

Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Black holes, formation of structure, and extreme physics: the present and future of X-ray astrophysics RALPH KRAFT, Smithsonian Astrophysical Observatory, MARK BAUTZ, MIT — X-ray astrophysics lies at the conjunction of many of the big picture questions we have about our Universe. We detect X-rays from supermassive black holes when the Universe was 7% of its present age, just after the formation of the first galaxies. Most of the baryons in the Universe are in clusters or in the filaments between collapsed structures heated to X-ray emitting temperatures. X-ray studies of the evolution of these collapsed structures provide strong constraints on cosmological parameters. Studies by future X-ray observatories of this hot filamentary gas between clusters and of halos of galaxies will provide unique windows in the processes of the early universe and formation of structure. In this presentation, we discuss the current state of X-ray astrophysics. We will present the status of and recent science highlights from the current generation of X-ray observatories. We will outline the scientific potential for missions that will soon be launched including NICER, eRosita, and a potential reflly of the Hitomi mission, as well as longer term missions such as the European L2 Athena mission. Finally, we will summarize the status of the X-ray Surveyor, one of the four large mission concepts under study prior to the 2020 Astrophysics Decadal Review.

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Date submitted: 28 Sep 2016

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