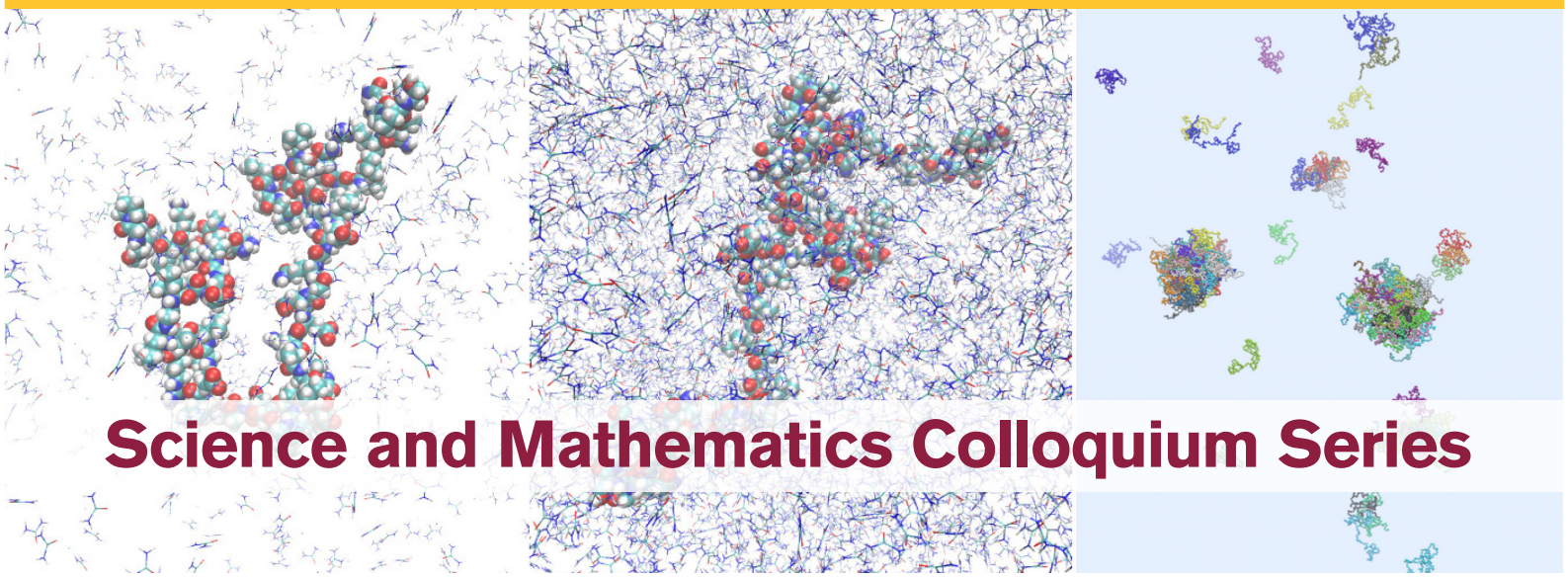
Organized Disorder

Understanding the structure, dynamics of intrinsically disordered proteins



Science and Mathematics Colloquium Series

Presentation by Wenwei Zheng

Assistant Professor, Faculty of Science and Mathematics
ASU College of Integrative Sciences and Arts

Wednesday, April 4, 2018
3 – 4 p.m.

Student Union, Cooley Ballroom B
ASU Polytechnic campus

Intrinsically disordered proteins (IDPs) revolutionized the classical structure-function paradigm. They can function without necessarily folding into an ordered three-dimensional structure and stay unfolded in physiological conditions. However, recent discoveries have shown that IDPs can also form highly organized functional liquid droplets and membraneless organelles. In addition, growing evidence suggests a connection between these liquid droplets and pathological solid aggregates. How can we understand such organized assembly composed of disordered conformations?

In this session Wenwei Zheng will present recent research progress on understanding the structure and dynamics of IDPs using a homopolymers model. Such simple models are found to be surprisingly accurate to describe both the single-molecule properties and macroscopic phase behaviors of IDPs. This suggests the importance that randomness plays in the structure and function of IDPs.

Faculty and practitioners discuss their current research and field projects in the Science and Mathematics Colloquium Series, held throughout the academic year at ASU's Polytechnic campus. All seminars are free and open to the public.

Wenwei Zheng joined ASU as an assistant professor in fall 2017. Trained in physics and computer science as an undergraduate, he obtained a doctorate in chemistry at Rice University, focusing on developing machine learning methods for molecular simulations.

Zheng got into the field of intrinsically disordered proteins in 2014, when he started as a postdoctoral researcher at the National Institutes of Health. His current research mainly focuses on developing computational methods to understand the functional or pathological behaviors of intrinsically disordered proteins, including liquid-liquid phase separation to form membraneless organelles and liquid-solid phase separation to form fibril aggregates.

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