Abstract Submitted
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Discovery Space and Motivations for a Multimessenger Observatory Network[1] DEREK FOX, Penn State University, AMON TEAM — We present the science case, including illustrative simulations, motivating construction of a multimessenger observatory network linking the world's leading high-energy electromagnetic, neutrino, cosmic ray, and gravitational wave facilities. As currently being realized at Penn State, the Astrophysical Multimessenger Observatory Network (AMON) will carry out real-time coincidence searches for multimessenger astrophysical transients and distribute the resulting "AMON alerts" to interested parties for follow-up observation. In this way, AMON aims to evoke the discovery of multimessenger transients from observatory subthreshold data streams, and facilitate the exploitation of these transients for purposes of astronomy and fundamental physics. I will present the results of three simulated case studies of AMON analyses which explore: (1) The expected efficiency improvements for triggered searches for the counterparts to jointly-emitting neutrino + gamma-ray sources; (2) The expected gains to be realized in searches for joint sources of gravitational waves and high-energy neutrinos; and (3) The discovery potential of AMON for primordial black hole evaporation events. Distribution of the first neutrino + gamma-ray AMON alerts is currently anticipated for mid-2015.

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