

Abstract Submitted  
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**Perylene Diimide Based “Nanofabric” Thin Films for Organic Photovoltaic Cells**<sup>1</sup> AUSTIN CARTER, JUNE HYOONG PARK, Dept. of Physics, The Ohio State University, YONG MIN, Dept. of Chemistry, The Ohio State University, ARTHUR EPSTEIN, Dept. of Physics and Chemistry, The Ohio State University — We report progress in using a perylene diimide (PDI) nanofabric as an effective electron accepting nanostructure for organic photovoltaics (OPV). A key challenge in OPV continues to be the recovery of electrons after charge separation due to the relatively poor mobility of C60 and related materials. A series of PDI compounds and complexes have been synthesized and used to fabricate nanofibers and thin films using solution and vacuum deposition techniques. Overlapping PDI-based nanofibers form a fast electron-transporting “nanofabric” that has been characterized (AFM, PL, UV-vis, etc.) and can be blended with electron donating materials. A solution-processible OPV configuration containing a nanofabric heterojunction (FHJ) of poly(3-hexylthiophene) and the PDI nanofabric was investigated. We observed a significant improvement in power-conversion efficiency due in part to expansion of the interfacial area and the presence of high mobility electron pathways to the LiF/Al electrode.

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