



# Daring and achieving

JUVENTAS WITHIN THE WIDER HERA MISSION



[See all asteroids](#)

viewing

65803 Didymos

LIVE

JUN 19, 2024

5 mins/s

## General

- Asteroid Name - Didymos
- Moon Name - Dimorphos
- Class - Binary asteroid system

## Didymos Characteristics

- Diameter - Approximately 780 meters
- Shape - Roughly spherical
- Spectral Type - S-type (silicaceous asteroid)
- Rotation Period - About 2.26 hours
- Distance (Sun) - About 1.64 AU
- Orbital Period - Approximately 2.11 Earth years

## Dimorphos Characteristics

- Diameter - Approximately 160 meters
- Shape - Roughly ellipsoidal
- Spectral Type - Likely similar to Didymos
- Distance (Didymos) - About 1.2 kilometers
- Orbital Period - About 11.9 hours



# Juventas Mission Objectives

## 1) Help Hera understand:

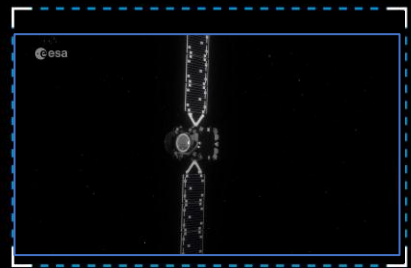
- how binary asteroids form
- what they are like inside (subsurface)
- what they are like outside (surface)
- how they interact with things near them (dynamical properties)

## 2) Demonstrate the use of CubeSats for deep space

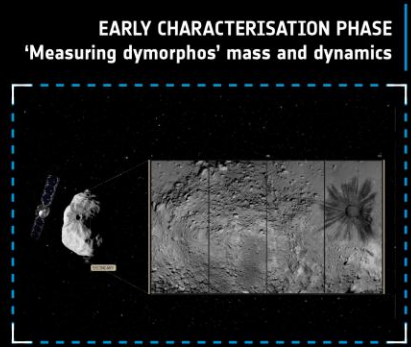




HERA LAUNCH IN OCTOBER 2024



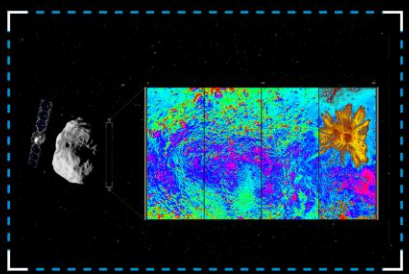
MARS FLYBY



EARLY CHARACTERISATION PHASE  
'Measuring dymorphos' mass and dynamics



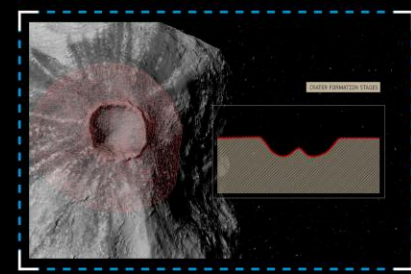
CUBESATS RELEASE



DETAILED CHARACTERISATION PHASE  
Measuring Dimorphos  
surface and interior properties



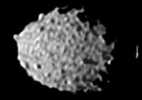
MULTI-POINT INVESTIGATION  
OF DIMORPHOS



