STATUS OF THE LARGE HADRON COLLIDER PROJECT

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The Large Hadron Collider (LHC), which is now well under construction at CERN in Geneva, Switzerland, is designed to provide, to four different particle detectors, colliding proton beams of an energy of 14,000 GeV in the centre of mass at a luminosity of more than 10^{34} $cm^{-2}sec^{-1}$. With its expected turn-on by the year 2007, the LHC will provide mankind with a unique tool at the cutting edge of science, as it is expected to (1) detect and explore the Higgs boson, (2) to search for super-symmetric particles, (3) to study the nature of the quark-gluon plasma, and (4) to further our knowledge on the CP violation. The presentation will provide an overview of the LHC project, i.e. its aims and its present status, and it will demonstrate the benefits of LHC not only to high-energy particle physics and cosmology, but also, on a global scale to all participating countries, through high-technology innovation and transfer to industry (detector technology, computing, cryogenics, electronics, etc.). It will further be shown that the LHC will provide high-level education and training to an entire generation of young scientists and engineers in a truly international environment.

EXPERIMENTS AT THE LARGE HADRON COLLIDER

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Preparation of experiments at the Large Hadron Collider (LHC) is discussed. LHC is the largest particle accelerator currently being built at CERN, Geneva, Switzerland by the international high energy physics community. The facility will become operational in 2007. An extensive physics research program includes searches for the Higgs particle, Supersymmetry, quark internal structure (compositeness), quark-gluon plasma and many other topics.

FIRST RESULTS OF THE NEMO 3 EXPERIMENT AND DOUBLE BETA DECAY

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NEMO Collaboration

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The NEMO collaboration is looking to measure neutrinoless double beta decay. The search for the effective neutrino mass will approach a lower limit of 0.1 eV. The NEMO 3 detector is now operating in the Frejus Underground Laboratory. The fundamental design of the detector is reviewed and the performances detailed. Finally, a summary of the data collected in the first runs, which involve energy and time calibration and study of the background are presented. A short review on double beta decay experiments will also presented.