



ARIS - Akademische Raumfahrtinitiative Schweiz

aris
space to grow

beyond gravity

KISTLER
measure. analyze. innovate.

maxon

**meteo
matics**

RAMSEYER 80
1944 - 2024

ETH zürich

**zh
aw** School of
Management and Law

 **Universität
Zürich** UZH

**HOCHSCHULE
LUZERN**

 **OST**
Eastern Switzerland
University of Applied Sciences

2017
founded

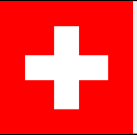
250+
active
members

aris
space to grow

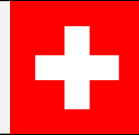
70+
partners

5
universities

200+
alumni



Strengthen the Swiss space sector trough ...



... education



TEAM 27 - EIDGENÖSSISCHE TECHNISCHE HOCHSCHULE ZÜRICH
ZÜRICH, KANTON ZÜRICH, SWITZERLAND



... inspiration



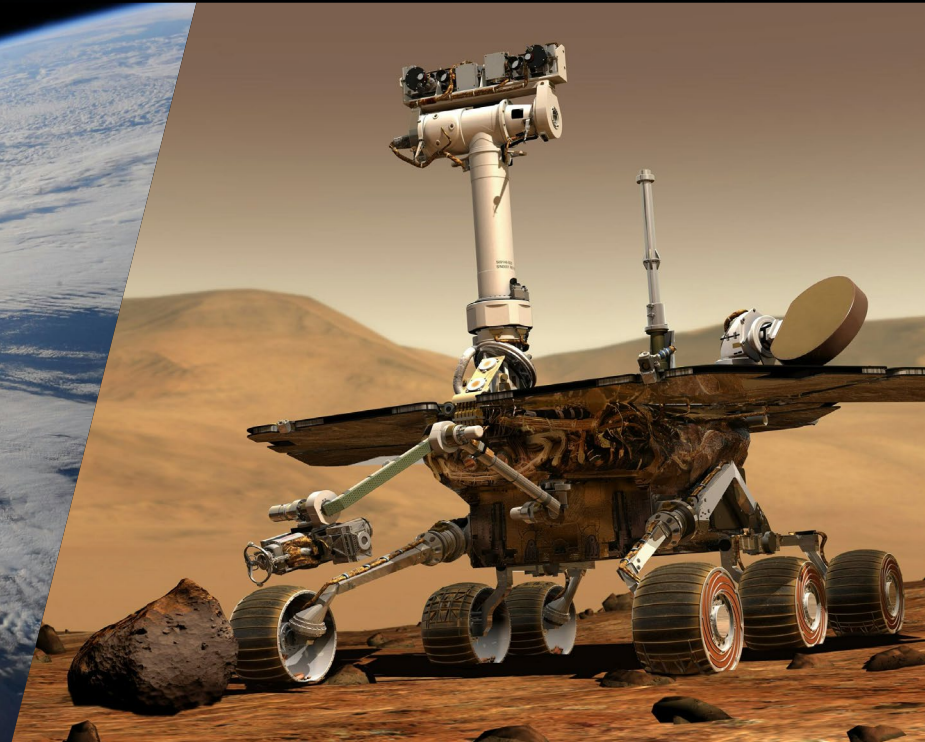
Space Systems



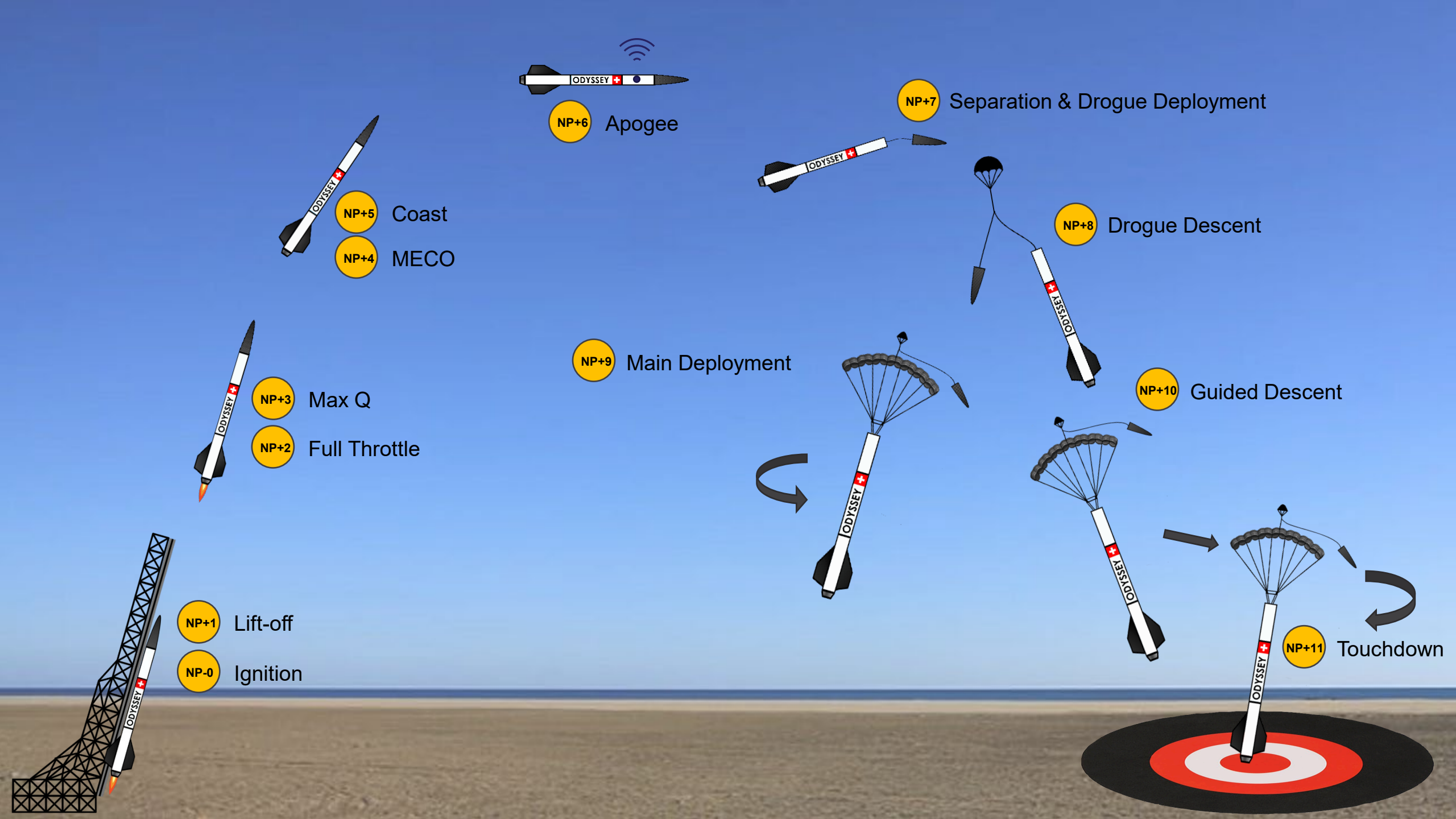
Rockets



Satellites



Robots



NP+1 Lift-off
NP-0 Ignition

NP+3 Max Q
NP+2 Full Throttle

NP+5 Coast
NP+4 MECO

NP+6 Apogee

NP+7 Separation & Drogue Deployment

NP+8 Drogue Descent

NP+9 Main Deployment

NP+10 Guided Descent

NP+11 Touchdown

What is needed for a rocket launch?

Structures &
Avionics



Engine



Recovery





What is needed for a rocket launch?

Structures &
Avionics



Engine



Recovery



Rocket Engines



SOLID

Fuel: *solid*
Oxidizer: *solid*



HYBRID

Fuel: *solid*
Oxidizer: *liquid*



LIQUID

Fuel: *liquid*
Oxidizer: *liquid*

ETH zürich

Institute for
Dynamic Systems and Control
IDSC

zhaw
HOCHSCHULE
LÜZERN
University of
Zürich

beyond gravity

ESTECH
INDUSTRIES | FAES-PWR

emi
Technik AG

ADP
ATP HYDRAULIK

BOLLHOFF

BREIT

FEUSI
Aus Passion für Präzision

FLS
GROUP
TAILOR-MADE GLOBAL SOLUTIONS

FRANKE
Franke Industries

Conducta

ERB
ERB

D-Link
FLARM
hasler
Kalrez

KISTLER
measure. analyze. innovate.