VERY LOW-ALTITUDE  
DETAILED INVESTIGATION



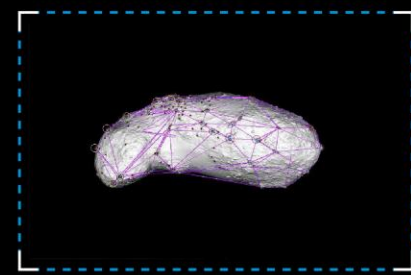
DIDYMOS



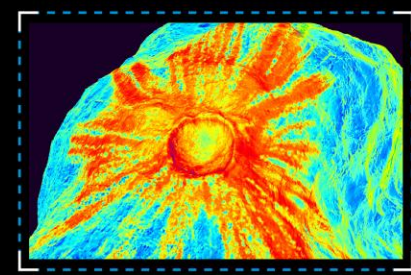
DIMORPHOS



HERA CRUISING  
TO DIDYMOS

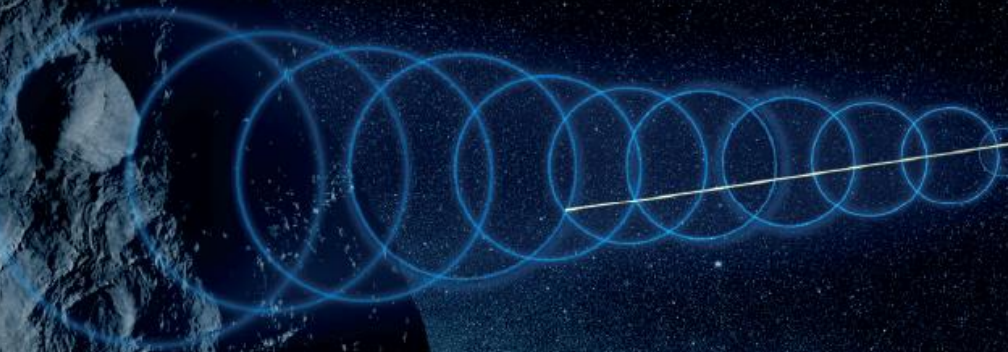


