



Contribution ID: 174

Type: Oral

## Scintillating Crystals for Directional Detection of Sub-GeV Dark Matter

*Tuesday, 7 November 2023 16:30 (15 minutes)*

The only unambiguous way to detect dark matter (DM) scattering in a direct detection experiment is with a detector capable of distinguishing the direction of the incident particles. Even without event-by-event directionality, such a detector can use the daily modulation (or lack thereof) of measured rates to detect (or set strong limits on) DM-electron scattering, even over otherwise-limiting backgrounds. To be sensitive to sub-GeV DM scattering, an experiment needs to maintain directional sensitivity down to eV-energies. Organic scintillating crystals, such as trans-Stilbene, offer great promise as sub-GeV directional DM detectors. The scintillation light from these crystals can be measured using optically-sensitive Skipper CCDs, potentially launching a new application for the technology. I present a proposal for a modular, segmented array of crystals that can be read out using such Skipper CCDs that has the potential to push past otherwise-limiting excess backgrounds and unambiguously observe DM scattering using directionality.

### Early Career

Yes

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**Session Classification:** RDC7

**Track Classification:** RDC Parallel Sessions: RDC7: Low-Background Detectors