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Crystalline assembly of hard polyhedra via directional entropic forces[1] PABLO F. DAMASCENO, MICHAEL ENGEL, SHARON C. GLOTZER, University of Michigan — Entropic forces are effective forces that result from a system's statistical tendency to increase its entropy. Hard rods and disks spontaneously align and can assemble into layers and columns if those structures increase the configurational space available to the particles. Hard spheres, cubes and even tetrahedra order for the same reason. Here we extend those findings by showing that hard polyhedra can self-assemble into a variety of complex phases, most of them never before reported in systems of single-component hard particles. The role of shape and directional entropic forces in stabilizing these structures will be discussed. Our results suggest new possibilities for self-assembling complex target structures from colloidal building blocks.

[1] Damasceno, PF; Engel, M; Glotzer, SC. arXiv:1109.1323v1

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