AUTONOMOUS PROXIMITY  
OPERATIONS DEMONSTRATION



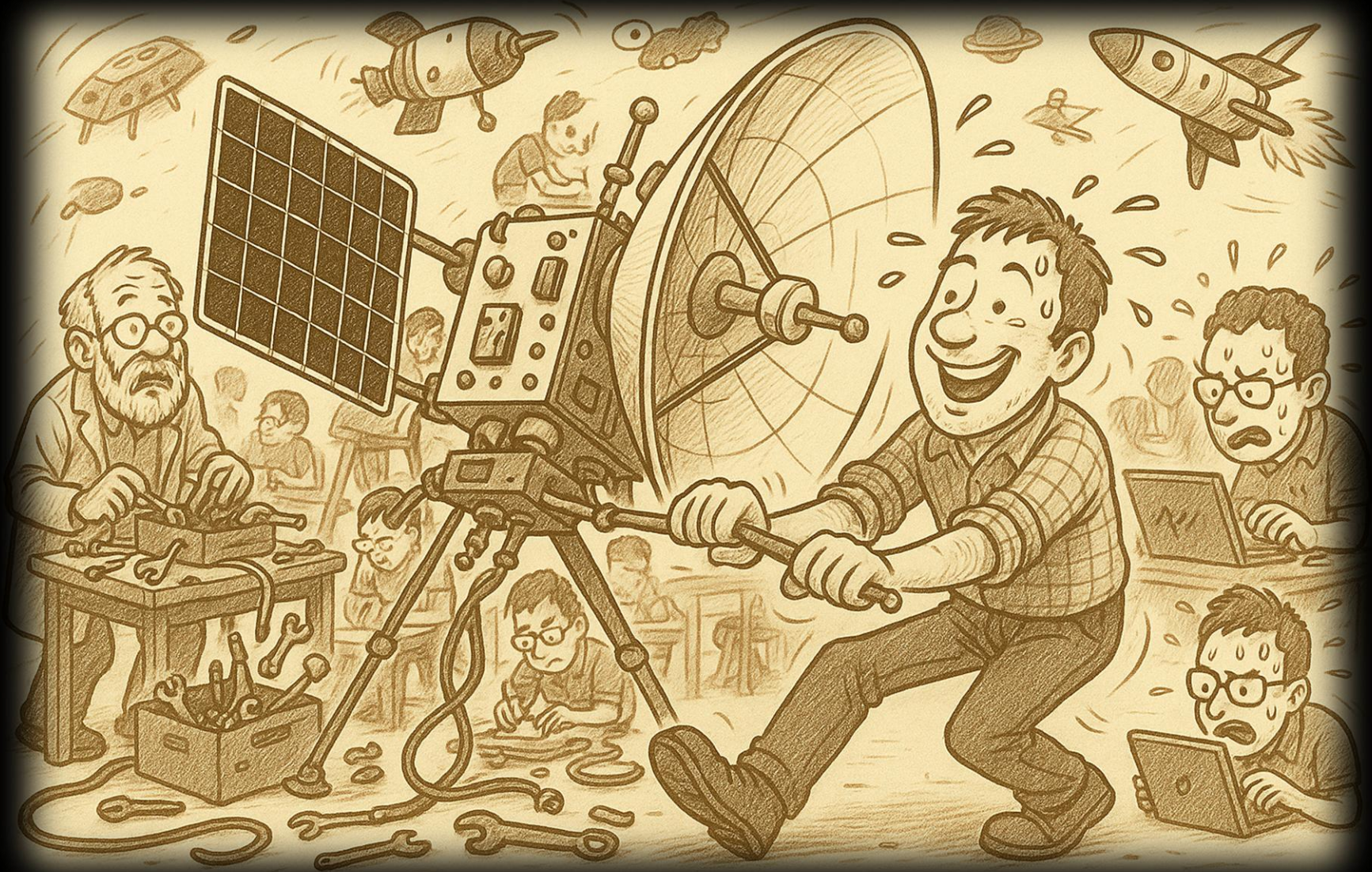
DETAILED CRATER INVESTIGATION

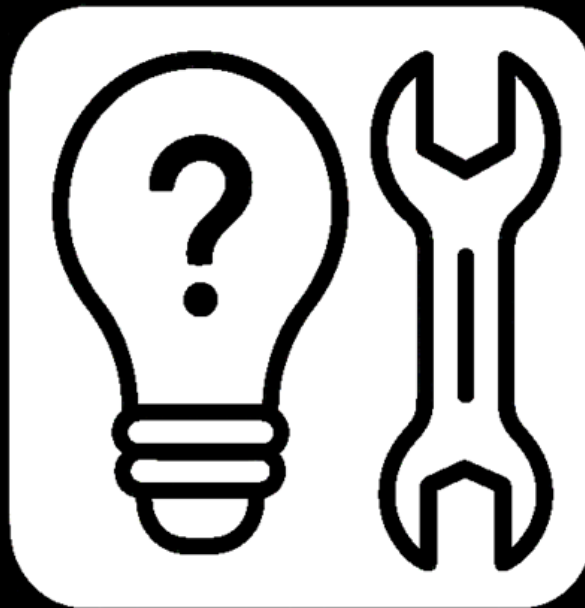
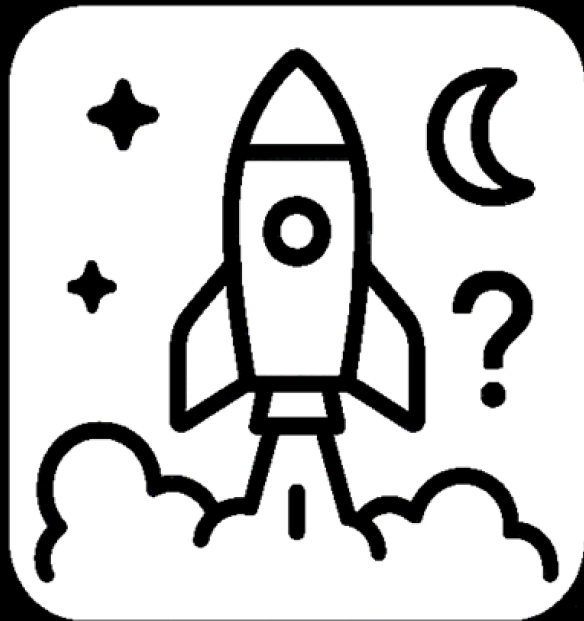
LANDING ON DIDYMOS  
MISSION ENDS

