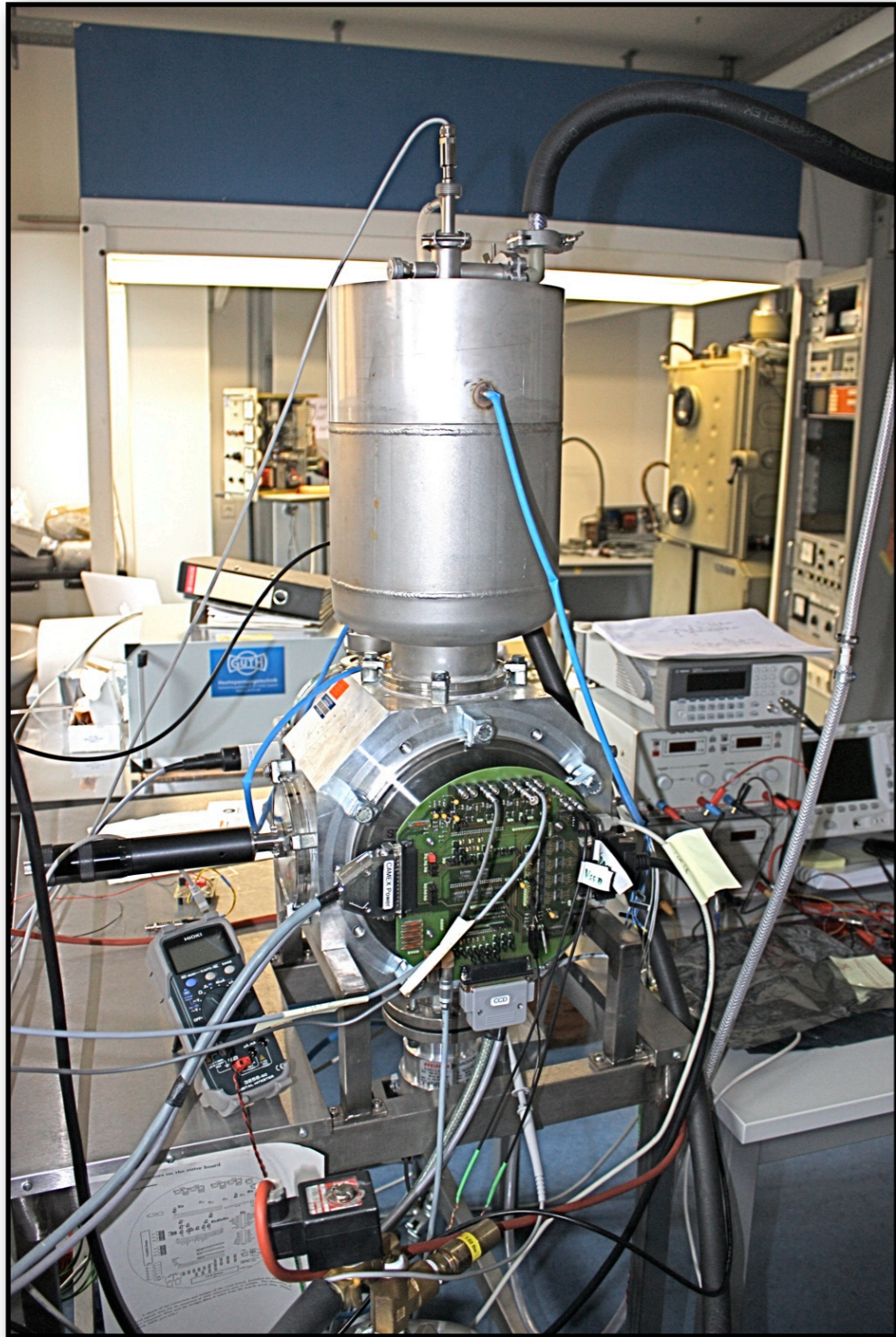


# Continuing Experimental High-Energy Astrophysics in Tübingen

---

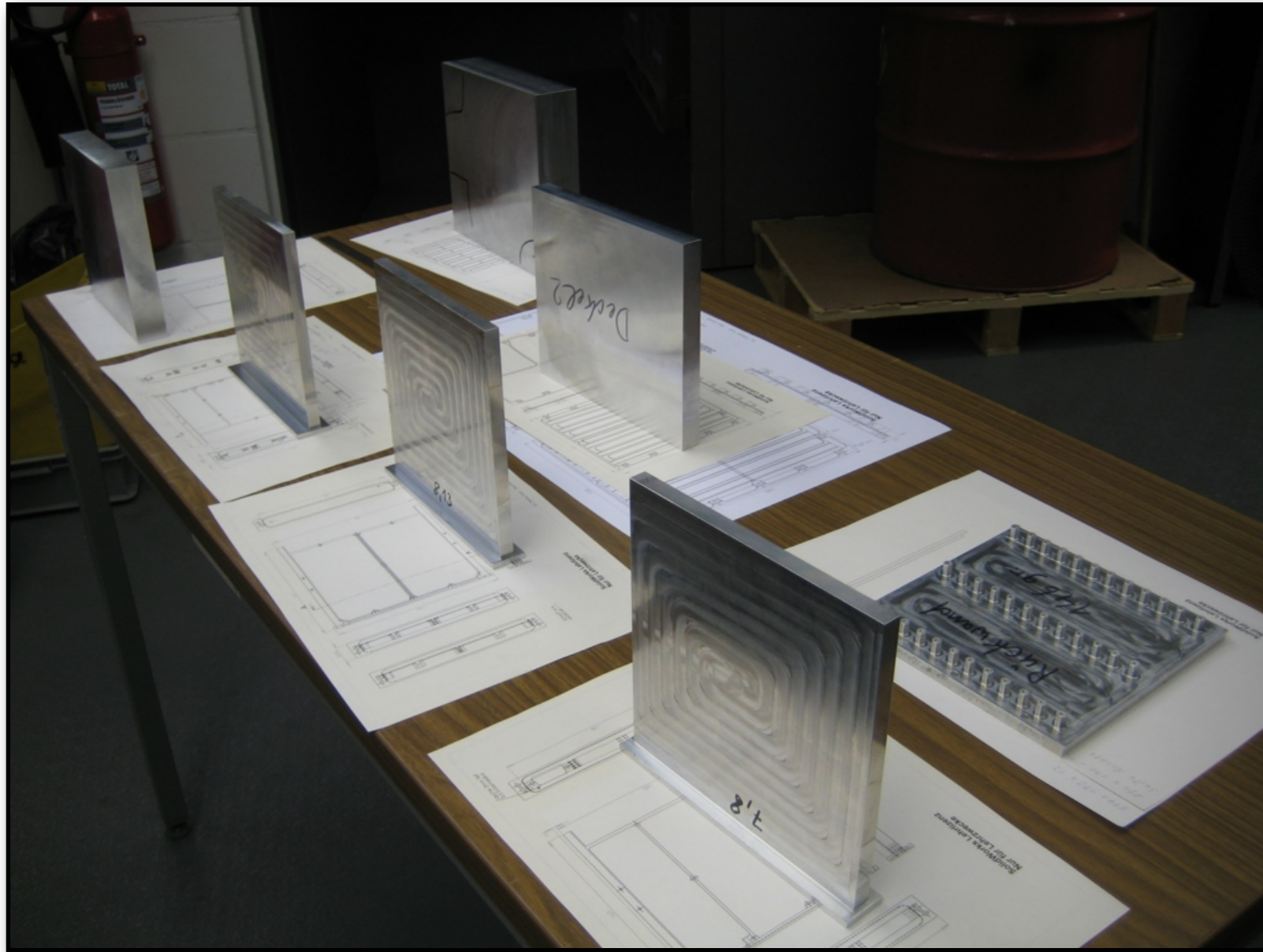
Chris Tenzer - IAAT  
Kepler Center for Astro- and Particle Physics  
University of Tübingen

# eROSITA FrameStore-CCD setup

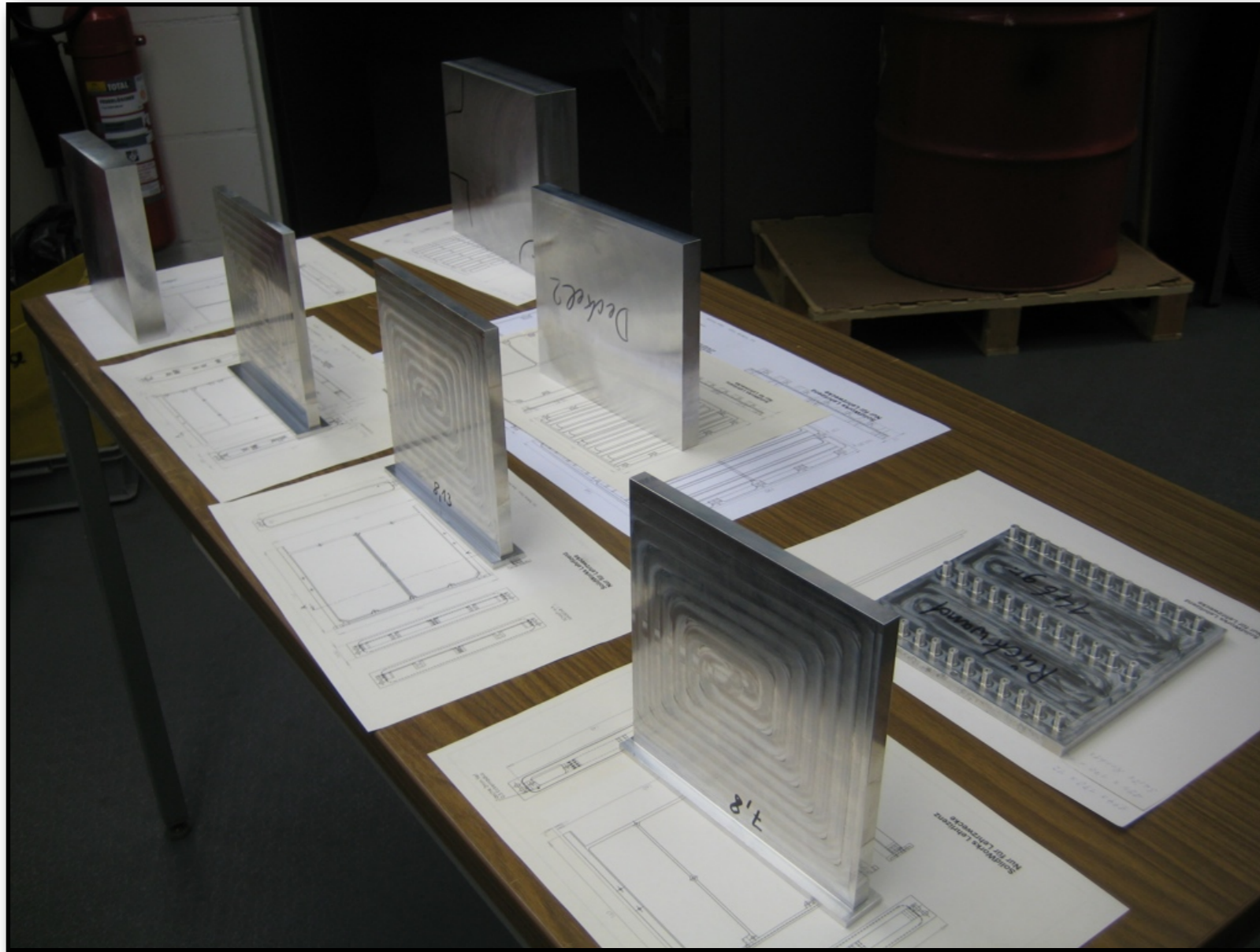


- Hardware development:
  - sequencer to drive CCD operation and readout
  - electronic boxes
- FrameStore-CCD lab setup:
  - 128 x 128 Pixel Prototype FS-CCD
  - $10^{-7}$  mbar vacuum chamber
  - liquid nitrogen cooling
- Tests include...
  - sequencer electronics test
  - optimum sample time
  - gain behaviour
  - spectral resolution
  - thermal noise as a function of temperature
  - tests of optical filter quality (pinholes)

