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.