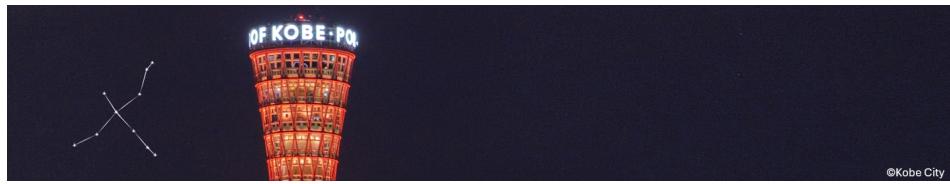


9th edition of the international CYGNUS Workshop on Directional Recoil Detection



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An overview of CYGNUS' reach for dark matter and neutrino searches

Monday, 23 February 2026 09:40 (30 minutes)

As dark matter experiments grow in size and more of the parameter space available to WIMPs is investigated and excluded, it is necessary to plan ahead to circumvent the looming neutrino fog, a goal further motivated by the recent claims of 8B hints seen across the much larger Xenon-based dark matter experiments. For an experiment which is only capable of reconstructing the recoil's energy, solar neutrino signals constitute a near-irreducible background. While the primary goal for CYGNUS lies in reconstructing the characteristic directional signature of signals incoming from the dark matter halo to disentangle them from those incoming from the Sun. However, the excellent background rejection that comes with directional sensitivity means that these experiments would be able to target solar neutrinos as a signal, rather than just as a background. In this talk, I will present CYGNUS's reach for different dark matter and neutrino signals, highlighting its capabilities for neutrino reconstruction across different detector volumes, and demonstrating that compelling neutrino physics can be achieved with stepping-stone detectors while building toward the full dark matter program.

Presenter: LISOTTI, Chiara (University of Sydney)

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