Particle detection in space: From the TeV to the eV energy range

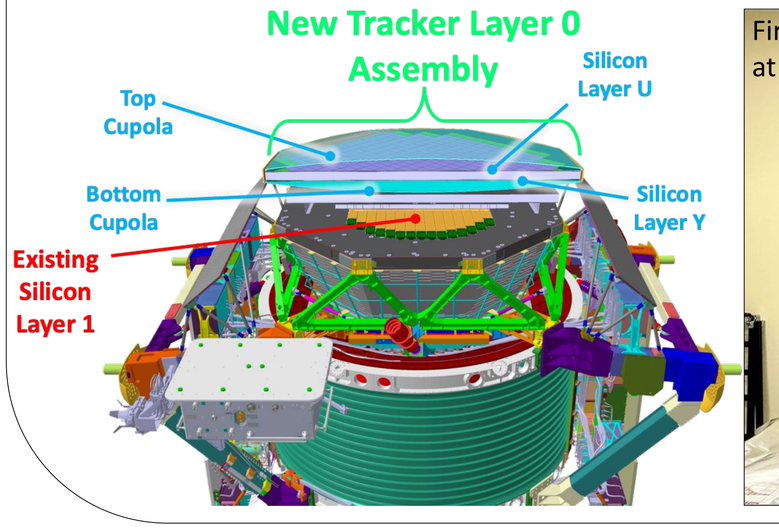
AMS, Limadou, NUSES-LEM, SPARKLE

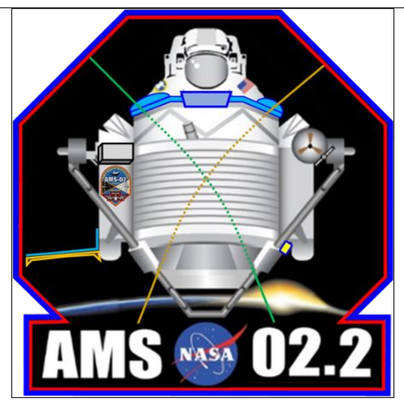
10 anni di TIFPA

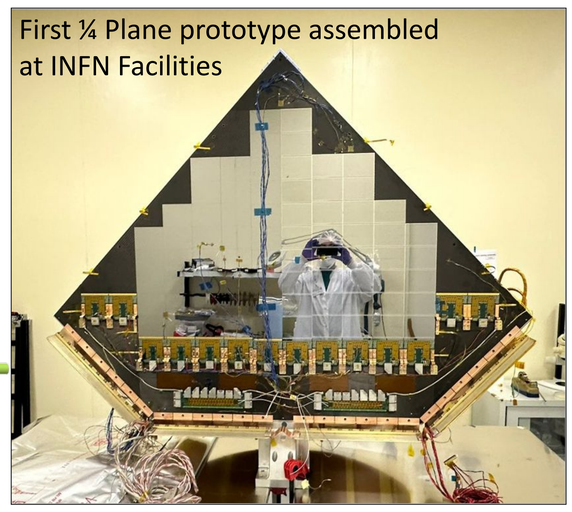
AMS-02.2

After more than 10 years on the ISS, AMS-02 will have an upgrade in early 2026
A new layer of silicon detector will be added on top the existing AMS-02

