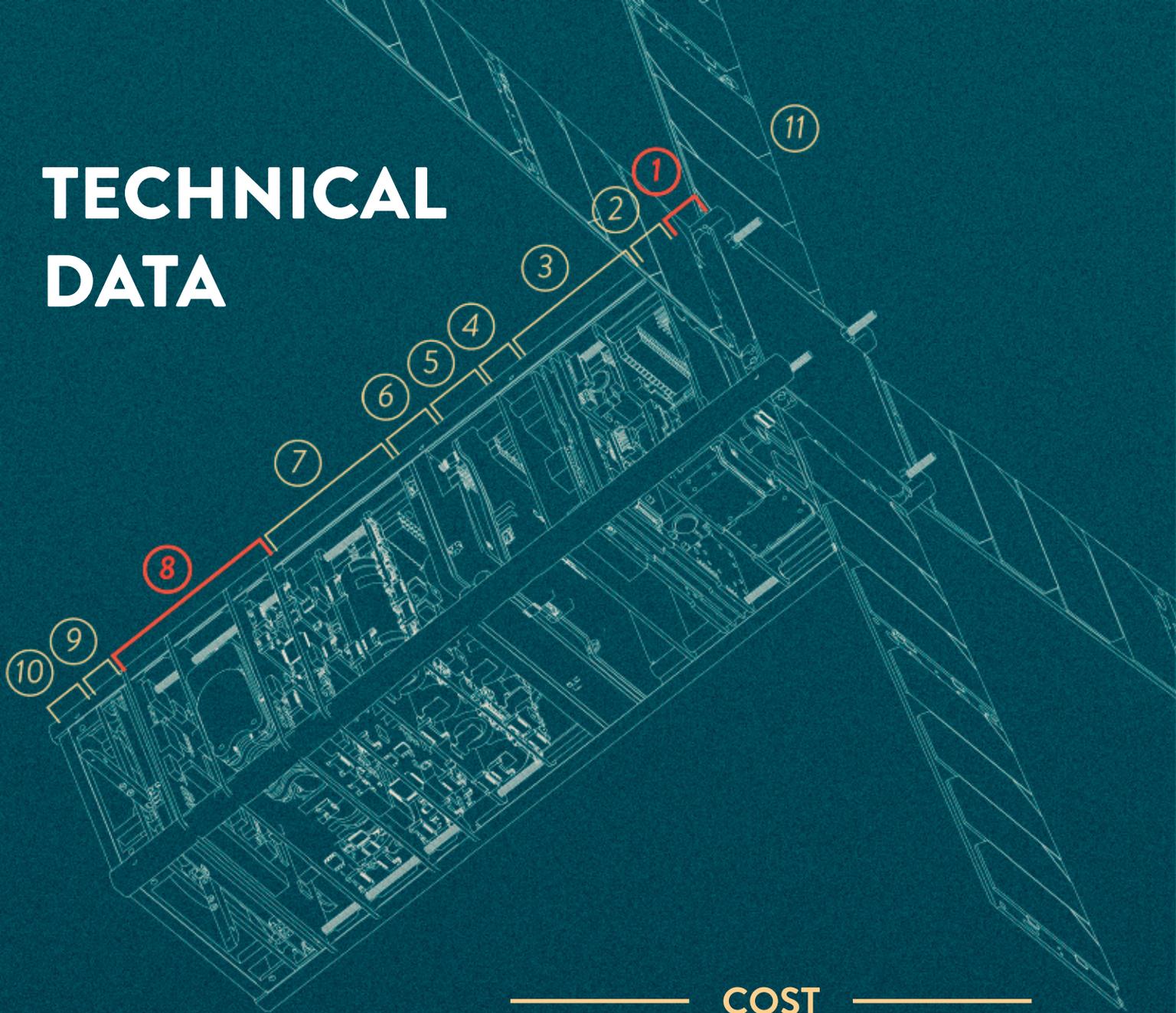
# ...TO UNDERSTAND OUR ATMOSPHERE

Earth's upper atmosphere is poorly known as yet. To tackle **climate change** and offer a more **sustainable access** to space, scientists, governments and industries need to understand how our planet's atmosphere is evolving. This requires **reliable data**.

