

High Energy Particle Seminar

Wednesday, September 11, 2019 / 705 Pupin Hall / 1:00 PM

JiHee Kim – University of Utah

"The Cosmic Ray Energy Spectrum above 0.1 EeV measured by the Telescope Array and TALE Fluorescence Telescopes"



The Telescope Array (TA), deployed in the desert of central Utah, is the largest cosmic ray detector in the Northern hemisphere. It was initially designed to observe ultra high energy cosmic rays with energies $> 10^{19}$ eV. It consists of three telescope stations viewing the sky over an array of scintillator surface detectors. The fluorescence telescopes observe the longitudinal development of an extensive air shower induced by an incident cosmic ray by detecting the scintillation light as the shower develops. Meanwhile, the array of scintillator surface detectors measures the lateral distribution of particles reaching the Earth's surface. More recently the Telescope Array Low-energy Extension (TALE) was added to lower the experiment's energy threshold. This was accomplished by installing high elevation angle telescopes to one of the telescope stations and adding a graded array of more densely spaced surface detectors to the existing main array. This allows us to extend our study to cosmic rays as low in energy as $\sim 10^{15.3}$ eV. The observatory now consists of 48 fluorescence telescopes at three stations viewing the sky above an array of 610 surface detectors. The scintillator array is spread over $\sim 750 \text{ km}^2$. One complication of combining TA and TALE telescope data is that these telescopes use significantly different electronics for historical reasons. In this talk, I will present a measurement of the energy spectrum in the energy range of $10^{17.2}$ - $10^{19.0}$ eV using fluorescence data collected by the TA and TALE telescopes.

Lunch will be available for attendees