國立清華大學數學系學術演講
NTHU MATH Colloquium

講題　Emergent behavior of mathematical models on manifolds

講者　Prof. Hansol Park (NTHU)

時間　2025.12.01 (Mon.) 16:00 – 17:00

地點　第三綜合大樓**2樓 Room 201**

茶會　15:30, Room 707

Abstract

In this talk, I introduce several first- and second-order models for self-collective behavior on general manifolds and discuss their emergent behaviors. For the first-order model, I consider purely attractive interaction potentials and investigate the equilibria and the asymptotic behavior of the solutions. In particular, I show how to quantify the approach to asymptotic consensus in terms of the convergence rate of the diameter of the solution's support. I also consider the model with linear diffusion on general Cartan-Hadamard manifolds, and investigate the existence of ground states of the corresponding free energy. For the second-order model (known as the Cucker-Smale model), I present the emergence of velocity alignment on certain specific manifolds. To analyze the emergent behaviors of the models, the LaSalle invariance principle is used. Also, various geometric tools used to study the aggregation models on manifolds are presented.