



Contribution ID: 85

Type: **Oral**

## The HALO and HALO-1kT Supernova Detectors

*Friday, 20 October 2017 12:00 (30 minutes)*

This talk will present the case for lead-based supernova detectors. Such detectors are robust and economical to build and maintain over long timescales. By instrumenting tonnes of lead with He-3 neutron detectors supernova neutrinos create bursts of neutrons which can be detected with high efficiency. Electron anti-neutrino charged current reactions are Pauli-blocked by the neutron excess in lead. Neutrons from neutral current and electron neutrino charged current excitations provide complimentary sensitivity to water Cherenkov and liquid scintillator-based detectors. The HALO detector, constructed with 79 tonnes of lead, has been running at SNOLAB since May 2012. HALO-1kT is a proposal for a scaled up detector which would utilize 1000 tonnes of INFN lead from the decommissioned OPERA detector. With increased mass and improved neutron capture efficiency HALO-1kT would provide over a 20-fold increase in event statistics from the next galactic supernova.

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**Session Classification:** Plenary