DIFFERENTIAL GEOMETRY/PDE SEMINAR

Wednesday, February 3
Communications 326
3:45 pm

Velocity dominated behavior near the singularity in cosmological solutions of Einstein equations

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The Hawking-Penrose singularity theorems tell us that cosmological solutions of Einstein's equations are generically singular (in the sense of geodesic incompleteness). What are the asymptotic properties of solutions approaching the singular region? Recent work (both numerical and analytic) supports a remarkably simple picture: With respect to some choice of time, the extrinsic geometry asymptotically dynamically dominates the intrinsic geometry, and the spacetime evolution asymptotically behaves like a collection of solutiions of ODEs in time. We describe this picture in some detail, and discuss some of the work on T^2 symmetric solutions which supports it.