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Self Assembly and Interface Engineering of Organic Functional Materials for High Performance Polymer Solar Cells ALEX JEN, University of Washington — The performance of polymer solar cells are strongly dependent on the efficiency of light harvesting, exciton dissociation, charge transport, and charge collection at the metal/organic, metal/metal oxide, and organic/metal oxide interfaces. To improve the device performance, two parallel approaches were used: 1) developing novel low band gap conjugated polymers with good charge-transporting properties and 2) modifying the interfaces between the organic/metal oxide and organic/metal layers with functional self-assembling monolayers to tune their energy barriers. Moreover, the molecule engineering approach was also used to tune the energy level, charge mobility, and morphology of organic semiconductors.

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