



## Rational Design of N-type High Mobility Ambipolar Conjugated Polymers: Observation of band-like transport

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The development of molecular semiconductors for optoelectronic devices has tremendous impact on energy production. However, a major challenge to attain widespread implementation of this technology would be to develop materials by cost effective methods and achieve high stability. Although this can pose a great challenge, remarkable improvements in device efficiencies have been achieved by using *donor-acceptor* structures in conjugated polymer design. The bulk heterojunction organic solar cells by utilizing *donor-acceptor* conjugated polymers have provided the record breaking efficiency of as high as **9.2%**. However, a clear relationship between the material properties and stability is still lacking. In this talk, the role of torsional defects and substituted alkyl chain in *donor-acceptor* molecular semiconductor shall be discussed. Moreover, I shall present results from an n-type DPP-polymer system which exhibits band-like transport and highlight the necessary prerequisites for this occurrence.