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ASSEMBLY OF MOLECULAR ELECTRONICS: THE JOURNEY IS MORE IMPORTANT THAN THE DESTINATION

Prof. Dr. Ying Diao

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Wednesday, 28/10/2020, <u>15.00 h</u> Zoom ID: 955 3584 8356/PW:932715



Abstract: Directed assembly, crystallization and microphase separation have played a central role in the development of modern electronics and energy materials. Recent years, printed electronics based on semiconducting molecular systems have emerged as a new technology platform that promises to revolutionize the electronics, clean energy and healthcare industries. In contrast to traditional electronic manufacturing that requires high temperature and high vacuum, these new electronic materials can be solution printed at near ambient conditions to produce flexible, light-weight, biointegrated forms at low-cost and high-throughput. However, it remains a central challenge to control the morphology of semiconducting molecular systems across length scales, due to their high conformational complexity and weak, non-specific intermolecular interactions. The significance of this challenge lies in the order of magnitude modulations in device performance by morphology parameters across all length scales. We believe that the key to addressing this challenge lies in understanding assembly pathways of electronic molecules. However, the existing literature has largely overlooked the journey of the molecules and focused only on the final morphology and electronic properties in the solid-state. Bio: Professor Diao is a Beckman Fellow, Dow Chemical Company Faculty Scholar, Lincoln Excellence for Assistant Professor (LEAP) Scholar at University of Illinois at Urbana-Champaign. She received her Ph.D. degree in Chemical Engineering from MIT in 2012 and pursued postdoctoral training at Stanford University till 2014. Diao group, started in 2015 at Illinois, focuses on understanding assembly of organic functional materials and innovating printing approaches that enable structural control down to the molecular and nanoscale. For her work on printed electronics, Professor Diao was named to the MIT Technology Review's annual list of Innovators Under 35 as a pioneer in nanotechnology and materials in 2016. She is also a recipient of NSF CAREER Award, NASA Early Career Faculty Award, 3M Non-Tenured Faculty Award and was selected as a Sloan Research Fellow in Chemistry as one of the "very best scientific minds working today".



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