

## PROSPECT: A Precision Reactor Oscillation and Spectrum Experiment

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PROSPECT is a reactor antineutrino experiment whose primary goals are to probe short-baseline oscillations and perform a precise measurement of the U-235 reactor antineutrino spectrum. These goals demand close proximity to a compact research reactor core, posing detector design challenges such as tight space constraints, limited overburden and reactor-correlated backgrounds. Therefore, PROSPECT has designed a 4-ton segmented antineutrino detector using  $^6\text{Li}$ -loaded liquid scintillator that provides excellent background rejection, position resolution, and energy resolution. When deployed at the High Flux Isotope Reactor (HFIR) at the Oak Ridge National Laboratory, PROSPECT will provide a model-independent oscillation measurement by comparing the observed antineutrino spectrum across a baseline range of 7-12m. The high resolution and high statistics energy spectrum measurement to be performed by PROSPECT of the U-235 HFIR core will provide insight into spectral anomaly recently observed in other antineutrino experiments at commercial power reactors. Here we describe the experimental program, detector design, and discovery potential of PROSPECT.

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