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High Energy Astrophysics and Cosmology from Space: NASA's Physics of the Cosmos Program

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We summarize currently-funded NASA activities in high energy astrophysics and cosmology, embodied in the NASA Physics of the Cosmos program, including updates on technology development and mission studies. The portfolio includes development of a space mission for measuring gravitational waves from merging supermassive black holes, currently envisioned as a collaboration with the European Space Agency (ESA) on its L3 mission and development of an X-ray observatory that will measure X-ray emission from the final stages of accretion onto black holes, currently envisioned as a NASA collaboration on ESA's Athena observatory. The portfolio also includes the study of cosmic rays and gamma ray photons resulting from a range of processes, of the physical process of inflation associated with the birth of the universe and of the nature of the dark energy that dominates the mass-energy of the modern universe. The program is supported by an analysis group called the PhysPAG that serves as a forum for community input and analysis and the talk will include a description of activities of this group.