


复旦大学数学科学学院
数学综合报告会

报告题目： Active Droplets: Mathematical Approaches to Active Phase Separation

报告人：Prof. Andrea Signori（Politecnico di Milano）

报告时间：2026 年 6 月 10 日星期三，13：30—14：30

报告地点：光华楼东主楼 1704 室

报告摘要： Active phase separation gives rise to remarkable behaviors, including suppressed coarsening and the spontaneous growth and division of droplets, which sharply contrast with those observed in classical phase separation. While traditional systems tend to favor the growth of larger domains at the expense of smaller ones, chemically active mixtures can maintain a stable population of finite-sized droplets. In this talk, I will introduce a mathematical framework for describing active droplet dynamics, employing both the phase-field approach via the Cahn- Hilliard equation and its sharp-interface counterpart, the Mullins-Sekerka free-boundary problem. I will examine the relationship between these formulations and address questions of well-posedness and stability, particularly in planar and radially symmetric settings. The presentation will conclude with numerical simulations.

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