



Geodesic Completeness in General Cosmological Scenarios

The well-known Borde-Guth-Vilenkin Theorem shows that inflationary spacetimes are generically, geodesically past-incomplete, thus necessitating the existence of a pre-inflationary boundary of some sort – possibly singular. In this talk, I discuss the generalisation of the BGV theorem to spacetimes beyond inflation, including inhomogeneous and cyclic models. I argue that the cyclic model proposed by Ijjas and Steinhardt is geodesically incomplete, and that an asymptotically de Sitter version of Penrose's Conformal Cyclic Cosmology is either past- or future-incomplete.

Biography

Will Kinney is a professor in the Department of Physics at the University at Buffalo, SUNY, where he has been on faculty since 2003. Dr Kinney received his Bachelor of Arts from Princeton University, and PhD from the University of Colorado, Boulder. He has worked as a research associate at Fermi National Accelerator Laboratory, the University of Florida, and Columbia University, and held visiting positions at Yale University, Perimeter Institute for Theoretical Physics, Harish Chandra Research Institute, Allahabad, the University of Chicago, the University of Valencia, Indian Institute of Technology Madras, and Stockholm University. Dr Kinney's research focusses on the physics of the very early universe, including inflationary cosmology, the cosmic microwave background, dark matter, and dark energy. He has authored more than seventy published research articles, and received the SUNY Chancellor's award for excellence in teaching in 2014. Kinney is author of the popular book *An Infinity of Worlds*, available from MIT Press.



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