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国台学术报告 NAOC COLLOQUIUM

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Time: Wed. 2:30 PM, May 04 Location: A601, NAOC

Hunting for Cosmic Baryons

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Wei Cui is a joint professor at Tsinghua and Purdue University. He received his PhD in physics from the University of Wisconsin-Madison in 1994, before taking up a Research Scientist position at MIT Center for Space Research. Being an experimentalist, he has worked on a number of major projects in high-energy astrophysics and particle astrophysics, including a sounding rocket experiment employing the first microcalorimeter for highresolution X-ray spectroscopy, the Rossi X-ray Timing Explorer, the Very Energetic Radiation Imaging Telescope Array (VERITAS), and the Large Synoptic Survey Telescope. He also holds a joint appointment of Chief Scientist in the Chinese Academy of Sciences Key Laboratory of Particle Astrophysics at the Institute of High Energy Physics, and is involved in the Hard X-ray Modulation Telescope project, as well as in the discussion of future space projects in China. Professor Cui has published extensively on microquasars, accreting pulsars, supernova remnants, and active galactic nuclei, as well as on clusters of galaxies and the cosmic X-ray background.

Abstract

One of the triumphs of the Big Bang Nucleosynthesis (BBN) theory is that its predicted abundances of primordial isotopes agree with the measured values. Moreover, the predicted baryonic mass is accounted for at high redshifts observationally. Going towards low redshifts, however, only a fraction of the BBN baryons are detected; this is the “missing baryon” problem. The common wisdom is that those baryons are not missing, but are hidden in some warm-hot gas of very low density, which is difficult to detect; cosmological simulations support this view. Such gas may be “seen” through the emission or absorption lines of its highly ionized constituents. For that, an X-ray spectrometer of high throughput and high resolution would likely be required. I will describe the development of microcalorimeters for X-ray spectroscopy. I will also briefly discuss the design of a satellite experiment that employs the microcalorimeters to carry out a survey of warm-hot gas in the universe, addressing a wide range of important issues in astrophysics, including the “missing baryon” problem.

All are welcome! Tea, coffee, biscuits will be served at 2:15 PM.