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The GRAMS (Gamma-Ray and AntiMatter Survey) Project

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GRAMS (Gamma-Ray and AntiMatter Survey) is a next-generation proposed balloon/satellite mission that will be the first to target both MeV gamma-ray observations and antimatter measurements with a LArTPC (Liquid Argon Time Projection Chamber) detector. With a cost-effective, large-scale LArTPC, GRAMS can have extensively improved sensitivities to both MeV gamma rays and antiparticles compared with previous missions. MeV gamma-ray measurements with GRAMS can explore new parameter space for annihilating dark matter and evaporating primordial black holes. GRAMS is also capable of exploring dark matter parameter space via antimatter measurements. In particular, low-energy antideuterons and antiheliums measurements can offer background-free dark matter searches. We are currently building a prototype detector, MiniGRAMS, to validate the detection concept. In this talk, I will give an overview and the current status of the GRAMS project.

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