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ICTS MONTHLY COLLOQUIUM

Dark Energy Dynamics, Spatial Curvature, Neither, or Both?

Observations over the last two and half decades have persuaded cosmologists that (as yet only indirectly detected) dark energy is by far the main component of the energy budget of the current universe. I review a few simple dark energy models, including the currently-standard Λ CDM cosmological model, and compare their predictions to observational data, to derive cosmological parameter constraints and to study consistency of different data sets. I summarize observational constraints on dark energy dynamics and spatial curvature, two parameters that extend away from the time-independent cosmological constant dark energy and flat spatial hypersurfaces of the standard Λ CDM model. I also summarize observational constraints on the Hubble constant. I conclude with a list of my favorite open cosmological questions.



Bharat Ratra

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Prof. Bharat Ratra is a Distinguished Professor of Physics at the Kansas State University. He works in the areas of cosmology and astroparticle physics. His current principal research interests include developing models for large-scale matter and radiation distributions in the universe and testing these models by comparing predictions to observational data. Prof. Ratra earned a doctorate in physics from Stanford University and a master's degree from the Indian Institute of Technology in New Delhi. He carried out his postdoctoral research work at Princeton University, the California Institute of Technology, and the Massachusetts Institute of Technology. He has been the recipient of several awards and honors including the National Science Foundation CAREER award(1999), Commerce Bank Distinguished Graduate Faculty Award (2012-2013), Olin Petefish Award in Basic Sciences (2017), Kansas Science Communication Initiative (KSCI) Science Communication Award (2020), Julius Edgar Lilienfeld Prize (2025). He is a fellow of the American Physical Society, the American Association for the Advancement of Science, and the American Astronomical Society.

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Madhava Lecture
Hall ICTS, Bengaluru