maxon

oerlikon
am

HB
Mitutoyo

Kindlimann ag
RAMSEYER

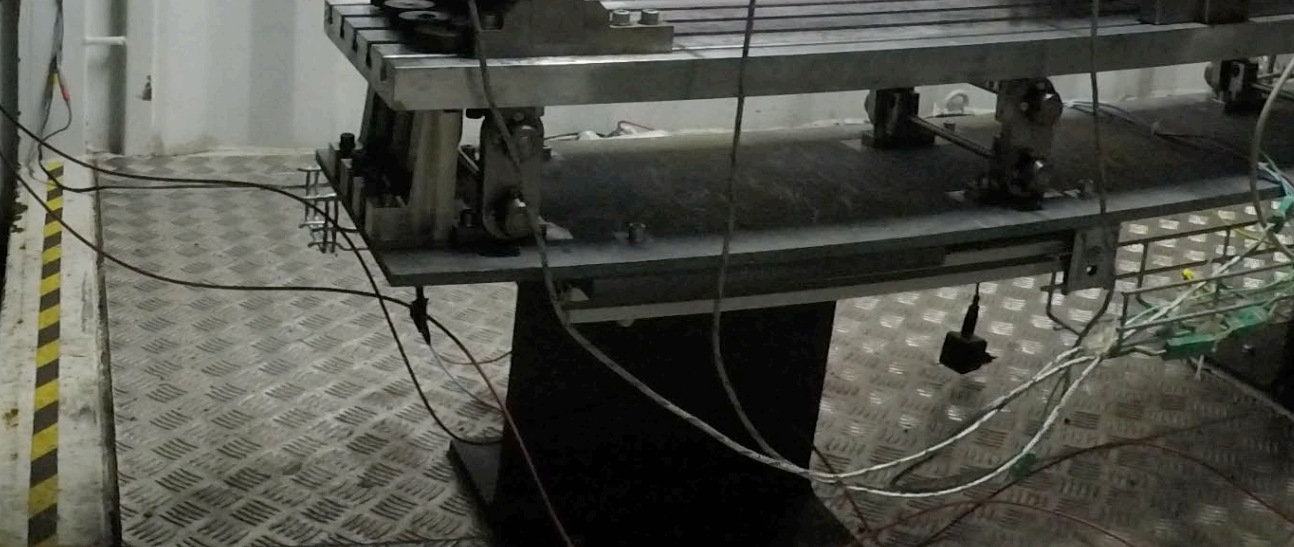
RAMSEYER

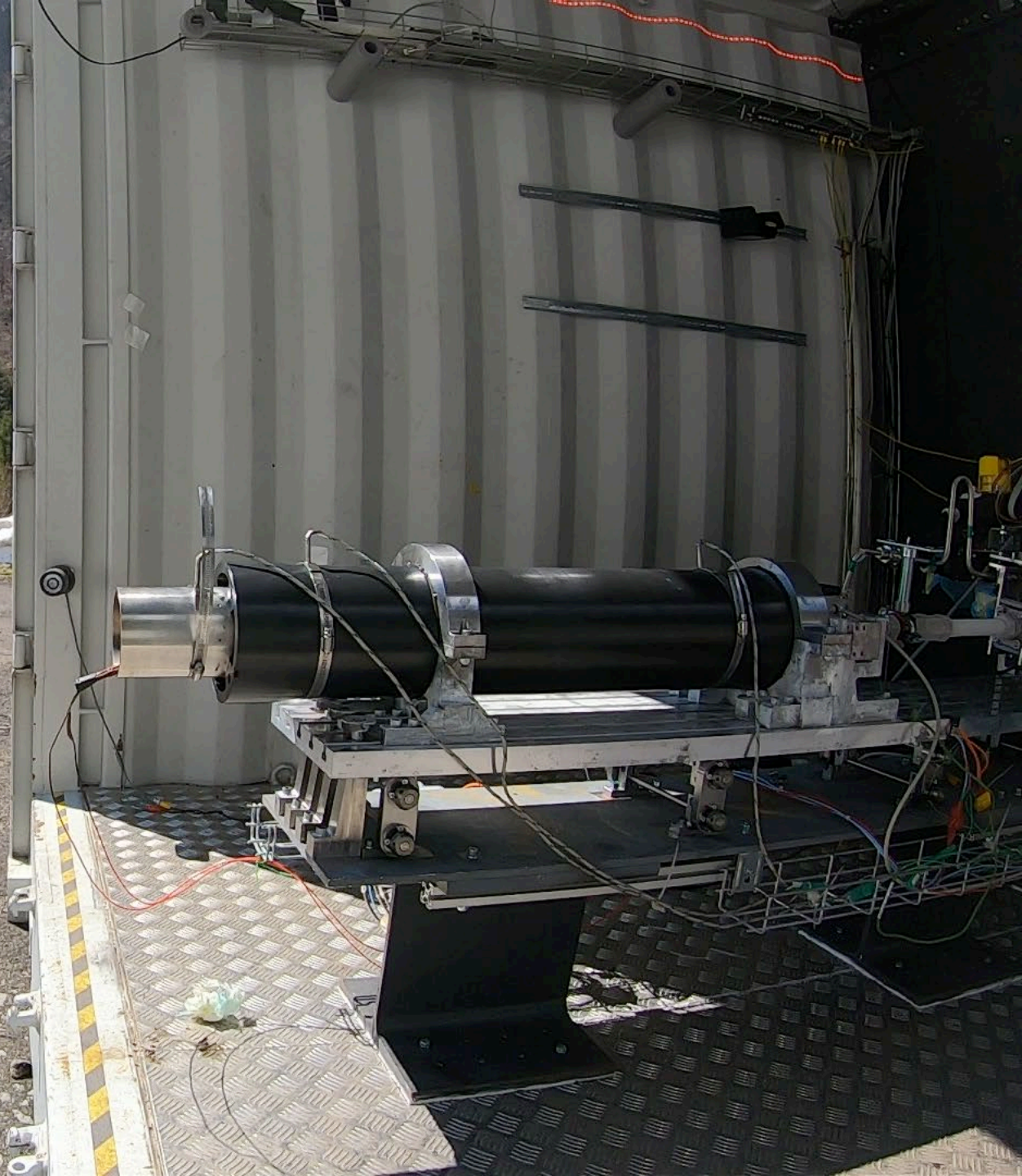
Swagelok

RHEINMETALL

SFS

SKF
REMCO
trafoc





What is needed for a rocket launch?

