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Research summary:

My research focuses primarily on organic and hybrid organic-inorganic photovoltaics (everything from novel materials development to device fabrication and characterization), but I also explore self-assembling nanomaterials, advanced lithographies, solar energy economics, and other topics. Recent studies have focused on rational design of morphologies for next generation solar energy devices, explorations of organic-organic and organic-inorganic interfaces in optoelectronic materials, and a new materials synthesis technique called sequential infiltration synthesis.

Selected recent publications:

“Enhanced lithographic imaging layer meets semiconductor manufacturing specification a decade early,” Y.-C. Tseng, A.U. Mane, J.W. Elam, and S.B. Darling, *Adv. Mater.* **24** (2012) 2608-2613.

“Hierarchical nanomorphologies promote exciton dissociation in polymer/fullerene bulk heterojunction solar cells,” W. Chen, T. Xu, F. He, W. Wang, C. Wang, J. Strzalka, Y. Liu, J. Wen, D.J. Miller, J. Chen, K. Hong, L. Yu, and S.B. Darling, *Nano Letters* **11** (2011) 3707-3713.

“Assumptions and the levelized cost of energy for photovoltaics,” S.B. Darling, F. You, T. Veselka, and A. Velosa, *Energy Environ. Sci.* **4** (2011) 3133-3139.

“Optoelectronic properties and charge transfer in donor-acceptor all-conjugated diblock copolymers,” I. Botiz, R.D. Schaller, R. Verduzco, and S.B. Darling, *J. Phys. Chem. C* **115** (2011) 9260-9266.

“Nanoscale patterned materials with tunable dimensions via atomic layer deposition on block copolymers,” Q. Peng, Y.-C. Tseng, S.B. Darling, and J.W. Elam, *Adv. Mater.* **22** (2010) 5129-5133.

“Block copolymers for photovoltaics,” S.B. Darling, *Energy Environ. Sci.* **2** 1266-1273 (2009).

“Self-assembly of poly(3-hexylthiophene)-*block*-polylactide block copolymer and subsequent incorporation of electron acceptor material,” I. Botiz and S.B. Darling, *Macromolecules* **42** 8211-8217 (2009).

“Importance of side chains and backbone length in defect modeling of poly(3-alkylthiophenes),” S.B. Darling and M. Sternberg, *J. Phys. Chem. B* **113** 6215-6218 (2009).

“Directing the self-assembly of block copolymers,” S.B. Darling, *Prog. Polym. Sci.* **32** 1152-1204 (2007).

