

THE EVANS LECTURES

January 24–25, 2013

Karin Melnick, University of Maryland

Lecture I – A Rigidity Theorem in Conformal Geometry and Beyond

• Thursday, January 24 @ 4:00 PM in 532 Malott Hall •

The classical exponential map in Riemannian geometry has the following very important implications: if an isometry f fixes a point and has trivial derivative there, then f is trivial; moreover, the differential gives a simple normal form for all isometries fixing a given point. Conformal transformations of a Riemannian manifold are required only to preserve angles, not distances. These have no exponential map. Nontrivial conformal transformations can have differential equal the identity at a fixed point, but this occurrence has very strong implications for the underlying manifold.



I will present this rigidity phenomenon in conformal geometry and a wide range of generalizations. The key to these results is the notion of Cartan geometry, which infinitesimally models a manifold on a homogeneous space. This point of view leads to a normal forms theorem for conformal Lorentzian flows. It also leads to a suite of results on a seemingly widespread rigidity phenomenon for flows on parabolic geometries, a rich family of geometric structures whose homogeneous models include flag varieties and boundaries of symmetric spaces.

Lecture II – Normal Forms for Conformal Lorentzian Vector Fields

• Friday, January 25 @ 1:30 PM in 224 Malott Hall •

In this talk, I will present a normal forms theorem for conformal flows on Lorentzian manifolds. (Joint work with C. Frances.)

Please join us Thursday, January 24 at 3:30 PM for refreshments in the Mathematics Department lounge (532 Malott Hall).