Structures &
Avionics



Engine



Recovery



Rocket Recovery



Ocean Splash-Down



Propulsive



Guided Recovery

Rocketry – All comes together

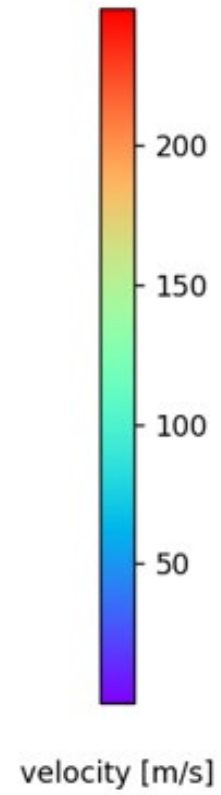
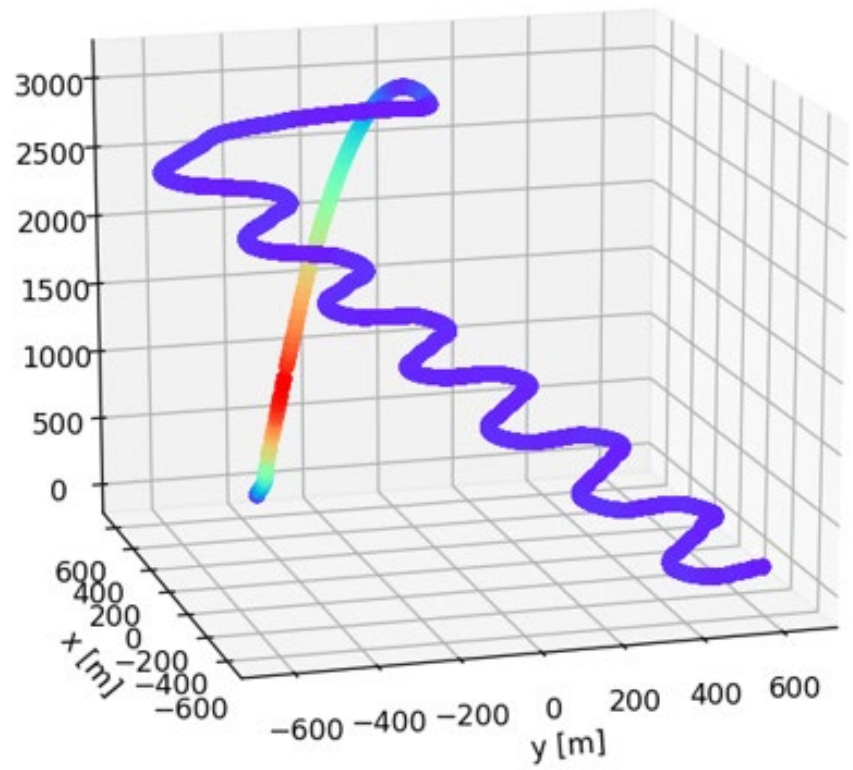


