

SCHOOLS

ICTP summer school reviews latest findings in astroparticle physics

The seventh School on Non-Accelerator Astroparticle Physics was held at the Trieste Abdus Salam International Centre for Theoretical Physics (ICTP) from 26 July to 6 August 2004. The school, which is sponsored by the ICTP and the Istituto Nazionale di Fisica Nucleare (INFN), is held every three years. Non-accelerator astroparticle physics is a rapidly growing field that is often modified significantly by exciting new results, so the general picture presented at each of the schools has been considerably different.

Last year marked the 40th anniversary of the foundation of the ICTP (*CERN Courier* November 2004 p30). During that period the centre has grown in size and complexity. For example, it now has several buildings, a large library, guest houses and well equipped computer rooms. Located about 10 km from the centre of Trieste, it is close to Miramare Castle and Grignano Bay. Besides theoretical research carried out at the centre by staff and visitors, summer schools and workshops are held every year and these represent one of the centre's main activities.

Around 100 participants, including 80 students and 16 lecturers, attended the seventh astroparticle physics school. The participants came from 38 nations, mainly from developing countries although a significant number also came from western countries. The lectures were given by well known theoretical and experimental physicists involved in intensive research in the fields covered by the school. Four sessions were devoted to discussion and participants proved to be very motivated, so the atmosphere was lively. Three poster sessions



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The main building of the ICTP in Trieste.

were organized and students presented 32 posters, which gave a broad view of activities in the field in general and in developing countries in particular.

After a few introductory lectures on basic particle physics, the school covered the status of the field and the future perspectives of astroparticle physics in detail, from both the experimental and theoretical points of view.

A first set of lectures introduced the fundamentals of particle physics with a review of the Standard Model and beyond. A comprehensive section on neutrino physics and astrophysics covered neutrino masses and oscillations, short- and long-baseline neutrino experiments, atmospheric and solar neutrinos, and neutrino telescopes.

Theoretical aspects as well as current and potential dark-matter searches were

extensively discussed. Several lectures dealt with searches for axions, magnetic monopoles and nuclearites. Cosmic rays and astrophysics were covered, with reviews on experiments in space, extreme-energy cosmic rays and photons and antimatter in space. The theory of gravitational waves was introduced, and current and future searches for gravitational waves were reviewed.

A session was devoted to the legacy of the Large Electron-Positron Collider (LEP) at CERN and future accelerators and superbeams. Large-scale facilities, detectors and data acquisition, and large-scale computing were a significant part of the programme. Other sessions concerned the world of science, with reviews on 100 years of science, science and society, and the universe.

Further reading

Copies of the lecture transparencies are available on the ICTP website http://cdsagenda5.ictp.trieste.it/full_display.php?ida=a0355 and at www.bo.infn.it/~giacomelli/ictp/ (see under School Agenda and Documents). The proceedings, edited by R A Carrigan Jr, G Giacomelli and N Paver, are to be published by World Scientific, Singapore.

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