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The Non-Imaging CHErenkov (NICHE) Array: A TA/TALE extension using Cherenkov radiation to measure Cosmic Ray Composition to sub-PeV energies JOHN KRIZMANIC, Universities Space Research Association, DOUGLAS BERGMAN, University of Utah, YOSHIKI TSUNESADA, Osaka City University, TAREQ ABU-ZAYYAD, JOHN BELZ, GORDON THOMSON, University of Utah — Co-sited with the Telescope Array (TA) Low Energy (TALE) extension, 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 in its eventual full deployment. NICHE will co-measure CR air showers with TA/TALE and will initially be deployed to observe events simultaneously with the TALE telescopes acting in imaging-Cherenkov mode, providing 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 (jNICHE) that will be deployed in early 2017 at the TA/TALE site. In this talk, the NICHE design, array performance, jNICHE 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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