

## HOW STUDENTS SHAPE THE FUTURE WITH THE 3DEXPERIENCE PLATFORM



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DINGORE**

Head of  
Structures  
ASTRA E.V.



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WISHWAKARMA**

Structural  
Engineer  
ASTRA E.V.



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Business &  
Authorization  
Lead  
HORYZN



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Project Lead  
HORYZN



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AZEVEDO**

Head of  
Sponsoring  
SP80



**Guilhem  
DESTRIAU**

President SP80  
Student  
Association  
SP80



**Anne  
MEIER**

HAMLET Project  
TRIER  
UNIVERSITY OF  
APPLIED  
SCIENCES



**Lena  
PITZ**

HAMLET Project  
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UNIVERSITY OF  
APPLIED  
SCIENCES



**ASTRA**

**EXPAND YOUR HORIZONS**

**PHOENIX ROCKET**

# WHO ARE WE ?

SHREYA WISHWAKARMA  
Structural Engineer



ATHARVA DINGORE  
Head of Structures

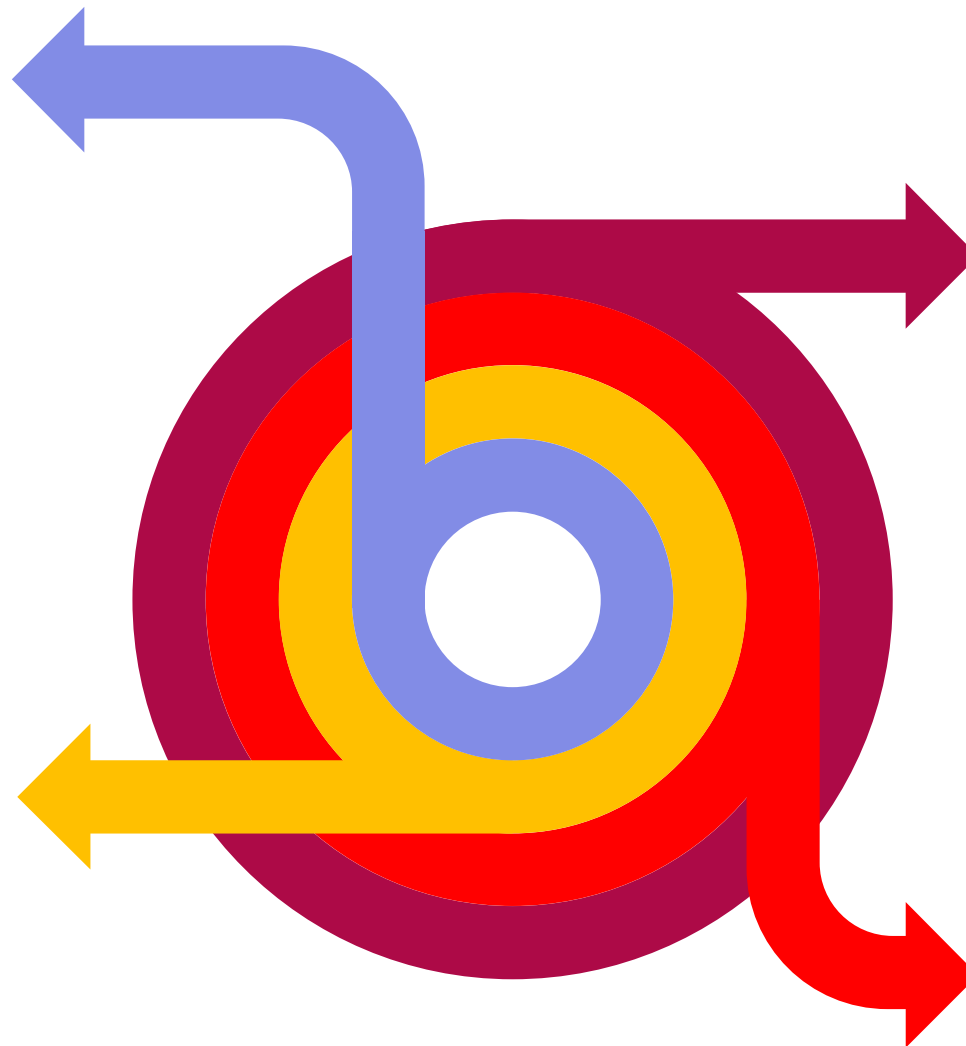
# ASTRA e.V. Bremen

A student-run space association – focused on Hybrid Rockets

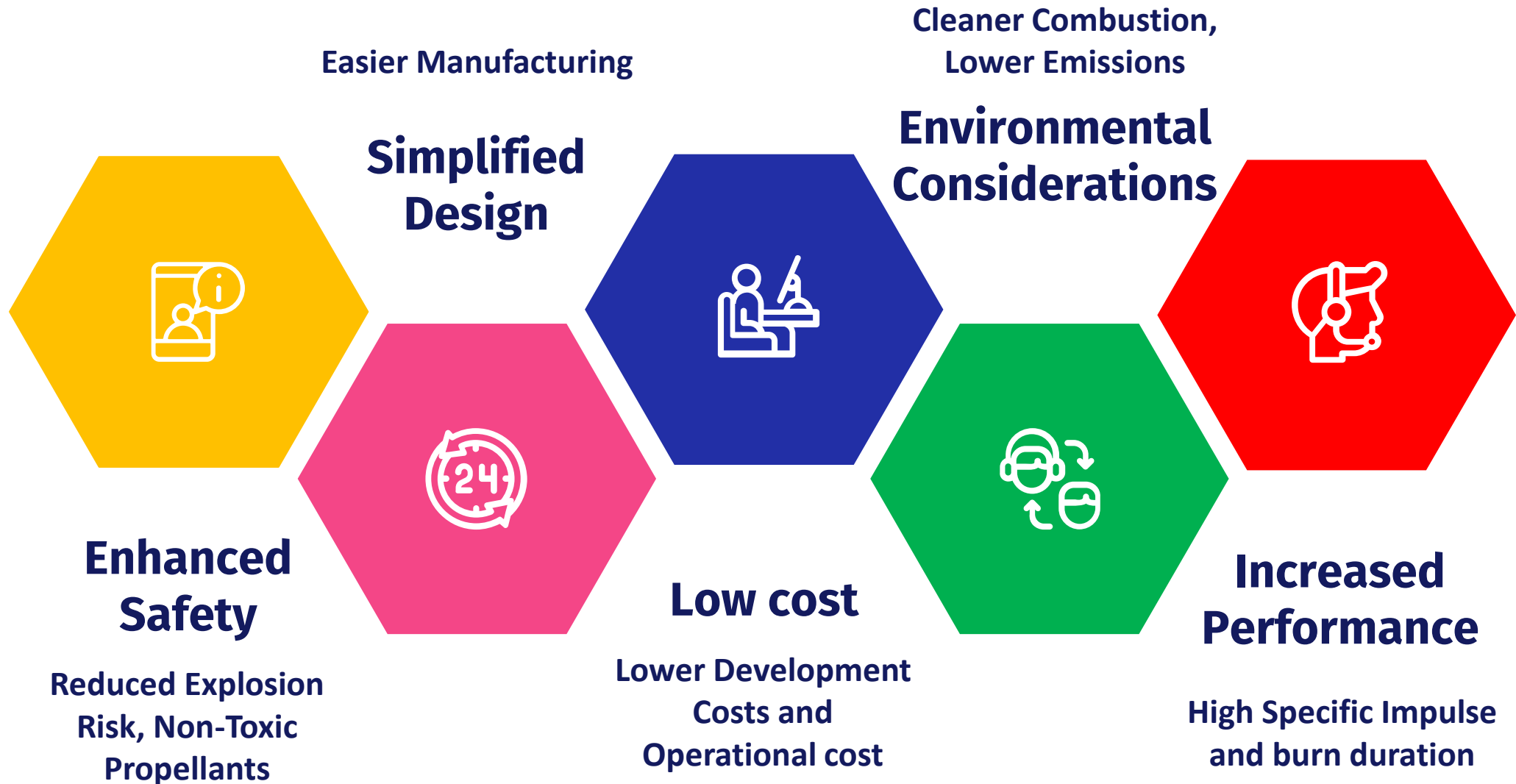
A team of 60+ Students, from over fifteen different courses of study

