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Seminar Monday 26th October 2009 5.15-6.15pm

Rupert Beckett Lecture Theatre, Michael Sadler Building

“SNO, SNO+ and the new SNOLAB”

Abstract

The Sudbury Neutrino Observatory (SNO) is a 1,000 tonne heavy-water-based neutrino detector in an ultra-clean environment created 2 km underground in a mine near Sudbury, Canada. SNO has used neutrinos from ${}^8\text{B}$ decay in the Sun to observe one neutrino reaction sensitive only to solar electron neutrinos and others sensitive to all active neutrino flavors and has found clear evidence for neutrino flavor change. The implications of the SNO results to date and other recent neutrino results for particle physics and solar physics will be discussed. The SNO detector has now completed its operation and final data analysis is in progress. The subjects of that analysis and plans for future use of the SNO detector for the SNO+ experiment will be discussed. The expansion of the underground facility to create a long-term international laboratory (SNOLAB) with a broad future experimental capability for the detection of dark matter, double beta decay, lower energy solar neutrinos and geo-neutrinos will also be described.

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