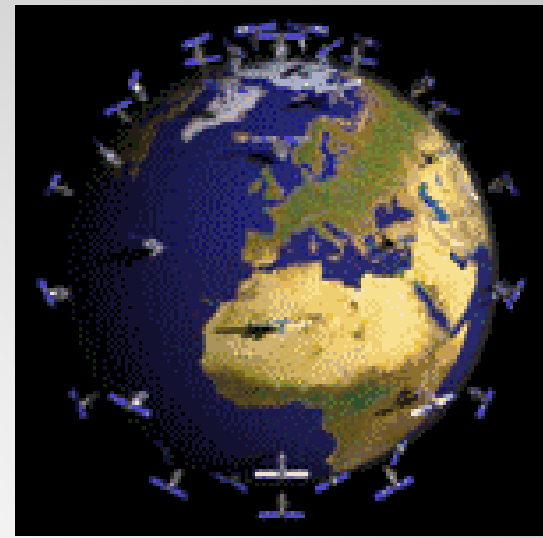




HERMES

A constellation of nano-satellites for high energy astrophysics and fundamental physics research

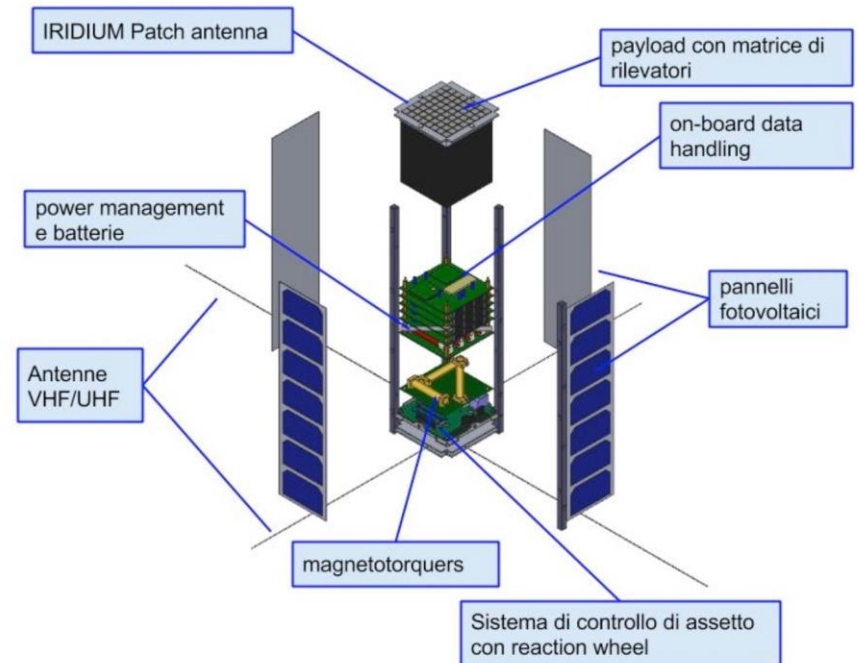
- GRB
- Multimessenger revolution
- Space-time structure