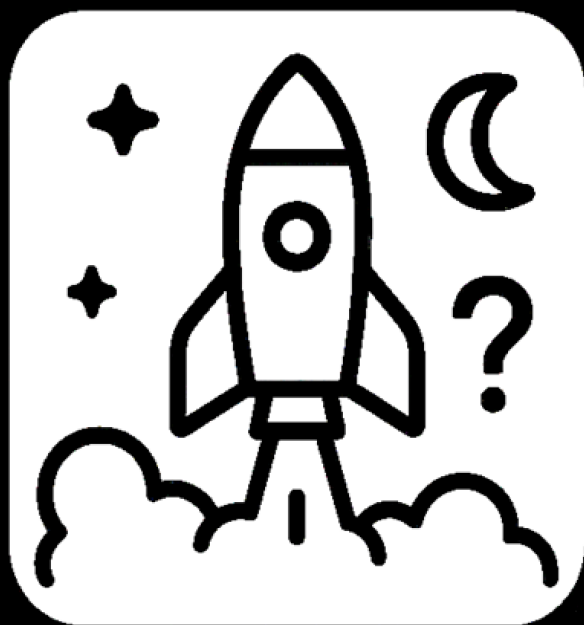




# BUILDING A DEEP SPACE PROBE

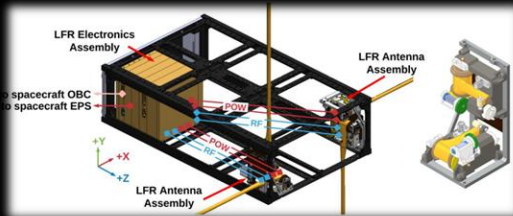






# Juventas Layout & Payloads

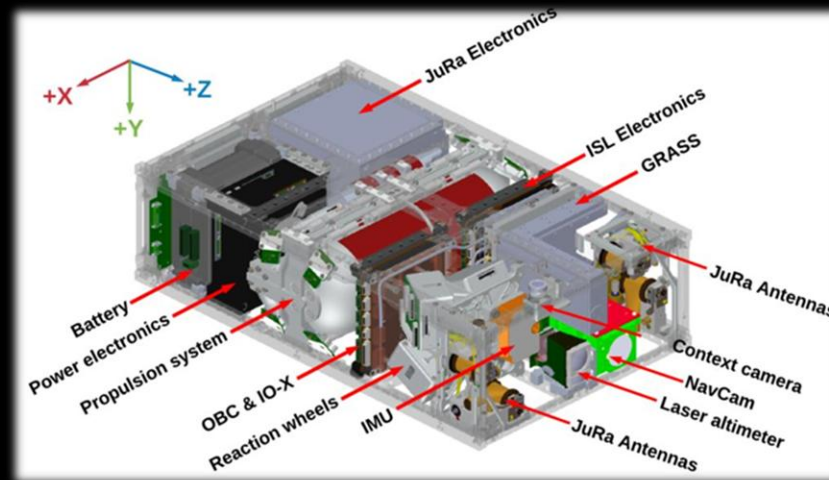
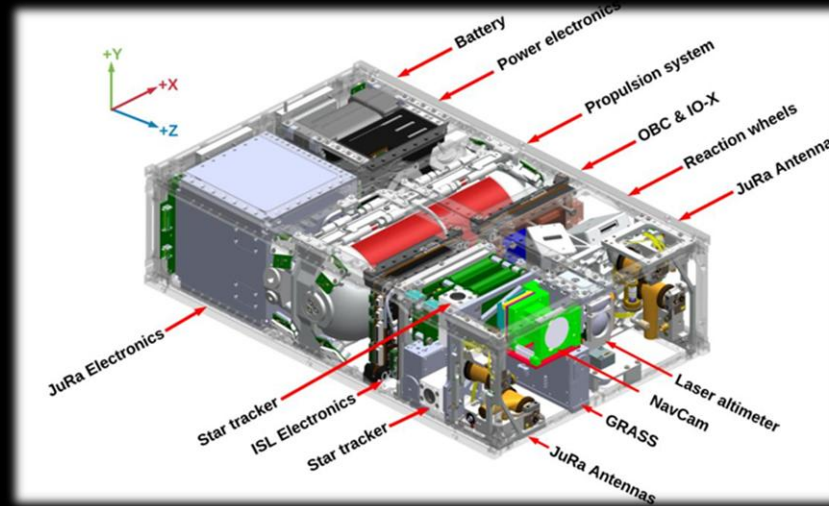
## JuRa: Juventas Radar



