Contribution ID: **25** Type: **not specified**

The Search for Dark Matter in the Ultra-high-energy Sky

The nature of dark matter (DM) —the cold, neutral entity comprising roughly 85% of all matter content in the universe —is one of the biggest open problems in modern astrophysics. One plausible class of candidate DM particles, from beyond the Standard Model of physics, are Weakly Interacting Massive Particles (WIMPs), ranging in masses between ˜GeV to hundreds of TeV. Such DM particles may annihilate or decay in astrophysical environments to produce photons and neutrinos that may be detectable on earth. The search for the nature of DM is, therefore, closely tied to precision measurements, of both point and diffuse sources of ultra-high-energy (> 10 TeV) Galactic and extra-galactic emission. I will describe the efforts to survey the universe in extreme energies with two on-going experiments —High Altitude Water Cherenkov (HAWC) Gamma-ray Observatory, and the IceCube South Pole Neutrino Observatory. In particular, I will discuss how we use the high-statistics, continuous measurements in neutrinos and gamma rays to search for signatures of DM in a variety of astrophysical targets, and will present some of the resulting constraints on model parameters.

Author: NISA, Mehr Un (Michigan State University)

Presenter: NISA, Mehr Un (Michigan State University)

Session Classification: Dark Matter