

## Cosmic Antimatter and MeV Gamma-Ray Survey with the GRAMS Experiment

The upcoming GRAMS (Gamma-Ray and AntiMatter Survey) experiment is one of the NASA Physics of the Cosmos suborbital missions. GRAMS aims to provide excellent sensitivity to gamma rays in the poorly explored MeV region often referred to as the “MeV gap” and to antideuteron/antihelium for an essentially ‘background-free’ indirect dark matter search. Utilizing Liquid Argon Time Projection Chamber (LArTPC) technology to detect MeV gamma rays and antimatter, GRAMS has the potential to uncover crucial details behind a variety of processes in multi-messenger astrophysics and explore new dark matter parameter space.

The GRAMS LArTPC will function as a Compton camera in the MeV regime to determine the energy and origin of incident gamma-rays while also measuring the decay products of an exotic atom with an antideuteron/antihelium.

In this talk, an overview will be given for the projected science reach of GRAMS, the design and detection mechanism with the LArTPC, and the status of preparations for the scheduled prototype flight in 2025/2026.

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