

Cosmin Deaconu – HEP Seminar – October 11, 2022
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Title: The exciting near future of radio detectors for ultrahigh energy neutrinos, starring RNO-G and PUEO

Abstract:

Ultrahigh-energy (UHE) neutrinos, corresponding to energies of around 100 PeV and higher, are expected to exist at some level but have so far evaded detection. When interacting in a dense medium, their cascades produce coherent broadband radio (~ 100 MHz-1GHz) emission via the Askaryan mechanism. For radio transparent media, such as polar ice sheets, the signal may be measured from far away, providing a promising detection technique. This talk will focus on the two newest experiments of this type. The Radio Neutrino Observatory - Greenland (RNO-G) experiment began deployment in the Greenlandic ice sheet last summer. While only $\sim 20\%$ complete, RNO-G has already become already the largest in-ice radio neutrino detector. The Payload for Ultrahigh Energy Observations (PUEO) targets even higher-energy neutrinos (~ 10 EeV), taking advantage of a high-altitude balloon platform to instantaneously monitor over a million cubic kilometers of ice, albeit only for the duration of the balloon flight and at higher energy threshold. PUEO is expected to launch in Antarctica in late 2024.