

Abstract Submitted  
for the APR16 Meeting of  
The American Physical Society

**NICHE: Using Cherenkov radiation to extend Telescope Array to sub-PeV energies.** DOUGLAS BERGMAN, University of Utah, JOHN KRIZMANIC, Universities Space Research Association, YOSHIKI TSUNESADA, Osaka City University, TAREQ ABU-ZAYYAD, JOHN BELZ, GORDON THOMSON, University of Utah — The Non-Imaging Cherenkov (NICHE) Array will measure the flux and nuclear composition evolution of cosmic rays (CRs) from below 1 PeV to 1 EeV. NICHE will be co-sited with the Telescope Array (TA) Low Energy (TALE) extension, and will observe events simultaneously with the TALE telescopes acting in imaging-Cherenkov mode. This will be the first hybrid-Cherenkov (simultaneous imaging and non-imaging Cherenkov) measurements of CRs in the Knee region of the CR energy spectrum. NICHE uses easily deployable detectors to measure the amplitude and time-spread of the air-shower Cherenkov signal to achieve an event-by-event measurement of  $X_{\max}$  and energy, each with excellent resolution. First generation detectors are under construction and will form an initial prototype array (j-NICHE) that will be deployed in Summer 2016. In this talk, the NICHE design, array performance, prototype development, and status will be discussed as well as NICHE's ability to measure the cosmic ray nuclear composition as a function of energy.

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Date submitted: 08 Jan 2016

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