

UCLA High Energy & Astro-Particle (HEAP) Seminar

“The Search for Primary Antimatter with GAPS”

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Two compelling mysteries in physics are the baryon asymmetry and the nature of dark matter. Cosmic antimatter searches can shed light on both of these mysteries. Cosmic ray positrons and antiprotons are now well measured by magnetic spectrometer experiments and the data are generally consistent with expectations from background models – i.e. there is no clear evidence for new physics. However, there is still ample room for sources of primary antimatter that would come from new physics and not from conventional sources.

GAPS is a new balloon experiment that is dedicated to the search for antinuclei (especially antideuterons). At low kinetic energies, antideuterons are expected to be produced by a wide range of viable dark matter models at flux levels that are detectable by GAPS and well above the background expected from conventional astrophysical sources. GAPS uses a novel exotic atom technique for identifying antinuclei that is complementary to magnetic spectrometers. GAPS is currently in its final integration phase with a scheduled launch in Antarctica in December 2025. This talk will motivate low-energy cosmic antimatter searches and will discuss the GAPS design and the current status of the mission.

Location: Knudsen 4-134

Date: Monday, November 3, 2025

Time: 12:00pm

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