To give a opportunity to apply what they have learned and gain new skills.

Enable students to gain practical experience during their studies



# WHY BUILD A HYBRID ROCKET ?



**Hybrid Rockets has launch Costs of \$10M to \$40M, Compared to \$60M to \$200M for Liquid Rockets!**



**ASTRA INTEGRATED PHOENIX IN CITY CENTER**



**ASSEMBLY AT CREATIVE HUB**



**DHI EVENT**



**Executive Board**



**EUROC 2023**

# PHOENIX



GOAL  
ALTITUDE  
**9 KMS**

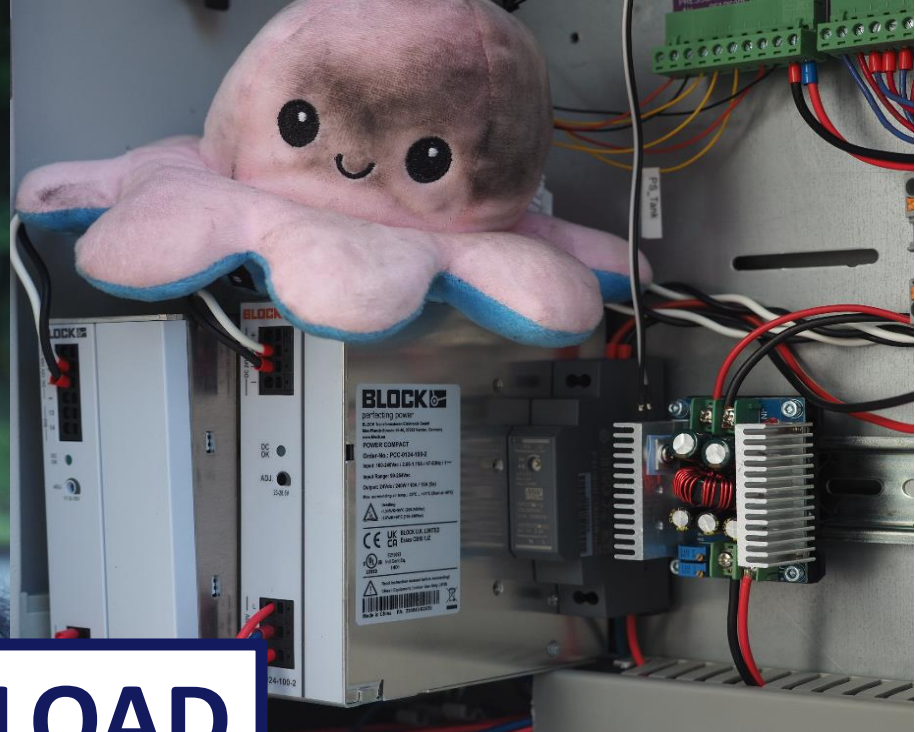
PEAK THRUST  
**8.7 KN**

HEIGHT  
**4.5 METERS**  
MASS  
**68 KGS**

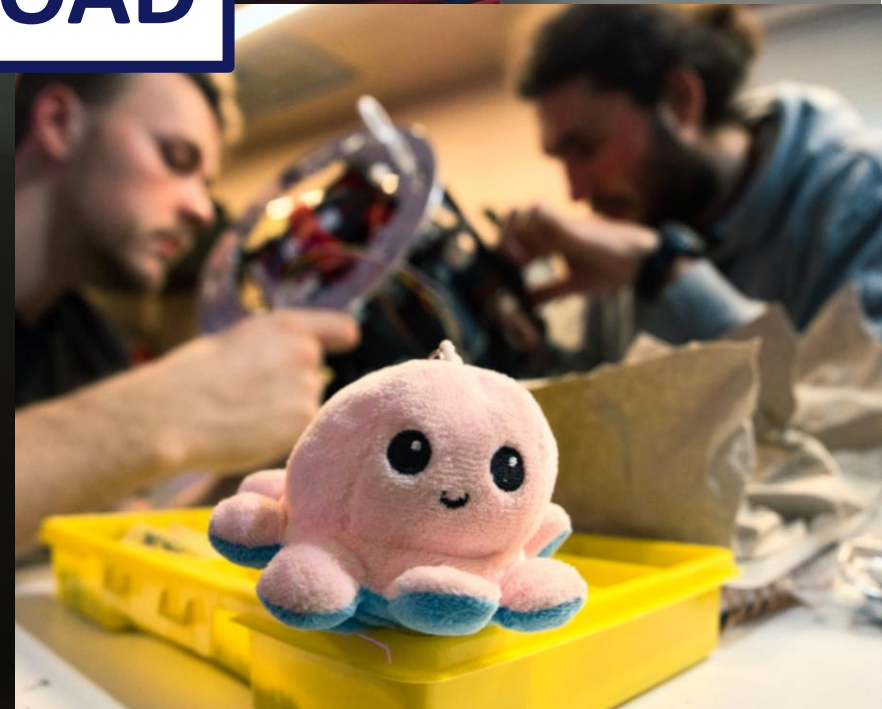
PAYLOAD  
**Octavia**







# OCTAVIA – OUR PAYLOAD



# Full Rocket Assembly



# FAIRING



# OXIDIZER TANK



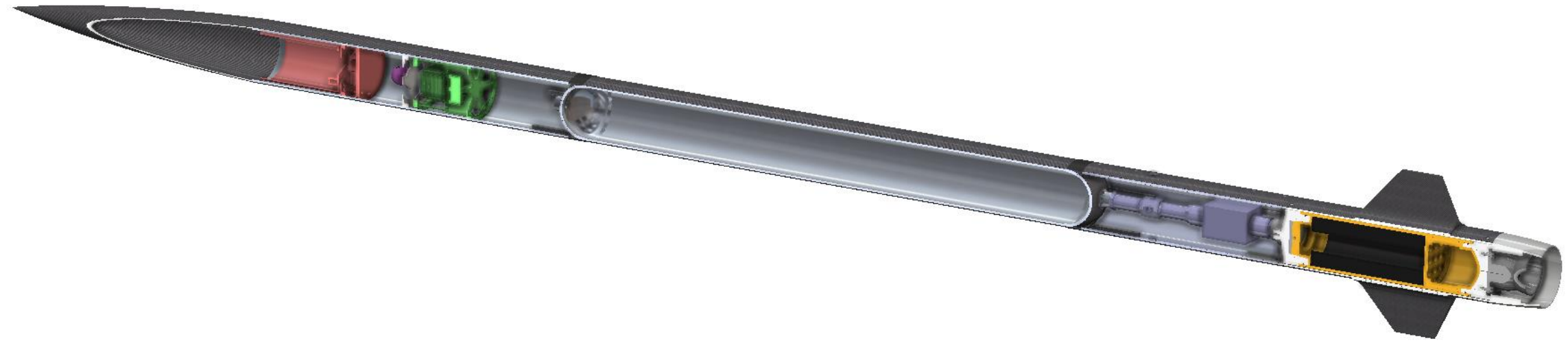
