



复旦大学数学科学学院 数学综合报告会

报告题目: **On Singularity Formation in General Relativity**

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摘要: In the process of gravitational collapse, singularities may form, which are either covered by trapped surfaces (black holes), or visible to faraway observers (naked singularities). In this talk, with three different approaches coming from hyperbolic PDE, quasilinear elliptic PDE and dynamical system, I will present results on four physical questions:

- i) Can “black holes” form dynamically in the vacuum?
- ii) To form a “black hole”, what is the least size of initial data?
- iii) Can we find the boundary of a “black hole” region? Can we show that a “black hole region” is emerging from a point?
- iv) For Einstein vacuum equations, could singularities other than black hole type form in gravitational collapse?

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