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Shape Allophiles Improve Entropic Assembly[1] ERIC HARPER, RYAN MARSON, JOSHUA ANDERSON, GREG VAN ANDERS, SHARON GLOTZER, Univ of Michigan - Ann Arbor — We investigate a class of "shape allophiles" that fit together like puzzle pieces as a method to access and stabilize desired structures by controlling directional entropic forces. Squares are cut into rectangular halves, which are shaped in an allophilic manner with the goal of re-assembling the squares while self-assembling the square lattice. We examine the assembly characteristics of this system via the potential of mean force and torque, and the fraction of particles that entropically bind. We generalize our findings and apply them to self-assemble triangles into a square lattice via allophilic shaping. Through these studies we show how shape allophiles can be useful in assembling and stabilizing desired phases with appropriate allophilic design. [1] Harper, et. al., Soft Matter, 2015, 11, 7250-7256. DOI: 10.1039/C5SM90160J. This work was featured on the cover of Soft Matter 07 October, 2015.

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