



Mathematics Colloquium

Singularity formation in black hole interiors

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Abstract

The prediction that solutions of the Einstein equations in the interior of black holes must always terminate at a singularity was originally conceived by Penrose in 1969, under the name of “strong cosmic censorship hypothesis”. The nature of this break-down (i.e. the asymptotic properties of the space-time metric as one approaches the terminal singularity) is not predicted, and remains a very hotly debated question to this day. One key question is the causal nature of the singularity (space-like, vs null for example). Another is the rate of blow-up of natural physical/geometric quantities at the singularity. Mutually contradicting predictions abound in this topic. Much work has been done under the assumption of spherical symmetry (for various matter models). We present recent developments (due to the speaker and G. Fournodavlos) which go well beyond this restrictive class. A key role is played by the axial symmetry reduction of the Einstein equations, where a wave map structure appears.

Wednesday, 12 October 2016, 4pm

Smith Hall 204

Tea and refreshments will be served at 3:45pm.