Stony Brook University
The Graduate School

Doctoral Defense Announcement

Abstract

The Stability of the Penrose Inequality is Spherical Symmetry

By

Emily Schaal

We formulate and prove the stability statement associated with the spacetime Penrose inequality for n-dimensional spherically symmetric, asymptotically flat initial data satisfying the dominant energy condition. We assume that the ADM mass is close to the half area radius of the outermost apparent horizon and, following the generalized Jang equation approach, show that the initial data must arise from an isometric embedding into a static spacetime close to to the exterior region of a Schwarzschild spacetime in the following sense: the time slice is close to the Schwarzschild time slice in the volume preserving intrinsic flat distance, the static potentials are close in L^2_{loc}, and the initial data extrinsic curvature is close to the second fundamental form of the embedding in L^2.

Date: April 18, 2024   **Program**: Mathematics
Time: 11:30am   **Dissertation Advisor**: Marcus Khuri
Place: Math 5-127