Increases Detector acceptance by ~300%

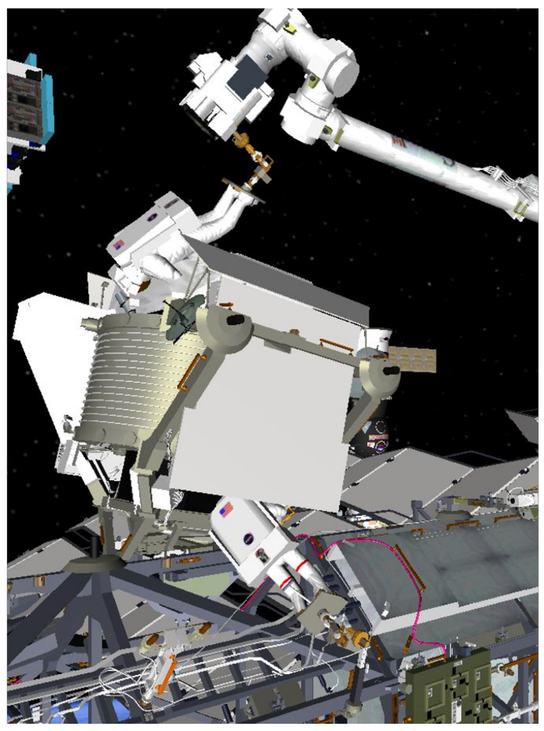




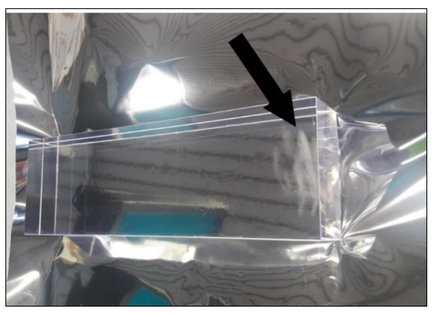


Vibration test at INFN – Terni lab

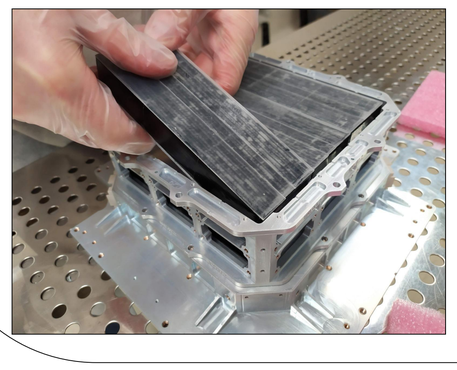
Installation procedure simulation

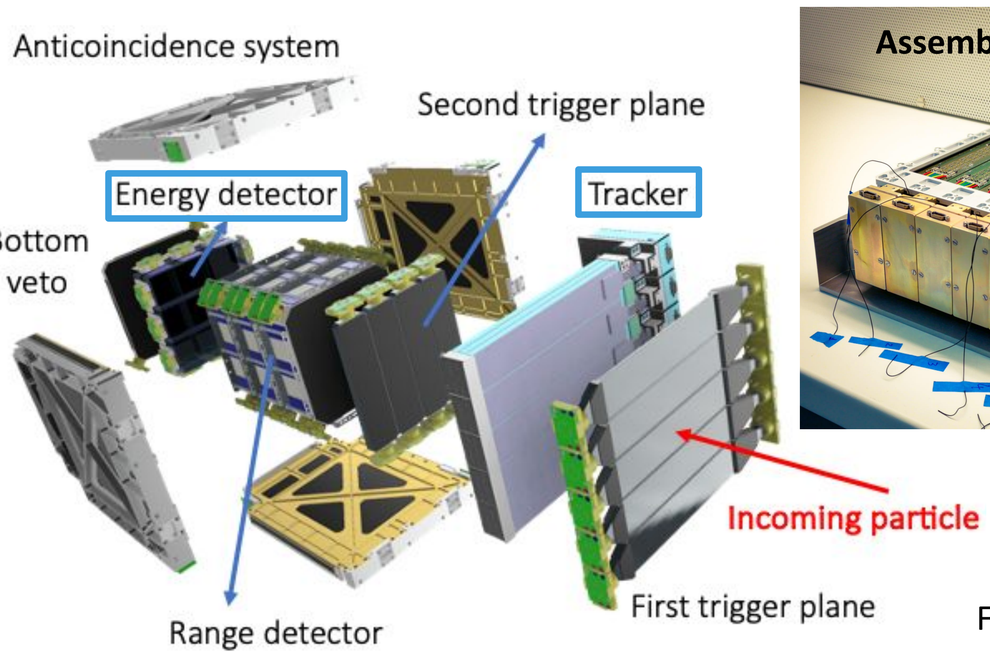


HEPD-02 detector
Hardware activities @ TIFPA

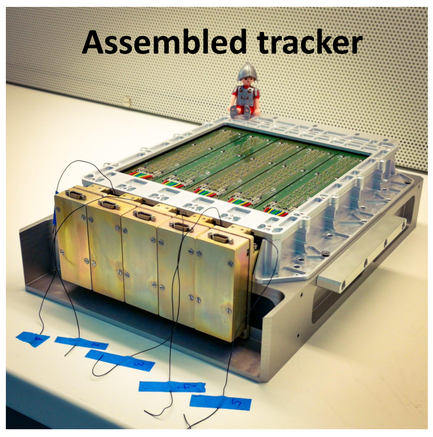


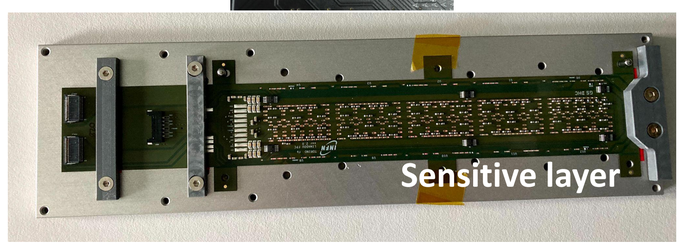
Largest LYSO crystals for space use hosted in Energy Detector

