Title and Abstract

Title: *TBA*
Speaker: Mario Garcia Fernandez (Universidad Autonoma de Madrid)
Abstract: TBA

Title: *Remarks on the self-shrinking Clifford torus*
Speaker: Jason Lotay (University College London)
Abstract: The Clifford torus in the 3-sphere is a simple and important example of a Lagrangian mean curvature flow self-shrinker in $\mathbb{C}^2$. In this talk I will discuss two related but distinct issues concerning the Clifford torus: stability under Lagrangian mean curvature flow, and rigidity as a self-shrinker. This is joint work with Christopher G. Evans and Felix Schulze.

Title: *Curvature estimates in higher codimensional mean curvature flow*
Speaker: Mao-Pei Tsui (National Taiwan University)
Abstract: K. Ecker and G. Huisken have derived a priori estimate for the curvature (second fundamental forms) when they study the mean curvature flow of the graph of a function in Euclidean space. In this talk, I will explain that a similar curvature estimate also exists for higher codimensional mean curvature flow under certain natural conditions.

Title: *Volume preserving flow by powers of k-th mean curvature*
Speaker: Yong Wei (The Australian National University)
Abstract: We consider the flow of closed convex hypersurfaces in Euclidean space with the speed given by positive powers of the k-th mean curvature plus a global term such that the volume of the domain enclosed by the flow hypersurface remains constant. We prove that if the initial hypersurface is strictly convex, then the solution of the flow exists for all time and converges to a round sphere smoothly. No curvature pinching assumption is required on the initial hypersurface. The key ingredients include the monotonicity of the mixed volume V_{n+1-k} and the Schneider's generalized Alexandrov Theorem for convex bodies with constant curvature measures. In the end of this talk, I will discuss some generalizations. This is a joint work with Ben Andrews.

Title: *Uniqueness of stable Capillary hypersurfaces in a ball*
Speaker: Chao Xia (Xiamen University)
Abstract: Capillary surfaces in a domain Ω are minimal or CMC surfaces whose boundary intersects $\partial\Omega$ at a constant angle. They are critical points of some energy functional under volume preserving variation. CMC surfaces with free boundary are a special class of capillary surfaces with constant angle equal to $\frac{\pi}{2}$.

The study of stability of capillary hypersurfaces was initiated by Ros and his collaborators in 90's. An open problem is whether any immersed stable capillary hypersurfaces in a ball in space forms are totally umbilical. In this talk, we present our solution to this problem. The key ingredient in the proof is a discovery of a new Minkowski formula for the setting of capillary hypersurfaces in a ball.

If time permits, I would also like to talk about Sternberg-Zumbrun's conjecture on regularity issue of local minimizer of perimeter with respect to fixed volume in a convex domain. Our result provides a resolution of this conjecture when the convex domain is a ball.

The talk is based on a joint work with Guofang Wang (University of Freiburg).

Title: *When the fundamental group of a Riemannian manifold is finitely generated?*
Speaker: Guoyi Xu (Yau Mathematical Sciences Center, Tsinghua University)
Abstract: For every compact Riemannian manifold, it is well known that the fundamental group is finitely generated. For complete non-compact Riemannian manifolds, the fundamental group possibly is not finitely generated. A natural question is: which complete Riemannian manifolds have finitely generated fundamental group? We will survey the progress in this question from Bieberbach, Cheeger-Gromoll, Gromov to more recent work by Kapovitch and Wilking, and my recent work will also be presented. No technical proofs in the talk, some elementary topology and Riemannian geometry knowledge is enough to understand most of the talk.