

**Title:** Concept for an all-sky low-energy gamma-ray observatory (ALLEGRO)

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We describe a concept for a NASA mission to study gamma-ray bursts, pulsars, and hard x-ray transients. That a large area all sky monitor is an outstanding design was demonstrated by the BATSE (Burst And Transient Source Experiment) on board the Compton Gamma-Ray Observatory (CGRO). The proposed All Sky Low Energy Gamma-Ray Observatory (ALLEGRO) will combine the best characteristics of BATSE and OSSE (Oriented Scintillation Spectrometer Experiment), namely continuous all-sky coverage with a reduced background obtained from relatively narrow field of view collimation. The design goals call for an effective area of greater than or approximately equal to 2000 cm<sup>2</sup> (in the 20- 200 keV range) provided by 35 separate detectors aligned to cover the entire sky, plus 1/8 ms time tagging of all events and energy coverage from 7 - 200 keV. We combine this with what have probably been the greatest advances in technology over the past few years, namely, advances in electronics, computing power, and data storage and retrieval. With these capabilities plus enhancements to the design based on our experience with BATSE and OSSE, we will explore the realm of high time resolution phase space with all-sky coverage at unprecedented sensitivity. Such a satellite will provide a myriad of fascinating studies of the hard x-ray sky. Three general areas where we expect to make major advances are the understanding of gamma-ray bursts, rotationally powered neutron stars, and binary x-ray sources. As an added bonus, this satellite will allow us to monitor the hard x-ray sky, provide hard x-ray maps, and even provide a stringent test of the general relativistic Shapiro delay.

Link to full paper:

<http://adsabs.harvard.edu/abs/1995SPIE.2515..544U>