

Detection of ultra-high-energy particles with the Pierre Auger Observatory and GRAND

Thursday, 25 March 2021 14:20 (30 minutes)

Ultra-high-energy cosmic rays are unique probes of both cosmic phenomena and particle interactions at energies well beyond what is achievable with human-made accelerators. In the past decade, much progress has been made in their detection and study, notably also with the Pierre Auger Observatory. Definitive answers on questions such as their cosmic sources and precise models for hadronic physics at the $\sqrt{s}=100$ TeV scale require knowledge of the ultra-high-energy cosmic ray composition. The detection of ultra-high-energy neutrinos and photons will provide important complementary information to that of cosmic rays. The AugerPrime upgrades aim at improving composition information and neutrino and photon identification. It is already clear that for detailed ultra-high-energy cosmic ray, neutrino and photon astronomy a next generation observatory will be needed, for which the Giant Radio Array for Neutrino Detection (GRAND) has the most advanced design. The Dutch cosmic ray science group plays leading roles in both the AugerPrime upgrade and the preparations for GRAND. The status of the field based on the Pierre Auger Observatory data, as well as the progress on the AugerPrime upgrade and GRAND prototypes will be presented.

Summary

Presenter: GALEA, Cristina

Session Classification: Update talks