

WORKSHOP ON LAGRANGIAN AND MINIMAL SURFACES

DEC 18–DEC 19, 2025; ROOM 102, 106 SCMS

- **Jingyi Chen**, UBC

Dec 18, 9:20–10:10 & Dec 19, 10:50–11:40, Room 102, SCMS

Title: Volume of Lagrangian submanifolds under Hamiltonian variations

Abstract: In the first lecture, I will discuss some general background and motivation from viewpoint of calculus of variations. In the second lecture, I will give a survey on some recent progress on Hamiltonian stationary submanifolds.

- **Dekai Zhang**, ECNU

Dec 18, 10:30–11:20, Room 102, SCMS

Title: The LYZ equation in Kähler geometry

Abstract: The LYZ equation (deformed Hermitian Yang-Mills equation) in Kähler geometry has been extensively studied in recent years. In this talk, we introduce a new flow to solve the LYZ equation in the supercritical case. Under suitable conditions, we establish the long-time existence and convergence of the flow. We also consider the critical LYZ equation, and prove the existence of a smooth solution on a compact Kähler manifold.

- **Jiayu Li**, USTC

Dec 19, 9:30–10:20, Room 102, SCMS

Title: On symplectic translating solitons

Abstract: As an important model of a Type II singularity of the mean curvature flow, the translating soliton is studied mainly. We prove that the symplectic translating soliton must be a plane under some natural assumptions, which we demonstrate is a necessity through an exploration of compelling examples. Furthermore, we derive a necessary condition for the translating soliton to be a blow-up limit of the symplectic mean curvature flow.

- **Yangyang Li**, University of Notre Dame

Dec 19, 14:30–15:20, Room 106 SCMS

Title: Constructing minimal surfaces of prescribed genus in closed Riemannian 3-spheres

Abstract: In the round 3-sphere, there exists an RP^3 family of minimal 2-spheres (the equatorial spheres) and an $RP^2 \times RP^2$ family of minimal tori (the Clifford tori). Almgren (1966) and Calabi (1967) proved that the equatorial spheres are the only minimal 2-spheres, and Brendle (2013) confirmed that the Clifford tori are the only minimal tori,

thereby resolving the Lawson conjecture. The topology of these moduli spaces motivated Yau (1982) and White (1989) to conjecture the existence of at least four minimal spheres and five minimal tori, respectively, in any closed Riemannian 3-sphere. For other topological types, Lawson (1970) constructed minimal surfaces of arbitrary genus in S^3 , now known as Lawson surfaces. Inspired by Yau's and White's conjectures, it is further expected that for any genus g , there exist multiple genus- g minimal surfaces in any closed Riemannian 3-sphere, with the number related to the topology of the space of Lawson surfaces.

In this talk, I will present the resolution of Yau's conjecture by Wang–Zhou (2023) and of White's conjecture by joint work of Adrian and myself (2024), in the setting of positive Ricci curvature. I will then discuss how the techniques we developed can be applied to construct multiple minimal surfaces of higher genus. This is based on joint work with Adrian Chu (Cornell University) and Zhihan Wang (Cornell University).

Organizers: Qi Ding, Jixiang Fu, Zhichao Wang