# INTERSTAGE



# ROCKET ENGINE



# Phoenix on the Inside



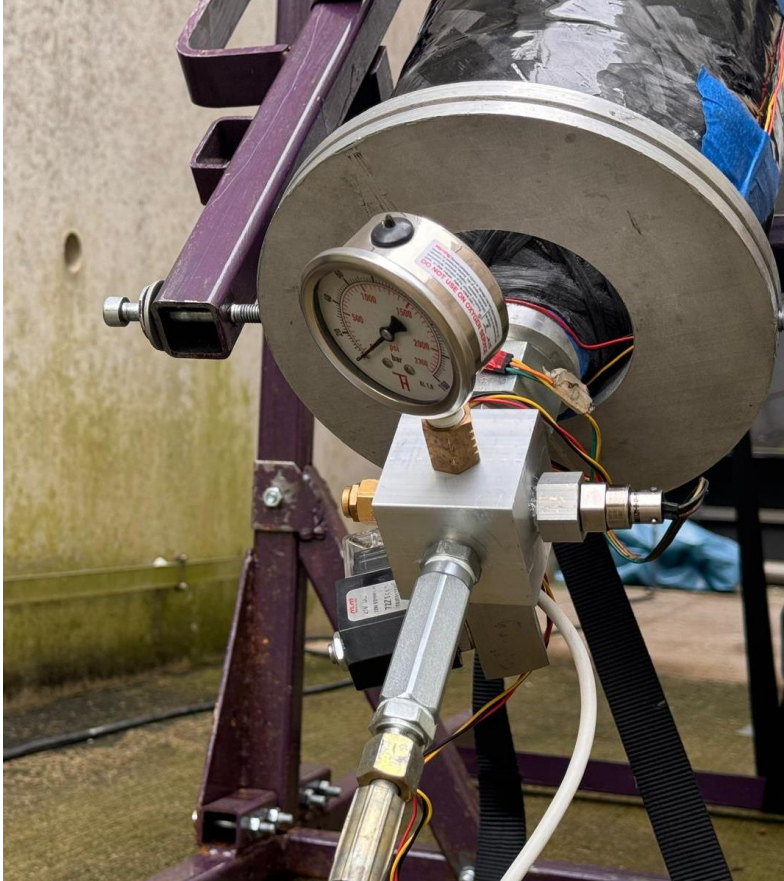
# Test Campaign



# Recovery System Drop Test

South Germany





# TANK PRESSURE TESTING

DLR BREMEN

# HOT FIRE TEST CAMPAIGN 2024



DLR LAMPOLDSHAUSEN



# Hot Fire Test



# Launching Towards a Greener Tomorrow

Structural Efficiency:  
**CFRP for Lightweight Design**

**lower fuel consumption, reduce emissions, Long product lifecycles**

**Energy-intensive production processes, Challenges in recycling and end-of-life disposal**



**Sustainable Propulsion:**  
**Nitrous oxide** (oxidizer) and **paraffin wax** (fuel).

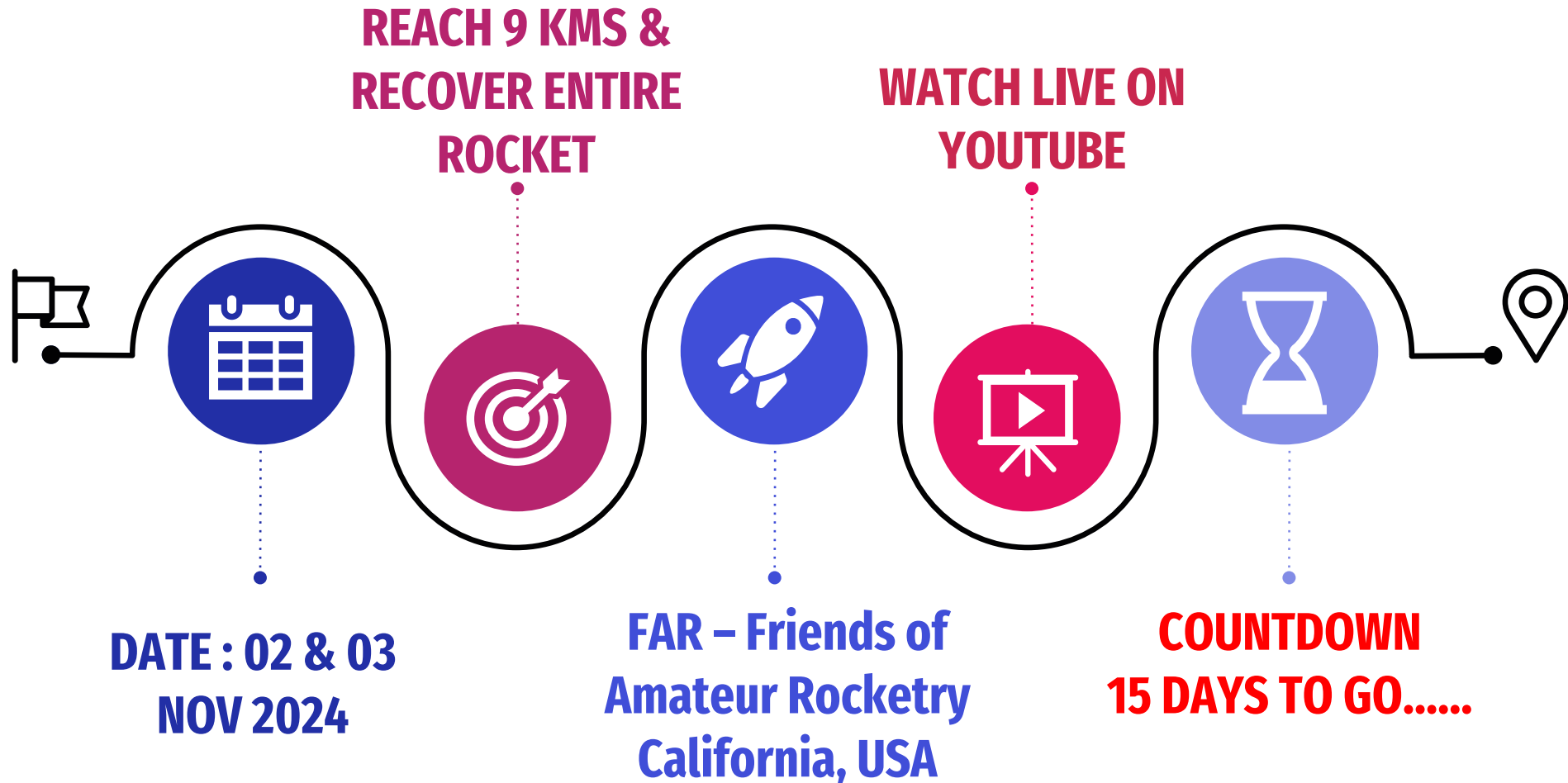
Combustion produces **CO<sub>2</sub>, nitrogen, and water vapor**

