

Cosmic-Ray Antinuclei from Dark Matter and the GAPS Experiment

Thursday 30 March 2023 12:00 (20 minutes)

The discovery of cosmic antinuclei would be an unambiguous signal of new physics and transform the field of cosmic particle research. The GAPS Antarctic balloon payload, scheduled for its initial flight in the upcoming year, is the first experiment optimized specifically for cosmic antiprotons, antideuterons, and antihelium as signatures of dark matter. The distinctive GAPS particle identification technique relies on a system of >1000 lithium-drifted silicon (Si(Li)) detectors, which both capture an incoming antinucleus into an exotic atom and measure the resulting X-ray and nuclear annihilation products, surrounded by a precision-timing, large-area time-of-flight system. In this talk, I will detail preparation of the GAPS payload for initial flight and the potential impact of these measurements in the coming years.

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Session Classification: SESSION 6: Astrophysics and Cosmology-2 (CHAIR: Tommaso Treu- UCLA)

Track Classification: Indirect dark matter detection