## AND BEYOND

Our measurements will enable us to develop world-class tools for **climate research** and for **managing debris** that threatens the space environment. This data will also stimulate the search for **exoplanets** and extraterrestrial life by providing a better understanding of what makes Earth so special.

# TECHNICAL DATA



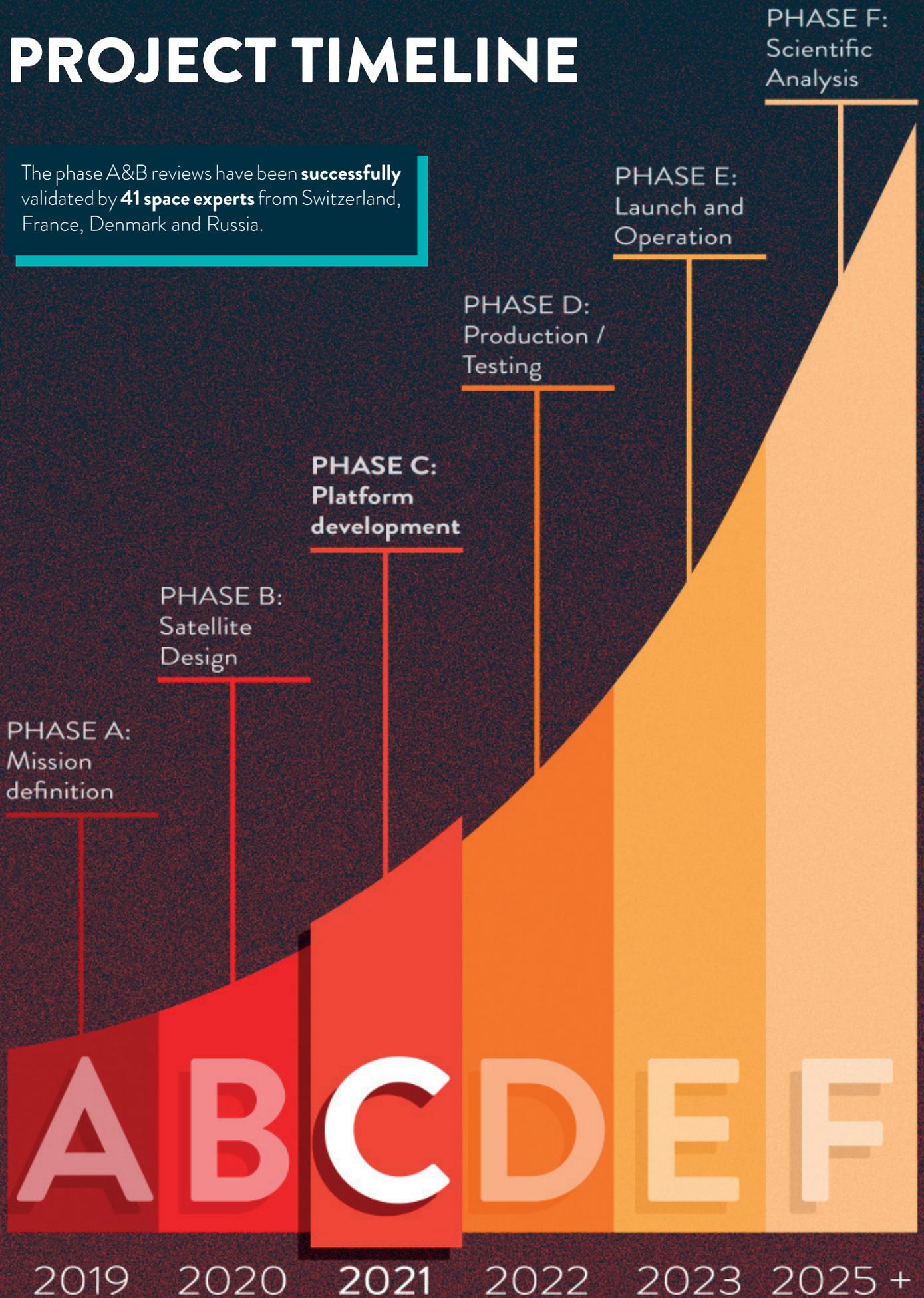
- ① **GNSS: position system**  
(secondary payload)
- ② OBC (On-Board-Computer)
- ③ ADCS (Attitude Determination and Control System)
- ④ R-A Transponder  
(Radio communications)
- ⑤ UHF Transceiver  
(Radio communications)
- ⑥ X Band Transmitter  
(Radio communications)
- ⑦ Batteries
- ⑧ **Mass Spectrometer**  
(primary payload)
- ⑨ UHF/VHF Antennas  
(Radio communications)
- ⑩ S/X Band Antennas  
(Radio communications)
- ⑪ Solar panels  
(Energy production)

