

B19r **Nonthermal Astrophysics with ASTRO-H**

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I will discuss the potential of ASTRO-H for a broad range of high energy nonthermal phenomena related to particle acceleration and radiation processes in different astronomical source populations, including supernova remnants, pulsar wind nebulae, compact binary systems, active galactic nuclei and clusters of galaxies. These studies will allow us to address several principal issues in the context of origin of galactic and extragalactic cosmic rays and physics and astrophysics of relativistic outflows like the pulsar winds and black-hole jets. While generally the results of ASTRO-H will be complementary to observations in other bands of electromagnetic radiation, in some cases ASTRO-H promises unique/key information in extremely broad energy range of accelerated particles, both electrons and protons, from 10^5 eV to 10^{20} eV.