Physics
AT QUEENS COLLEGE

Colloquium Notice

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Big bounce and inflation from spin and torsion

The conservation law for the total (orbital plus spin) angular momentum of a Dirac particle in the presence of gravity requires that spacetime is not only curved, but also has a nonzero torsion. The coupling between the spin and torsion in the Einstein–Cartan theory of gravity generates gravitational repulsion at extremely high densities, which prevents a singularity in a black hole and may create there a new, closed, baby universe undergoing one or more nonsingular bounces. We show that quantum particle production caused by an extremely high curvature near a bounce creates enormous amounts of matter and can generate a finite period of inflation. Our scenario has only one parameter, does not depend significantly on the initial conditions, does not involve hypothetical scalar fields, avoids eternal inflation, and predicts plateau-like inflation that is supported by the Planck observations of the cosmic microwave background. This scenario suggests that our Universe may have originated from a black hole existing in another universe.

Monday
November 12, 2018
Starts at 12:15 PM
Coffee at 12:00 PM
Physics Conference Room, SB B326