Seminar

Prof. Eric Woolgar

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Lorentzian Bakry-Émery Theory

Monday, August 7, 2017

at 13:00 h

ESI, Boltzmann Lecture Hall

Abstract: In a recent seminar, Khuri observed that Riemannian Bakry-Émery geometry may have a role to play in the study of near-horizon geometries. I will describe Bakry-Émery geometry and show how the Lorentzian version arises in scalar-tensor gravitation. A fairly complete picture of Lorentzian Bakry-Émery geodesic geometry is now available. J Case initiated its study several years ago, giving an extension of the Hawking-Penrose singularity theorem and timelike splitting theorem. Galloway and the speaker then found a version of the Hawking cosmological singularity theorem for Bakry-Émery geometry with infinite synthetic dimension. Wylie and the speaker have now extended these results to all values of the synthetic dimension, including negative values, save for a gap $a \leq N \leq n$ where $a = 1$ or $a = 2$ depending on the theorem. The techniques are standard applications of geodesic geometry, with a few tricks.

P. Chruściel

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