



## Mathematics Colloquium

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# Mass, Scalar Curvature, Kaehler Geometry, and All That

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### Abstract

Given a complete Riemannian manifold that looks enough like Euclidean space at infinity, physicists have defined a quantity called the “mass” which measures the asymptotic deviation of the geometry from the Euclidean model. In this lecture, I will explain a simple formula, discovered in joint work with Hajo Hein, for the mass of any asymptotically locally Euclidean (ALE) Kaehler manifold. For ALE scalar-flat Kaehler manifolds, the mass turns out to be a topological invariant, depending only on the underlying smooth manifold, the first Chern class of the complex structure, and the Kaehler class of the metric. When the metric is actually AE (asymptotically Euclidean), our formula not only implies a positive mass theorem for Kaehler metrics, but also yields a Penrose-type inequality for the mass.

**Wednesday, 11 October 2017, 4pm**

**Smith Hall 204**

Tea and refreshments will be served at 3:45pm.