

# Staying Cool, The Thermoelectric Cooling of SiPMs

*Monday, August 19, 2024 2:45 PM (10 minutes)*

The proposed future experiment nEXO aims to find neutrino-less double beta decay in liquid xenon. A critical component of nEXO is the silicon photomultipliers (SiPMs) used to detect the light emitted by the decay. To understand how the SiPMs will behave in nEXO, a characterization of them at liquid xenon temperature, -100 C, is necessary. Fortunately, characterization at -40 C is predictive of their behavior at -100 C. We are building a system using cascading thermoelectric coolers with an open loop water cooling setup to scan a SiPM with a single photon light source. Preliminary results show that it is possible to cool one SiPM from room temperature to less than -10 C. To reach the -40 C threshold, future work will include a redesign of the geometry of the cooling units and an upgrade of the cooling module.

## What area of study best describes your talk?

Physics

**If you answered 'Other', please provide the study area.**

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**Session Classification:** Presentations