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The X and Gamma-ray Imager and Spectrometer on board THESEUS: status and technological progresses

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THESEUS (Transient High-Energy Sky and Early Universe Surveyor) is one of the three M7 mission candidates currently in Phase A for assessment and launch opportunity in 2037. The mission is designed to provide unprecedented capabilities for detecting and characterizing X-ray and gamma-ray transients, supporting time-domain and multi-messenger astrophysics. A key instrument on board THESEUS is the X and Gamma Imaging Spectrometer (XGIS), which will detect and localize transient sources over a broad energy range (2 keV–10 MeV) with timing resolution down to milliseconds.

XGIS consists of two identical coded-mask cameras covering 2 steradians, equipped with an innovative detection technology based on Silicon Drift Detectors (SDDs) with CsI(Tl) crystal scintillator bars. This configuration, combined with a low-noise distributed front-end electronics system (ORION-ASICs), enables spectroscopy and precise timing over an unprecedentedly wide energy range within a single, modular, and compact device. Utilizing the coded mask technique, the instrument provides imaging capabilities up to 150 keV while serving as a half-sky monitor in the 150 keV–10 MeV energy range.

Since its initial design phase, significant technological advancements have been made in the XGIS system. In this talk we present an updated overview of the XGIS instrument, highlighting its current status, technological developments, and its expected impact on high-energy astrophysics.

Eligibility for ”Best presentation for young researcher” or ”Best poster for young researcher” prize

Yes

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