

# Directional Dark Matter Detection

*Friday 31 March 2023 19:00 (20 minutes)*

A directional nuclear recoil detector with sufficient target mass could be used to observe and distinguish different neutrino sources, to search for dark matter in the presence of irreducible background, including neutrinos, and to demonstrate the cosmological origin of a dark matter signal. I will review detector R&D efforts and experiments aimed at dark matter detection with directional sensitivity, and the so-called CYGNUS proposal to build large scale directional detectors. I will focus on gas-based efforts based on the concept of recoil imaging, i.e., reconstructing the detailed topology of nuclear recoils. If time allows, I will also comment briefly on broader impacts and other applications of the detectors being developed.

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