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Shedding light on the early Universe with THESEUS

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The Transient High Energy Sky and Early Universe Surveyor (THESEUS) is a mission concept developed by a large international collaboration aimed at exploiting Gamma-Ray Bursts for investigating the early Universe. The main scientific objectives of THESEUS include: investigating the star formation rate and metallicity evolution of the ISM and IGM up to redshift 10, detecting the first generation (pop III) of stars, studying the sources and physics of re-ionization, detecting the faint end of galaxies luminosity function. These goals will be achieved through a unique combination of instruments allowing GRB detection and arcmin localization over a broad FOV (more than 1sr) and an energy band extending from several MeVs down to 0.3 keV with unprecedented sensitivity, as well as on-board prompt (few minutes) follow-up with a 0.6m class IR telescope with both imaging and spectroscopic capabilities. Such instrumentation will also allow THESEUS to unveil and study the population of soft and sub-energetic GRBs, and, more in general, perform monitoring and survey of the X-ray sky with unprecedented sensitivity.

Collaboration

THESEUS collaboration

Primary author: AMATI, Lorenzo (INAF - IASF Bologna)

Presenter: AMATI, Lorenzo (INAF - IASF Bologna)

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