EP Seminar

SPEAKER: Ashot Chilingarian

TITLE: **Observation of high-energy gamma rays and electrons born in thunderclouds**

DATE: Mon 22/08/2011 11:00

PLACE: Council Chamber

ABSTRACT

Recent atmospheric observations show that thunderstorms produce intense gamma and electron showers at energies up to 100 MeV. These are explained by a process known as runaway breakdown (also referred as relativistic runaway electron avalanche - RREA) in which MeV primary electrons from cosmic ray showers are accelerated in thunderstorm electric fields of several 100 kV/m, producing intense avalanches. Gamma rays and electrons from thunderstorms are detected by satellites (Terrestrial Gamma Flashes - TGFs) and by ground-based particle detectors. In this talk I will present the thunderstorm ground enhancements (TGEs) detected by the Aragats Space Environmental Center (ASEC) at an altitude of 3200 m. The high-statistics observations provide new insights that challenge existing models of relativistic runaway electron avalanches. We introduce and discuss a new model of TGF-TGE initiation that can explain the experimental observations of electron acceleration in the atmosphere.

Organised by: M. Mangano, M. Spiropulu, G. Unal