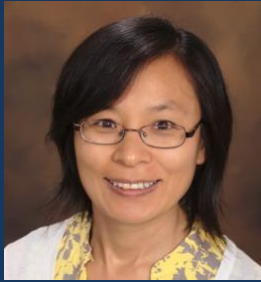


# Department of Applied and Computational Mathematics and Statistics Colloquium



**Chuan Xue**

Department of Mathematics  
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## *Multiscale Problems in Cell Biology*

Complex biological systems involve multiple space and time scales. To get an integrated understanding of these systems involves multiscale modeling, computation and analysis. In this talk, I will discuss two such examples in cell biology and illustrate how to use multiscale methods to explain experimental data. The first example is on chemotaxis of bacterial populations. I will present recent progress on embedding information of single cell dynamics into models of cell population dynamics. I will clarify the scope of validity of the well-known Patlak-Keller-Segel chemotaxis equation and discuss alternative models when it breaks down. The second example is on the axonal cytoskeleton dynamics in health and disease. I will present a stochastic multiscale model that gave the first mechanistic explanation for the cytoskeleton segregation phenomena observed in many neurodegenerative diseases.

**Monday, April 29, 2019**

**4:15 PM – 5:15 PM**

**127 Hayes-Healy Center**

Colloquium Tea 3:45 PM to 4:15 PM 101A Crowley Commons Room