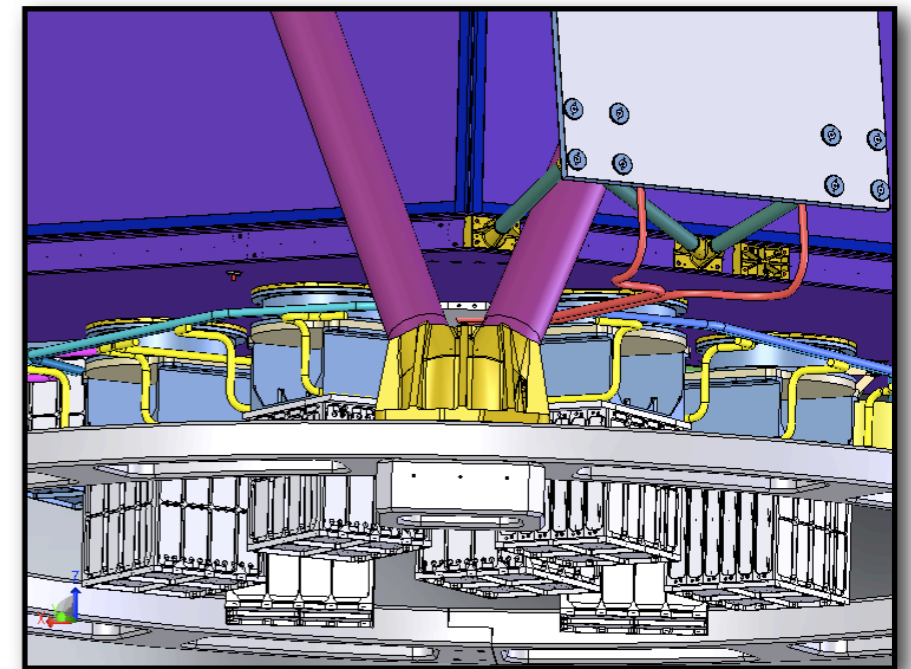
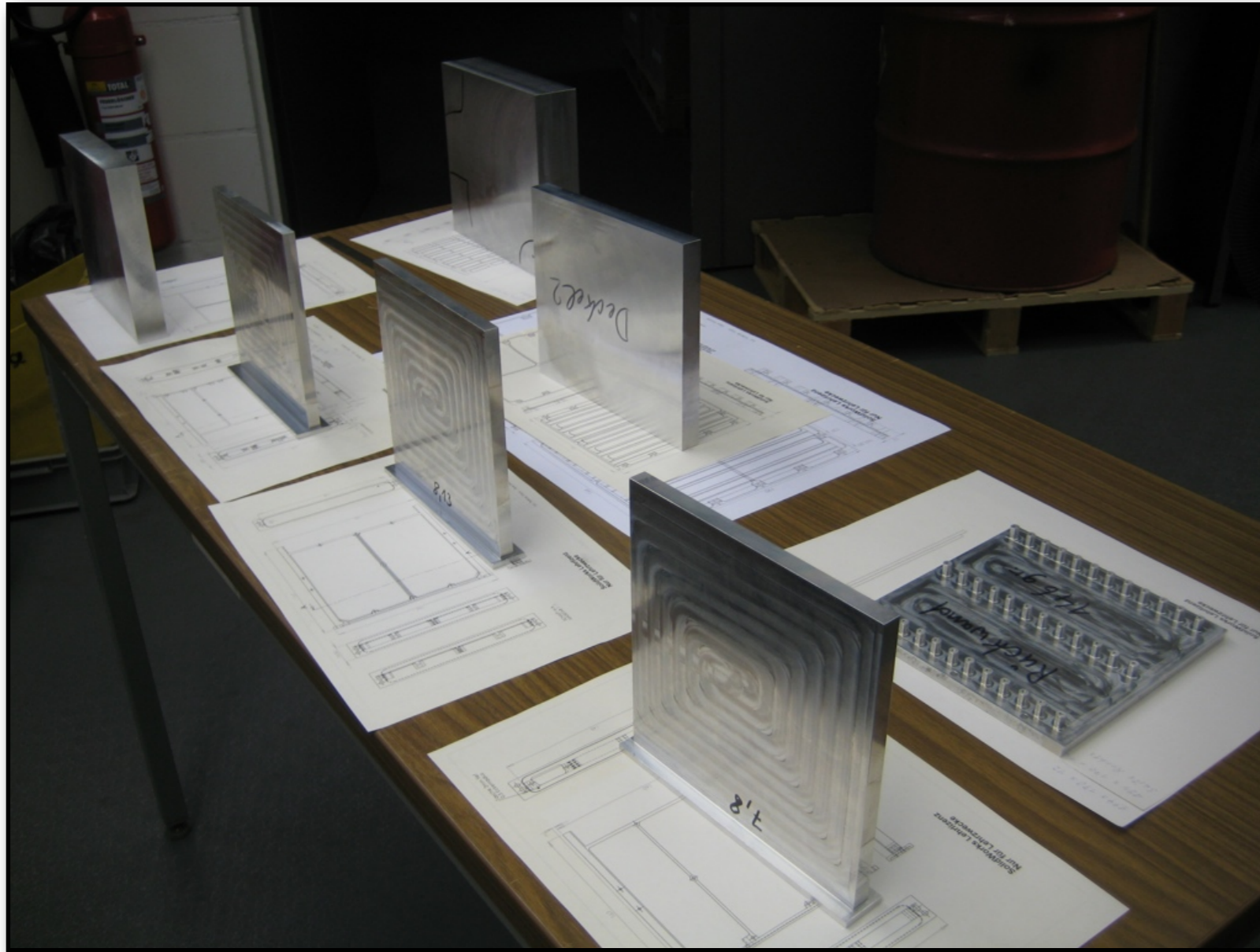
# eROSITA electronics boxes