MISSION CONCEPT

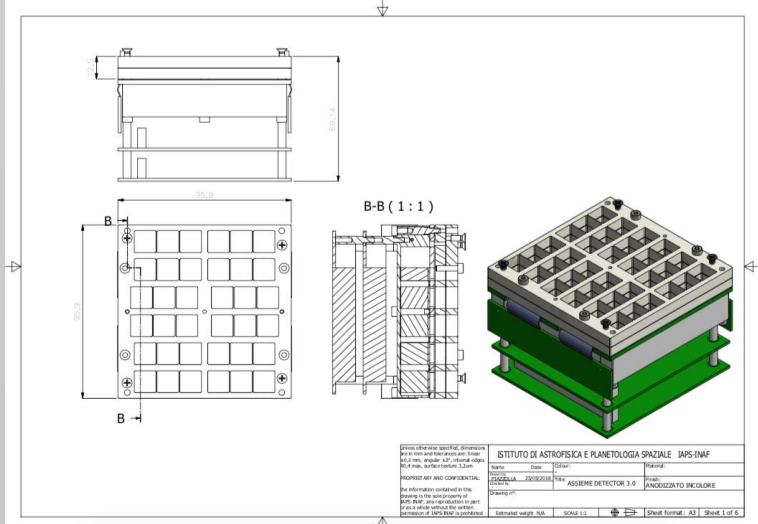
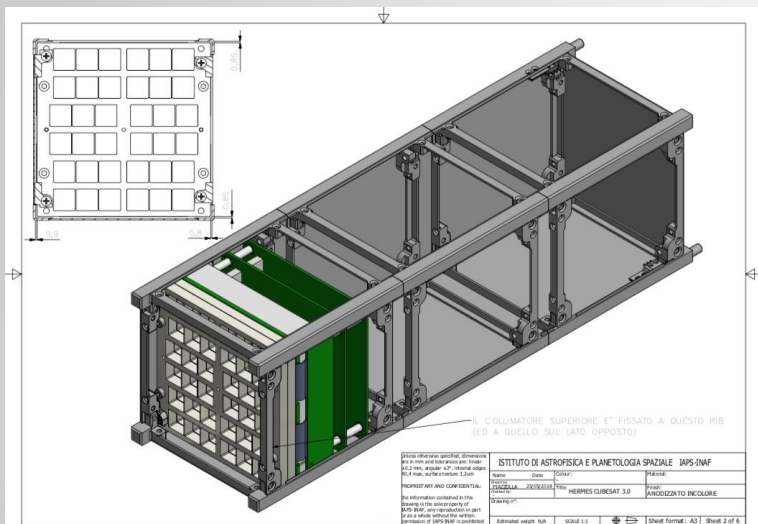
Disruptive technologies: cheap, underperforming, but producing high impact.