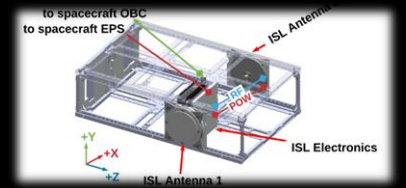
## Star-Trackers



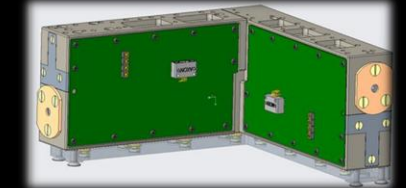
## Inertia Measurement Unit



## ISL: Radio



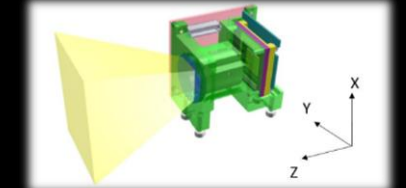
## GRASS: Gravimeter

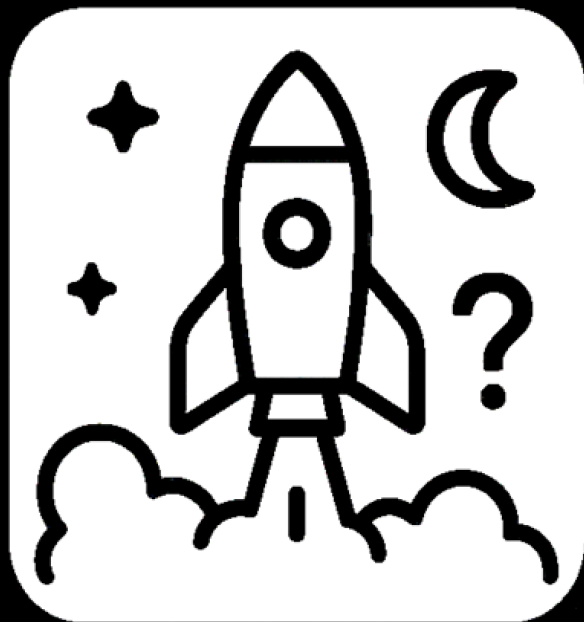


## Context Camera



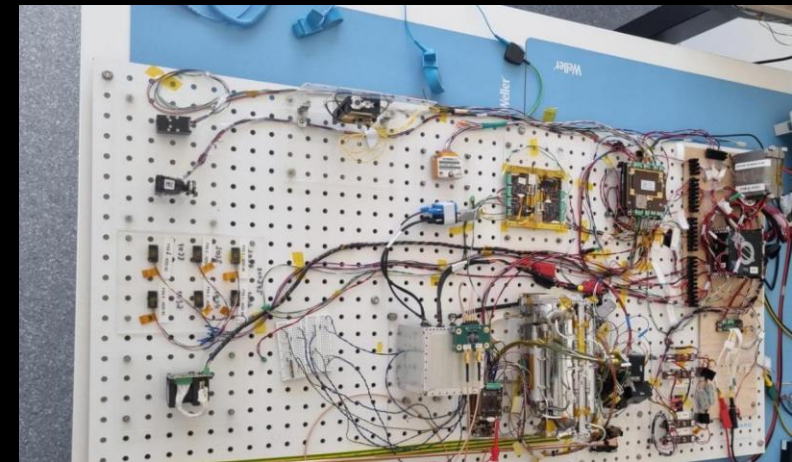
## Navigation Camera





## FLATSAT

- Validation of test procedures and OBCPs
- De-risking electrical interfaces
- Test driven development of on-board software features



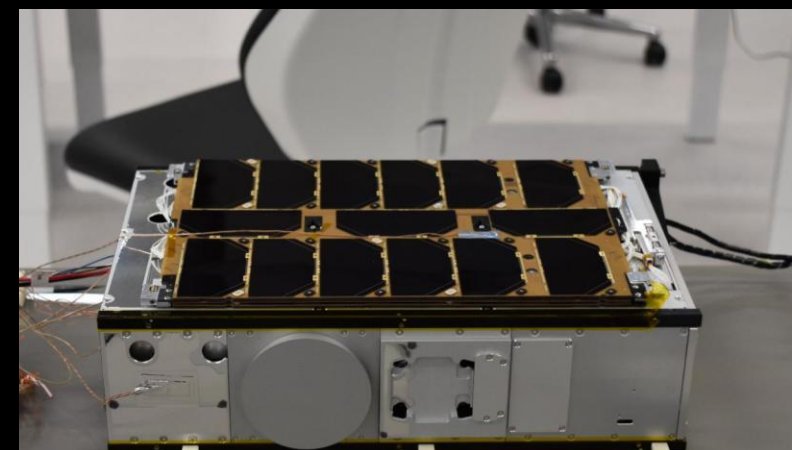
## REDUCED ENGINEERING MODEL (REM)

