i-Astro Activities

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July 10th, 2022

Science

Society

Outreach

Our Partners

LIP – Laboratório de Instrumentação e Física Experimental de Partículas – partículas e tecnologia

1290 Universidade de Coimbra

Universidade da Beira Interior

INAF – OAS Bologna

Università degli Studi di Ferrara

activespace technologies – making space a global endeavour

ADVACAM – Imaging the Unseen

deec.uc

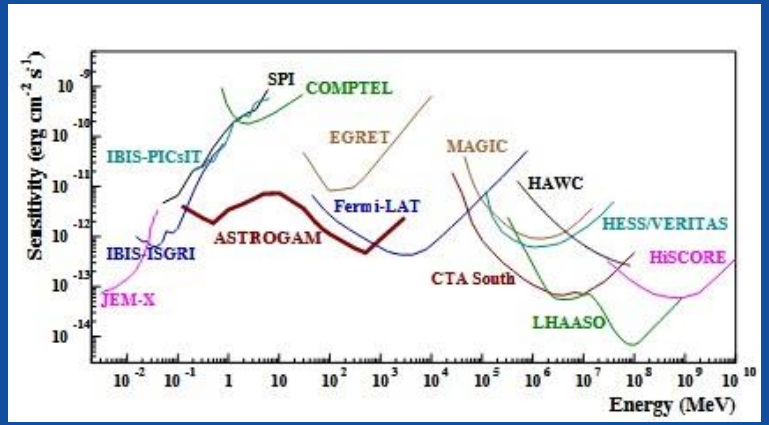
df.uc

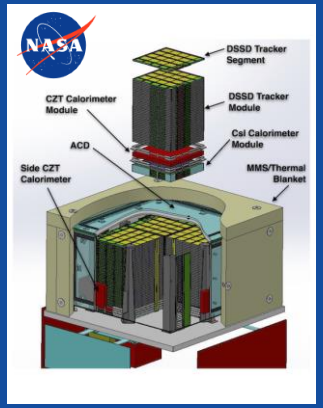
esa

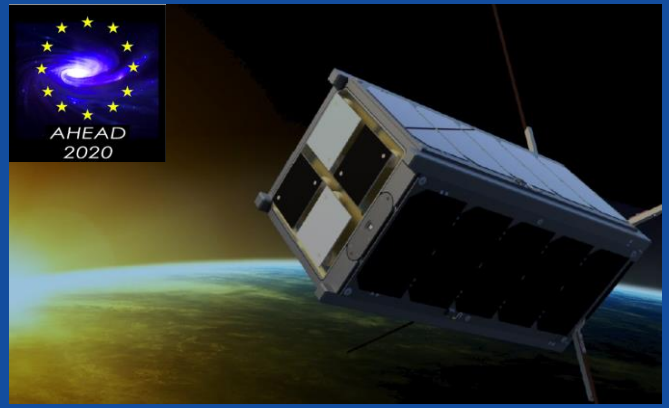
imem

pollux

High-energy Astrophysics Missions







ASTROGAM (ESA M7 Pre-selected)

- Calorimeter development
  - FPGA system
- Testing: polarimetry, radiation hardness

AMEGO (NASA)

- Polarimetry (sim. and exp.)