Compared to **Liquid and Solid Rockets** less harmful to environment

**A step towards Sustainability, but Room for Improvement**

# Into the Blue: November 2024

## Where Dreams Take Flight!



# TRANSCENDENCE

Our Journey to  
100 km "the  
Kármán Line"!

**100 KM**  
GOAL ALTITUDE

**275 KG**  
MASS

**5 KG**  
PAYLOAD MASS

**24 kN**  
MAXIMUM THRUST

**5,400 KM/H**  
MAXIMUM SPEED



# BE A PART OF OUR PHOENIX LAUNCH CAMPAIGN!!!





# **Thank You for Joining Us on This Journey!**

*"Space exploration is a force of nature unto itself that no other force in society can rival."*

**Neil deGrasse Tyson.**

HORIZON







80 members



25 nationalities

# Our History

Since 2019



2019 - 2020



Silencio Gamma

2021 - 2023



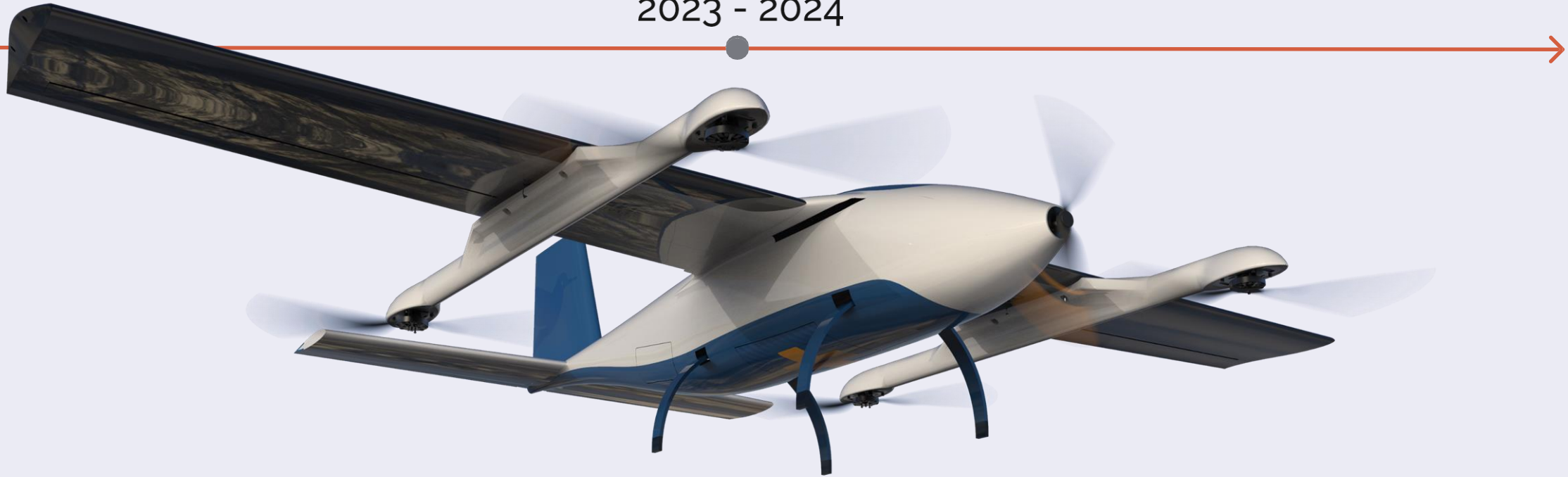
Frankenstein

# Our History

Since 2019



2023 - 2024



Kolibri

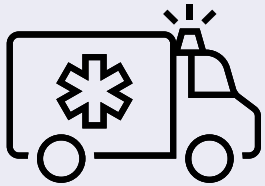
# Mission **Pulse**

“Every Sencond Counts”



