CERN Colloquium

SPEAKER: Dr. Katherine Freese (University of Michigan)

TITLE: **Dark Matter in the Universe**

DATE: Thu 25/10/2012 16:30

PLACE: Council Chamber

ABSTRACT

The question “What is the Universe made of?” is the longest outstanding problem in all of physics. Ordinary atoms only constitute 5% of the total, while the rest is of unknown composition. Already in 1933 Fritz Zwicky observed that the rapid motions of objects within clusters of galaxies were unexplained by the gravitation pull of luminous matter, and he postulated the existence of Dunkle Materie, or dark matter. A variety of dark matter candidates exist, including new fundamental particles already postulated in particle theories: axions and WIMPs (weakly interacting massive particles). Over the past 25 years, there has been a three pronged approach to WIMP detection: creating them at particle accelerators; searched for detection of astrophysical WIMPs scattering off of nuclei in underground detectors; and “indirect detection” of WIMP annihilation products (neutrinos, positrons, or photons). As yet the LHC has only placed bounds rather than finding discovery. For 13 years the DAMA experiment has proclaimed evidence of annual modulation of the signal which could be evidence of detection. Over the past few years the situation has become very exciting as many different experiments are independently seeing unexplained results; yet the various experiments do not seem to agree. The hunt for dark matter has become very exciting and yet very puzzling. This talk will describe the current anomalies that may herald WIMP discovery.

Organised by: Ignatios Antoniadis/PH-TH .....**Tea and coffee will be served at 16h00**