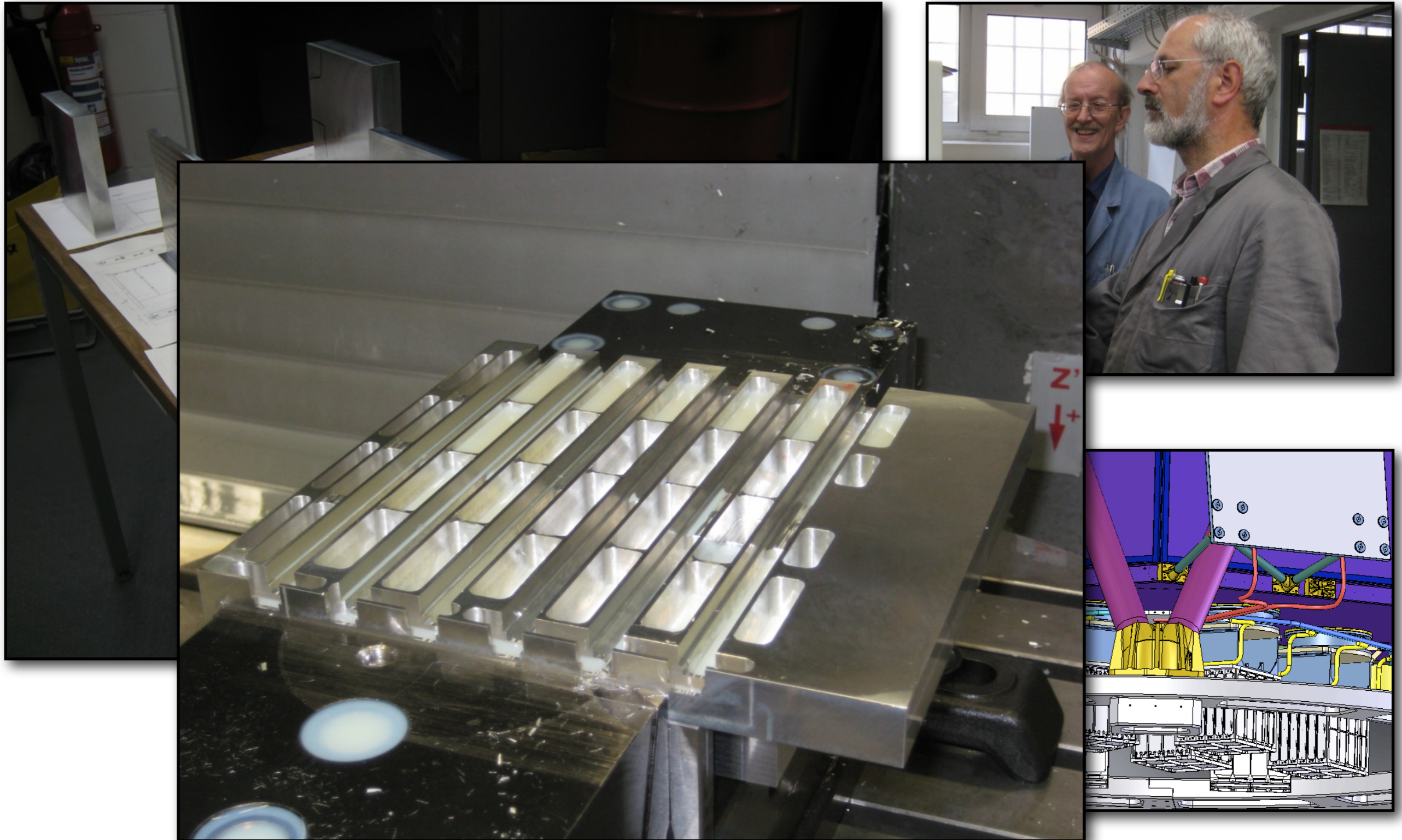
# eROSITA electronics boxes



# eROSITA electronics boxes



# eROSITA electronics boxes



# stacked detectors as proposed for Simbol-X / IXO-WFI

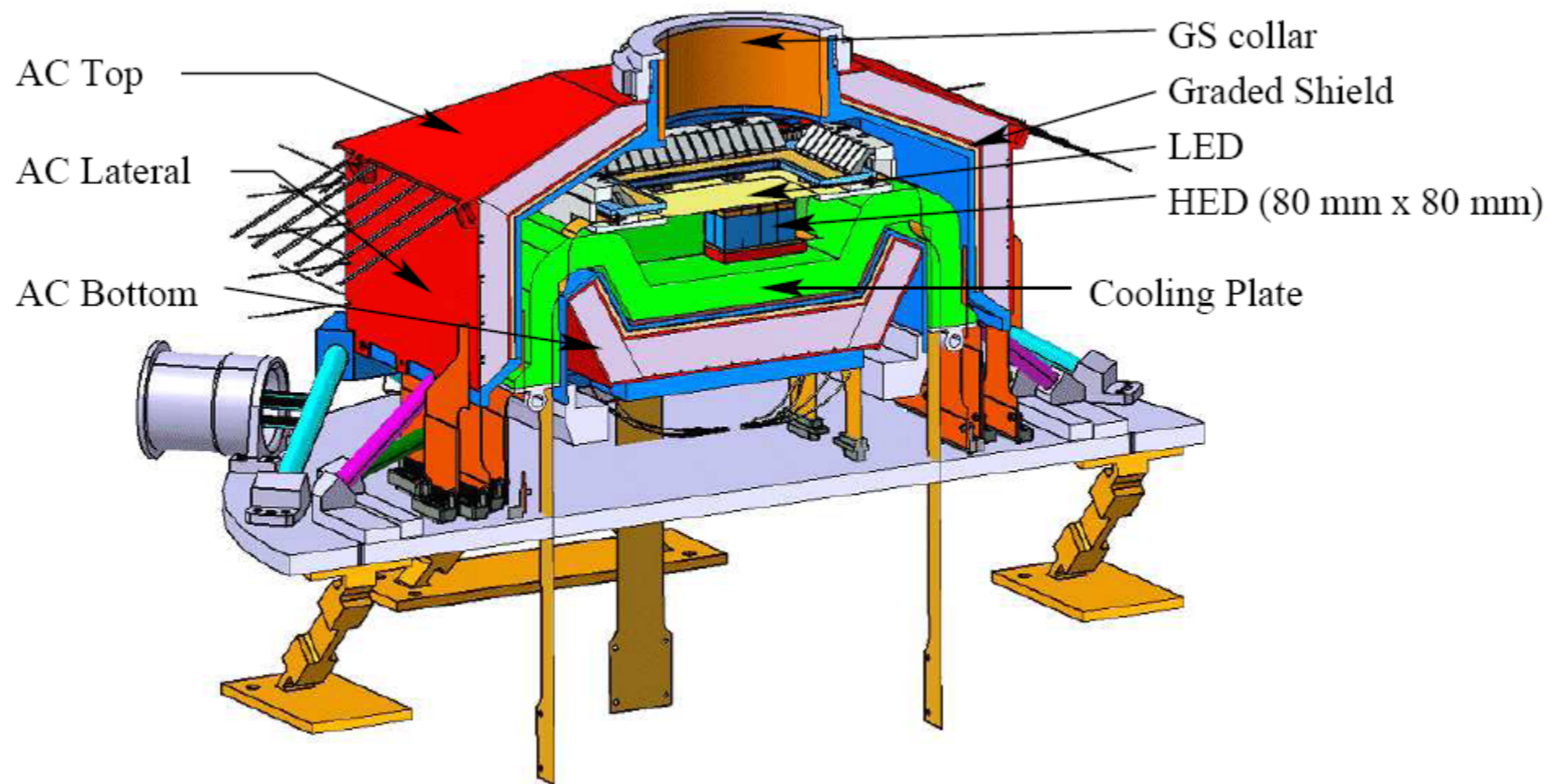
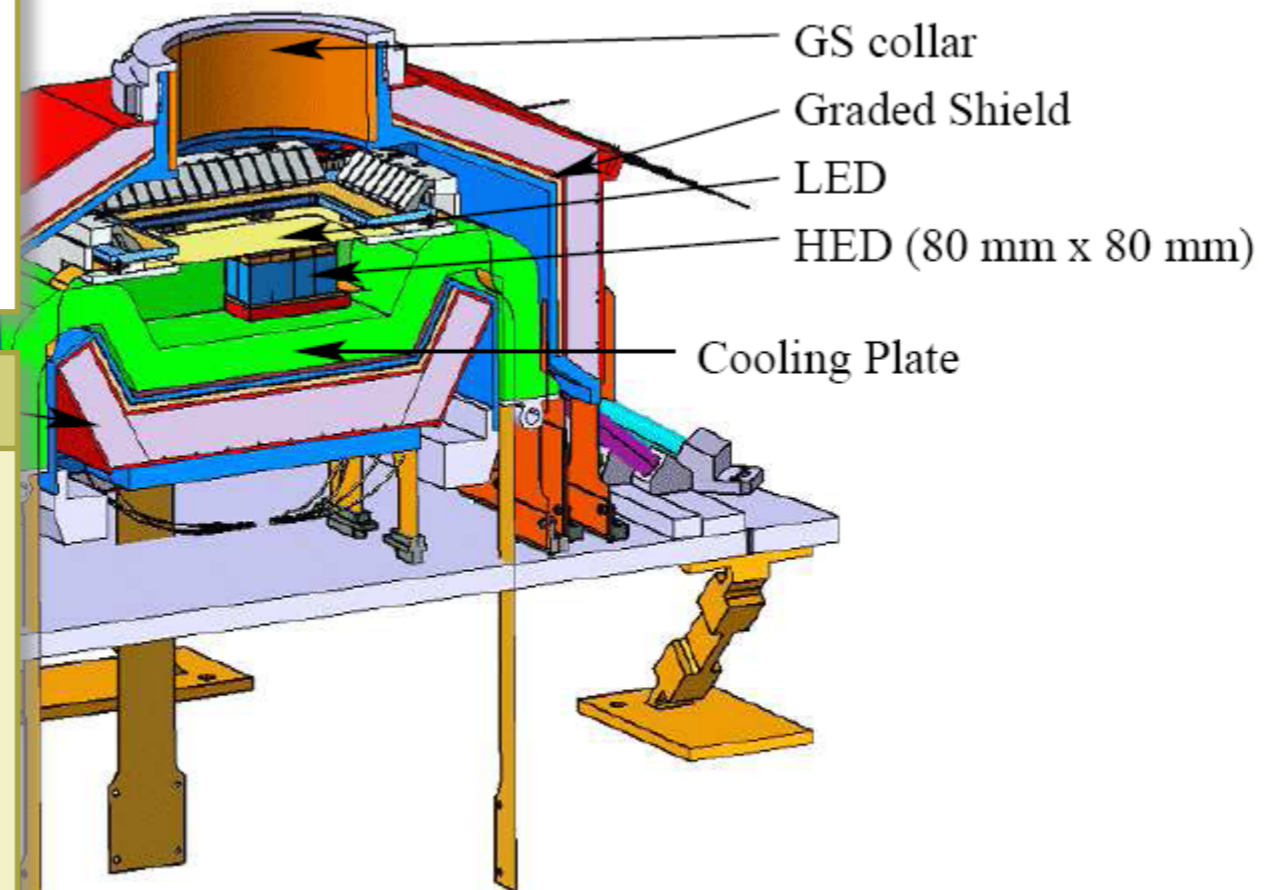
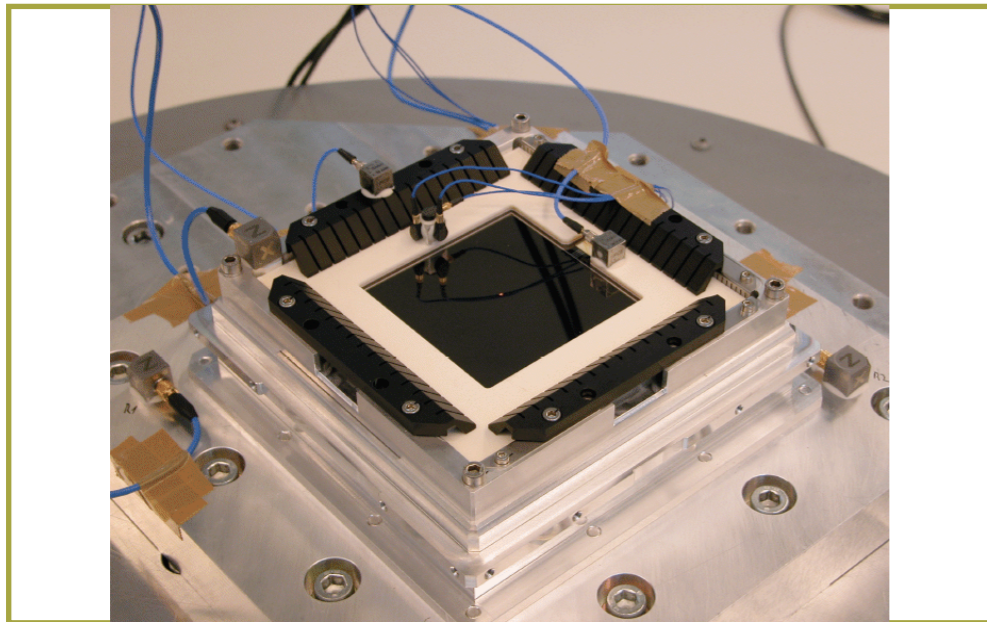


image: Jerome Martignac, CEA

# stacked detectors as proposed for Simbol-X / IXO-WFI

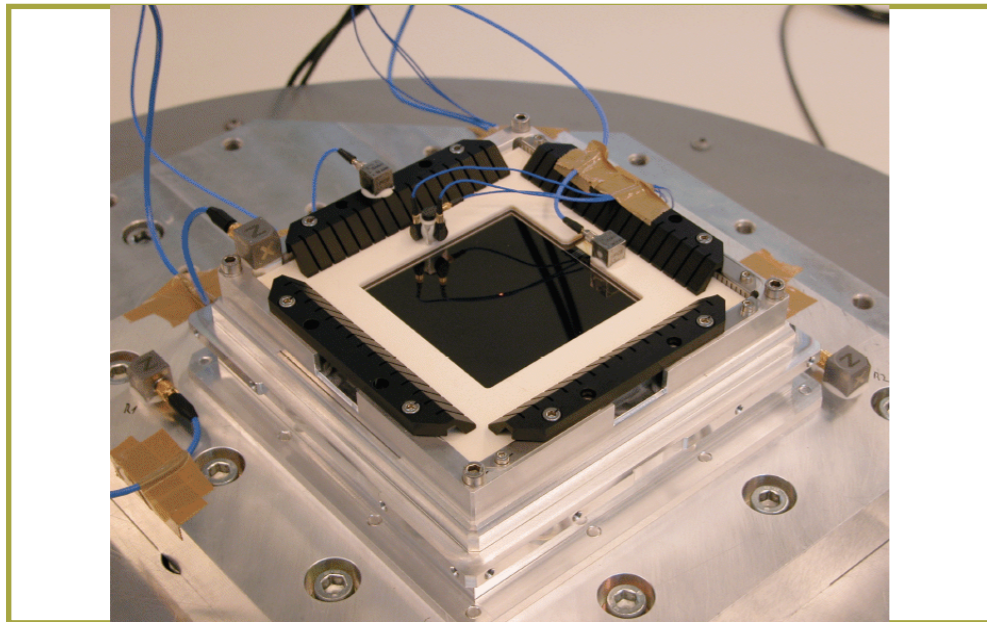


## Low Energy Detector

- ▶ sensitive area: 8.0 x 8.0 cm<sup>2</sup>
- ▶ pixel size: 625 μm x 625 μm
- ▶ silicon thickness: 450 μm
- ▶ number of pixels: 128 x 128
- ▶ energy resolution: 150 eV @ 6 keV
- ▶ warm temperature: -40 °C
- ▶ readout time: 128 μs

