



# THE UNIVERSITY OF CHICAGO

## COMPUTATIONAL AND APPLIED MATHEMATICS STUDENT SEMINAR

---

JUNE WU

Committee on Computational and Applied Mathematics  
University of Chicago

### Extracting Coherent Patterns through Spectral Properties of the Koopman Operator

THURSDAY, November 1, 2018, at 1:00 PM  
Jones 226, 5747 South Ellis Avenue

#### ABSTRACT

Coherent patterns are frequently observed in oceanic currents, planetary atmosphere, and many other natural contexts. Studying coherent patterns enables the discovery of important transport properties of fluid flows and reveals the robust material surfaces behind complex dynamics. There are two main approaches for identifying coherent patterns using dynamical systems theory: the geometric approach and the spectral approach. In this seminar, I will introduce the main idea behind the spectral approach, which is to study the trajectories of passive tracers through spectra of certain evolution operators, which are called Koopman operators, act on observables of the system.