Hybrid Rocket



Guided Parachute

EuRoC22

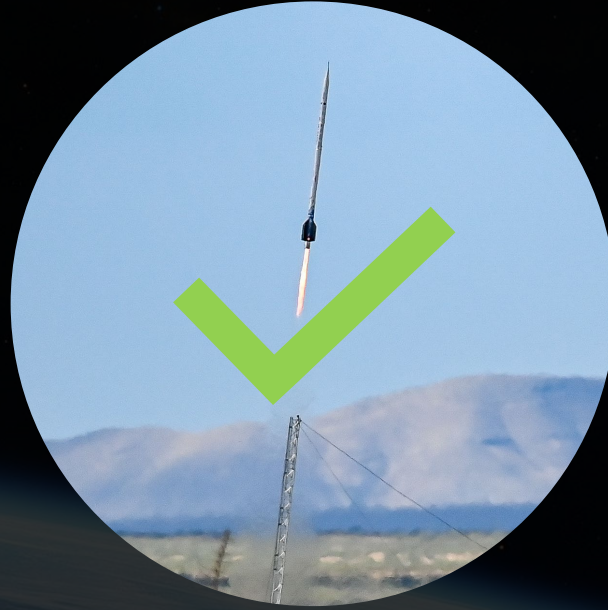


Rocket Engines



SOLID

Fuel: *solid*
Oxidizer: *solid*



HYBRID

Fuel: *solid*
Oxidizer: *liquid*



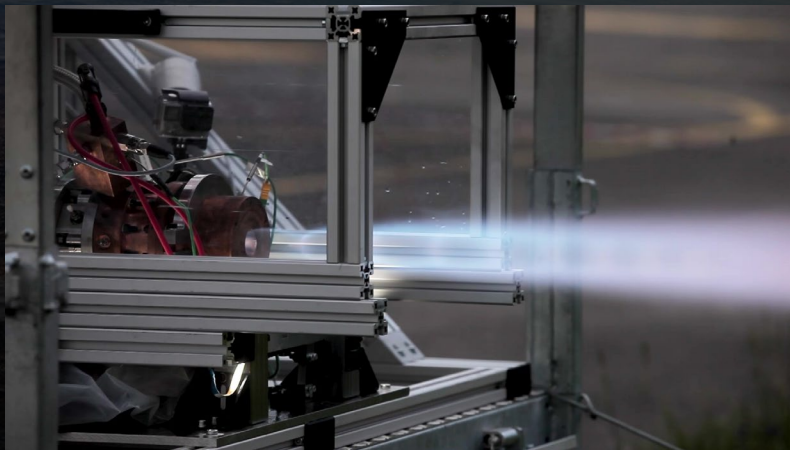
LIQUID

Fuel: *liquid*
Oxidizer: *liquid*

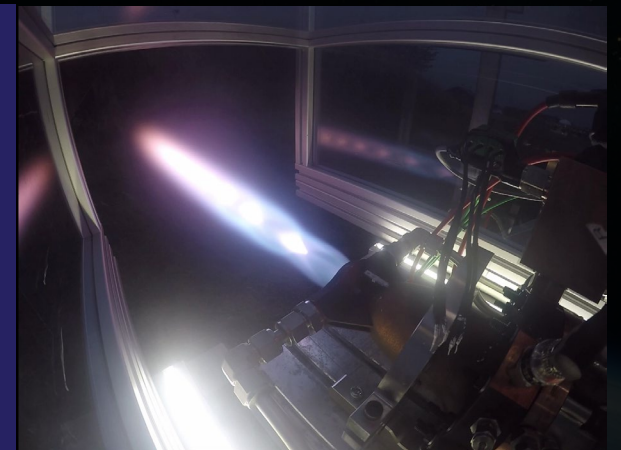
Where are we with LRE's?



Horizontal LRE test facility



LRE firings with up to 20 s burn time





am|z
advanced manufacturing
laboratory | ETHzürich

ETH zürich

aris
space to grow

Where are we headed?