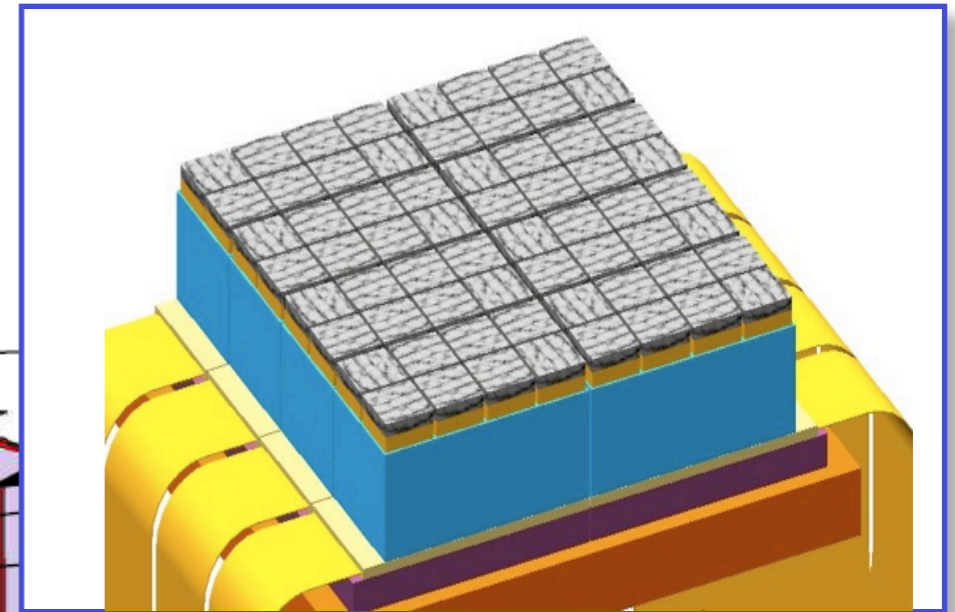
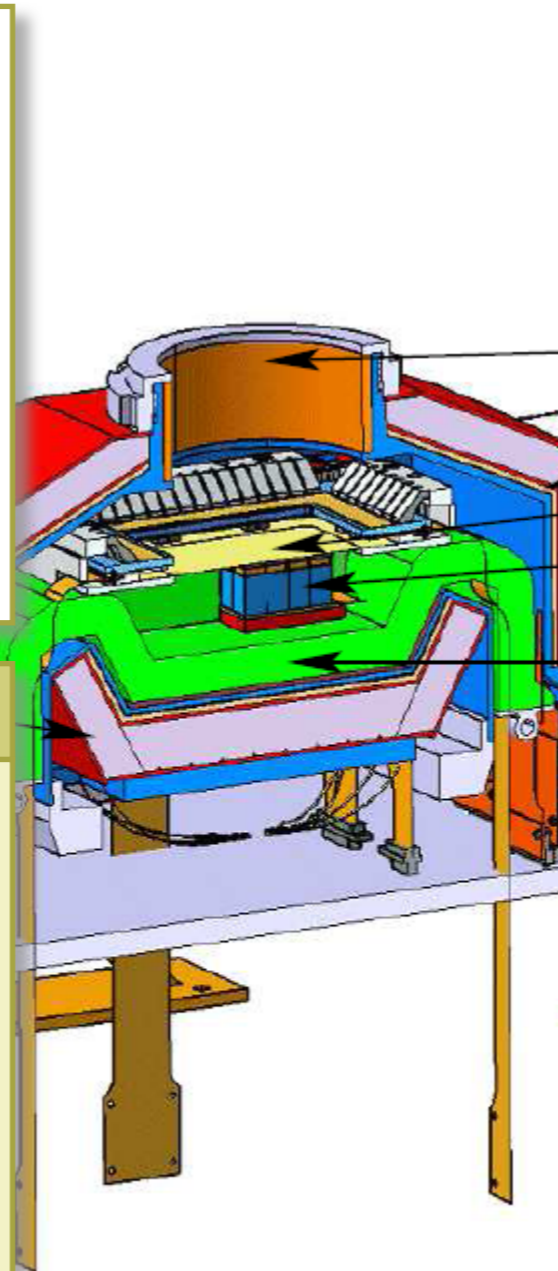


# stacked detectors as proposed for Simbol-X / IXO-WFI



## Low Energy Detector

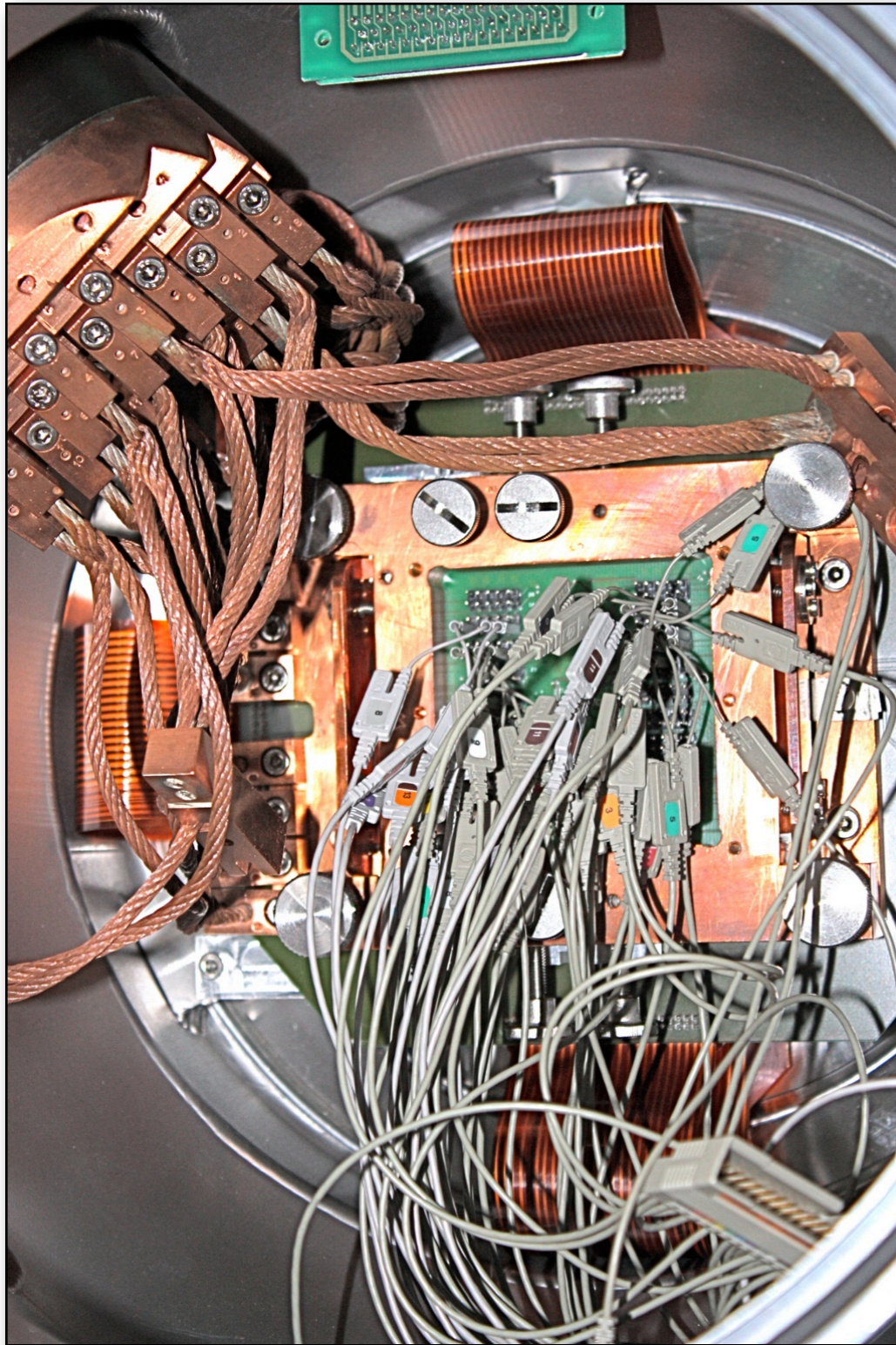
- ▶ sensitive area: 8.0 x 8.0 cm<sup>2</sup>
- ▶ pixel size: 625 μm x 625 μm
- ▶ silicon thickness: 450 μm
- ▶ number of pixels: 128 x 128
- ▶ energy resolution: 150 eV @ 6 keV
- ▶ warm temperature: -40 °C
- ▶ readout time: 128 μs



## High Energy Detector

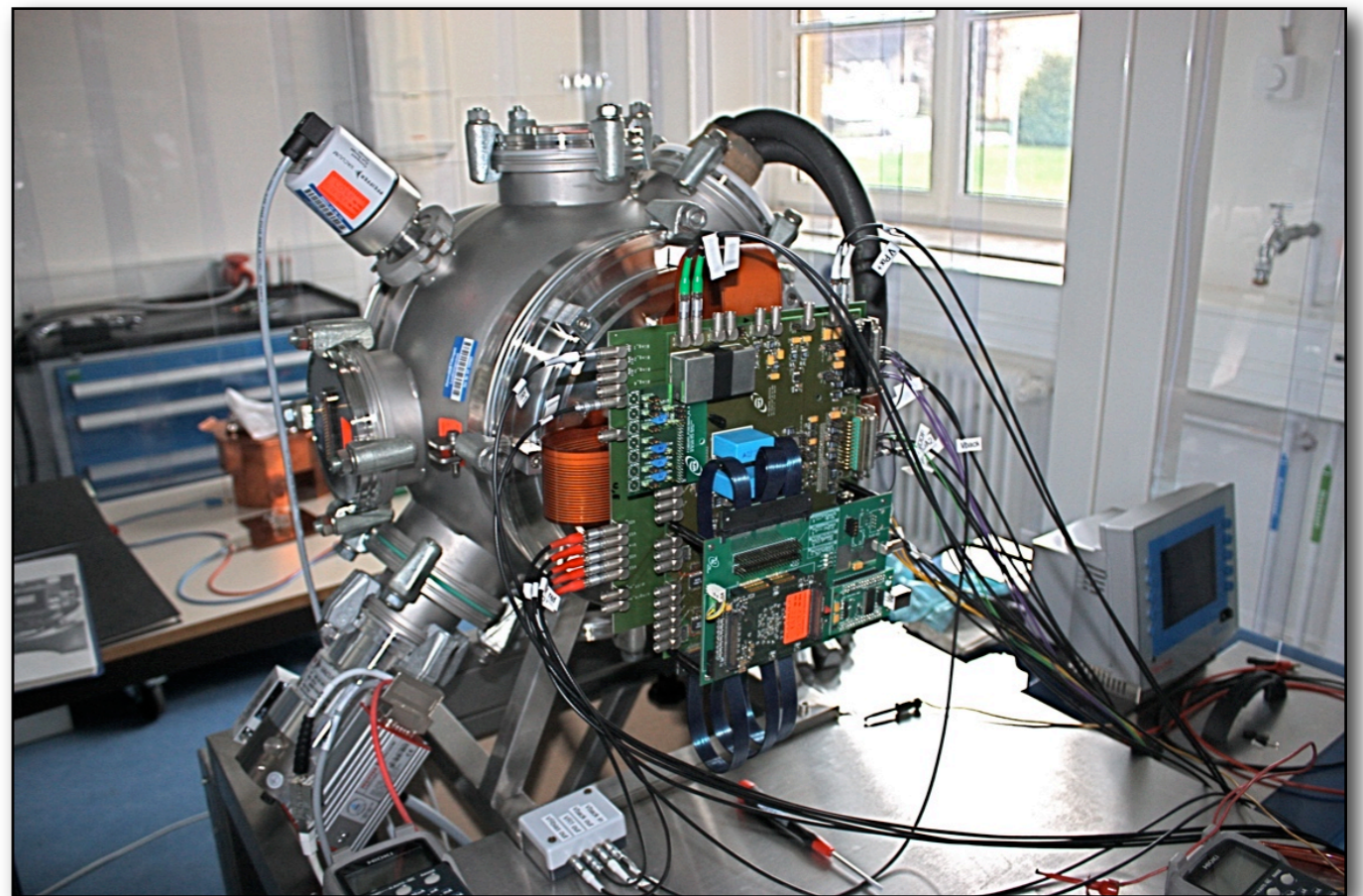
- ▶ active imaging size: 64 cm<sup>2</sup>
- ▶ pixel size: 625 μm x 625 μm
- ▶ CdTe thickness: 2 mm
- ▶ number of pixels: 128 x 128
- ▶ energy resolution: 0.8 keV @ 59 keV
- ▶ filling factor: 87.1 %