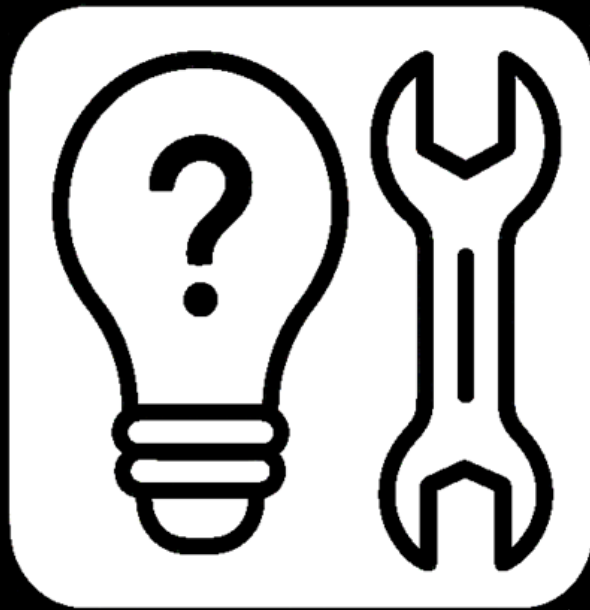
- JUV-Hera testing
- Early validation of interfaces
- Freezing and derisking interfaces



## STRUCTURAL THERMAL INTERFACE MODEL (STIM)

- **Primary use:** Hera campaign
- Secondary use: de-risk of PFM integration and testing
- Validation of JUV-DSD interfaces
- Source of *many* LLs





# Juventas Assembly Integration and Testing

## Assembly + Integration

Parts  
Assembly

test

Internal  
Integration

test

External  
Integration

Co-op testing  
with Hera

Deployer fit +  
mass checks

EMC  
Campaign

test

## Environmental Testing

Vibration  
Campaign

Bakeout  
Campaign

TVAC  
Campaign

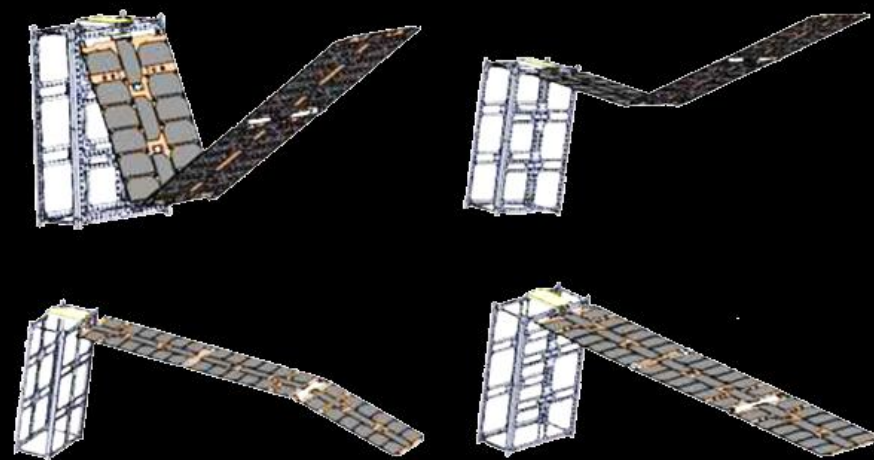
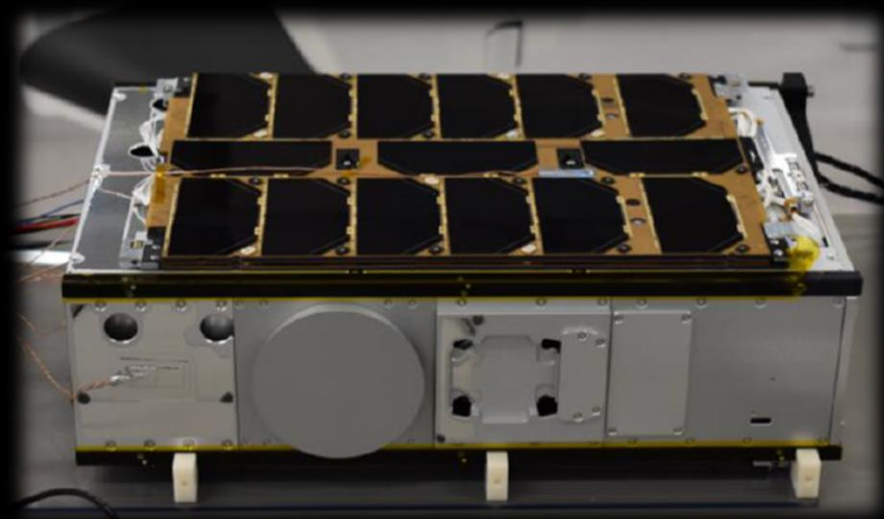
test

