

AS-NCTS-NTU

Distinguished Lectures in Geometry

Speaker: **Simon Brendle** (Columbia University)



Professor Simon Brendle is renowned for his transformative contributions to differential geometry, including sharp geometric inequalities, the differentiable sphere theorem, and the Lawson conjecture on minimal tori in the 3-sphere. He also made significant advances to the Ricci flow, the mean curvature flow, and the Yamabe flow. His numerous honors include the European Mathematical Society Prize, the AMS Bôcher Prize, the Fermat Prize, and the 2024 Breakthrough Prize in Mathematics.

Venue: Cosmology Building Room 515, NTU campus

Lecture 1: Minimal surfaces and the isoperimetric inequality

15:30-16:30, Wednesday, March 19, 2025

Reception: 15:00-15:30

Abstract: The isoperimetric inequality has a long history in the geometry. In this lecture, we will discuss how the isoperimetric inequality can be generalized to submanifolds in Euclidean space. As a special case, we obtain a sharp isoperimetric inequality for minimal submanifolds of codimension at most 2, thereby answering a question going back to work of Carleman. The proof of that inequality is inspired by, but does not actually use, optimal transport.

Lecture 2: Systolic inequalities and the Horowitz-Myers conjecture

15:30-16:30, Thursday, March 20, 2025

Reception: 16:30-17:00

Abstract: Let n be an integer with $3 \leq n \leq 7$, and let g be a Riemannian metric on $B^2 \times T^{n-2}$ with scalar curvature at least $-n(n-1)$. We establish an inequality relating the systole of the boundary to the infimum of the mean curvature on the boundary. As a consequence, we obtain a new positive energy theorem where equality holds for the Horowitz-Myers metrics. This is joint work with Pei-Ken Hung.

Registration

Event website



中央研究院數學研究所
Institute of Mathematics, Academia Sinica

