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Directional Entropic Forces in Hard Colloids GREG VAN ANDERS, KHALID AHMED, ROSS SMITH, MICHAEL ENGEL, SHARON GLOTZER, University of Michigan — Based on known results from the literature of hard particles we introduce the concept of entropically patchy particles – particles that bind with angular specificity entirely due to their geometry via directional entropic forces or "bonds". Unlike ordinary patchy particles, in which "valence" vis-a-vis angular specificity is dictated by microscopic energetic considerations (sticky patches), entropic forces causing the binding of particles at entropic patch sites are emergent. Using basic examples we show both theoretically and computationally that we can alter the geometry of a particle to create an entropic patch and tune the resulting effective pair potential in such a way that it can lead to angularly specific binding, even in the absence of depletants.

Greg van Anders
University of Michigan

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