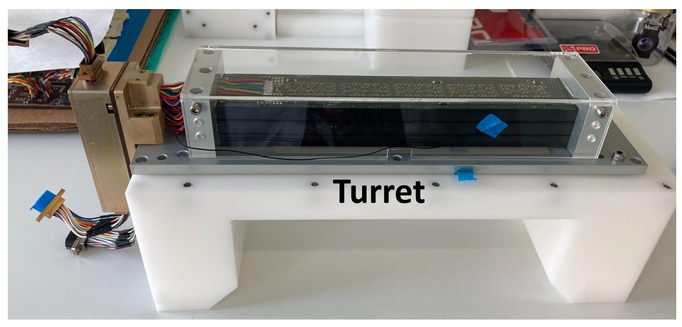




Energy range: 3 - 100 Mev electrons, 30 -200 MeV protons

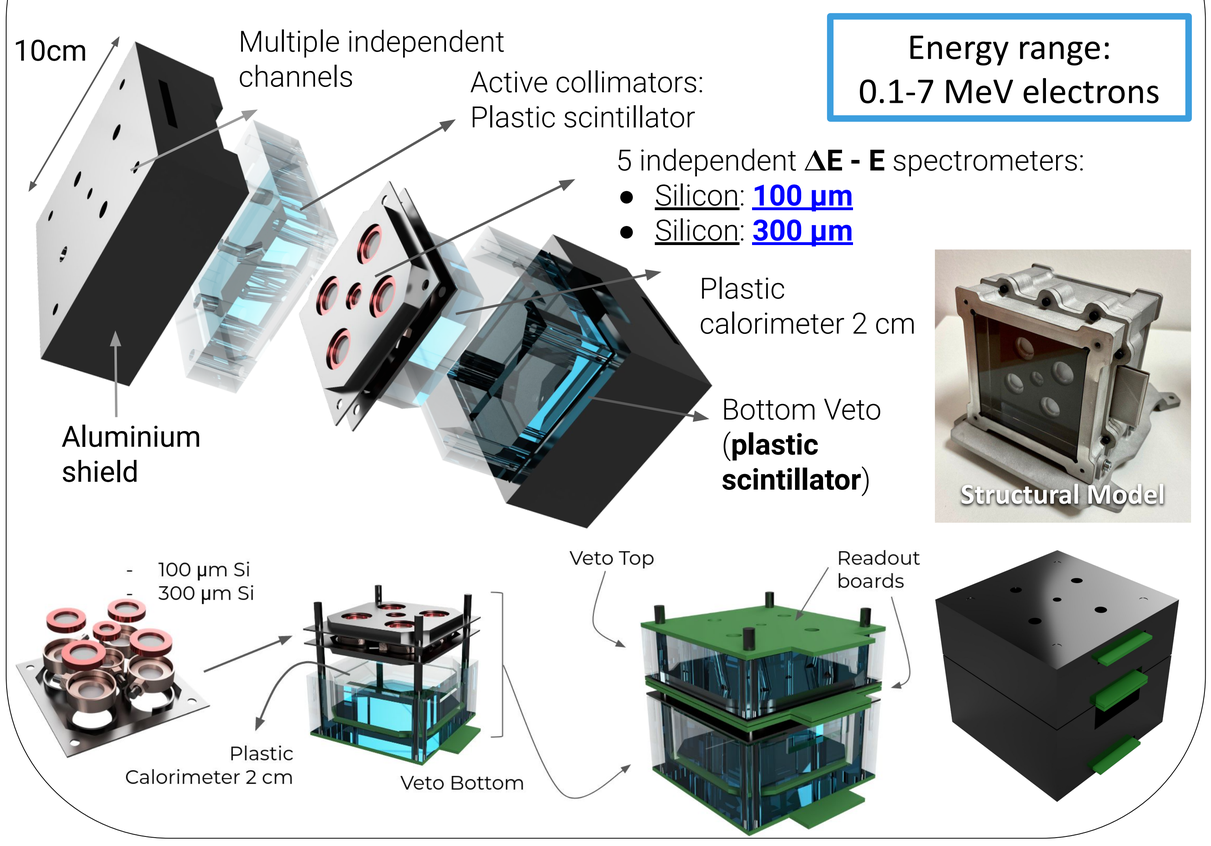






First **pixel-based** fully digital tracker for **space applications**
It is composed of **five independent modules**
Each turret has **three planes** hosting 10 ALTAI sensors each

The Low Energy Module onboard the NUSES satellite



The Small Particle Recognition Kit for Low Energies (SPaRKLE) for the ESA Academy Experiments - Space Rider program

- Selected project for the **ESA Academy Experiments - Space Rider Programme**
- Space Rider: an uncrewed robotic laboratory in space. After launch, it will stay in low orbit for about two months.
- SPaRKLE is the **first ever** student-led space initiative in **Trentino**
- A compact payload for low-energy particles, X-rays and γ