Type: Talk

In Search of Cosmic-Ray Antinuclei from Dark Matter with the GAPS Experiment

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The GAPS Antarctic balloon payload, scheduled for its initial flight in late 2021, is the first experiment optimized specifically for low-energy cosmic antinuclei signatures of dark matter. Low-energy antideuterons provide a "smoking gun" signature of dark matter annihilation or decay, essentially free of astrophysical background. Studies in recent years have emphasized that models for cosmic-ray antideuterons must be considered together with the abundant cosmic antiprotons and any potential observation of antihelium. Together, these signatures offer a potential breakthrough in unexplored dark matter parameter space, providing complementary coverage with direct detection, collider, and other indirect searches. In this contribution, I will detail the novel GAPS detection technique, based on exotic atom capture and decay; the status of the GAPS instrument construction; and the potential of upcoming measurements to clarify ongoing open issues.

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