Distributed instrument, tens/hundreds of simple units

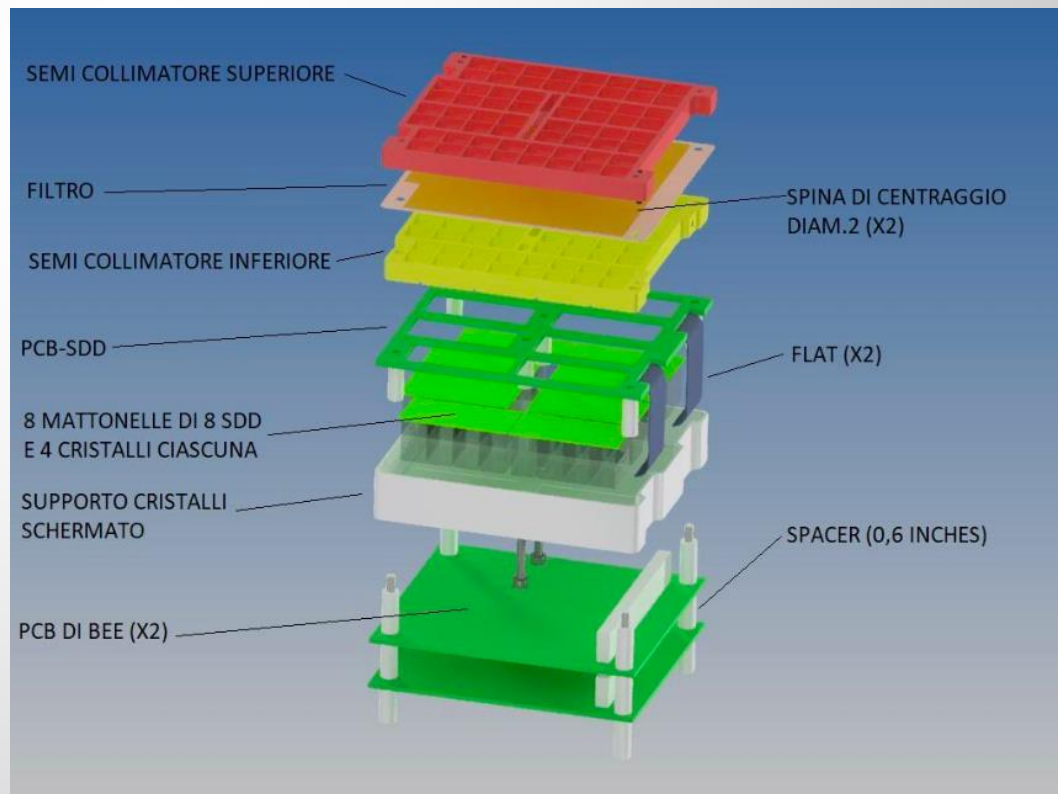


PAYLOAD

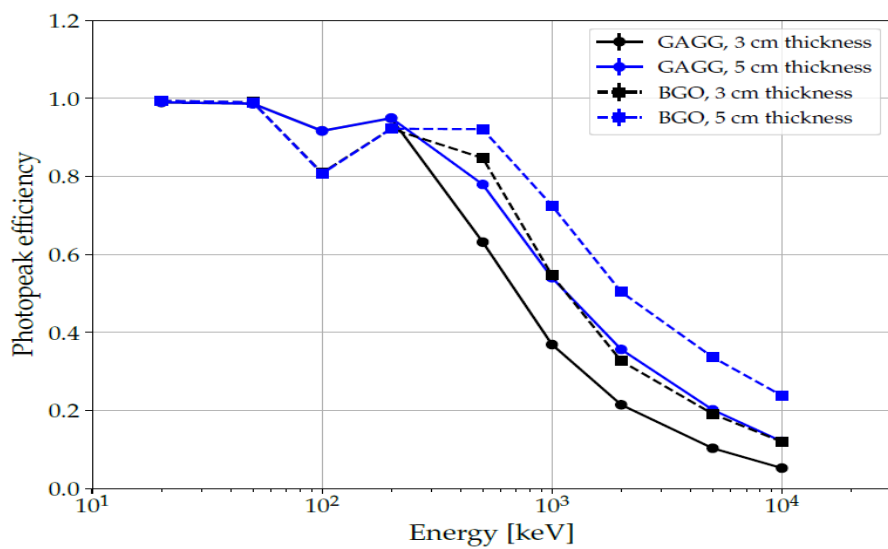
3Ucubesat simplest basic configuration



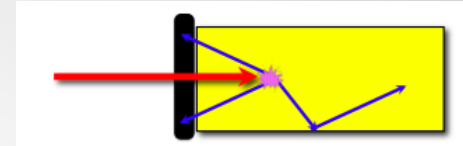
- Scintillator cristal (GAGG) + Photo detector (SDD)
- 3-2000 keV
- ~50 cm² coll. area
- a few sr FOV
- Temporal res. ≈ 100 ns
- Power < 4W
- ~1.8kg



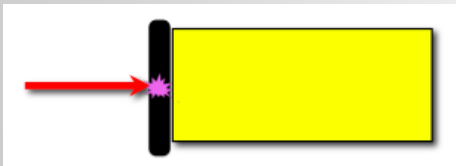
HERMES WIDE-BAND SENSITIVITY



Dual Simultaneous Functionality for SDDs:

