Riemannian Geometry
Abstracts

Saturday 3:15 – 5:15
Bianca Santoro, CCNY, CUNY
Emily Proctor, Middlebury College
Lan-Hsuan Huang, Columbia University
Megan Kerr, Wellesley College

Sunday 8:30 – 10:30
Moon Duchin, Tufts University
Lu Wang, MIT
Rosa Sena-Dias, Instituto Superior Técnico, Lisbon
Nancy Hingston, College of New Jersey

Saturday 3:15 – 5:15

Complete Ricci-flat Kahler metrics on resolutions of singularities
Bianca Santoro, CCNY, CUNY
ABSTRACT

Orbifold homeomorphism finiteness based on geometric constraints
Emily Proctor, Middlebury College

We will describe a proof that the collection of all compact n-dimensional orbifolds with sectional curvature uniformly bounded below, diameter bounded above, volume bounded below, and having only isolated singular points contains only finitely many orbifold homeomorphism types. As a corollary, any isospectral collection of orbifolds with sectional curvature uniformly bounded below and having only isolated singular points contains only finitely many orbifold homeomorphism types. The proof involves finitely partitioning the collection according to singular data, and then showing that any sequence from a particular subcollection has a convergent sequence whose limit is also an orbifold. From there, Perelman's stability theorem can be used to obtain the final result.

Homogeneous spaces with nonnegative curvature
Megan Kerr, Wellesley College

Abstract: We study invariant Riemannian submersion metrics on compact homogeneous spaces G/H where
there is a fibration $K/H \to G/H \to G/K$. Given a triple (H,K,G), we determine whether scaling up the fibers maintains the nonnegative curvature of a normal homogeneous metric on G/H. In this work, we use a criterion of Schwachh\"{o}fer and Tapp, exploring the algebraic causes

behind their condition.

Hypersurfaces with nonnegative scalar curvature
Lan-Hsuan Huang, Columbia University

Since the time of Gauss, geometers have been interested in the interplay between the intrinsic metric structure of hypersurfaces and their extrinsic geometry in the ambient space. For example, a result of Sacksteder tells us that if a complete hypersurface has non-negative sectional curvature, then its second fundamental form in Euclidean space must be positive semi-definite.

In a recent joint work with Damin Wu, we study hypersurfaces under a much weaker intrinsic curvature condition. We prove that closed hypersurfaces with nonnegative scalar curvature must be mean convex. This result is optimal in the sense that the scalar curvature cannot be replaced by other k-th mean curvatures. The result and argument have applications to the mean curvature flow, to the positive mass theorem, and to the rigidity theorems.

Sunday 8:30 – 10:30

Asymptotic geometry of the Heisenberg group
Moon Duchin, Tufts University
ABSTRACT

Self-shrinkers of Mean Curvature Flow
Lu Wang, MIT
ABSTRACT

Scalar flat Kahler metrics on non compact toric surfaces
Rosa Sena-Dias, Instituto Superior Técnico, Lisbon
ABSTRACT

Resonance for loop homology on spheres
Nancy Hingston, College of New Jersey
ABSTRACT