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Assembly of PCBM Domains on Si(111) from Liquid Solution[1]
RAYMOND PHANEUF, MIRIAM CEZZA, University of Maryland — In this talk we present the results of investigations aimed at exploring the mechanisms by which small organic molecules self-assemble into domains during phase separation from liquid solutions in the presence of a solid substrate. As an example system we investigated molecular [6,6]-phenyl-C_{61}-butyric acid methyl ester (PCBM), an electron acceptor, in chloroform solution, deposited onto native oxide-covered Si(111) substrates. We find the morphology of PCBM molecule domains varies widely depending on solvent evaporation rate, the presence/absence of a second solute, tn-ZnPc, in the solution, and seemingly the presence/absence of trace impurities. We investigate the role that the solvent evaporation rate plays, and find evidence for spontaneous decomposition at the highest rates, nucleation and growth of crystalline PCBM domains on the substrate for slower rates, and dendritic assembly of domains on the substrate at the slowest rates studied.

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