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The GRAMS (Gamma-Ray and AntiMatter Survey) Project: Overview and Current Status

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GRAMS (Gamma-Ray and AntiMatter Survey), one of the NASA Physics of the Cosmos missions, is a balloon-borne experiment utilizing a LArTPC (Liquid Argon Time Projection Chamber) detector that is potentially expandable to a future satellite mission. GRAMS aims for both MeV gamma-ray observations and antimatter-based indirect dark matter searches. With a low-cost, large-scale LArTPC detector, GRAMS can provide significantly improved sensitivities to gamma rays in a historically under-explored energy regime often referred to as the MeV Gap. GRAMS can also extensively probe a new dark matter parameter space via low-energy antinuclei measurements, including the regions suggested by the Fermi Galactic Center Excess and AMS-02 antiproton excess. We recently had a successful engineering balloon flight in Japan and an antiproton beam test at J-PARC to demonstrate our detector performance. GRAMS has been funded by NASA for a prototype (pGRAMS) balloon flight, which is planned for early 2026 from Tucson, Arizona. In this talk, I will present an overview and the current status of the GRAMS project.

Collaboration(s)

GRAMS

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