

**2002 CONGRESS – WEDNESDAY SESSION WE-A7
CONGRÈS 2002 - RÉSUMÉS DE SESSION WE-A7 (Mercredi)**

[WE-A7]

**NUCLEAR-PARTICLE ASTROPHYSICS /
ASTROPHYSIQUE NUCLÉAIRE ET DES PARTICULES**

**WEDNESDAY, JUNE 5
MERCREDI LE 5 JUIN**

ROOM / SALLE 2001 C

Chair: A. Shotton, TRIUMF

WE-A7-1 10h00**R. DICK**, University of Saskatchewan*Dark Matter Candidates from Theories Beyond the Standard Model*

I review the current status of dark matter candidates from extensions of the standard model of particle physics. I will focus in particular on very light particles from string theory, and also on very heavy particles as possible remnants of inflation.

WE-A7-2 10h30**J.R.LESLIE***, Queen's University at Kingston*The Sudbury Neutrino Observatory – Detection of Neutrinos from the Sun*

The Sudbury Neutrino Observatory (SNO) detector is a water Cherenkov detector located at a depth of 6800 ft in INCO's Creighton Mine near Sudbury. The central region of the detector is 1000 tonnes of heavy water giving the detector a unique sensitivity to neutrinos from the Sun. The detector has been recording data since November 1999. An analysis of the first 241 live-days of data was reported at CAP-2001. This analysis [1], restricted by an energy cut to the charged current reactions in the detector, was combined with the Super-Kamiokande published results to provide evidence for a non-electron neutrino component in the solar neutrino flux and to determine the total active solar neutrino flux. Further analysis, including the extraction of the neutral current (NC) signal, of the full data set taken in the pure heavy water phase of the observations is in progress. In June of 2001, 0.2% by weight NaCl was added to the heavy water of the detector to enhance the efficiency of detection of NC interactions. The status of this phase of the experiment will also be discussed.

[1] *Phys. Rev. Lett.* (2001) **87**, 071301-1
* For the SNO Collaboration

11h00 Coffee Break / Pause café**WE-A7-3 11h15****JOHN SWAIN**, Dept. of Physics, Northeastern University*The Highest Energy Cosmic Rays and the Pierre Auger Observatory*

One of the great mysteries in astroparticle physics is the origin and nature of particles which reach the earth with energies of several joules and initiate extensive air showers containing billions of particles distributed over distances of several kilometers. After reviewing the puzzles and paradoxes surrounding these particles, the processes by which they can be detected are summarized, as is the evidence that such particles really do reach the earth. Following this background material, the physics and present status of the Pierre Auger Observatory is described, together with the latest results and projections for the future.

WE-A7-4 11h45**DAVID HANNA**, McGill University*Ground Based Gamma Ray Astronomy - Present and Future*

Ground based gamma ray astronomy is an important part of the broader discipline of Particle Astrophysics. Relying on techniques coming largely from subatomic physics, workers have learned how to use the earth's atmosphere as the 'front end' of a large acceptance detector for high energy gamma rays from astrophysical sources such as pulsar-driven supernova remnants and active galactic nuclei. In this talk I will review the present situation and describe some of the new instruments that are coming into existence.

WE-A7-5 12h15**V. ZACEK***, Université de Montréal*Search for Supersymmetric Dark Matter and the PICASSO Project*

The PICASSO project at the Université de Montréal is one of several on-going initiatives to directly search for non-baryonic dark matter candidates distributed in our galactic halo. In this conference we will review the present status of dark matter searches and discuss in particular recent progress made in Montréal to produce large mass superheated droplet detector modules. We will discuss the gain in sensitivity within reach, measurements in progress and developments going on in view of an installation of a very large dark matter detector with 100 kg up to one ton active mass, which would put PICASSO at the forefront of future dark matter experiments.

* On behalf of the PICASSO Collaboration : M. Di Marco, P. Doane, R. Gornea, C. Leroy, L. Lessard, J.-P. Martin, T. Noble(a), R. A. Noulty(b), V. Zacek, Université de Montréal, a) Carleton University, b) Bubble Technology Industries, Chalk River

12h45 Session Ends / Fin de la session