Contribution ID: **58** Type: **Experiment**

COSINUS and CRESST updates

Tuesday 11 February 2025 10:25 (20 minutes)

COSINUS (Cryogenic Observatory for SIgnatures seen in Next-generation Underground Searches) and CRESST (Cryogenic Rare Event Search with Superconducting Thermometers) are experiments conducted at the LNGS (Laboratori Nazionali del Gran Sasso) in Italy. Both search for dark matter (DM) nucleus scattering, and their key technology is a combination of 1) using transition edge sensors (TESs) on scintillating crystals at millikelvin temperatures to measure tiny phonon signals caused by particle interactions, and 2) additionally capturing the scintillation light. This dual-channel readout makes effective discrimination of electromagnetic backgrounds possible.

While CRESST is the leading experiment in exploring sub-GeV mass DM, with the constant goal of lowering the energy threshold, COSINUS will answer the long-standing question of whether the signal recorded by the DAMA/LIBRA collaboration could have a DM origin. To achieve this, COSINUS employs ultrapure NaI crystals operated as cryogenic scintillating calorimeters, which renders it unique among NaI-based experiments and allows a cross-check that is inherently model-independent.

This talk will give updates on the latest results, ongoing efforts, as well as perspectives for the future.

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Session Classification: Talks - Tuesday