MATH-IMS Joint Pure Mathematics Colloquium Series
The Chinese University of Hong Kong

This Colloquium Series in Pure Mathematics is organized by the Department of Mathematics and the Institute of Mathematical Sciences (IMS) at The Chinese University of Hong Kong. The series focuses on all areas of pure mathematics together with theoretical developments and applications.

Date: November 11, 2022 (Friday)
Time: 4:30PM-5:30PM (Hong Kong Time)
Zoom Link: https://cuhk.zoom.us/j/98846779826

Singularities along the Lagrangian mean curvature flow of surfaces

Speaker: Professor Felix Schulze
University of Warwick

Abstract: It is an open question to determine which Hamiltonian isotopy classes of Lagrangians in a Calabi-Yau manifold have a special Lagrangian representative. One approach is to follow the steepest descent of area, i.e. the mean curvature flow, which preserves the Lagrangian condition. But in general such a flow will develop singularities in finite time, and it has been open how to continue the flow past singularities. We will give an introduction to the problem and explain recent advances where we show that in the simplest possible situation, i.e. the Lagrangian mean curvature flow of surfaces, when the singularity is the special Lagrangian union of two transverse planes, then the flow forms a "neck pinch", and can be continued past the singularity. In a different direction we show that ancient solutions of the flow, whose blow-down is given by two planes meeting along a line, must be translators. These are joint works with Jason Lotay and Gábor Székelyhidi.

Bio: Prof. Schulze obtained his PhD at University of Tübingen in 2002 under the supervision of Prof. Gerhard Huisken. After graduation, he was appointed as a Postdoctoral Fellow at ETH Zürich. In 2013, Prof. Schulze joined the University College London as an Associate Professor and then promoted to full Professor in 2019. In 2020, Prof. Schulze moved to University of Warwick as a full professor. Prof. Schulze's research interest broadly covers a variety of topics in geometric analysis and Partial Differential Equations, especially on the theory of geometric flows, minimal surfaces and Willmore surfaces.