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**Results and prospects in multi-messenger particle astrophysics**

MIGUEL MOSTAFA, Pennsylvania State Univ

In high-energy particle astrophysics the old days were certainly not better than these. Our field has thrived in the past decade with experiments covering thousands of square kilometers to measure the suppression in the flux of the highest energy cosmic rays ever observed, instrumenting a cubic kilometer of Antarctic ice to discover astrophysical neutrinos, and measuring a change in arm length as small as $10^{-19}$ m for the ground-breaking direct observation of gravitational waves. Additionally, the current generation of space-borne and ground-based gamma-ray experiments have revealed a plethora of gamma-ray sources, including pulsars, compact binaries, the galactic center, and extragalactic sources such as starburst galaxies and radio galaxies. Before the next generation of instruments bring us yet another order of magnitude in sensitivity, we can combine current observations to probe physics beyond the standard model, and to extend the high-energy frontier well above the energies accessible to laboratory accelerators. One example of this potential is the search for dark-matter annihilation and decay products. To use the multi-messenger approach effectively for probing dark-matter signatures and physics beyond the LHC energy requires understanding the origin (or acceleration mechanism) and the propagation processes. High energy protons and nuclei, neutrinos, gamma-rays, X-rays, and gravitational waves bring new and complementary views of the astrophysical sources. By comparing observations through different windows, we can use the sites of violent phenomena as a laboratory to probe the physical processes under extreme conditions throughout the Universe, and to test the fundamental laws of particle physics and gravitation. As a community we need to engage in a bold synergistic approach to understanding the violent processes that give rise to the high-energy cosmic phenomena in the Universe. In this invited talk, I will present on-going multi-messenger studies to obtain new information about cosmic sources, and I will discuss the prospects of combining data from the electromagnetic, particle, and gravitational windows to advance high energy astrophysics into a new era.