

WINTER SEMESTER 2023/2024

RTG 2756 CYTAC SEMINAR SERIES

TUESDAY, NOVEMBER 21  
17:15 IN HS5

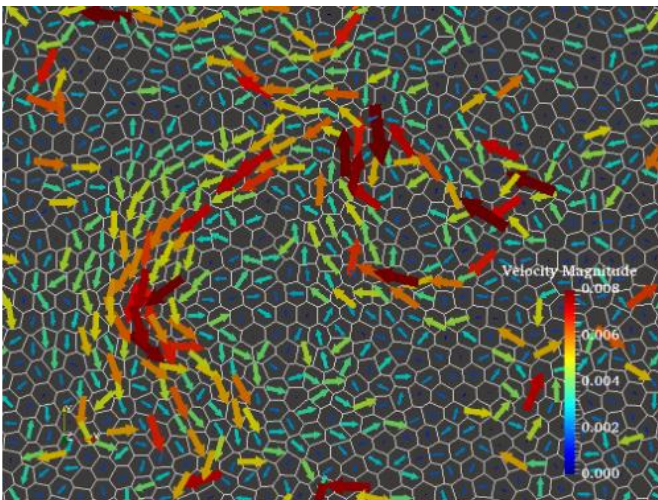
CYTAC

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### EMERGENT MESOSCALE CORRELATIONS IN SOFT ACTIVE MATERIALS



*In soft active matter, such as crawling and swimming cells, or active colloids and polymers, active driving interacts with the mechanical properties of the material to form active solids, liquids and everything in between.*

*Here I will present how a generic mesoscopic correlation length emerges from the coupling of uncorrelated but persistent self-propulsion to the elasticity of the underlying material in overdamped dynamics. It can be applied to an intriguing system of travelling strings made of active colloids, where it explains string propulsion and emergent tangent-tangent correlations seen in simulation and experiment.*

*Within this framework, we can model epithelial cell sheets with active Brownian dynamics and soft repulsive interactions, and also as a self-propelled Voronoi model. Then uncoordinated cell crawling interacting with mechanics produces characteristic 'swirly' motion with strong spatiotemporal correlations. We are able to quantitatively match simulations and in-vitro cell sheets made of corneal epithelial cells and MDCK cells. We have also recently shown that these emergent correlations are a good model for the fingering instability at the edge of these sheets.*