# SVM lab setup at IAAT

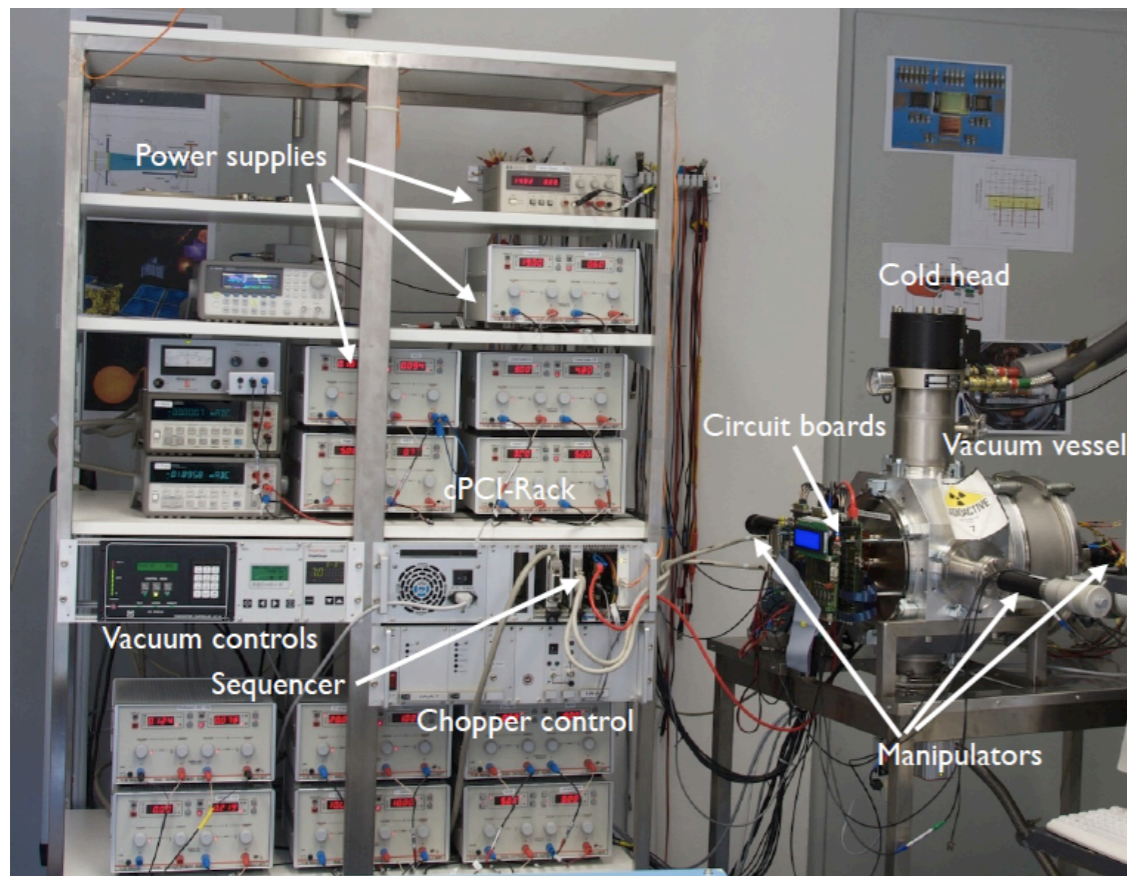


Goal of this setup:

- operate one quadrant of the LED together with one module of the HED
- test electronics components developed for detector readout and event-preprocessing



# IXO-WFI lab setup at IAAT

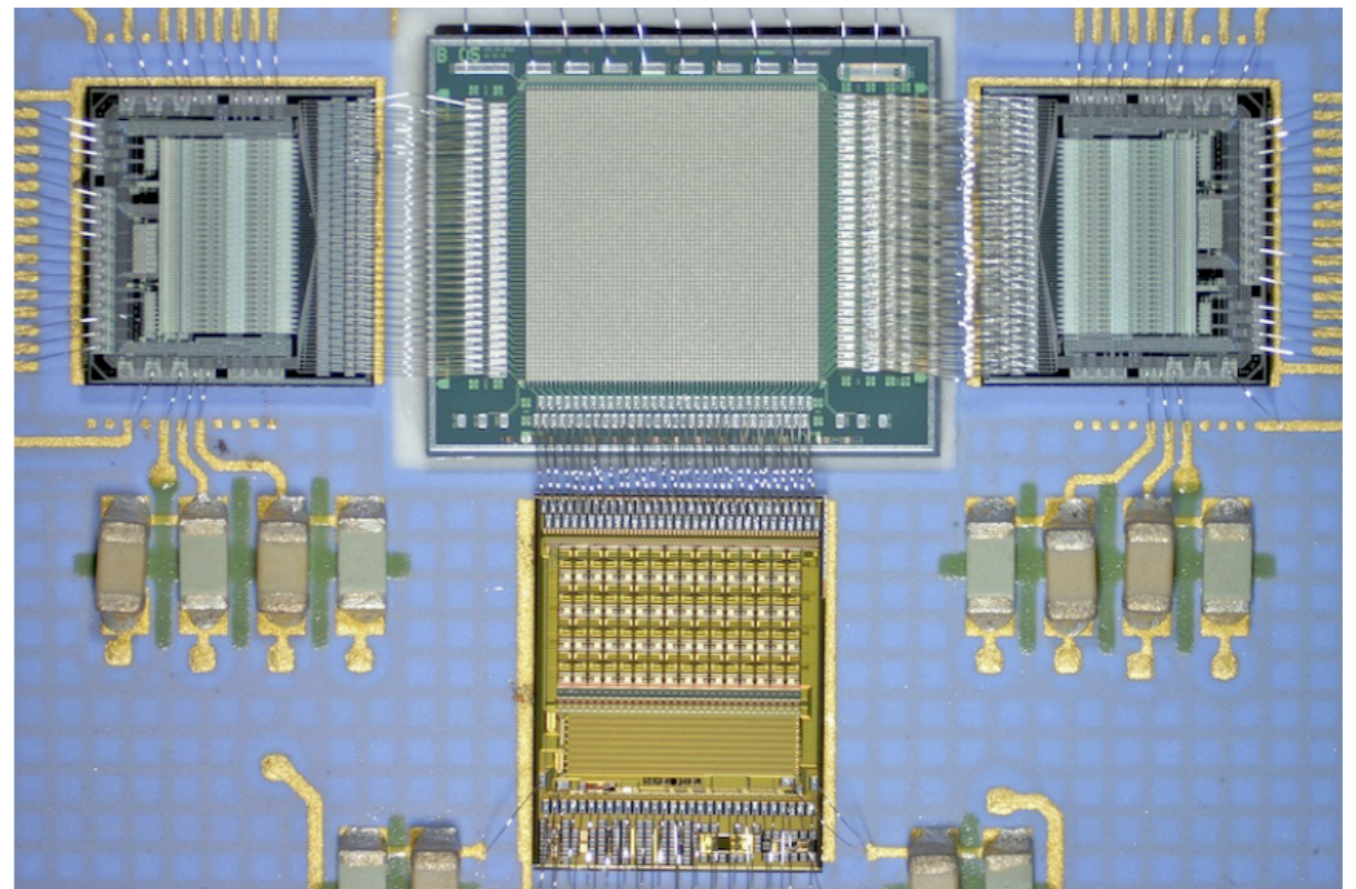


Goal of this setup:

- operate a 64 x 64 Pixel prototype
- test electronics components developed for detector readout and event-preprocessing