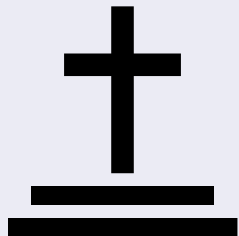
**115.000**

People suffer a cardiovascular arrest in Germany every year



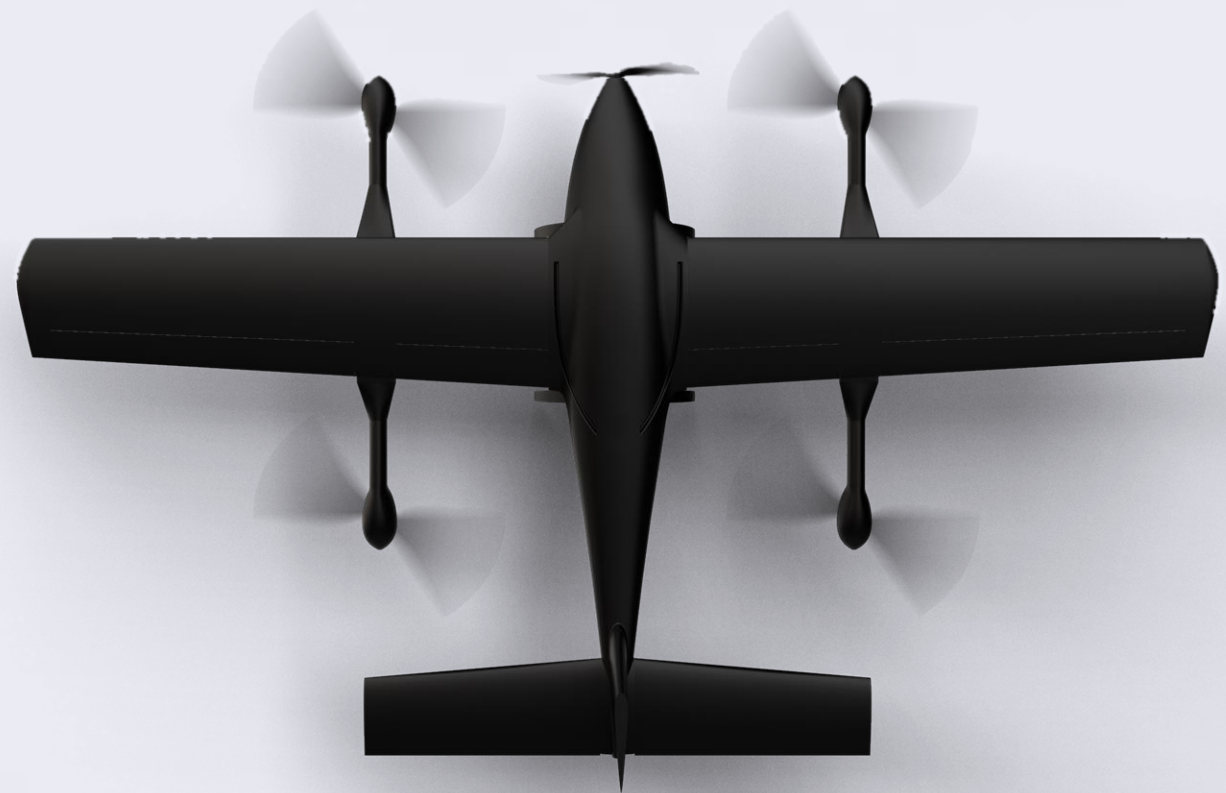
**9min**

Needs an ambulance



**89%**

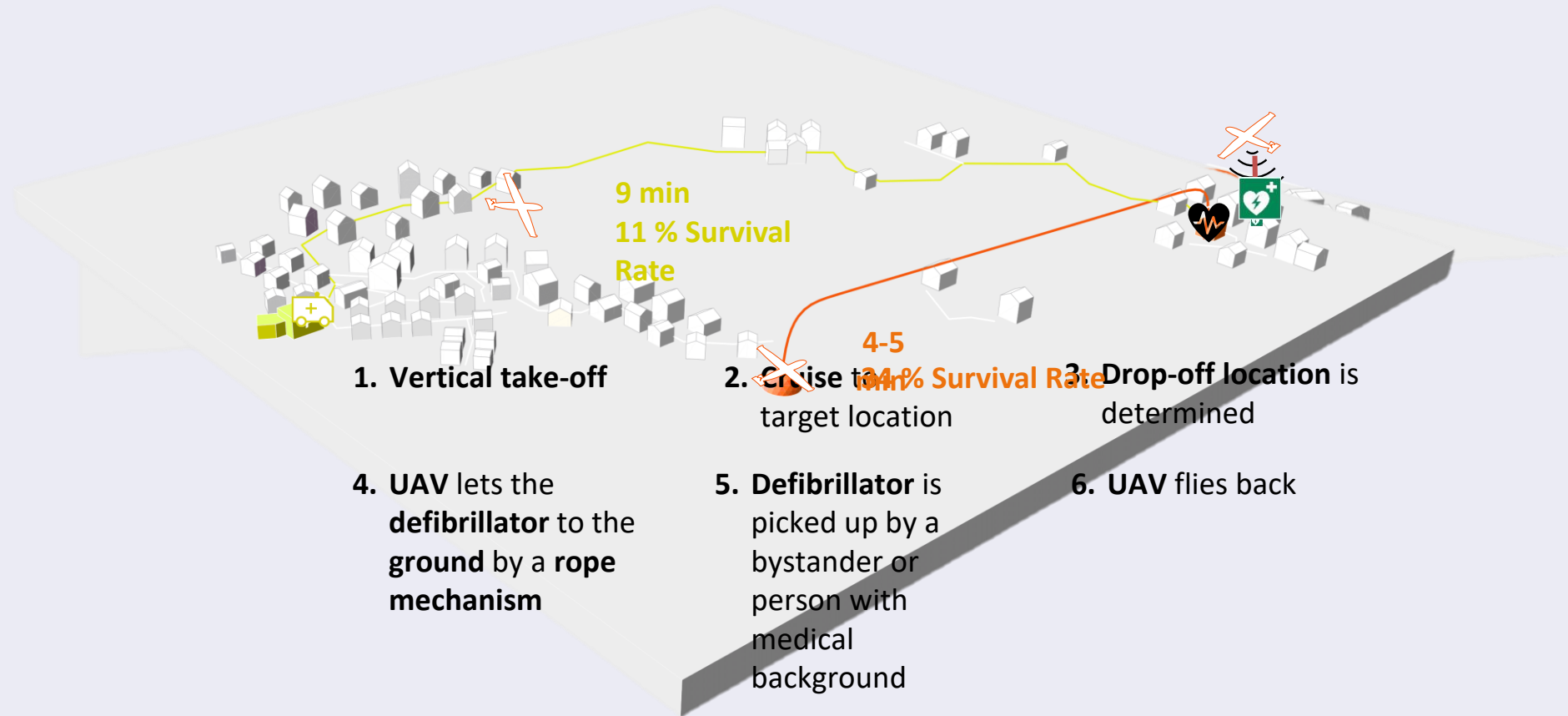
Do not survive



# The first eVTOL UAV defibrillator transport in Germany



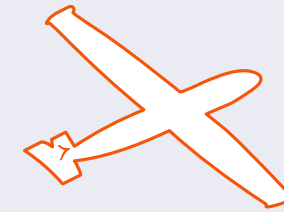
eVTOL UAV (electrical Vertical Take-Off and Landing Unmanned Aerial Vehicle)