Rocketry Development in ARIS



Liquid-Engine Development in ARIS

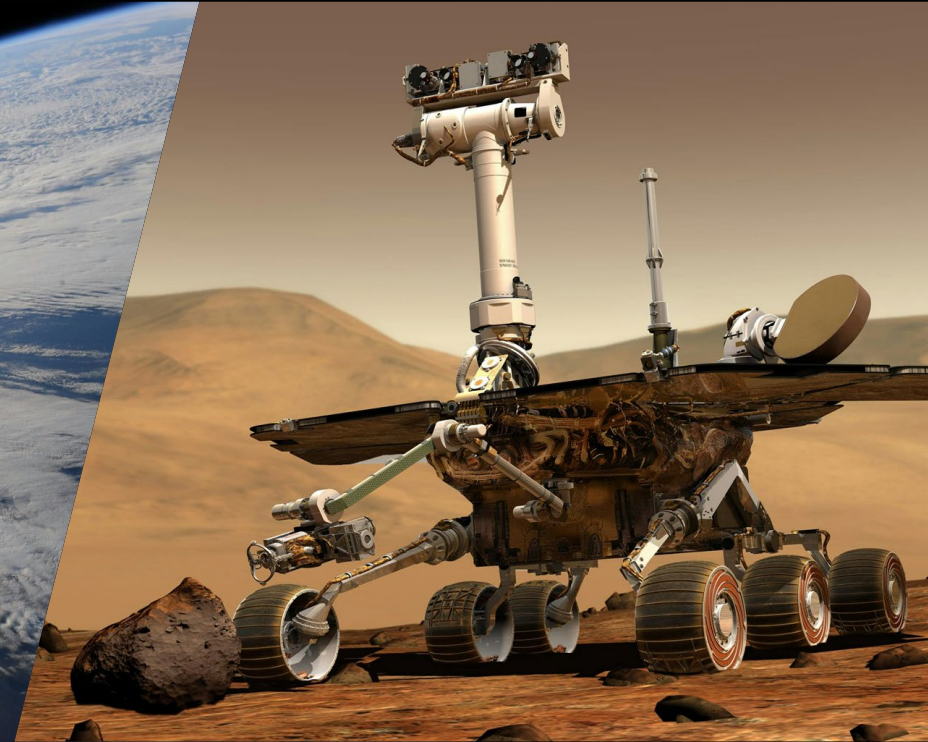
Space Systems



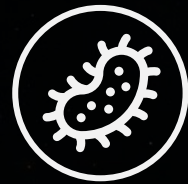
Rockets



Satellites



Robots



Aging in Cells:
Study the aging of cells under zero gravity for future space exploration.

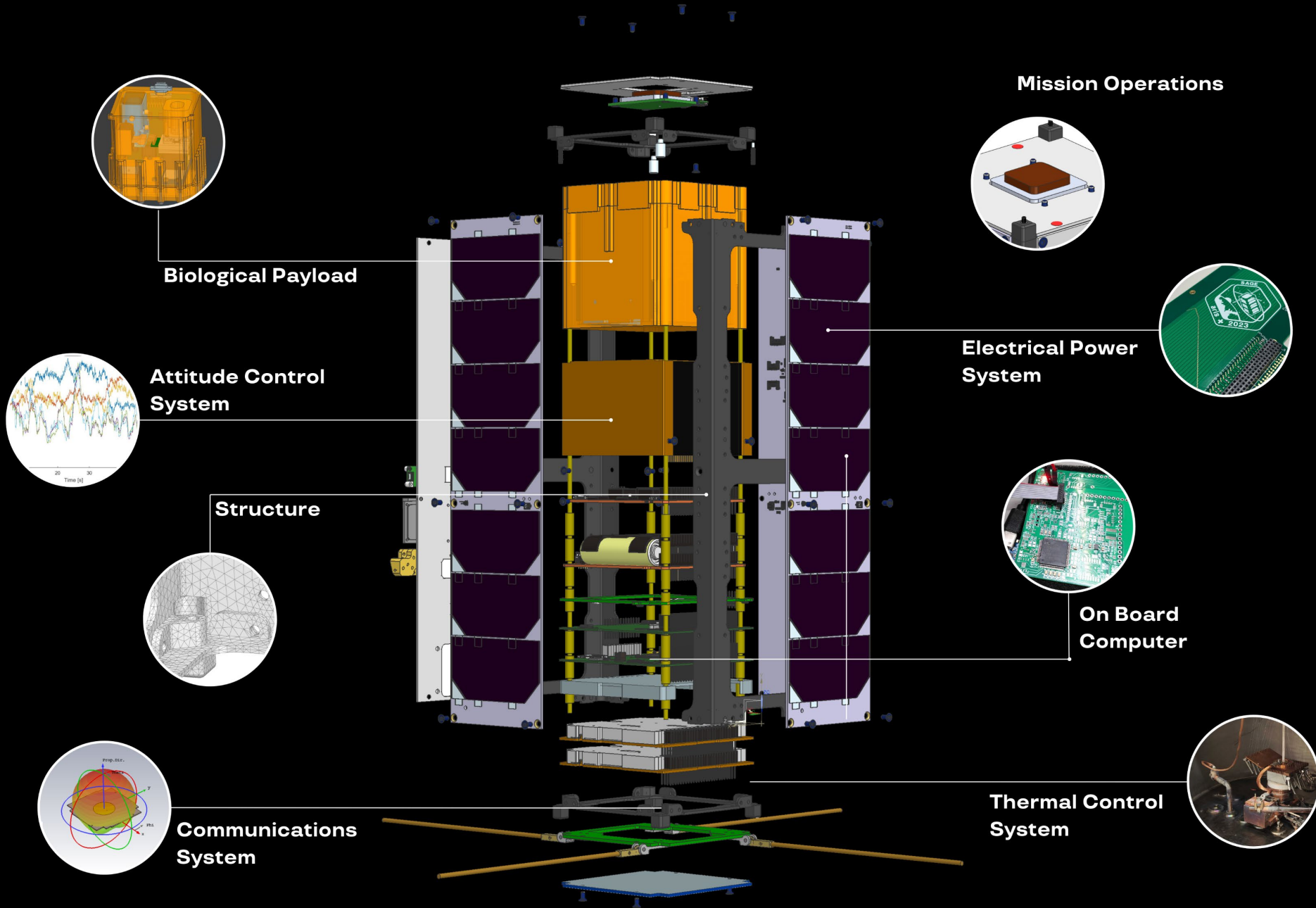


Satellite:
Provide and operate a satellite platform in space as an educational project

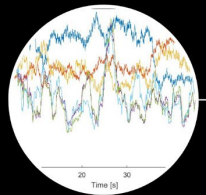


Communications:
An amateur radio transponder and an ETH developed GNSS module.

