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“Electrical properties of organic films:
The role of doping and inter-molecular charge transfer”

ABSTRACT: My talk comprises three parts. In the first part, I will present my research on doping in organic semiconductors. Controlling the electrical properties of organic films by chemical doping has recently become an active research topic with applications such as organic field effect transistors, organic light emitting diodes, and organic photovoltaic cells. I will show basic doping mechanisms, doping-induced bulk conductivity enhancement and injection improvement, and diffusional stability of dopant molecules in the host material. Then several examples will be given to demonstrate applications and benefits of doping. In the second part, I will present the conductance-atomic force microscopy study on oligothiophene Langmuir-Blodgett (LB) monolayers. It is shown that inter-molecular charge transfer plays a key role in electrical properties of these organic monolayers. In the last part, I will talk about my future research interests and plans with focus on nano-structured organic-inorganic hybrid solar cells.