



Guarav Giri

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“Controlling crystal growth for organic electronics and pharmaceutical applications”

Monday, Feb 23
McLeod Suites, CSC
11:15 am – 12:30 pm

Refreshments will be served

ABSTRACT Understanding and controlling crystal formation of inorganic and organic molecules are essential for many emerging applications and technologies, such as organic electronics and pharmaceuticals. This seminar first describes the use of controlled metastable polymorphism in organic semiconductor (OSC) crystals through solution deposition processes. The origin of metastable polymorphism is studied using high speed, in-situ optical imaging and X-ray diffraction. I then describe how concepts of crystal polymorphism and growth can be applied for industrial applications. I show that selective deposition of OSCs can be utilized to create high performance polymorphs and functional organic circuits. Then, I explain how controlling the crystal growth profile of products or byproducts can improve continuous manufacturing of fine chemicals and pharmaceuticals using microfluidic platforms.

BIOGRAPHY Gaurav Giri was born in Kathmandu, Nepal and grew up in Kathmandu and Boston. He earned his bachelor’s degree in Chemical Engineering from the California Institute of Technology (Caltech) in 2008. At Caltech, he carried out research in the laboratories of Professor Mark E. Davis and Professor Julia A. Kornfield, where he studied drug delivery and polymerization for solar cell light concentrators. He earned his Ph.D. in Chemical Engineering at Stanford University in 2013. There he worked in the laboratory of Professor Zhenan Bao in the areas of organic electronics, crystal growth and polymorphism, and X-ray diffraction. He is currently a Postdoctoral Associate at the Massachusetts Institute of Technology (MIT), in the Department of Chemical Engineering, in the laboratory of Professor Klavs F. Jensen. At MIT, his work focuses on controlling crystal growth to extend reactor lifetimes in flow synthesis of pharmaceutical products.