BOSTON UNIVERSITY

Astrophysics Seminar Monday, February 1, 2016

3:15 pm Refreshments CAS Room 500

3:30 pm Seminar CAS Room 502

Next Week

- Michael Nowak MIT
- Are Black Holes as Simple as They Used to Be?



http://www.bu.edu/iar/seminars/ current-seminars/

Why Quantum Gravity Matters: Quantum Avoidance of the Big Bang Singularity

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Abstract:

In this talk, I will describe how various approaches to quantum gravity suggest a possible resolution of the Big Bang / Big Crunch singularity problem. Despite differences in basic variables and formulation of the dynamics, many models indicate that quantum effects alter the evolution of the universe close to a singularity and create a bounce which reverses collapse before the average radius of the universe reaches zero. In particular, such a bounce-like effect seems to arise in quantum cosmology from certain ordering choices for non-commuting operators in the quantum Hamiltonian. I will discuss the origin of the factor ordering ambiguity and its equivalent effect on the construction of a Feynman path integral measure, as well as the significance of particular choices of ordering on boundary conditions for quantum wavefunctions of the universe.



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