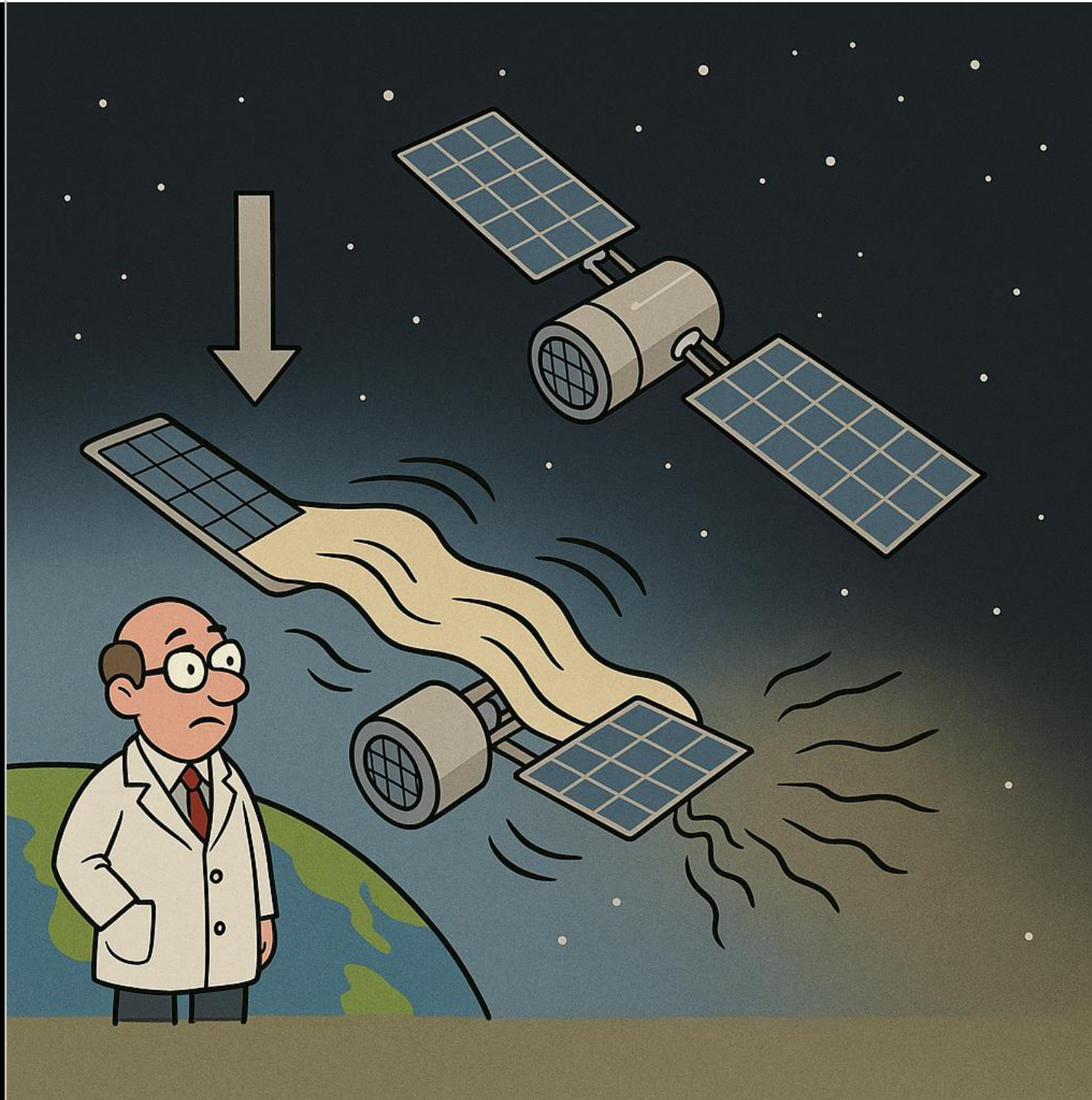
Mission  
Scenario  
Tests

Launch Site  
Integration with Hera

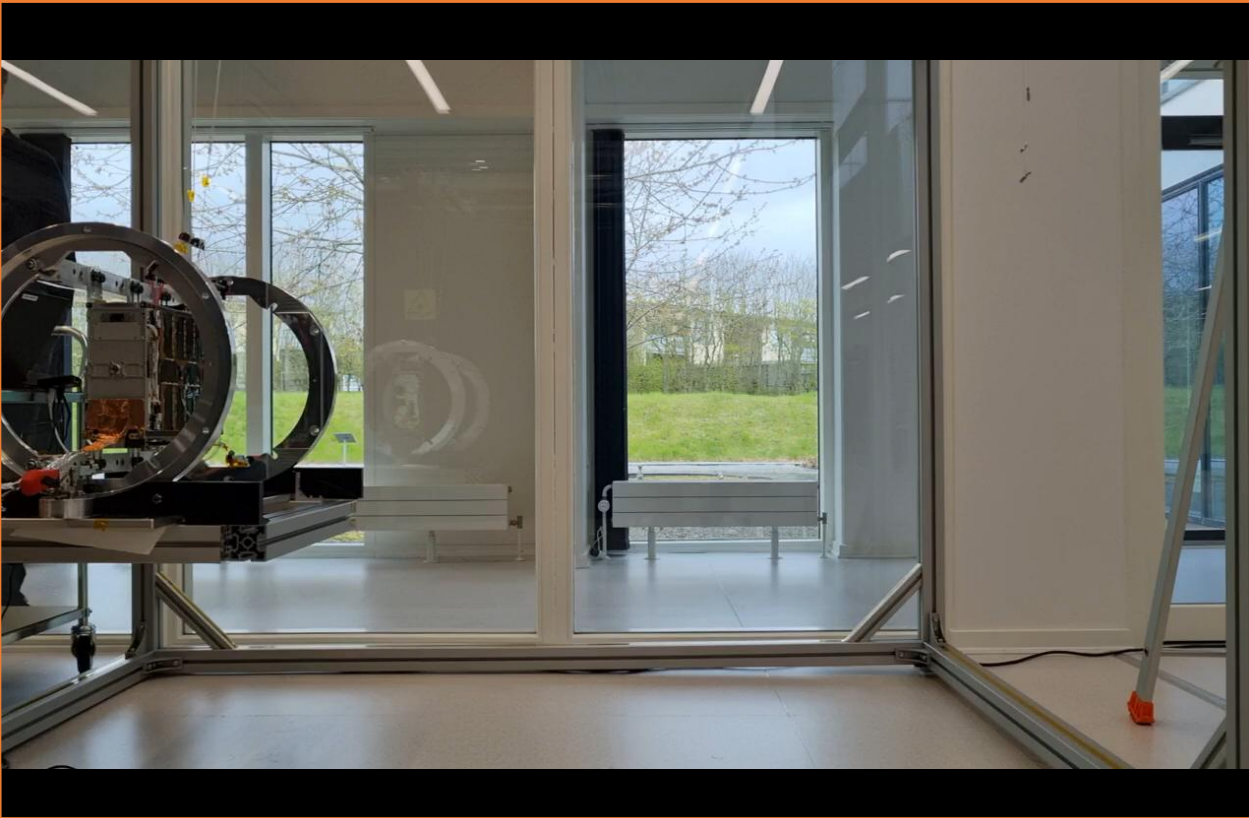
1 Year

Ext. Tests





# Adaptable hardware with a Deployment jig



- Off the shelf parts
- 3D printed parts
- Gravity compensation
- Aluminum extrusion framing

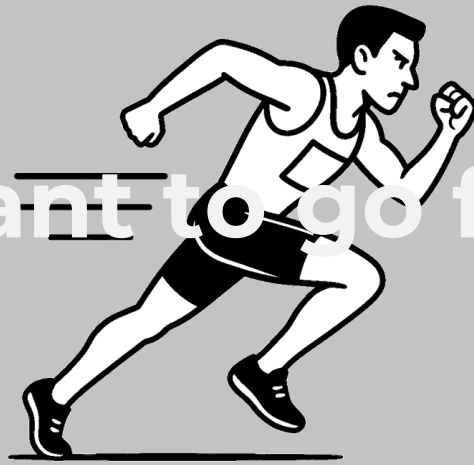




**Meeting**  
**Communicating**  
**Understanding**  
**Sharing**  
**Agreeing**



“If you want to go fast, go alone



If you want to go far, go together”

GOMSPACE

Three white flags with the GOMSPACE logo are flying against a bright blue sky filled with fluffy white clouds. The flags are attached to white poles and are positioned on the left side of the image, angled upwards towards the top right. The right side of the image is a solid teal color that serves as a background for the main text.

# THANK YOU

WE MAKE SPACE YOURS