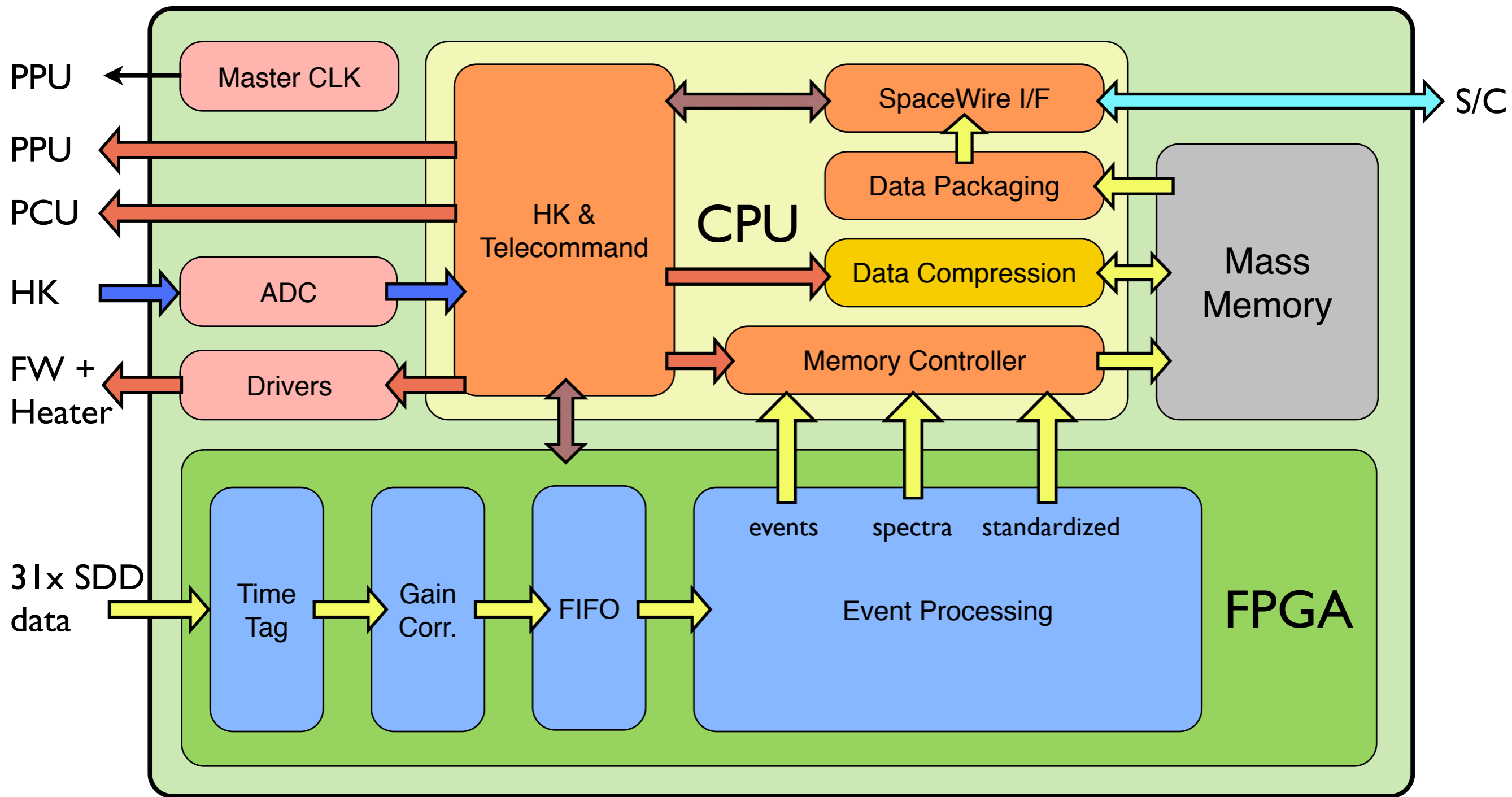
Performance measurements:

- energy resolution
- split event distribution
- noise and offset stability as a function of temperature



