

A complete framework for the modeling of the effect of cosmic rays in paleodetectors

Wednesday, April 15, 2026 9:00 AM (45 minutes)

Cosmic rays are usually treated as a background to be suppressed in dark matter and neutrino physics. However, for mineral paleo-detectors, they serve as the primary signal, encoding high-energy astrophysical history over millions of years. This talk details the interaction of cosmic rays with natural minerals and the methodology used to reconstruct past astrophysical fluxes from latent damage tracks. We present our simulation pipeline designed to model these observables: using MCEq-based atmospheric cascade models to propagate primary flux variations into secondary muon and neutron populations, Geant4 for subsurface particle transport, and SRIM to derive the resulting track-length distributions. By quantifying this cosmic-ray-induced “track budget,” we can provide the necessary tools for both paleo-astronomy and the determination of background floors for future rare-event searches.

Do you plan to give the talk in person?

Yes

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