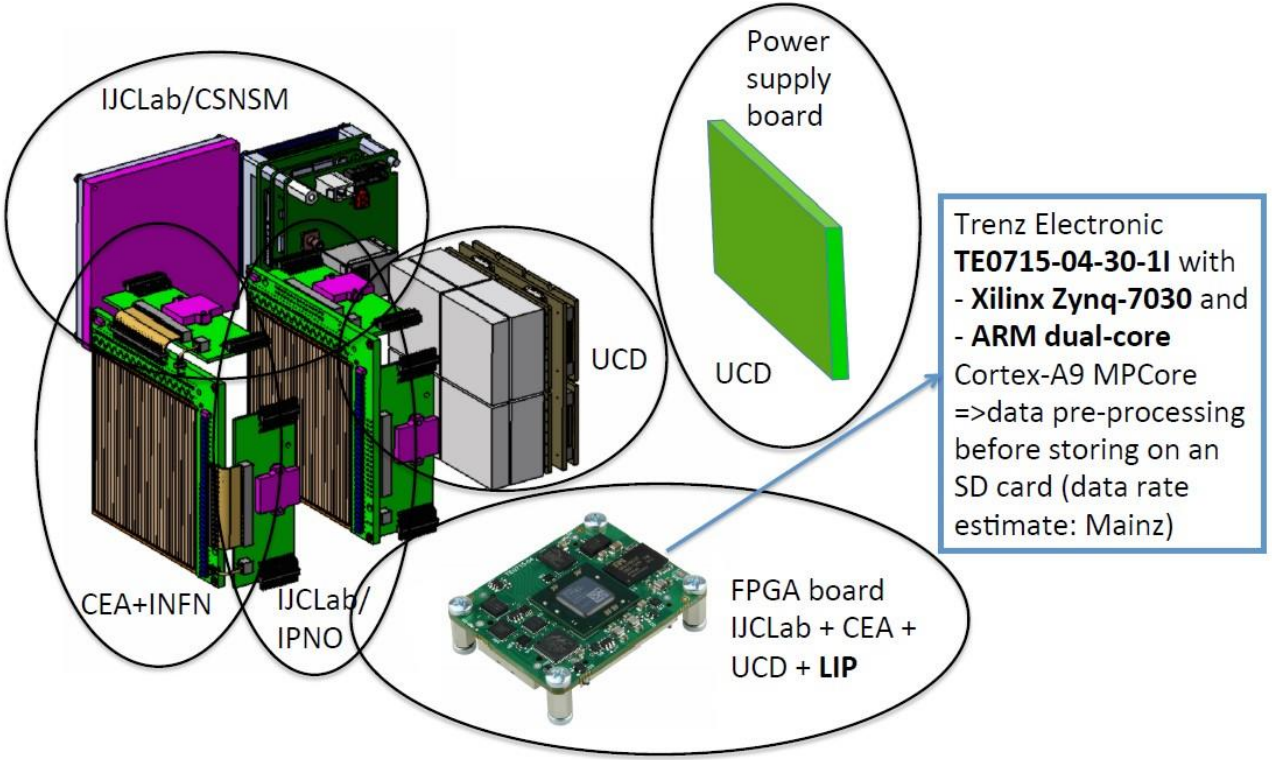
COMCube Constellation (EU)

