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STRUCTURES JOUR FIXE

EVELYN TANG

Rice University, Houston

“Predicting robust emergent function in active networks“

June 10, 2022 1:30 PM

HYBRID: Great lecture hall in Philosophenweg 12 and Zoom. Meeting ID: 935 6549 3662, Code: 928036
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ABSTRACT

Living and active systems exhibit various emergent dynamics necessary for system regulation, growth, and motility. However, how robust dynamics arises from stochastic components remains unclear. Towards understanding this, I develop topological theories that support robust edge states, effectively reducing the system dynamics to a lower-dimensional subspace. In particular, I will introduce stochastic networks in molecular configuration space that enable different phenomena from a global clock, stochastic growth and shrinkage, to synchronization. These out-of-equilibrium systems further possess uniquely non-Hermitian features such as exceptional points and vorticity. More broadly, my work provides a blueprint for the design and control of novel and robust function in correlated and active systems. If time permits, I will also discuss other work on analyzing neural data to reveal how fast learners have higher dimensional and more efficient representations.

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