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TUNING STRUCTURE AND ORDERING IN SEMICONDUCTING CONJUGATED POLYMERS

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Organic semiconductors with tunable optoelectronic properties represent a versatile class of multifunctional materials that can find usages in flexible electronics and energy-related applications. Some fundamental aspects related to their optoelectronic properties are the control of molecular packing, long range ordering, as well as donor-acceptor interfaces, all of which are essential for charge separation and charge transport. Our approaches toward high performance semiconductor materials include (a) developing electroactive building blocks that satisfy bandgap engineering, high absorptivity, and (b) utilizing strong intermolecular interactions to tune chain packing and facilitate charge transport. In this presentation, our recent advances on the development of new electron donors, acceptors and a novel quinoidal unit and their incorporation in conjugated polymers will be discussed. The combination of molecular level understanding of material

composition and control of thin film ordering, offer great opportunity for the development of novel high performance electronic materials.

Biography

Yi Liu is a career Staff Scientist at the Molecular Foundry, Lawrence Berkeley National Laboratory, USA. He obtained his PhD in Chemistry in 2004 from the University of California, Los Angeles, under the direction of Sir J Fraser Stoddart. After finishing his Post-doctoral Research with Professor K Barry Sharpless at the Scripps Research Institute, he joined the Molecular Foundry in 2006 as an Independent Principal Investigator. He is currently the Director of the Organic and Macromolecular Synthesis Facility. His research interests are design and self-assembly of functional organic and organic-inorganic hybrid framework materials, materials chemistry for organic electronics, and fundamental understanding of the associated electronic processes.

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