Funded by AHEAD2020
Horizon EU Project

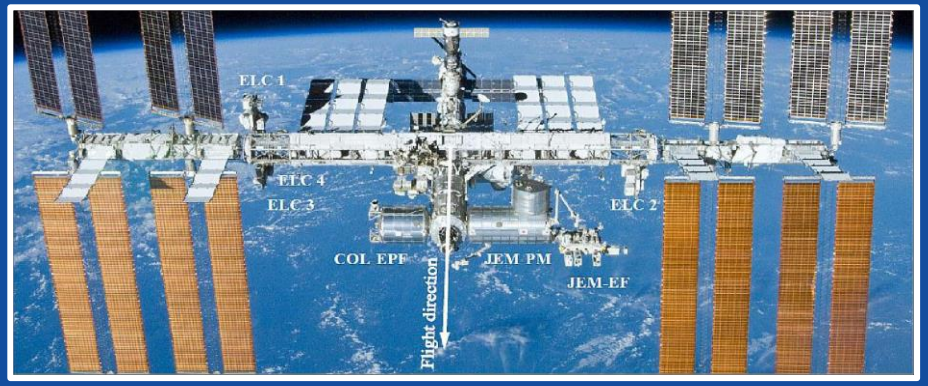
COMCUBE
Demonstrator

AHEAD WP 11

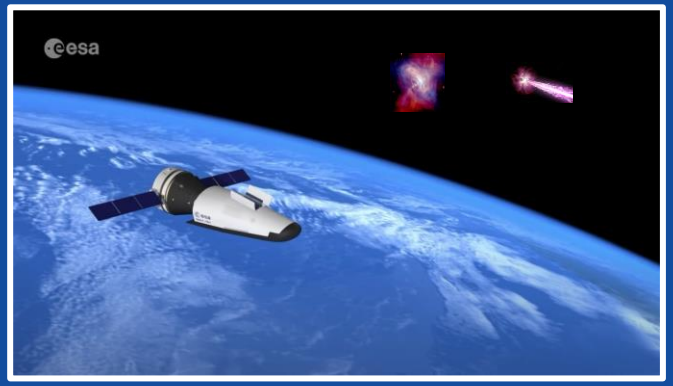
LIP: 30 k€ -> 2024



Space Experiments for High-energy Astrophysics

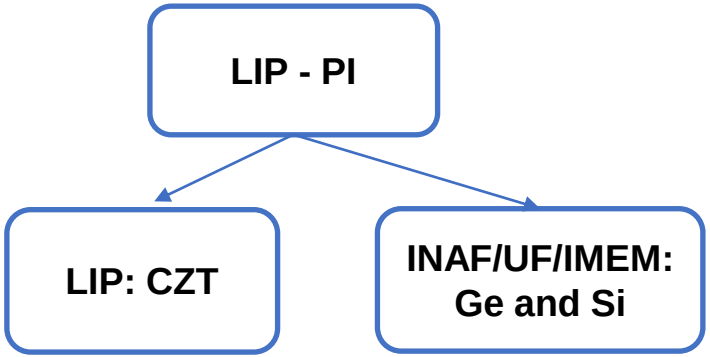


GLOSS: Gamma-ray Laue Optics and Solid State detectors
(ESA/CNES Euro Ageing Materials)



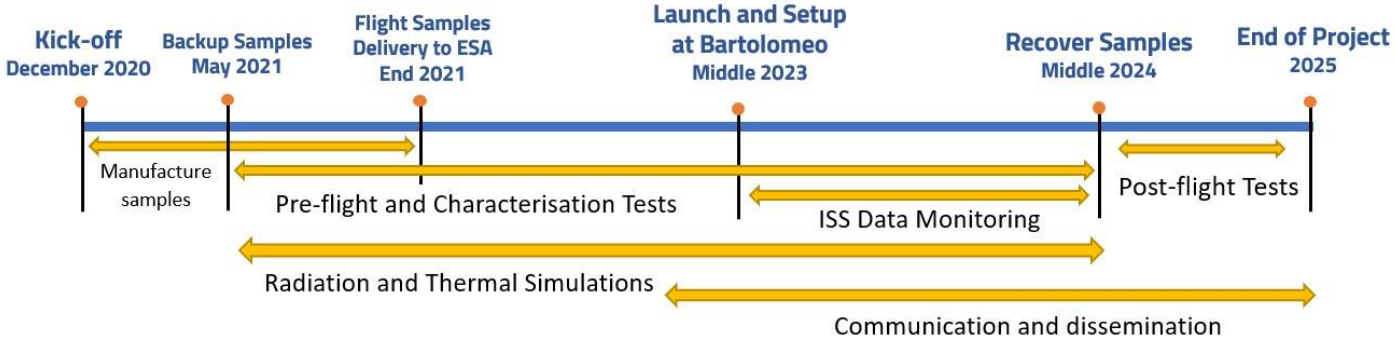
THOR-SR
(ESA Space Rider Maiden Flight Opportunity)