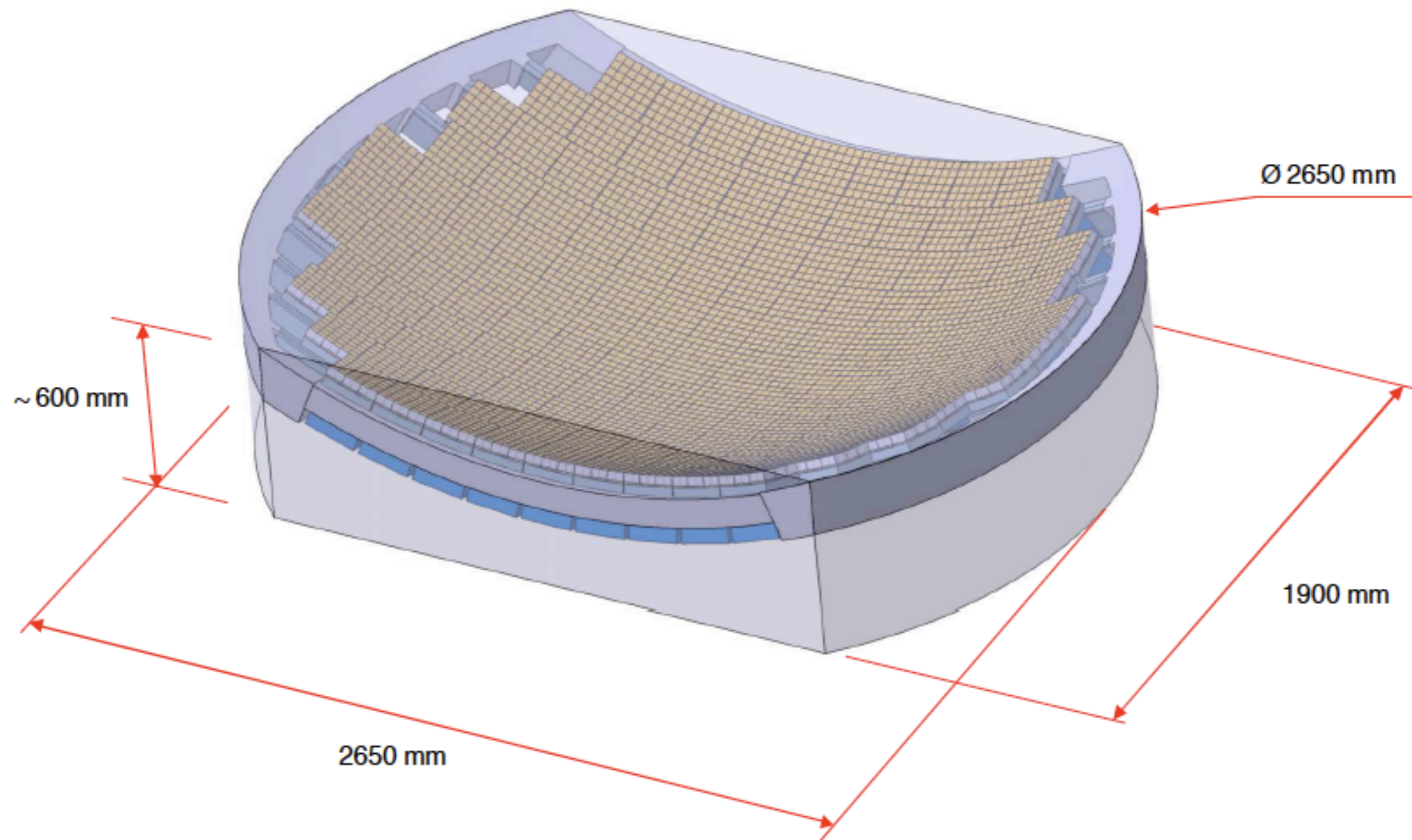
images: Michael Martin, IAAT

# IAAT hardware contribution for IXO-HTRS

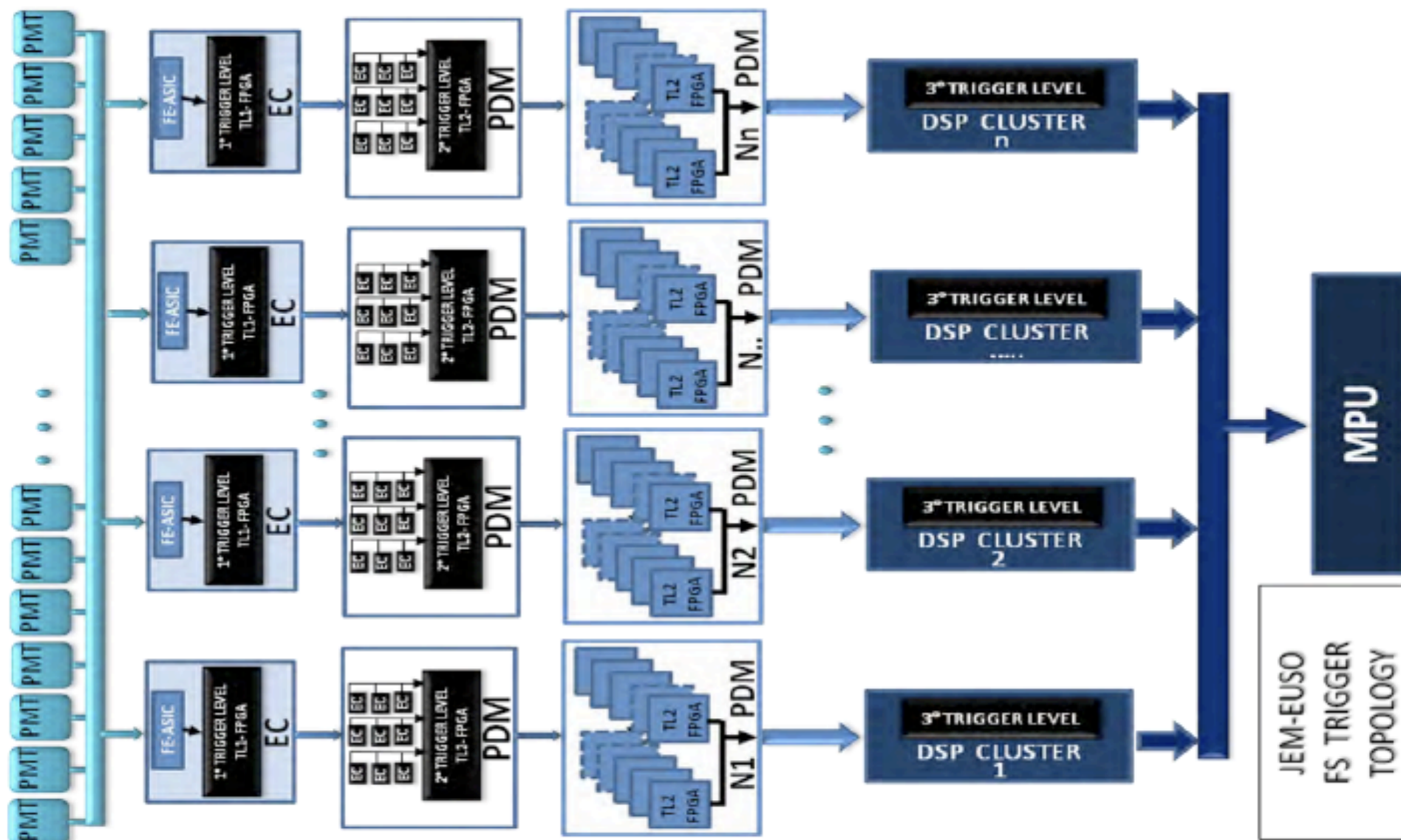


Digital Data Processing Unit

# electronics development for JEM-EUSO



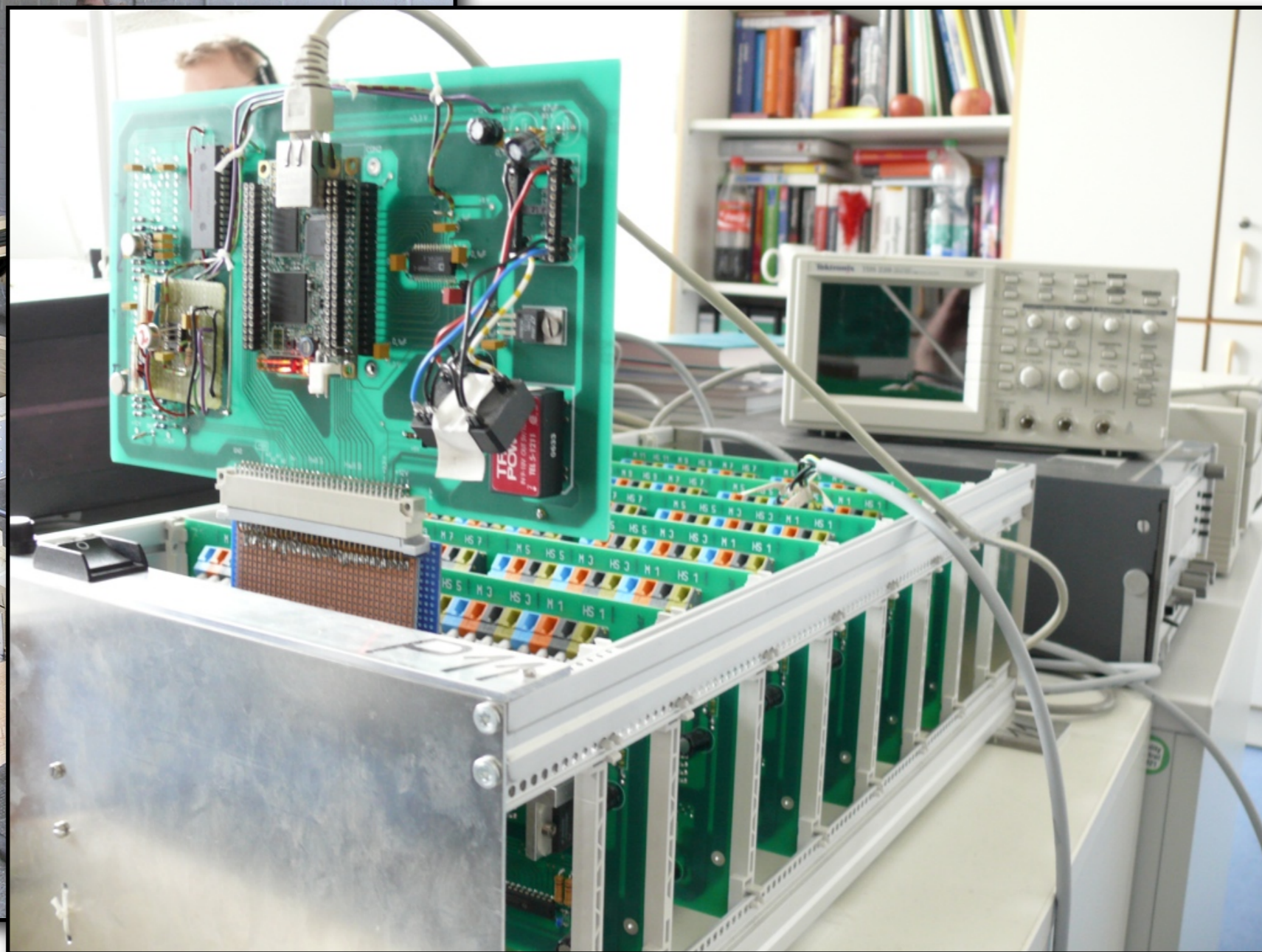
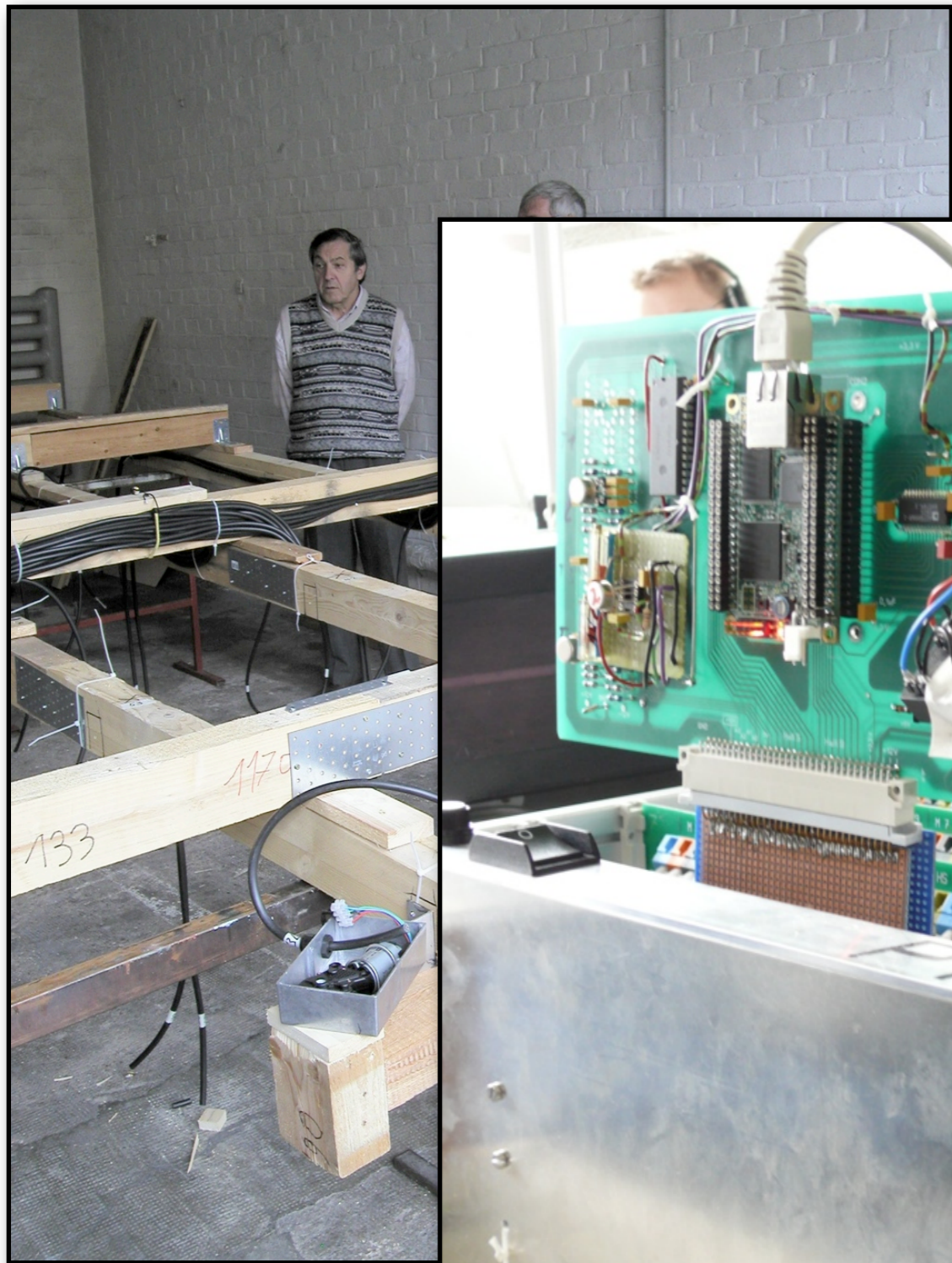
# electronics development for JEM-EUSO