## COST

	Total for 2 Satellites
<b>Payloads</b>	<b>1'750 kCHF</b>
<b>Satellite Platform</b>	<b>1'400 kCHF</b>
<b>Integration &amp; Testing</b>	<b>240 kCHF</b>
<b>Manpower</b>	<b>510 kCHF</b>
<b>Launch</b>	<b>750 kCHF</b>
<b>Operation</b>	<b>350 kCHF</b>
<b>Overall Budget</b>	<b>5 MCHF</b>

# PROJECT TIMELINE

The phase A&B reviews have been **successfully** validated by **41 space experts** from Switzerland, France, Denmark and Russia.



# PROJECT LEAD



The CHES mission was initiated by three EPFL students. With the help of experienced advisors from the EPFL Space Center, the now 40+ students team drives the project by carrying tasks going all the way from project management to subsystems design and integration.

# SUPERVISORS



Jean-Paul Kneib (EPFL)  
Principal Investigator



Markus Rotacher (ETHZ)  
GNSS payload



Rico Fausch (UniBe)  
Principal Investigator for  
Science



François Corthay (HES-  
SO)  
On-Board Computer



Marcel Joss (HSLU)  
Telecommunications



Nuria Pazos Escuderos  
(HE-arc)  
Flight Software





# WHAT YOU CAN GAIN FROM CHESS

- Customized marketing for **brand reach** on platform.
  - Customized repositioning of **brand awareness** and applicability.
  - Customized platform to showcase sponsor's **social responsibility** initiatives.
  - Increasing brand awareness of sponsors to **nationwide clientele**.
  - Access to all the partners for **networking and collaborations**.
  - Joint **event organization** to foster internal visibility on both sides.
  - Presenting **sponsor on website**, editorials and social media.
- 

# YOU CAN MAKE A DIFFERENCE

CHESS offers you the **opportunity** to support an extraordinary Swiss project tackling **sustainability** issues, providing access to innovative technologies and direct contact with the brightest and boldest engineering minds. This is a **large-scale project** with a nation-wide collaboration of various partners. And it can only be achieved by you **joining forces** with us.

Help us kickstart phase C!

[www.chessmission.ch](http://www.chessmission.ch)



[deblina.bhattacharjee@epfl.ch](mailto:deblina.bhattacharjee@epfl.ch)



# TESTIMONIES

“ I had the privilege to manage the student team that developed and operated the SwissCube mission, a CubeSat that was launched in 2009 and is still operational after 11 years. Over the last 2 years working with the CHESSE team, it has become obvious that this team is made of the same competent, smart and hard working young people. It is a team worth investing in! They will make it fly!

”



**Muriel Richard-Noca**, *ClearSpace Co-founder, CTO*



“ CHESSE is a very innovative space system utilizing cubesats to analyze and characterize the properties of the extremely low density thermosphere and exosphere beyond 400 km altitude. The recorded data will be essential to generate a safe and efficient space traffic management scheme applicable to these constellations.

”

**Claude Nicollier**, *EPFL honorary professor and former astronaut*