



The Accelerating Expanding Universe: Dark Matter, Dark Energy, and Einstein's Cosmological Constant

Dark energy is the leading candidate for the mechanism responsible for accelerating the cosmological expansion. I will describe the astronomical data which persuade cosmologists that (as yet undetected) dark energy and dark matter are by far the main components of the universe's energy budget at the present time. I will review how these observations have led to the development of a quantitative "standard" model of cosmology that describes the universe's evolution from an early epoch of inflation to the complex hierarchy of structure seen today. I will also discuss the basic physics and the history of ideas on which this model is based.



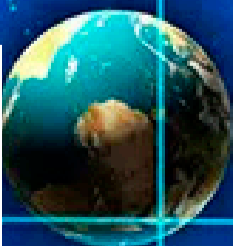
Bharat Ratra

Bharat Ratra is a distinguished professor of physics at Kansas State University (KSU). He works on cosmology and astroparticle physics, researching the structure and evolution of the universe. After earning his master's degree from the Indian Institute of Technology in New Delhi, Ratra earned a doctorate in physics from Stanford University. He was a postdoctoral fellow at Princeton University, the California Institute of Technology, and the Massachusetts Institute of Technology before joining KSU in 1996 as an assistant professor. In 1988, Ratra and Jim Peebles proposed the first dynamical dark energy model. He was named a fellow of the American Physical Society in 2002, the American Association for the Advancement of Science in 2005, and the American Astronomical Society in 2023.

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