**** The June issue will include an article on the COBE results.***

Also reported at the Workshop were new results from cosmic ray studies; searches for dark matter, deviations from Newtonian gravitation, time-reversal violation in beta decay, the electric dipole moment of the neutron, and neutron-anti-neutron oscillations; strong field tests of gravitational theories and other subjects.

For the first time the session had an interdisciplinary character, with an invited lecture by Ed Fredkin on 'Digital Mechanics: the Universe as a Computer'. The improvised evening concert of classical music, given by attending physicists Michael and Myriam Treichel, Jim Faller, Elisabeth Ribs and Tibault Damour added to the pleasant informal atmosphere which is one of the elements of Moriond success.

By S.T. Petcov

ASTROPARTICLE PHYSICS
New synergy

Two major recent experimental results have further strengthened the links between particle physics and cosmology. These are the confirmation by experiments at CERN's LEP electron-positron collider that there are only three species of light neutrino, as predicted by Grand Unified Theories and needed for primordial nucleosynthesis, and the results from the US Cosmic Background Explorer (COBE) satellite that show beyond any doubt that the cosmic background radiation is primordial.*

With this in mind, a new international school was initiated recently by Houston's Advanced Research Center (HARC) and co-sponsored by the nearby Superconducting Supercollider Laboratory. It attracted many distinguished speakers in this rapidly evolving field, resulting in a wide-ranging and stimulating scientific programme.

CERN's John Ellis discussed the Standard Model of Particle Physics and beyond, and the implications of recent LEP data (April, page 1). Rocky Kolb of Fermilab gave an introduction to the Standard Big Bang, while School Director Dimitri Nanopoulos of Texas A&M and HARC presented a unified view of the two fields.

David Schramm of Chicago discussed the important issue of primordial nucleosynthesis, with the observational basis covered by Greg Shields of Texas (Austin). Robert Wagoner of Stanford examined probes of the Universe at all scales, from nuclei to supernovae. Andre Linde, now at Stanford, looked back to the very early stages of the Universe, including the inflation mechanism linking the initial Big Bang to present large-scale structure.

Mark Srednicki of Santa Barbara reviewed the need for Dark Matter, leaving his colleague David Caldwell to look at experimental searches for it. George Smoot of Berkeley discussed the beautiful COBE results confirming the nature of the cosmic background radiation, while Alan Dressler of Mt. Wilson and Las Campanas Observatories reviewed the intriguing large-scale structures, including the great attractor, the great wall and similar concentrations of matter, revealed by recent astronomical surveys. Nicola Vittorio of D'Aquila and Joe Silk of Berkeley tried to make sense of it all.

Neutrinos are never far from the physics headlines – currently solar neutrino observations are in a state of flux and there is a spate of reports on 17 keV neutrinos (see page 21). John Bahcall of Princeton was among the neutrino speakers at the Texas meeting.

Dimitri Nanopoulos – strengthening links between particle physics and cosmology

The status of Big Science was illustrated in talks on the US Superconducting Supercollider (SSC) from Fred Gilman, SSC's Associate Director of Physics Research; on NASA's role from Venon Jones; on the European Space Agency's work from Giacomo Cavallo; and on Hubble telescope from Peter Stockman of the Space Telescope Science Institute.

The meeting showed that while the 'Standard Models' of both particle physics and cosmology were doing fine, some refinements are necessary, especially for the Big Bang picture, at a loss to explain new large-scale structure. New simulations show that even cold dark matter, until now the best candidate for the missing material of the Universe, may not fit the bill. New observations over the next few years will help to clarify many of the major issues in both particle physics and cosmology. Hopefully a clearer picture will emerge before the second school in this series.

From Dimitri Nanopoulos