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Ultra-High Energy Neutrino Astrophysics with the Askaryan Radio Array[1] BRIAN CLARK, The Ohio State University, ASKARYAN RADIO ARRAY (ARA) COLLABORATION — Text: We present an overview of the Askaryan Radio Array radio neutrino detector and the elusive cosmic neutrinos for which it searches. Neutrinos, interacting only through the weak force, are immune to photo-hadronic processes that screen photons and massive particles from outside the galaxy. As such, neutrinos are unique portals to ultra-high energy phenomena at cosmic distances, and are essential to our understanding of physics at energy scales beyond those of the LHC. Low cross-sections and low fluxes demand that any search for these particles be of enormous scale. The Askaryan Radio Array, or ARA, is a teraton, *in-situ* ultra-high energy ($> 10^{17}$ eV) neutrino detector undergoing phased construction at the South Pole. It searches for these cosmogenic neutrinos by looking for the broadband, impulsive radio-Cerenkov signals that are characteristic of neutrino interactions in dense media. In the radio-clear ice of Antarctica, these pulses travel un-attenuated for kilometers, allowing ARA to instrument the enormous volumes of ice necessary for practical detection. We will present the recently published limits set by ARA for the ultra-high energy neutrino flux between $10^{17} - 10^{21}$ eV.

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