Deciphering sequence-to-phase behavior relationships of intrinsically disordered proteins
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There is growing recognition of the importance of intrinsically disordered proteins (IDPs) as drivers and modulators of stimulus responsive phase transitions. In the cellular context, these phase transitions enable the formation of biomolecular condensates including nuclear bodies and cytoplasmic membraneless organelles that are involved in the regulation of a wide range of cellular processes. In recent work that combines multiscale computation, adaptations of the relevant theories, and biophysical experiments we have begun to uncover the determinants of sequence-encoded phase diagrams of IDPs. The talk will go over key conceptual and practical advances that are enabling the design of de novo condensates and novel materials based on IDP polymers.