

DEPARTMENT OF PHYSICS & ASTRONOMY

Fall 2026 Colloquium



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3:30 - 4:30 p.m. | Tuesday, September 22
Science Building 234

Expanding the lifetime frontier of particle physics with CMS

Despite the remarkable successes of the standard model (SM) of particle physics, profound mysteries of nature persist, calling for a deeper understanding of the universe's fundamental structure beyond the SM. Over the past decade, long-lived particles (LLPs) with macroscopic lifetimes have emerged as a central focus in the search for new physics at the LHC. Addressing the challenges of LLP searches demands innovations at every level of our experimental techniques, including data acquisition, reconstruction, machine learning, and detector technologies.

In this colloquium, I will discuss recent developments in the search for LLPs using displaced jets at the CMS experiment. These advancements have led to orders-of-magnitude improvements in our ability to probe challenging LLP signatures. Building upon these breakthroughs, many more new applications and developments can be pursued in the coming years with the full Run-3 dataset, as well as in the next decade with the High-Luminosity LHC upgrade. Further orders-of-magnitude improvements are expected across a large variety of new physics scenarios, which will lead to a rich physics program and provide powerful tools to address pressing questions in particle physics.

Refreshments at 3 p.m. | SC 103



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