

# Chemical Engineering Colloquium

October 25, 2023

Goddard Hall, Room 227

12:00 PM – 1:00 PM

## From Imaging Materials to Optoelectronic Devices: The Solution State Impacts Solid State Properties

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Molecular design plays a significant role in determining materials performance, and identifying relevant molecular functionalities that afford key performance attributes is essential. For solution processed systems, however, molecular design must be coupled with understanding of solution behavior. Here, the relationships between molecular structure and solution-based processing will be explored for different classes of nanostructured materials that play important roles in a wide range of advanced technology applications, stimulating interest in the 'Internet of Things'. For instance, for effective charge transport, the conjugated polymer chains that provide the foundation for solution processed organic electronic devices must be amenable to assembly and organization into architectures that support transport. Further, device performance also depends critically on surfaces, interfaces, and active material assembly/alignment at many length scales. This presentation will explore how solution state characteristics and surface chemistry considerations, coupled with interfaces and physical interactions can impact the design and development of advanced new materials technologies for applications ranging from devices to energy storage and conversion.



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