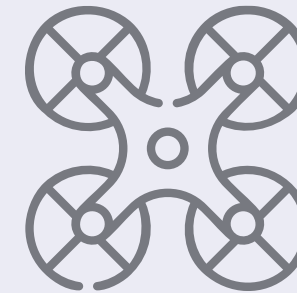


# Mission Pulse

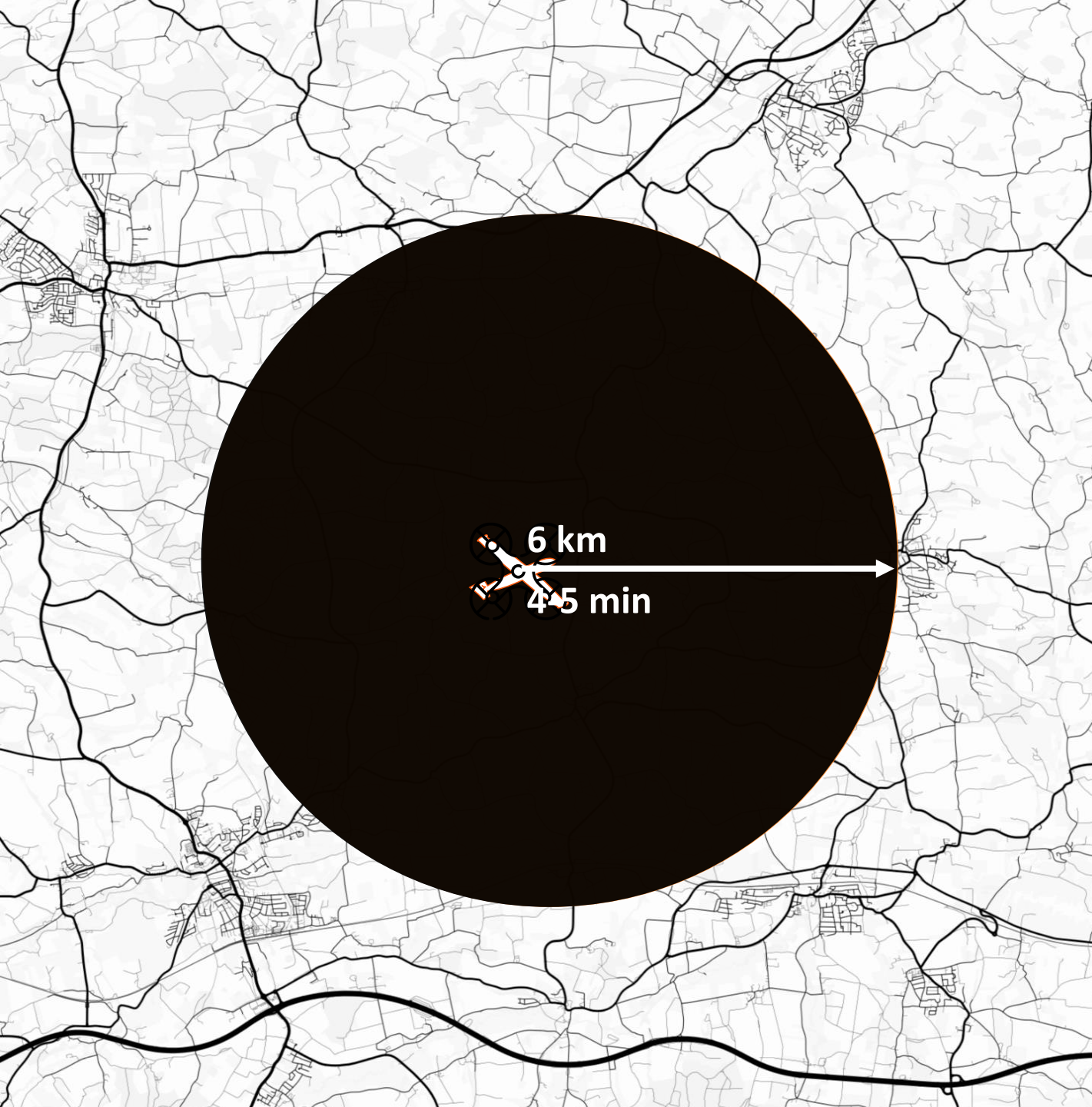
eVTOL UAV to save lives



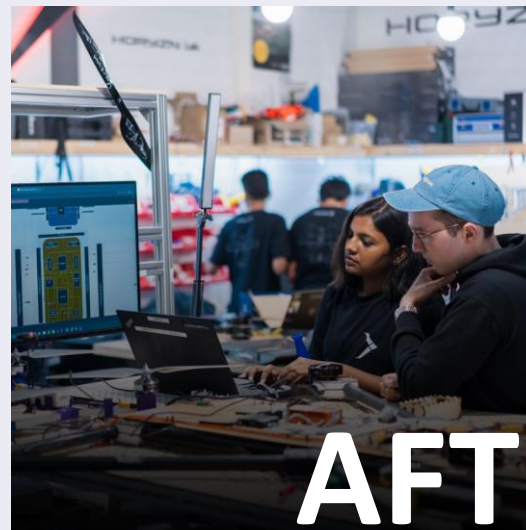
**High range 6km**  
**High speed ca. 125 km/h**



**Low speed ca. 60 km/h**



# HORYZN at a glance – from Concept to **Prototype**





**GO AERO**  
PRIZE

**To revolutionize Emergency  
Aerial Rescue**



**Technical  
Proposal**

December 2024



**35% Scale  
Prototype**

June 2025



**Maiden Flight  
& Qualification**

December 2026



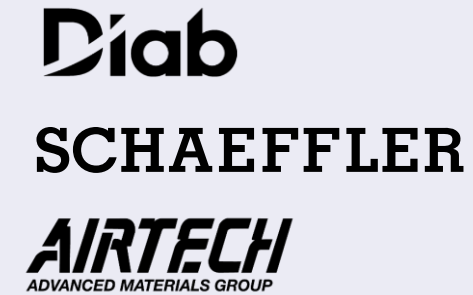
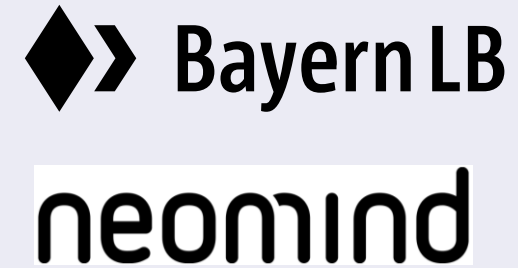
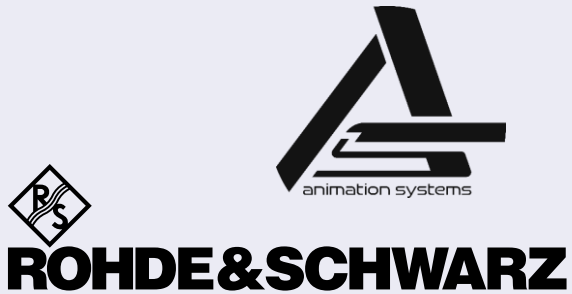
**Final  
Fly-Off**

