Contribution ID: **10** Type: **Talk (main workshop)**

Probing Rare Interactions from LZ to Snowball Chambers

Wednesday, 21 January 2026 10:30 (30 minutes)

The LUX-ZEPLIN (LZ) experiment uses a dual-phase xenon time-projection chamber designed to search for rare interactions between dark matter and ordinary matter. In this talk, I present LZ's latest results using an expanded exposure and improved background modeling, yielding the most stringent constraints to date on spin-independent WIMP–nucleon and spin-dependent WIMP–neutron scattering down to WIMP masses of 5 GeV/c². I also discuss LZ's sensitivity to low-energy processes, including the detection of solar neutrinos via coherent elastic neutrino–nucleus scattering, demonstrating the experiment's ability to probe signals approaching the neutrino fog.

I then introduce the Snowball Chamber, a novel detector concept based on supercooled liquids, where localized energy depositions trigger rapid, visible crystallization. I present early experimental results and outline future directions, highlighting Snowball chambers as a complementary approach to rare-event detection and a new platform for studying radiation-induced phase transitions.

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