

The Positive Mass Theorem

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The positive mass theorem (for spin manifolds) turns a local geometric condition of a manifold into a global rigidity statement about the entire manifold, namely that for a manifold with nonnegative scalar curvature the total (ADM) mass cannot be negative.

In this talk, I will develop the necessary framework starting from principal bundles and connections, leading to spin geometry and the Lichnerowicz formula. I will then introduce asymptotically flat manifolds and outline how these ingredients come together in the proof, concluding with some directions for further study.