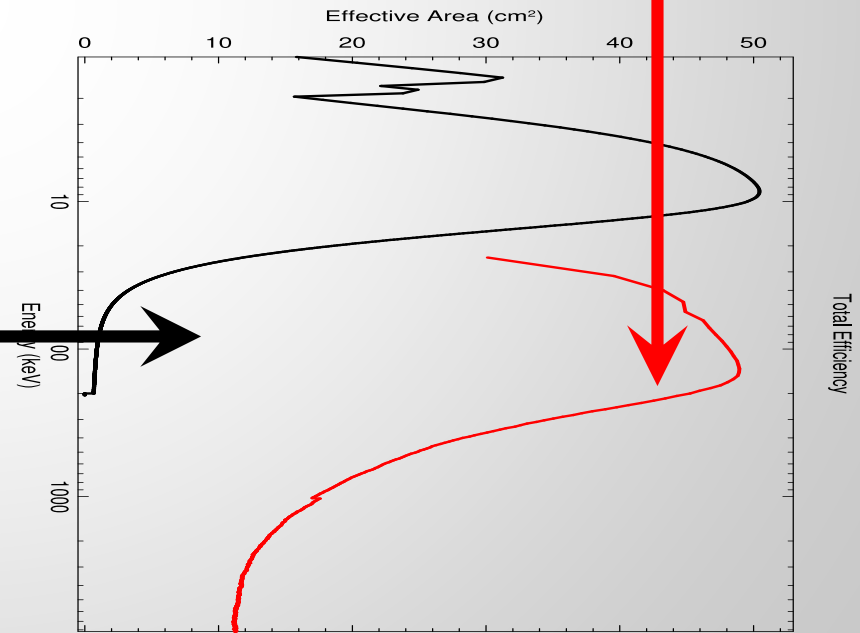


Scintillator readout system for Higher Energy X/ γ -rays



Solid State Detector for Low Energy X-rays

Feasible only with SDDs & Low Noise FEE



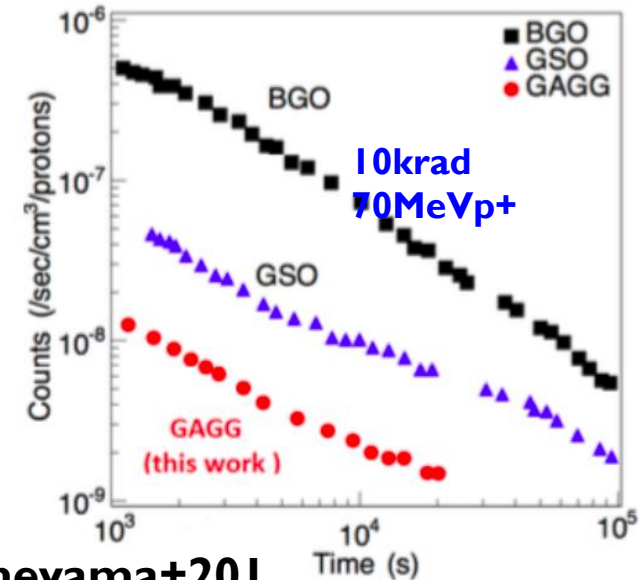
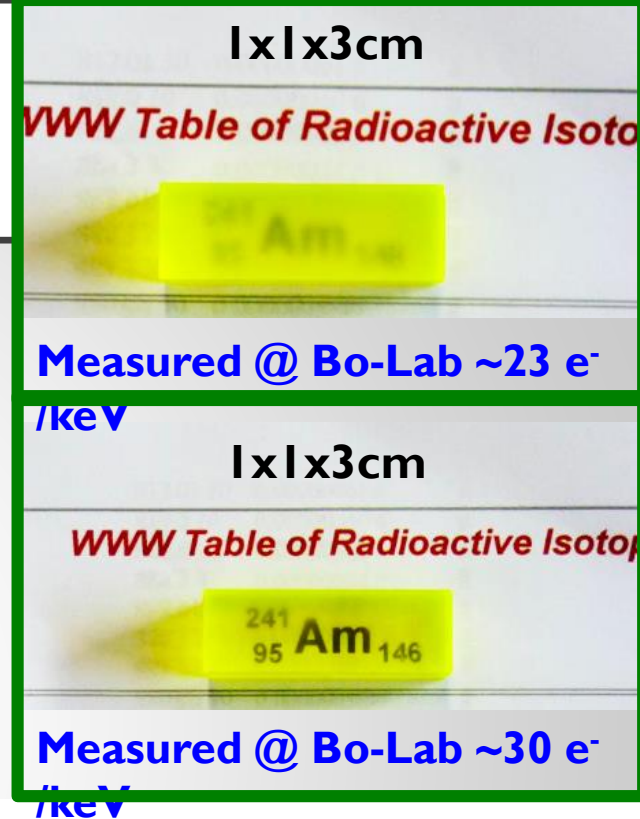
CE:GAGG CERIUM-DOPED GADOLINIUM-ALUMINUM- GALLIUM GARNET



Available from industry since ~2014

- Light output: 40 – 60 ph/keV
- No intrinsic background
- Not hygroscopic
- Decay time ~90 ns
- High density (6.63 g/cm³)
- Peak emission at 520 nm
- Hardness: 8 Mohs scale
- Energy resolution ~ 5% @ 662 keV

Very promising literature radiation tests
Planned further test to better understand
Afterglow effects



Breakthrough scientific case:

- EM of GWE

Modularity:

- Avoid single point failures, improve hardware
- Pathfinder

WHY HERMES
NOW?

