Electronic Structure of Interfaces and Heterojunction Ambipolar Organic Thin Film Transistor. YONGLI GAO, HUANJUN DING, University of Rochester, HAIBO WANG, DONGHANG YAN, Institute of Applied Chemistry, The Chinese Academy of Sciences — There has been a considerable interest in forming ambipolar organic thin film transistors (OTFTs) due to their advantageous for integrated circuits. Recently, Shi et al. observed a substantial improvement for both the hole and the electron mobility in ambipolar OTFTs based on the heterojunction formed between copper-hexadecafluoro-phthalocyanine (F\textsubscript{16}CuPc) and 2,5-bis(4-biphenyl) bithiophene (BP2T). We examined the interface formation between F\textsubscript{16}CuPc and BP2T using ultraviolet photoemission (UPS) and inverse photoemission spectroscopy (IPES). It is observed that in F\textsubscript{16}CuPc/BP2T the heterojunction is characterized by band bending in both materials, while in BP2T/F\textsubscript{16}CuPc the band bending is confined in BP2T only. For F\textsubscript{16}CuPc/BP2T, the band bending of BP2T and F\textsubscript{16}CuPc are 0.40 and 0.35 eV, respectively. The band bending region is about 15 nm in both materials, from which the Debye lengths of the materials can be deduced. The combination of the band bending and finite Debye lengths may provide an explanation to the observed ambipolar behavior and improved mobility of the OTFTs based on such heterojunctions.