February 2027



# REISER

SIMULATION • TRAINING





Institute of  
Aircraft Design



Institute of  
Flight System Dynamics



PHOENIX  
WINGS



SiRcom



makerspace



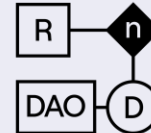
Lehrstuhl für Carbon Composites



PREMIUM-MODELLBAU



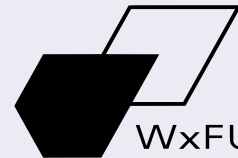
FRANK HIRSCHVOGEL  
STIFTUNG



AirShaper



Chem  
Trend



Wx FUSION



easycomposites





**DS** DASSAULT  
SYSTEMES

**ÆTHER**







ÆTHER



**PEO**





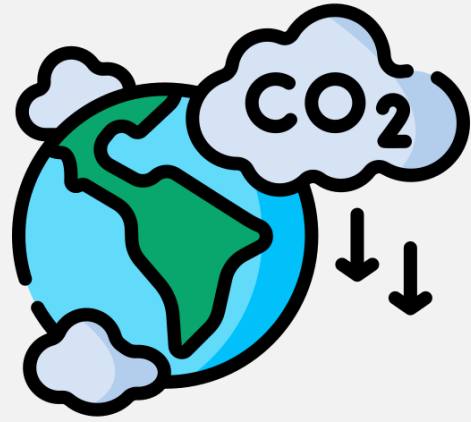
# ÆTHER SWISS KITE



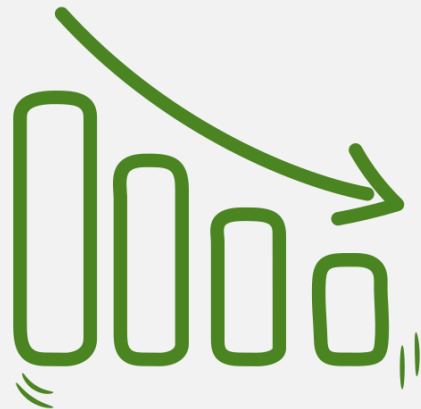
# ÆTHER SWISS KITE



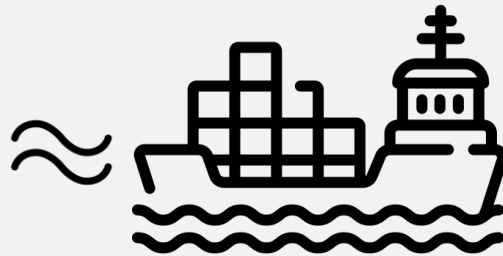
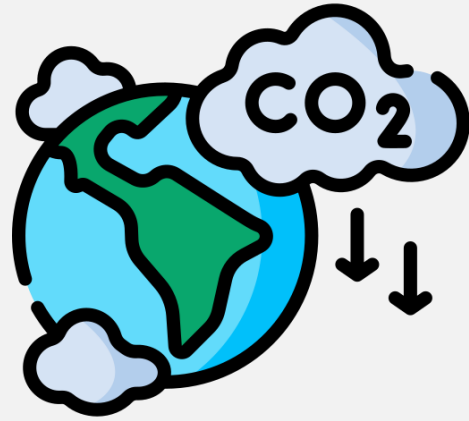
# ÆTHER SWISS KITE



**20%** Reduction



# ÆTHER SWISS KITE

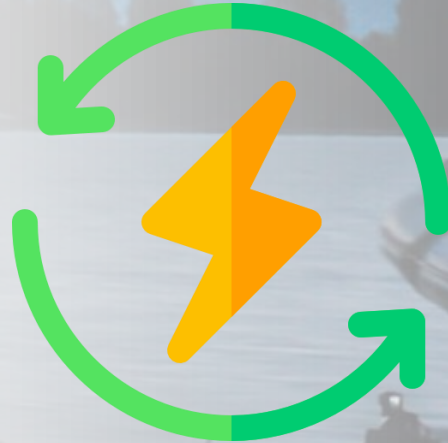


**3%** of global emission





# ÆTHER SWISS KITE



**AIRBUS**



**MAKANI**



**K LINE**



**SkySails**



beyond the sea<sup>®</sup>  
by Yves Parlier



**Cargill**



**NORSEPOWER**



**CargoKite**



**2019 - 2024**

SP80 Chasing the World Sailing Speed Record



**2024**

AETHER SWISS KITE - For a sustainable future



**2025**

Autonomous prototype validated

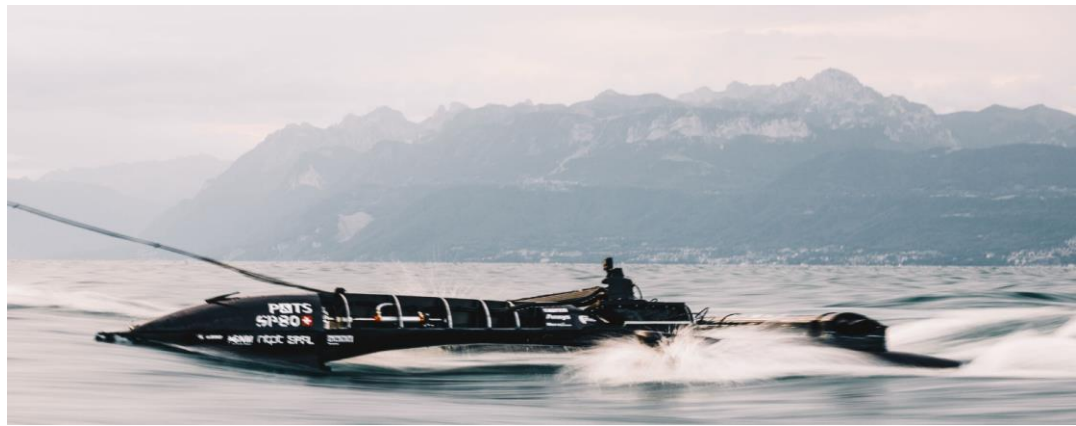
**2026**

Performance prototype on trimaran boat

**2027**

Scalable control module & accurate simulator





**DS** DASSAULT  
SYSTEMES



**ÆTHER**



# HAMLET

**H**aptic

**A**pplication for

**M**edical

**L**earning,

**E**xperimenting and

**T**eaching



Trier University  
of Applied Sciences

H O C H  
S C H U L E  
T R I E R





# HAMLET

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- ⊕ Training of patient-specific cases
  - ⊕ Minimizing training on specimens
  - ⊕ Practice in a stress-free environment
- 