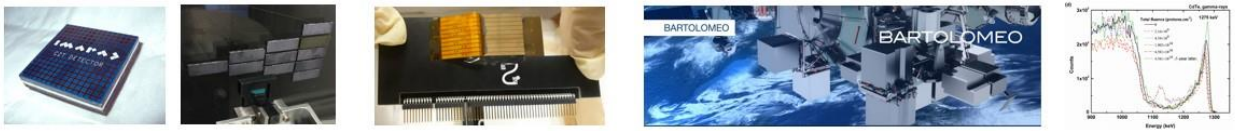
GLOSS
Experiment



PRODEX

LIP: 115 k€ -> 2025





THOR
SPACE RIDER

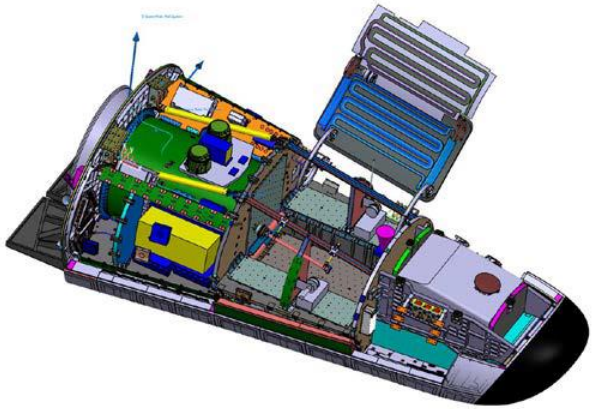
PRODEX

LIP: 470 k€ -> 2026

Industrial Partners

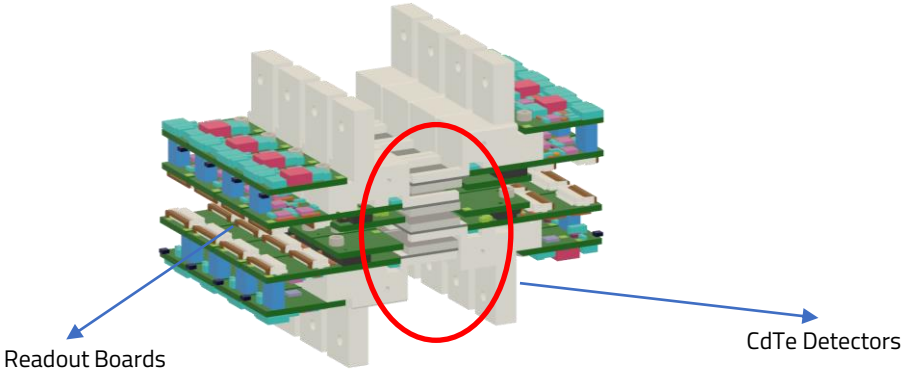
activespace technologies
making space a global endeavour

ADVACAM
Imaging the Unseen



- High-energy Astrophysics Pathfinder Instrument
  1. High-energy Sources: Crab Nebula or GRB. Spectroscopy, Imaging, Time Variability and Polarization in all-sky mode.
  2. Particle environment measurements and Radiation ageing (Space Exposure Locker);

- TGF Science and Aviation Safety:
  3. TGF monitor test;
  4. TGF polarization: outstanding scientific measurement



