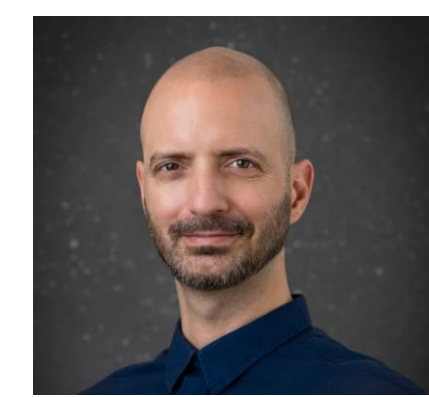


# THESEUS (The Transient High-Energy Sky and Early Universe Surveyor)

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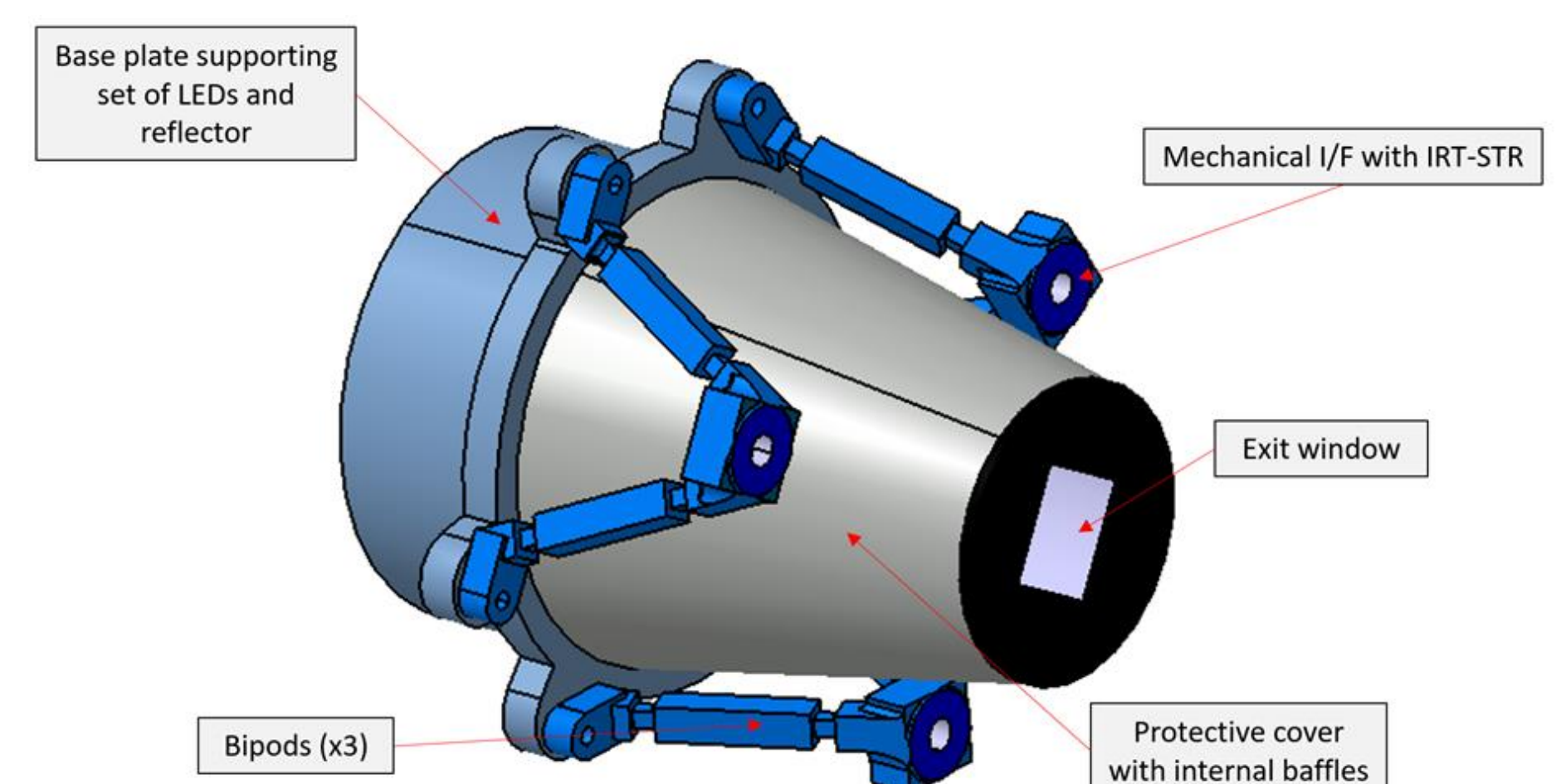
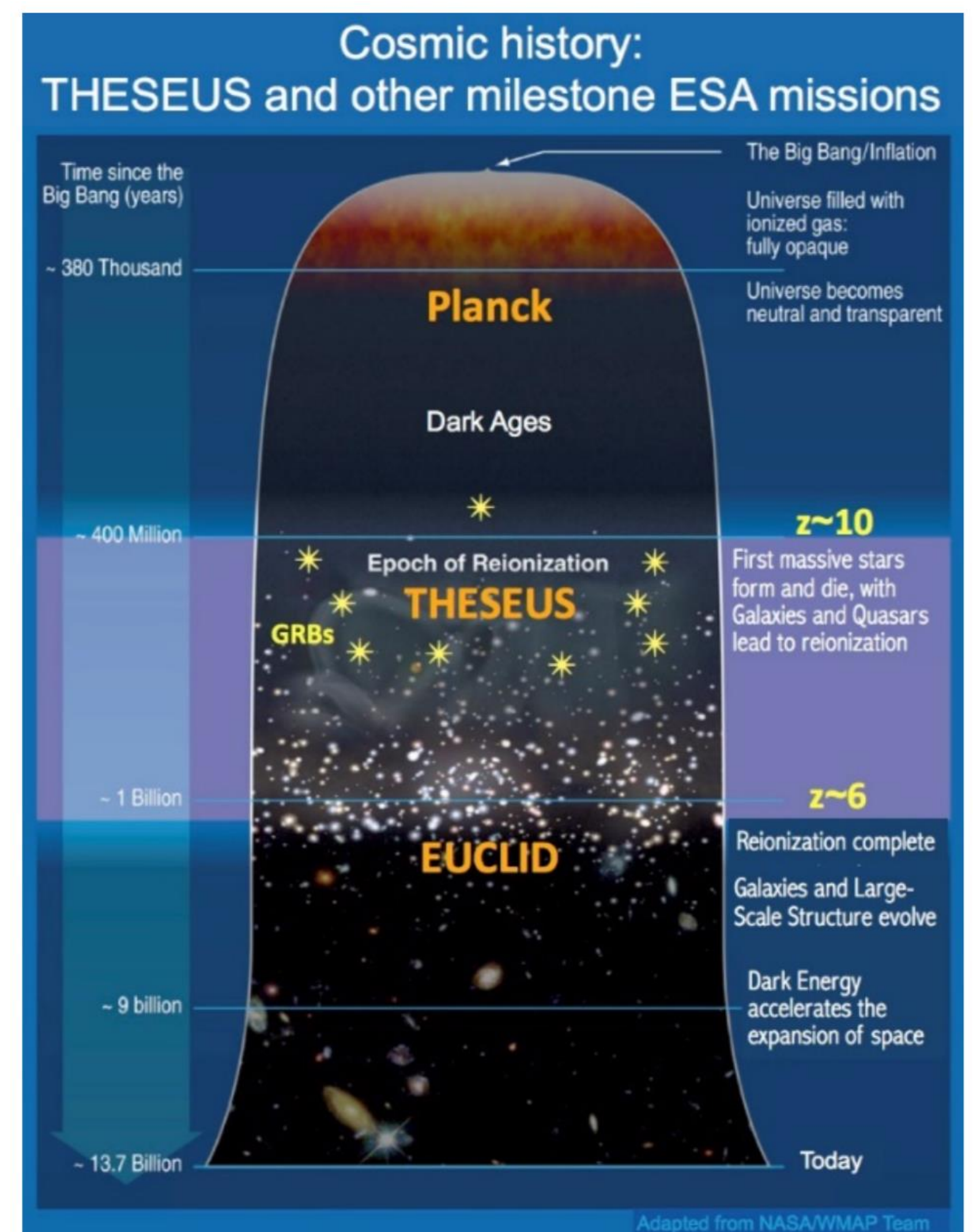


