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White Paper on the Status and Future of Ground-based Gamma-Ray Astronomy - Extragalactic Science Working Group H. KRAWCZYNSKI, WUSTL, P. COPPI, Yale, C. DERMER, NRL, E. DWEK, M. GEORGANOPOULOS, GSFC, D. HORAN, Argonne, T. JONES, U. Minnesota, F. KRENNRICH, ISU, R. MUKHERJEE, Barnard, E. PERLMAN, FIT, V. VASSILIEV, UCLA — In fall 2006, the Division of Astrophysics of the American Physical Society requested a white paper about the status and future of ground based gamma-ray astronomy. The white paper will largely be written in the year 2007. Interested scientists are invited to join the science working groups. In this contribution, we will report on some preliminary results of the extragalactic science working group. We will discuss the potential of future ground based gamma-ray experiments to elucidate how supermassive black holes accrete matter, form jets, and accelerate particles, and to study in detail the acceleration and propagation of cosmic rays in extragalactic systems like infrared galaxies and galaxy clusters. Furthermore, we discuss avenues to constrain the spectrum of the extragalactic infrared to optical background radiation, and to measure the extragalactic magnetic fields based on gamma-ray observations. Eventually, we discuss the potential of ground based experiments for conducting gamma-ray source surveys. More information about the white paper can be found at: http://cherenkov.physics.iastate.edu/wp/

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