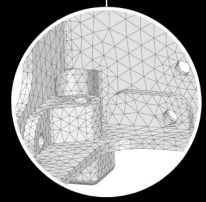




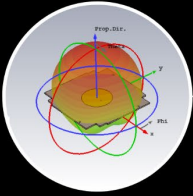
Biological Payload



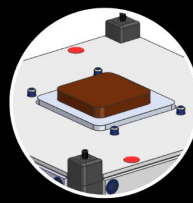
Attitude Control System



Structure



Communications System



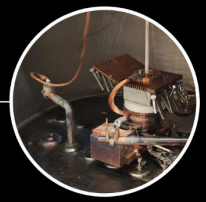
Mission Operations



Electrical Power System



On Board Computer

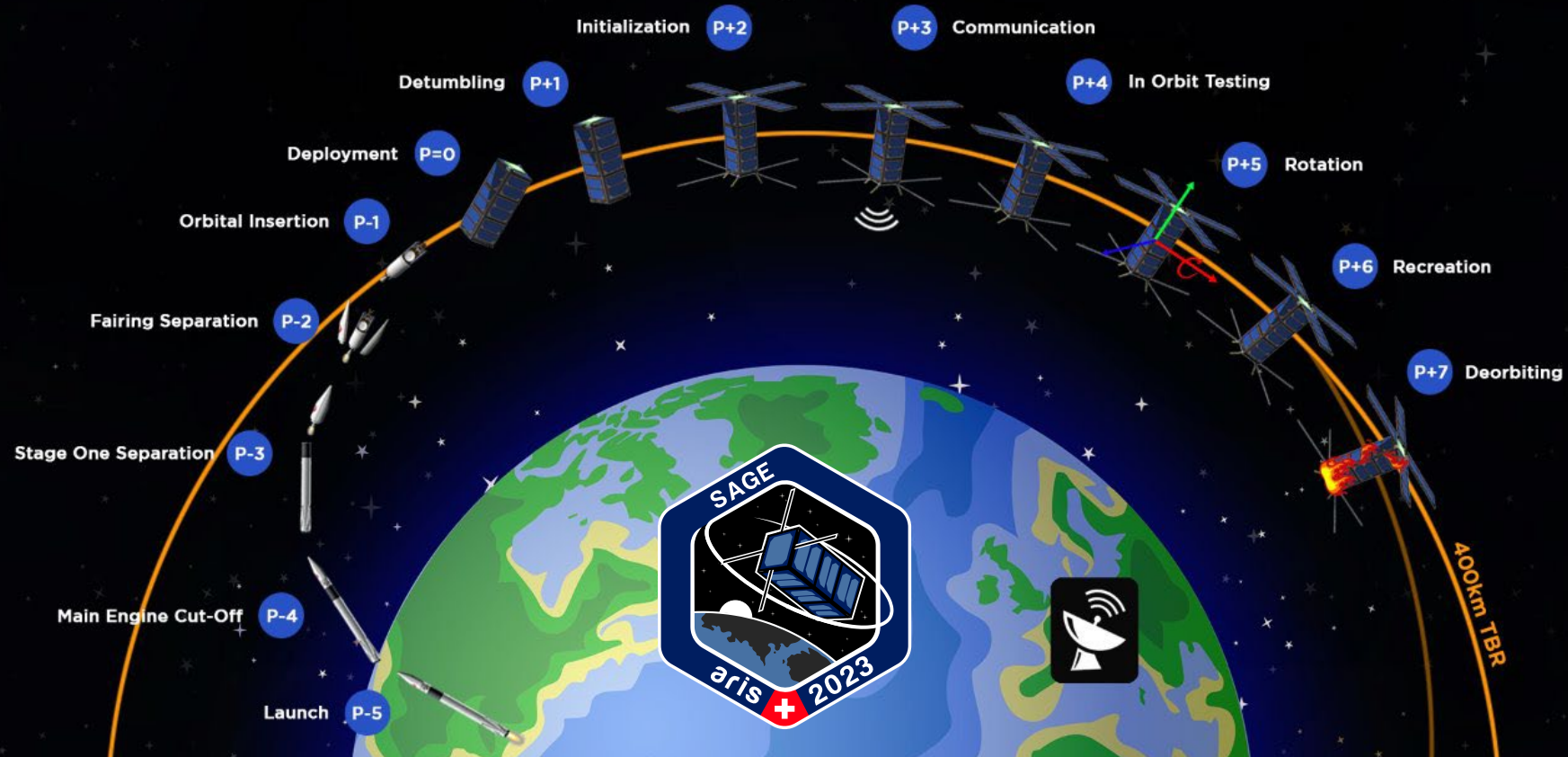


Thermal Control System



Where are we headed?