The Transient High Energy Sky and Early Universe Surveyor (THESEUS) space mission will address multiple fundamental questions for modern cosmology and astrophysics. The primary scientific goals of the mission address the Early Universe ESA Cosmic Vision theme "How did the Universe originate and what is made of?" THESEUS will have unique capabilities to:

- Explore the Early Universe (the cosmic dawn and reionization era) by unveiling the Gamma-Ray Burst (GRB) population in the first billion years; and
- perform an unprecedented deep monitoring of the soft X-ray transient Universe, thus providing a fundamental synergy with next-generation gravitational wave and neutrino detectors (multi-messenger astrophysics), as well as the large electromagnetic facilities of the next decades (ATHENA, E-ELT, SKA, CTA, LSST, etc.)

To meet the THESEUS science requirements requires the provision of 3 instruments on-board:

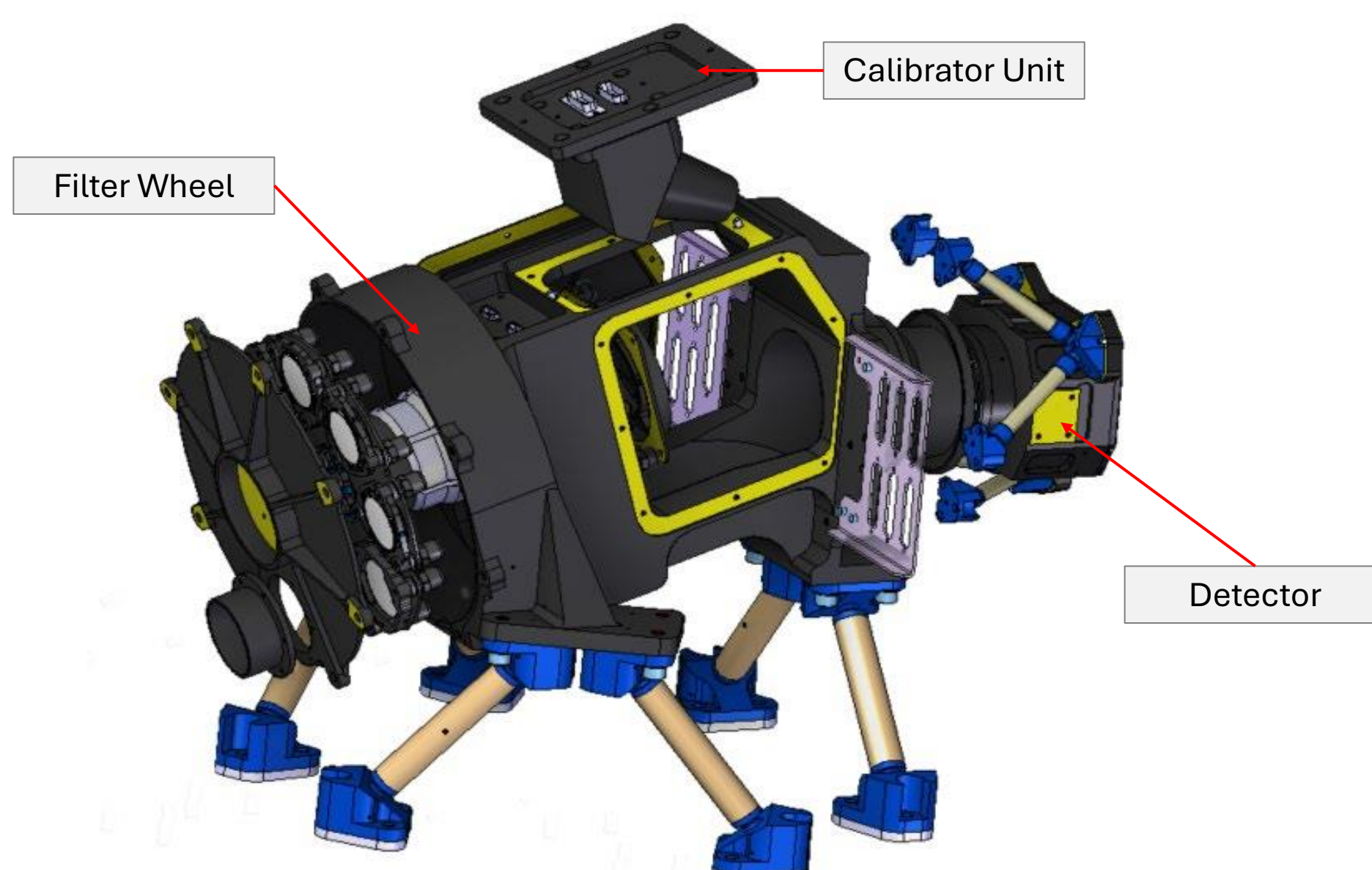
- Soft X-ray Imager (SXI)**: a set of 2 "Lobster-Eye" X-ray (0.3-5 keV) telescopes covering a total field of view (FoV) of 1 sr with 0.5–1 arcmin source location accuracy, provided by a UK led consortium;
- InfraRed Telescope (IRT)**: a 70 cm class near-infrared (up to 2 microns) telescope with imaging and moderate spectral capabilities provided by a France led consortium;
- X-Gamma-rays Imaging Spectrometer (XGIS)**: spectrometer based on 2 detection units based on SDD+CsI(Tl) modules (2 keV – 20 MeV), covering twice the FoV of the SXI. This instrument will be provided by an Italian led consortium.



The IRT Calibrator Unit Assembly (IRT-CUA) to be developed in Hungary at the University of Debrecen.

At present, the envisaged IRT-CUA equipment is designed to use NIR LED sources to generate light, which is reflected off a Lambertian-type reflector directly to the image sensor. The resulting illumination shall provide a stable flat calibration source for the sensor.

The IRT-CUA is aligned outside the optical path illuminating the detector at an angle without the need of a pickoff mirror, increasing robustness.



The IRT instrument