medical students



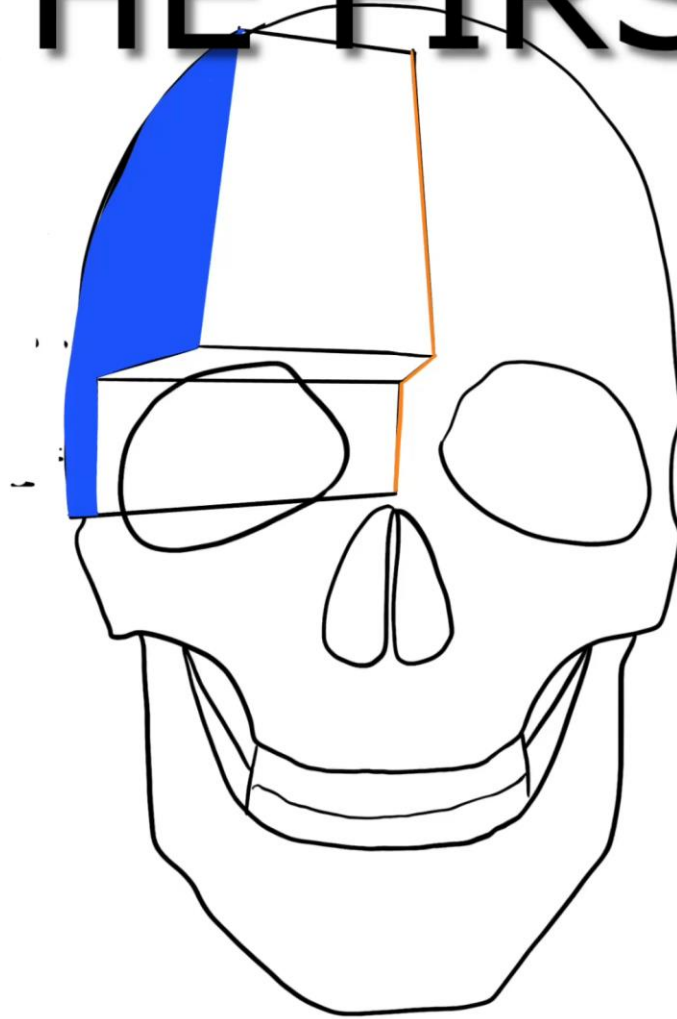
surgical team



specialists



# FROM THE FIRST IDEA...



# OUR GOALS

Trier University  
of Applied Sciences

H O C H  
S C H U L E  
T R I E R



Cost-effective



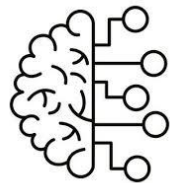
User-friendly



Modular

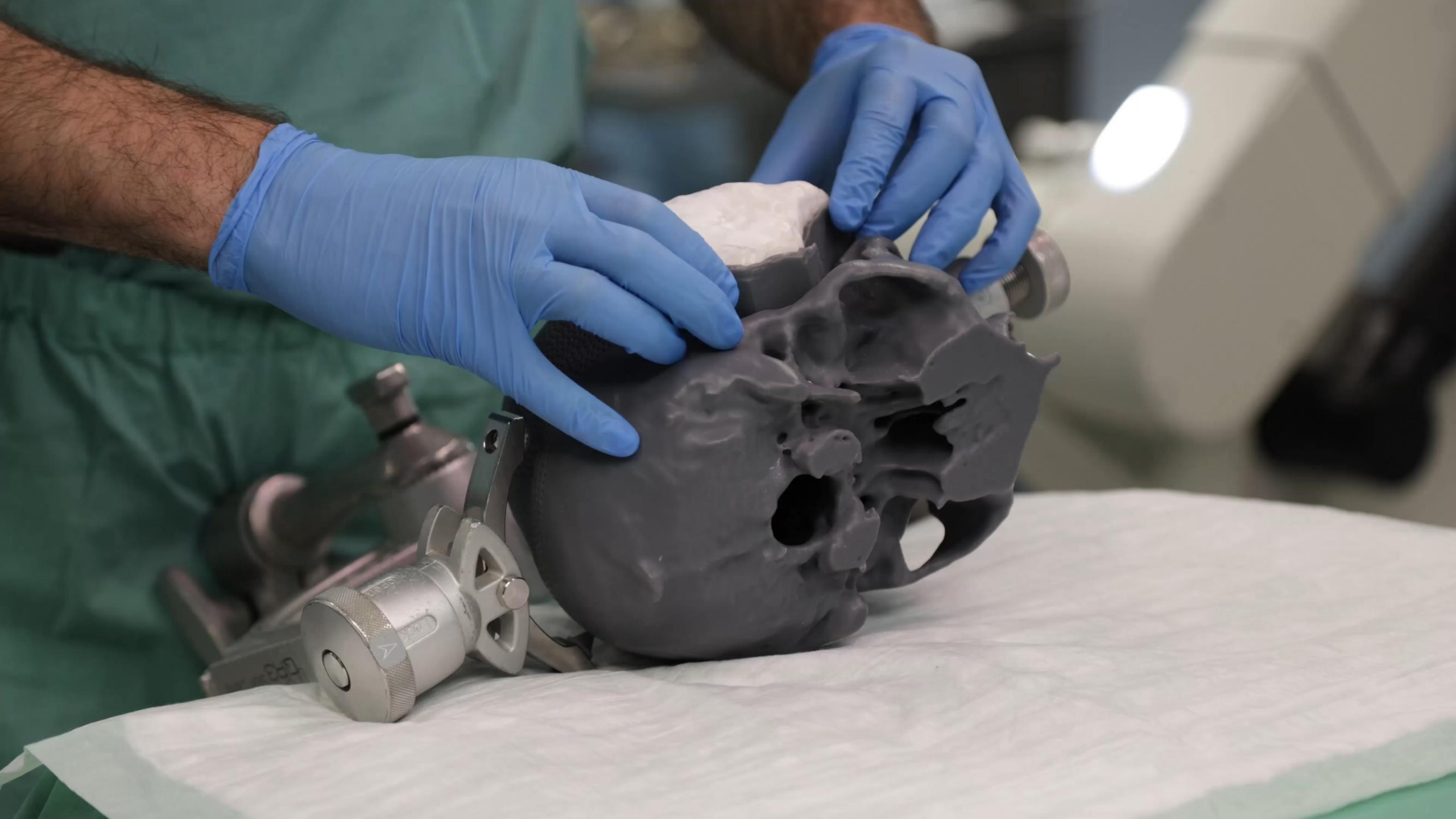


Sustainable



Different  
trainingscenarios





# FEEDBACK

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“

**It's proving a safer and more affordable approach to medical education that provides a similar experience to traditional cadavers. [...] Becoming a surgeon is all about repetition and being able to practice in a non-pressured setting like this really makes a difference.**

”

**Dr. Marcus Mehlitz**

Deputy Head of the Brain Tumor Center and Senior Consultant in the department of neurosurgery at Barmherzige Brüder Hospital

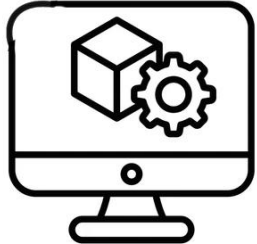


Trier University  
of Applied Sciences

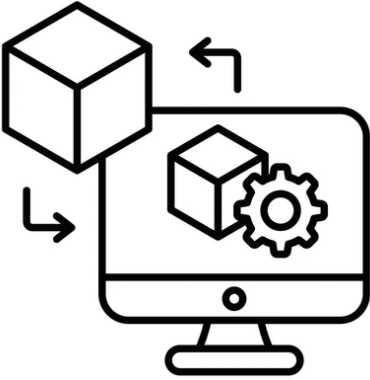
H O C H  
S C H U L E  
T R I E R



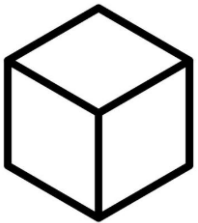
# WHAT'S NEXT



Virtual twin



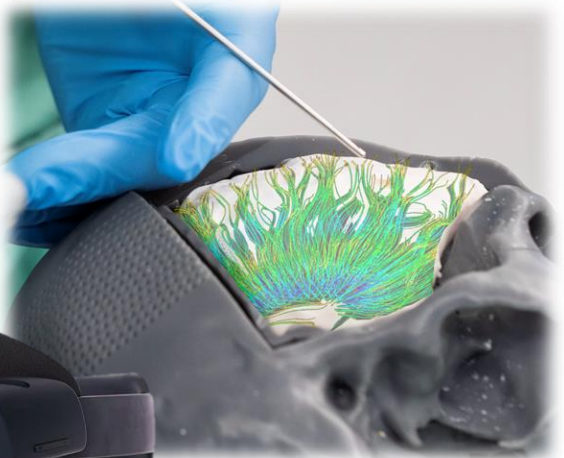
Digital twin



Physical twin



[2]



[1]

# # THE OPERATING TEAM



the technician



the doctor



the doctor assistant



the engineering student



the lecturer



the engineering student

# QUELLEN

[1] pixels.com Fiber tracts

[2] <https://www.techspot.com/news/91815-mercedes-benz-microsoft-hololens-2-show-off-augmented.html>