SUDBURY
NEUTRINO
OBSERVATORY

November 15, 2006 **News Release** For immediate use

The Sudbury Neutrino Observatory team celebrates the receipt of the John C. Polanyi Prize and the completion of very successful operations with heavy water.

Research scientists and staff of the Sudbury Neutrino Observatory (SNO) are gathering today at Science North in Sudbury to receive the John C. Polanyi prize of the Natural Sciences and Engineering Research Council of Canada (NSERC), and to celebrate a measurement milestone for the SNO detector.

After more than seven years of data taking in which major discoveries were made about the properties of neutrinos and neutrino emission from our sun, neutrino measurements using the unique heavy water core of the Sudbury Neutrino Observatory (SNO) detector will be completed at the end of November. During this measurement period, the SNO team of research scientists from 16 different universities and research laboratories in Canada, the United States and Great Britain have used the SNO detector to record and analyze about 25,000 neutrino signals, providing a very precise determination of the numbers and types of neutrinos which reach us from the Sun. Plans are underway for future measurements using a new detection material with extra sensitivity to neutrinos from the sun, the earth and supernovae.

SNO Director and Queen's University professor Art McDonald said, "Our team is very proud to have been named the first recipients of the Polanyi Prize – the Natural Sciences and Engineering Research Council has been a major funder of our SNO research and this recognition of our discoveries is a wonderful result of a great team effort and gratefully received. We would like to take this opportunity to recognize and thank the many Canadian and international partners that have contributed to the success of the SNO project. In SNO's latest operational phase we have used very sensitive detectors provided by our US colleagues to improve the accuracy of our previous results and we celebrate today the completion of measurements using the unique properties of heavy water to detect neutrinos from the sun."

The heavy water (a rare natural form of water found at trace levels in ordinary lake and river water) in the core of the SNO detector has the unique ability to detect all three types of neutrinos and SNO scientists have been able to deduce the total number of neutrinos of all types reaching us each second from the Sun, as well as the number of electron neutrinos (the type produced in the Sun's core). From the SNO measurements it was clear that about 2/3 of the neutrinos had changed to the other two types of neutrinos on their way to earth. This observation means that neutrinos have a finite mass and requires that the laws of physics be modified at a very fundamental level. A large discrepancy between the earlier measurements by other laboratories (not sensitive to these other neutrino types) and the predictions of theories of the sun was resolved. SNO's solution to this 30 year old "Solar Neutrino Problem" has been widely recognized and its results have used in many subsequent investigations and publications.

U.S. co-spokesman for SNO, Professor Hamish Robertson of the University of Washington in Seattle is pleased with the results of SNO's third phase of measurements begun in 2004 and now reaching completion. "The installation and successful operation of new detectors in SNO's heavy water core, led by groups from the University of Washington and Los Alamos National Laboratory, have enabled SNO's most important neutrino reaction to be measured with maximum precision", he said. Professor Nick Jelley, co-spokesman for SNO, from Oxford University in Great Britain states "The unique design and unprecedented cleanliness of the SNO detector and its water core combined with great operations and analysis achievements have enabled us to perform these ground-breaking measurements which have helped us learn exciting new things about neutrinos and the Universe. The SNO experiment has been an unqualified success".

Over the months ahead, the heavy water in the core of the SNO detector will be removed and returned to Atomic Energy of Canada Limited and Ontario Power Generation. Modifications to the detector are planned and funding is being sought to adapt it to a new "liquid scintillator" core which will enable it to further sensitive measurements of neutrinos from the Sun and from the core of the earth, as well as studying a very rare and fundamental form of radioactivity "neutrinoless double beta decay". In the years ahead, the new SNO+ experiment would explore areas where the results could be just as important and fundamental as the original SNO experiment.

The expansion of the SNO laboratory, 2 km underground in CVRD-INCO's Creighton Mine, into an international facility for underground science – SNOLAB – began in 2003 and is on schedule for completion late in 2007. SNOLAB Director, Professor David Sinclair from Carleton University says, "SNO's successful measurements have been of great help in establishing this additional world-class laboratory space – the deepest and cleanest in the world. We have letters of interest from a number of experiments proposed by groups from around the world, and including key Canadian scientists, which will attack new frontier areas in particle astrophysics – examining further neutrino properties and searching for the hidden "Dark Matter" component thought to be a part of our Universe. Stay tuned for further progress as this exciting research continues."

- 33 -

For further information:

Prof. Art McDonald, SNO Director
Gordon and Patricia Gray Research Chair in Particle Astrophysics
Physics Department
Queen's University
Kingston, Ontario
Cell: (613) 541 1405
FAX (613) 533 6813;
mcdonald@sno.phy.queensu.ca

Prof. Tony Noble, SNO Institute Director
Sudbury Neutrino Observatory Institute
Queen's University
Kingston, Ontario
(613) 533-2679, Cell: (705) 691-3692
FAX (613) 533-6813;
potato@surf.sno.laurentian.ca

Prof. Doug Hallman, Director of Communications - SNO
Laurentian University
Sudbury, Ontario
(705) 675-1151, ext. 2202
FAX (705) 675-4868
dhallman@laurentian.ca

SUDBURY NEUTRINO OBSERVATORY

Prof. Hamish Robertson, U.S. SNO Co-spokesman
University of Washington
Seattle, Washington, USA
(206) 616-2745
FAX (206) 616-2902
rghr@u.washington.edu

Prof. Eugene Beier, U.S. SNO Co-spokesman
University of Pennsylvania
Philadelphia, PA, USA
(215) 898-5960
FAX (215) 898-8512
geneb@hep.upenn.edu

Dr. Nick Jelley, UK SNO Co-spokesman
Oxford University
Oxford, England, UK
011 441 865 273380
FAX: 011 441 865 273418
n.jelley1@physics.oxford.ac.uk

Dr. Steve Biller, UK SNO Co-spokesman
Oxford University
Oxford, England, UK
011 441 865 273386
FAX: 011 441 865 273418
s.biller1@physics.ox.ac.uk

Prof. David Sinclair, SNOLAB Director
Carleton University
Ottawa, Ontario
(613) 520-7536
FAX: 613 520-7546
Sinclair@physics.carleton.ca

Ms. Guylaine Tousignant
Media Relations
Laurentian University
Sudbury, Ontario
(705) 675-1151 Ext. 3406
FAX : 675-4840
gj_tousignant@laurentian.ca