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Driving Organic Molecule Crystalliztion with Surface Reconstructions JESSICA BICKEL, GIANFRANCO TROVATO, Cleveland State University — This work examines how surface reconstructions can drive crystallization of organic molecules via self-assembly. Organic electronic molecules have low conductivities compared to inorganic materials, but crystallizing these polymers increases their conductivity. This project uses surface reconstructions with periodically repeating topographies to drive the crystallization process. The samples are grown by placing a drop of a dilute PEDOT solution on the clean Si(001)-(2x1) or Si(111)-(7x7) surface reconstruction and heating the surface up to both evaporate the solvent and promote diffusion of the polymer to the thermodynamically defined lowest energy position. The resulting samples are characterized by scanning tunneling microscopy (STM) with respect to their crystallinity and electronic properties. Of particular interest is whether there is a preferential location for the PEDOT molecule to adsorb and whether there are any conformational changes upon adsorption that modify the HOMO-LUMO gap. This work is being done in a new pan-style RHK-STM enclosed in a glovebox at Cleveland State University. The glovebox has O_2 and H_2O levels of less than 1ppm. This allows for sample preparation and imaging in a controlled environment that is free from contamination.

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