

Forty Years of Ricci Flow: The Geometric-Flow Revolution in Global Differential Geometry

Events for:
Monday, July 11th - Friday, July 15th

Monday, July 11th

9:00am **Breakfast - SCGP Cafe**

10:00am **Bruce Kleiner - SCGP Lecture Hall 102**

Speaker: Bruce Kleiner

Title: Ricci flow through singularities and applications to the topology of diffeomorphism groups and spaces of metrics

Abstract: TBA

11:00am **Coffee Break - SCGP Cafe**

11:30am **Jeff Streets - SCGP Lecture Hall 102**

Speaker: Jeff Streets

Title: Generalized Ricci flow

Abstract: In this talk I will survey recent progress on the generalized Ricci flow, including new global existence and convergence results for pluriclosed flow and generalized Kahler-Ricci flow.

12:30pm **Lunch - SCGP Cafe**

2:30pm **Paula Burkhardt-Guim - SCGP Lecture Hall 102**

Speaker: Paula Burkhardt-Guim

Title: Lower scalar curvature bounds for C^0 metrics: a Ricci flow approach

Abstract: We describe some recent work that has been done to generalize the notion of lower scalar curvature bounds to C^0 metrics, including a localized Ricci flow approach. In particular, we show the following: that there is a Ricci flow definition which is stable under greater-than-second-order perturbation of the metric, that there exists a reasonable notion of a Ricci flow starting from C^0 initial data which is smooth for positive times, and that the weak lower scalar curvature bounds are preserved under evolution by the Ricci flow from C^0 initial data.

3:30pm **Coffee Break - SCGP Cafe**

4:00pm **Lu Wang - SCGP Lecture Hall 102**

Speaker: Lu Wang

Title: Self-expanders of mean curvature flow

Abstract: TBA

Tuesday, July 12th

9:00am **Breakfast - SCGP Cafe**

10:00am **Robert Bryant - SCGP Lecture Hall 102**

Speaker: Robert Bryant

Title: On the solitons for the G_2 -Laplacian flow

Abstract: TBA

11:00am **Coffee Break - SCGP Cafe**

11:30am **Eric Chen - SCGP Lecture Hall 102**

Speaker: Eric Chen

Title: Ricci flow and critical integral curvature pinching

Abstract: TBA

12:30pm **Lunch - SCGP Cafe**

2:30pm **Lei Ni - SCGP Lecture Hall 102**

Speaker: Lei Ni

Title: Ricci flow and the fundamental groups

Abstract: TBA

3:30pm **Coffee Break - SCGP Cafe**

4:00pm **Xuan Nguyen - SCGP Lecture Hall 102**

Speaker: Xuan Nguyen

Title: Vanishing of the fundamental gap for (horo) convex domains in hyperbolic space

Abstract: For the Laplace operator with Dirichlet boundary conditions on convex domains in H^n , $n \geq 2$, we prove that the product of the fundamental gap with the square of the diameter can be arbitrarily small for domains of any diameter. This property distinguishes hyperbolic spaces from Euclidean and spherical ones, where the quantity is bounded below by $\frac{\pi^2}{4}$. We finish by talking about horoconvex domains.

Wednesday, July 13th

9:00am **Breakfast - SCGP Cafe**

10:00am **Peter Topping - SCGP Lecture Hall 102**

Speaker: Peter Topping

Title: Hamilton's Pinching Conjecture

Abstract: TBA

11:00am **Coffee Break - SCGP Cafe**

11:30am **Robert Haslhofer - SCGP Lecture Hall 102**

Speaker: Robert Haslhofer

Title: Ricci limit flows and weak solutions

Abstract: TBA

12:30pm **Lunch - SCGP Cafe**

3:30pm **Coffee Break - SCGP Cafe**

Thursday, July 14th

9:00am **Breakfast - SCGP Cafe**

10:00am **Xiuxiong Chen - Zoom**

Speaker: Xiuxiong Chen

Title: A recent update on the Kahler Ricci Flow

Abstract: This is an expository/survey talk where we tour recent developments in Kahler Ricci Flow tailor by the speaker's perspective.

11:00am **Coffee Break - SCGP Cafe**

11:30am **Peng Lu - SCGP Lecture Hall 102**

Speaker: Lu

Title: Ancient Solutions in Ricci Flow

Abstract: TBA

12:30pm **Lunch - SCGP Cafe**

2:30pm **Cristoph Bohm - SCGP Lecture Hall 102**

Speaker: Cristoph Bohm

Title: NON-COMPACT EINSTEIN MANIFOLDS WITH SYMMETRY

Abstract: For Einstein manifolds with negative scalar curvature admitting anisometric action of a Lie group G with compact, smooth orbit space, we show the following rigidity result: The nilradical N of G acts polarly, and the N -orbits can be extended to minimal Einstein submanifolds. As an application, we prove the Alekseevskii conjecture: Any homogeneous Einstein manifold with negative scalar curvature is diffeomorphic to a Euclidean space. This is joint work with R. Lafuente.

3:30pm **Coffee Break - SCGP Cafe**

4:00pm **John Morgan - SCGP Lecture Hall 102**

Speaker: John Morgan

Title: Application of Ricci flow to the topology of 3-manifolds.

Abstract: In this talk we will describe the decomposition of three manifolds along 2-spheres and tori as postulated by Thurston's Geometrization Conjecture and established by Perelman using Ricci flow with surgery. The first part of the talk will review the statement of the Geometrization Conjecture and its relation to the Poincaré Conjecture. In the later part of the talk, we will describe the basic qualitative results established by Perelman's for Ricci flows with surgery on 3-manifolds, and show how these mesh with the Geometrization Conjecture, leading to a proof of the latter.

6:00pm **Banquet - Simons Center Cafe**

Friday, July 15th

9:00am **Breakfast - SCGP Cafe**

10:00am **Bing Wang - Zoom**

Speaker: Bing Wang

Title: TBA

Abstract: TBA

11:00am **Coffee Break - SCGP Cafe**

11:30am **Tristan Collins - Zoom**

Speaker: Tristan Collins

Title: Spinar Flows with Flux

Abstract: I will introduce a coupled system of nonlinear heat flows whose critical points are spinors which are parallel with respect to a certain connection with flux. These critical equations are motivated by special holonomy and the equations of motion appearing in supergravity. The flows I will discuss are generalizations of the Ricci flow which are coupled to spinors and differential forms. I will describe the basic properties of these flows, including short time existence and smoothing estimates. This is joint work with D.H. Phong.

12:30pm **Lunch - SCGP Cafe**

2:30pm **Huai-Dong Cao - Zoom**

Speaker: Huai-Dong Cao

Title: Curvature estimates for expanding gradient Ricci solitons

Abstract: In my talk, I shall present some recent curvature estimates for complete expanding gradient Ricci solitons with nonnegative Ricci curvature.

Our main results are: (1) For dimension $n=4$, we show that the curvature tensor Rm (and its covariant derivative) can be bounded by the scalar curvature R . As an application, it follows that if the asymptotic scalar curvature ratio is finite so is the asymptotic curvature ratio; (2) For any dimension $n \geq 4$, if the scalar curvature has quadratic decay, then the Riemann curvature tensor must have at least sub-quadratic decay. This is a joint work with Tianbo Liu and Junming Xie.

3:30pm **Coffee Break - SCGP Cafe**