Topics in Geometric Analysis



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Causal Character of Killing Vectors and the Geometry of ADM Mass Minimizers

Friday, 27 June 2025 10:30 (1 hour)

We address two problems concerning ADM mass minimization for asymptotically flat initial data sets. First, we prove that data sets with zero ADM mass satisfying the dominant energy condition must embed in a pp-wave spacetime, without assuming spin. Second, we confirm Bartnik's stationary vacuum conjecture for positive Bartnik mass. A key ingredient is a monotonicity formula for the Lorentzian length of a Killing vector field, together with a strong maximum principle. This is based on joint work with Sven Hirsch.

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