SAGE ConOps



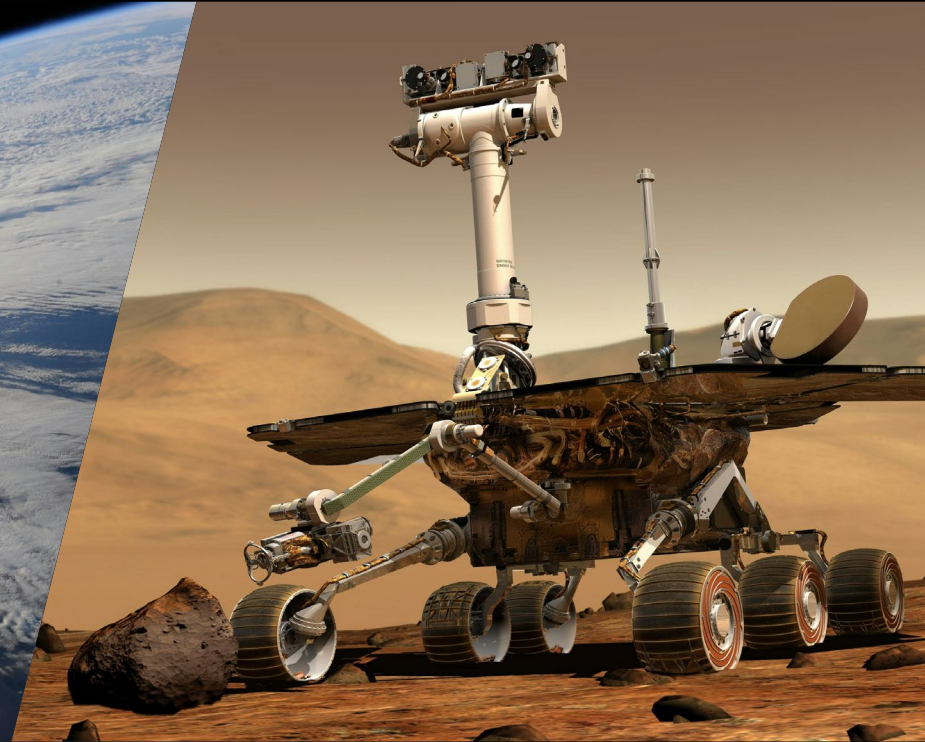
Space Systems



Rockets

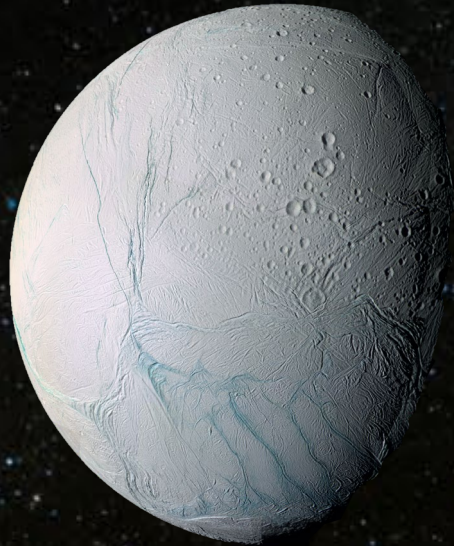


Satellites



Robots

1.000 Billion km away



Icy Moons

**Similar
Environment**

Polar Regions on Earth





Polar Research:

Provide a safe solution for accessing polar ice-shelves and conducting research



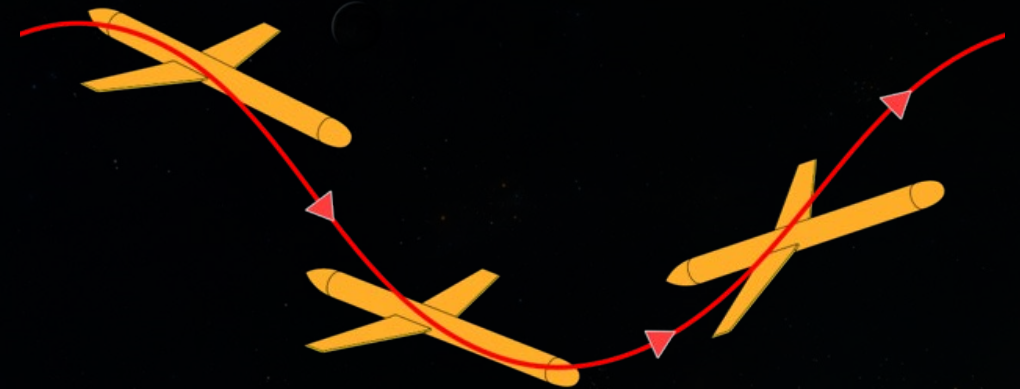
Navigation:

Autonomous underwater navigation system



Propulsion:

Efficient propulsion using buoyancy instead of propeller





Rescue Module

- Automatic ascent in case of system failure

Research Module:

- Sensors for research
- Experiments to be conducted during missions

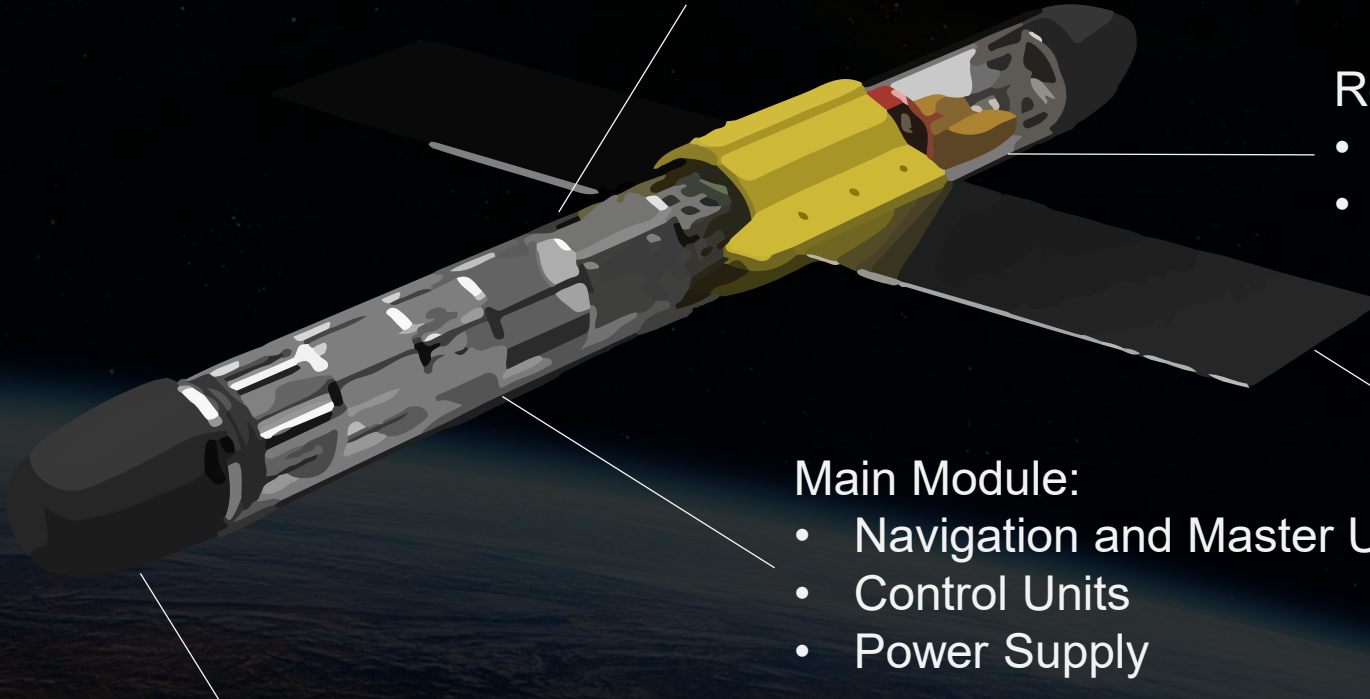
Main Module:

- Navigation and Master Unit
- Control Units
- Power Supply

Nose Cone:

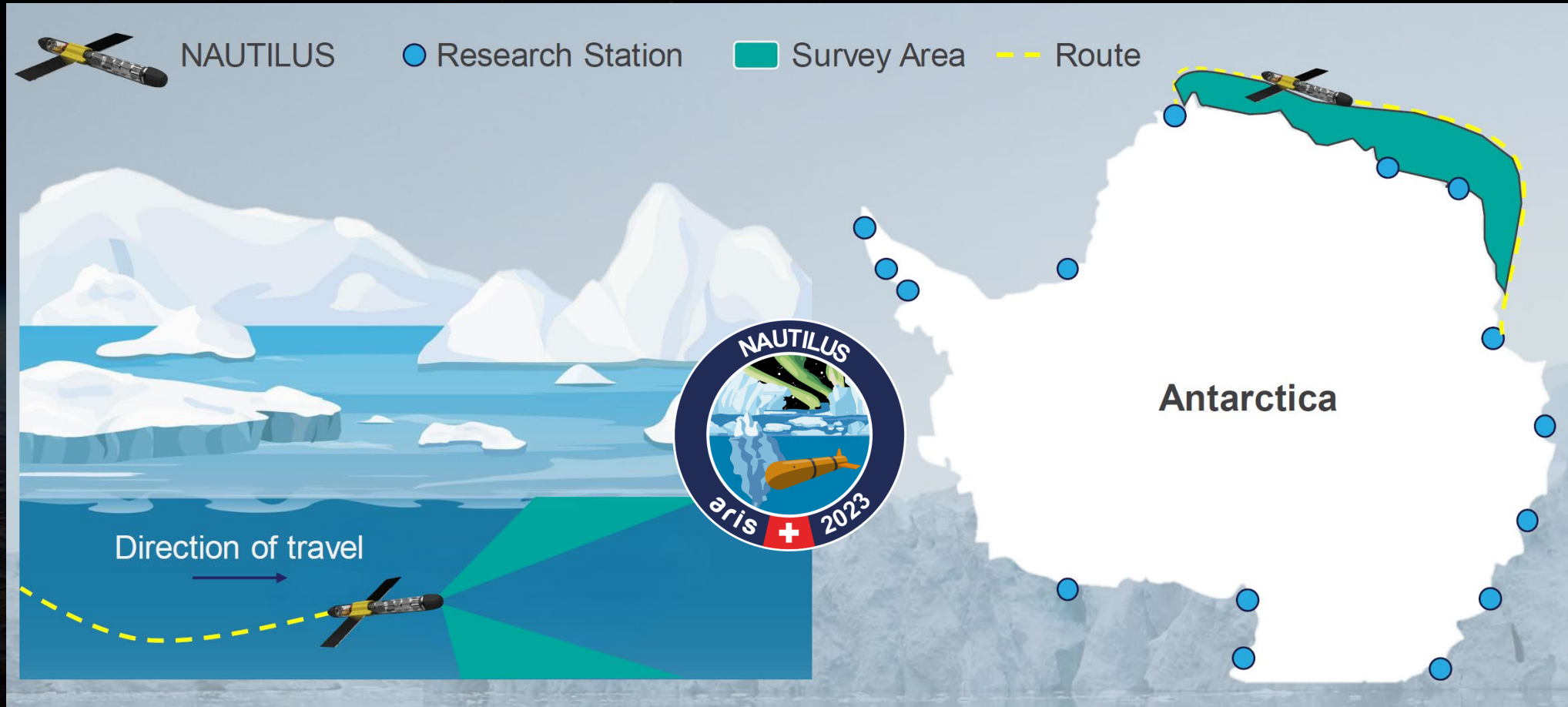
- Navigational Sensors
- Front-facing Sonar

Wings





Where are we headed?



ARIS Alumni

Where do our alumni work?





Using satellite imagery and meteo data to predict the future of planet Earth, a startup at ETH Zürich, Switzerland



Manuel Gerold
Co-Founder





Precise, flexible and low-cost launch service provider based in Augsburg, Germany



Rick Röthlisberger
Systems Engineer





First female German astronaut on first crewed mission over polar orbit.



Rabea Rogge
First ETH Astronaut





aris

space to grow

