

Minute-of-Arc Resolution Gamma Ray Imaging Experiment – MARGIE

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MARGIE (Minute-of-Arc Resolution Gamma-ray Imaging Experiment) is a large area ($\sim 10^4$ cm²), wide field-of-view (~ 1 sr), hard X-ray/gamma-ray (~ 20 – 600 keV) coded-mask imaging telescope capable of performing a sensitive survey of both steady and transient cosmic sources. MARGIE has been selected for a NASA mission-concept study for an Ultra Long Duration (100 day) Balloon flight. We describe our program to develop the instrument based on new detector technology of either cadmium-zinc-telluride (CZT) semiconductors or pixellated cesium iodide (CsI) scintillators viewed by fast-timing bi-directional charge-coupled devices (CCDs). The primary scientific objective is to image faint Gamma-Ray Bursts (GRBs) in near-real-time at the low intensity end (high-redshift) of the logN–logS distribution, thereby extending the sensitivity of present observations. Other high-priority scientific goals include a wide field survey of the Galactic center, mapping the distribution of the Galactic 511 keV emission and performing high-resolution spectral and temporal studies of active galaxies.