Fall 2025

Geometry and Topology Seminar

Title

Positive curvature conditions on contractible manifolds

Speaker:	Paul Sweeney Jr., Michigan State University
Date:	October 24, 2025
Time:	9:00AM (China Standard Time)
Zoom Meeting:	859 9751 3043, Password: 202510

Abstract: The goal of this talk is to identify curvature conditions that distinguish Euclidean space in the case of open, contractible manifolds and the disk in the case of compact, contractible manifolds with boundary. First, we show that an open manifold that is the interior of a sufficiently connected, compact, contractible 5-manifold with boundary and supports a complete Riemannian metric with uniformly positive scalar curvature is diffeomorphic to Euclidean 5-space. Next, we investigate the analogous question for compact manifolds with boundary: Must a compact, contractible manifold that supports a Riemannian metric with positive scalar curvature and mean convex boundary necessarily be the disk? We present examples demonstrating that this curvature condition alone cannot distinguish the disk; on the other hand, we exhibit stronger curvature conditions that allow us to draw such a conclusion.