International GMT Seminar

National Center for Theoretical Sciences

A sharp extension of Allard's boundary regularity theorem for are a minimizing currents with arbitrary boundary multiplicity

Time
Wednesday, March 19, 2025
19:00 - 21:00 (Taipei time)

Agenda
7:00 p.m. Get-together (30 min)
7:30 p.m. Presentation Ian Fleschler (60 min)
8:30 p.m. Questions and Discussions (30 min)

Venue
Online (HyHyve)

Registration and more information:

Ian Fleschler
Princeton University

In the context of area-minimizing currents, Allard boundary regularity theorem asserts that an oriented current with boundary that minimizes area cannot have boundary singularities of minimum density. Indeed, in a neighborhood of a point of minimum density, the surface must coincide with a classical smooth minimal surface that attaches smoothly to the boundary.

In this talk, I will discuss a series of papers, one of them in collaboration with Reinaldo Resende, that extend Allard's boundary regularity theory to a higher boundary multiplicity setting. Specifically, for an area-minimizing current with a multiplicity Q boundary, we study density $Q / 2$ boundary points. In this context, a regular point is one where smooth submanifolds with multiplicity attach transversally to the boundary. We establish that the set of singular boundary points of minimum density is of boundary codimension at most 2 and rectifiable, extending the corresponding result in 2d by De Lellis - Steinbrüchel - Nardulli to higher dimensional currents. The sharpness of this regularity theory is confirmed by my construction of a 3-dimensional area mininimizing current in $\mathbb{R}^5$ with a singular boundary point of minimum density.