# H.E.S.S. and H.E.S.S. 2 activities

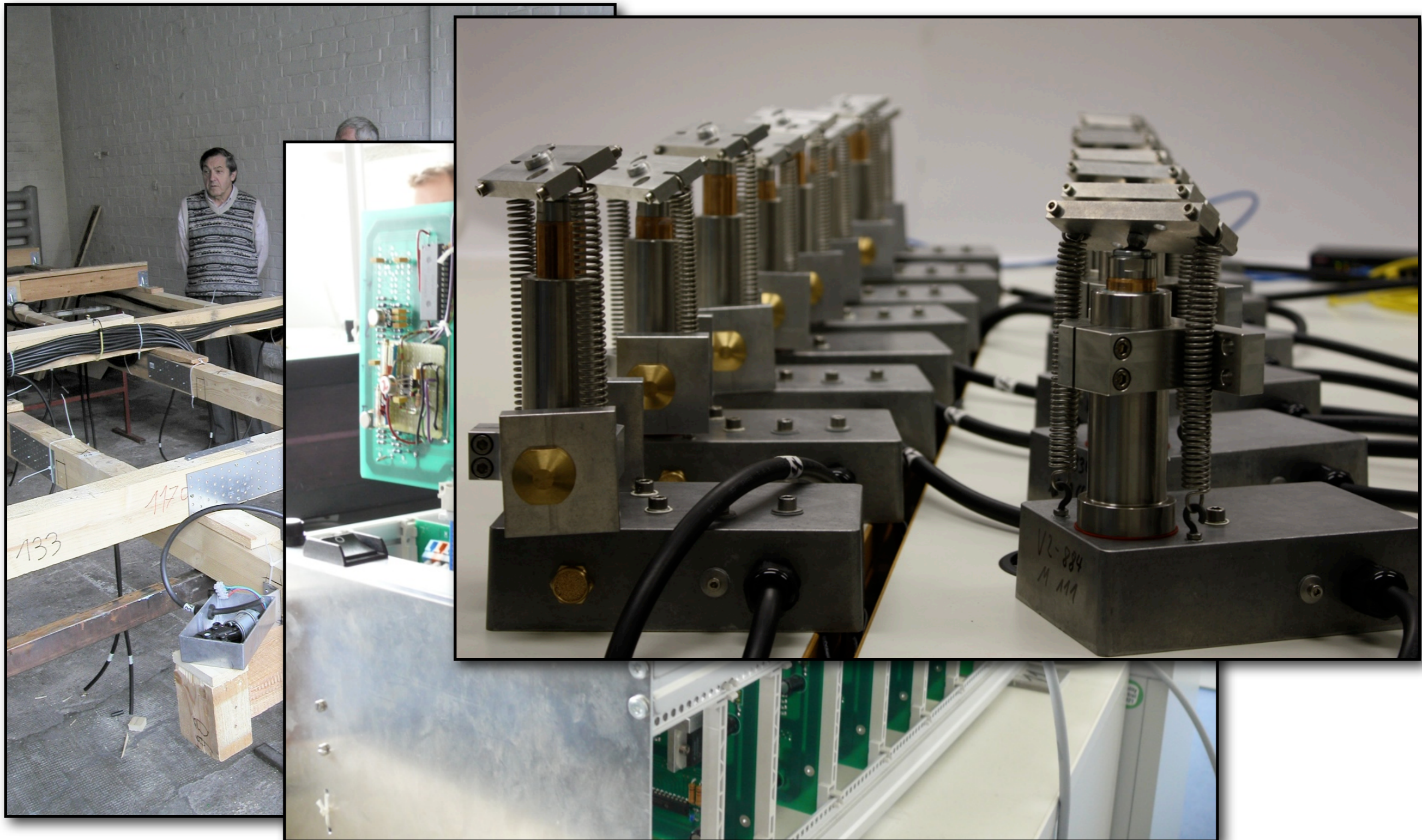


# H.E.S.S. and H.E.S.S. 2 activities





# H.E.S.S. and H.E.S.S. 2 activities



# H.E.S.S. and H.E.S.S. 2 activities



# H.E.S.S. and H.E.S.S. 2 activities



# H.E.S.S. and H.E.S.S. 2 activities



# H.E.S.S. and H.E.S.S. 2 activities



# H.E.S.S. and H.E.S.S. 2 activities



# possible contributions for CTA



# possible contributions for CTA



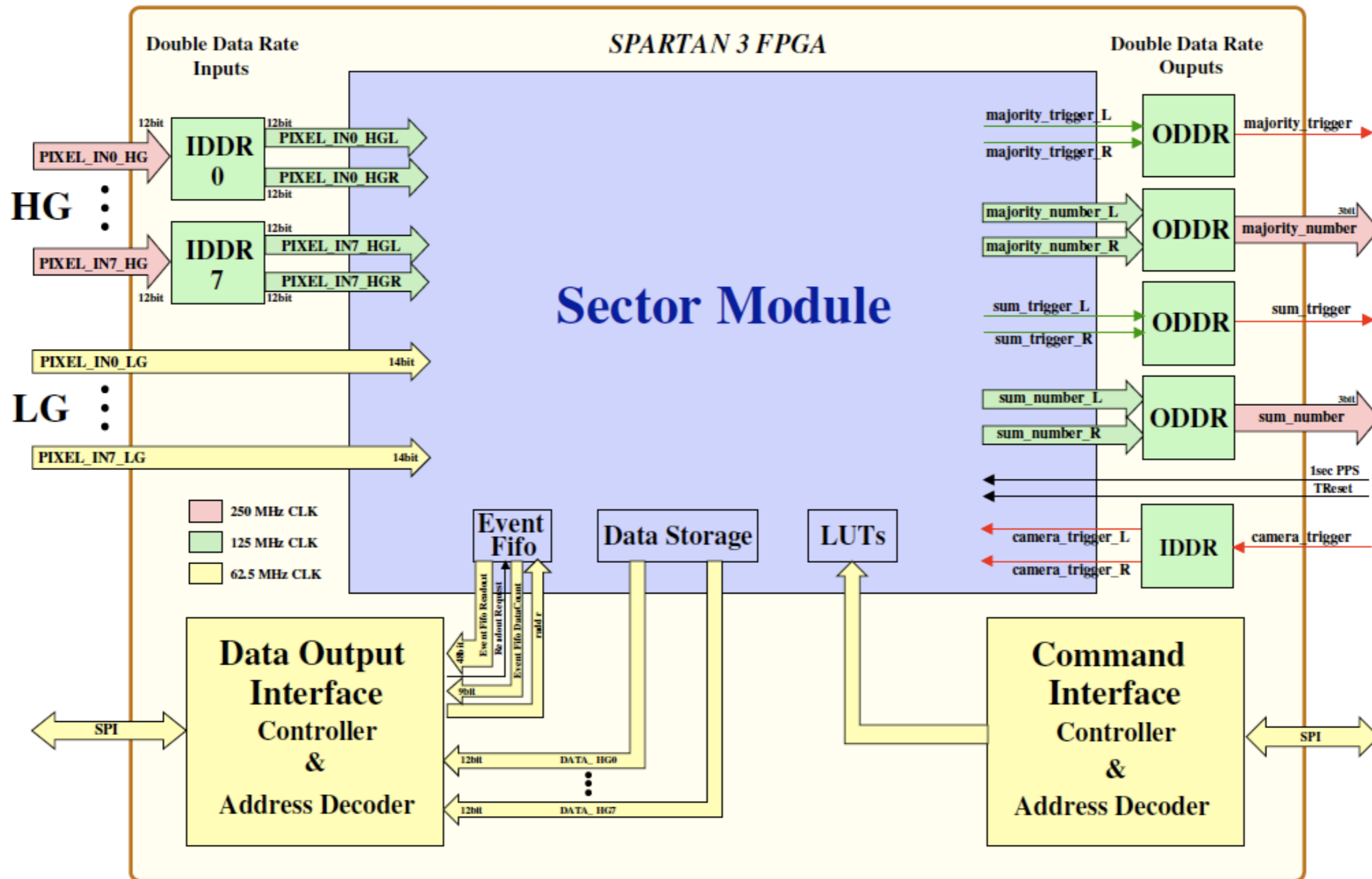


# possible contributions for CTA



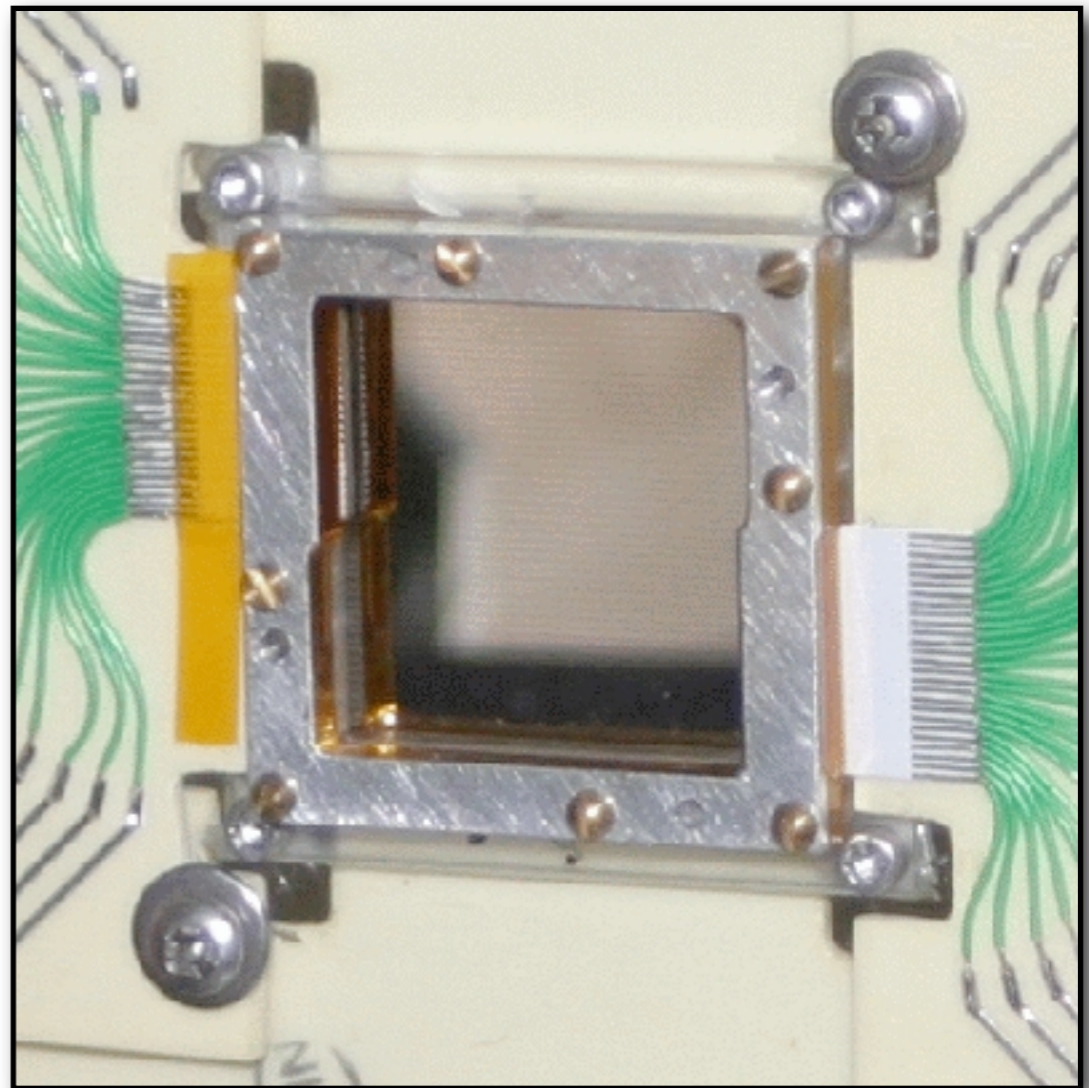
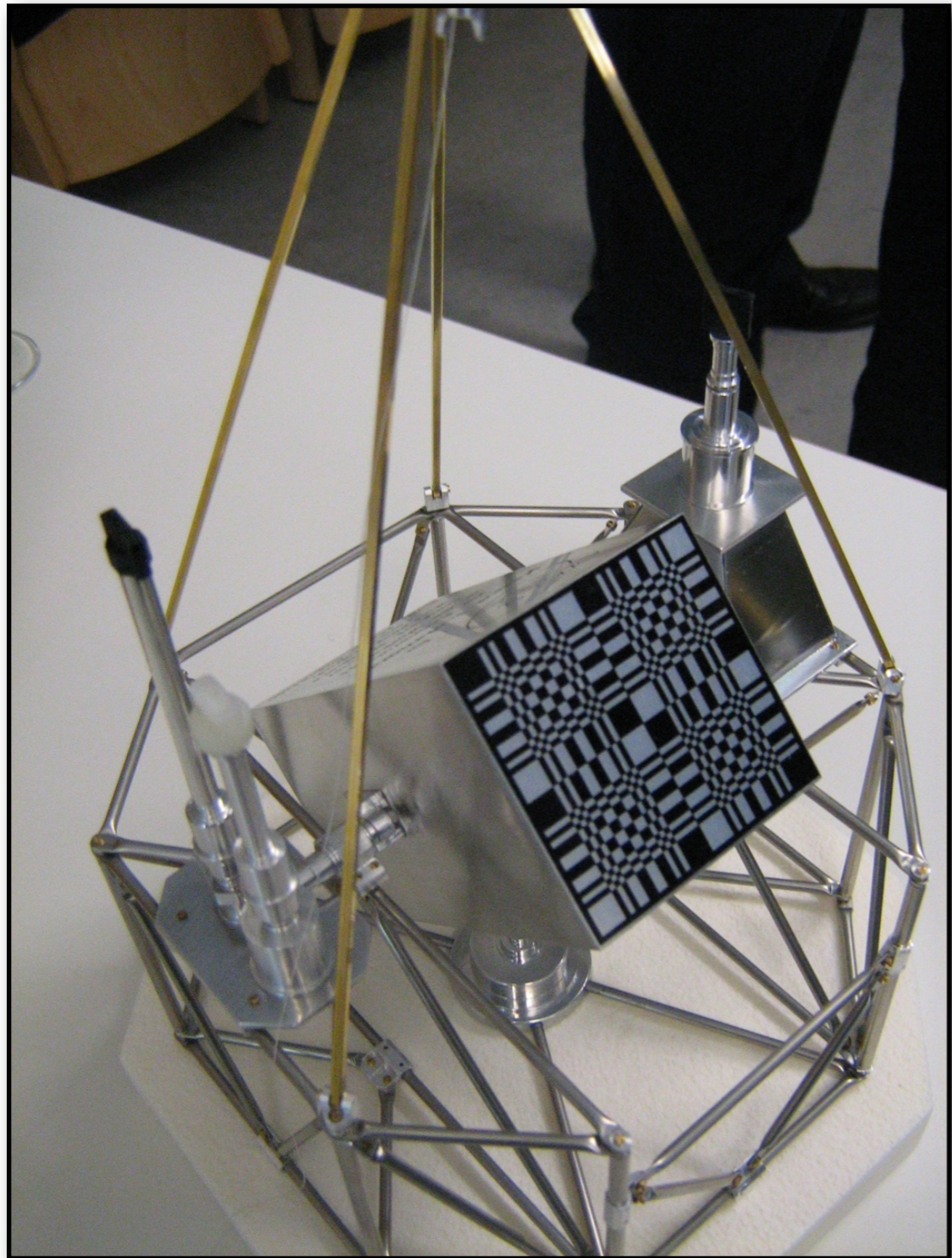
# possible contributions for CTA

## CTA Trigger 8 channel HG, 8 channel LG



07. May. 2010 TS@IAAT

# balloon gondola



Let's hope for that platinum age of  
X-ray Astronomy!



