In vitro synthetic biology for controlling materials

DNA circuits enable scalable computation and manipulation under a wide variety of temperatures and chemical buffers. In cells, transcription-translation and protein circuits orchestrate the growth, division and reorganization of cells by controlling when the molecular components that participate in these processes are available and active. I will describe work toward developing synthetic DNA circuits that can perform similar operations in vitro on synthetic materials. Such circuits must be inexpensive, robust and yet preserve the capacity for directing complex dynamics. We will discuss recent progress in this direction and discuss emerging design principles for designing dynamical materials whose complex responses are directed by programmable DNA circuits.

Speaker: Rebecca Schulman, PhD