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Multi-messenger and Particle Astrophysics studies with the VERITAS Atmospheric Cherenkov Telescope RESHMI MUKHERJEE, Barnard College, Columbia University, VERITAS COLLABORATION COLLABORATION — Multi-messenger astronomy is currently an emerging area of study, that employs different cosmic messengers such as neutrinos, photons, cosmic rays, and gravitational waves to obtain complementary information about energetic cosmic sources. With the recent detection of high-energy astrophysical neutrinos by IceCube, and the identification of electromagnetic counterparts to the gravitational waves detected by LIGO and Virgo, multi-messenger astronomy offers promising prospects. VERITAS plays a key role in multi-messenger astrophysics, operating at an opportune moment for making new discoveries. As both gamma-rays and neutrinos are produced in hadronic interactions, a joint study has the potential for revealing powerful cosmic accelerators. VERITAS looks for connections between very-high-energy gamma-rays and astrophysical neutrinos by following up on highly-energetic neutrinos discovered by IceCube. The Observatory is also involved in the follow up of gravitational wave events, as their progenitor sources may also emit gamma rays. VERITAS is an array of ground-based imaging air Cherenkov telescopes located in Arizona. VERITAS continues to provide high-quality gamma-ray observations with excellent sensitivity, operating in the energy range of 85 GeV to 30 TeV. In this talk, we present recent multi-messenger studies with VERITAS and discuss the prospects and goals for the future of the field in the era of the Cherenkov Telescope Array (CTA).

Reshmi Mukherjee
Barnard College, Columbia University

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