Sensitive Volume
18 CdTe matrices - each with 14x14 mm^2 and 2 mm thickness

SWOT

Strengths

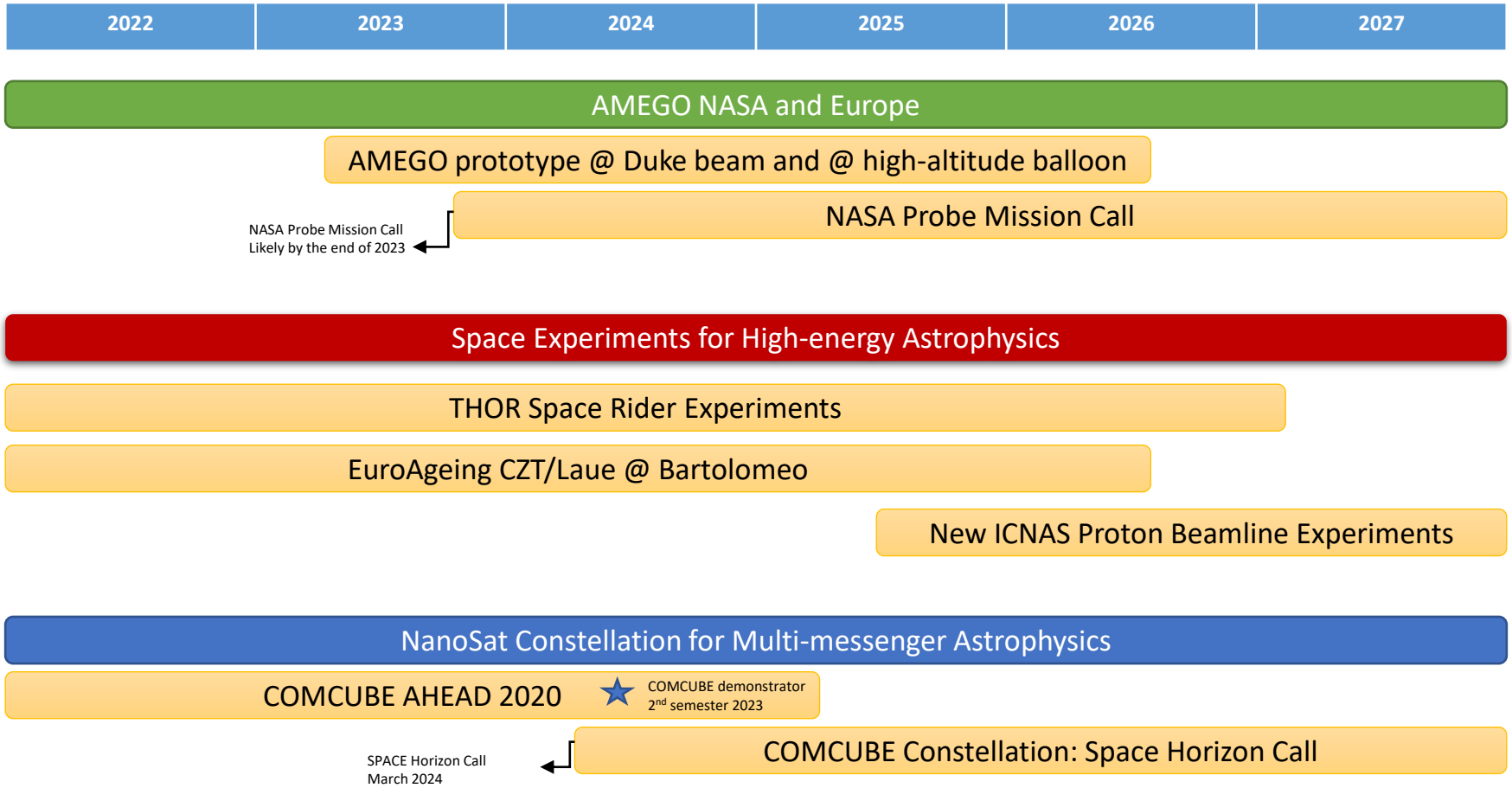
- i-Astro is leading the ESA Eu Material Ageing GLOSS international consortium and also the THOR Space Rider experiment. Members of three major international projects in high-energy astrophysics: AHEAD2020 European project, AMEGO NASA mission and ESA pre-select New Astrogam .

Opportunities

- AHEAD2020 activities provide balloon demonstrator launch opportunity and access to international scientific facilities.
- In case AMEGO or Astrogam selection outstanding NASA or ESA space mission participation.
- The GLOSS project provides an outstanding opportunity to estimate the performance of our instruments under orbital environment at ISS in LEO;
- The Space Rider will provide a unique opportunity to develop space scientific instruments for astrophysics and TGF observation with optimal design to operate in LEO. TGF Monitor product.

Weaknesses and Threats

- Components world market shortage due to Covid and War in Ukraine;
- Difficult to attract students beyond master thesis research for PhD degree: poor perspectives;
- The LIP Physics Department facilities are not up to date for fine scientific research activities, for instance mass device laboratorial plug sites are not uniformized and radioactive handling equipment is scarce and overused.


2022
2023
2024
2025
2026
2027
AMEGO NASA and Europe
AMEGO prototype @ Duke beam and @ high-altitude balloon
NASA Probe Mission Call
NASA Probe Mission Call
Likely by the end of 2023
Space Experiments for High-energy Astrophysics
THOR Space Rider Experiments
EuroAgeing CZT/Laue @ Bartolomeo
New ICNAS Proton Beamline Experiments
NanoSat Constellation for Multi-messenger Astrophysics
COMCUBE AHEAD 2020
COMCUBE demonstrator
2nd semester 2023
SPACE Horizon Call
March 2024
COMCUBE Constellation: Space Horizon Call