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How does jamming and glassy behavior depend on particle shape?[1] CARL SCHRECK, COREY O'HERN, Yale University — We present extensive computational studies of glassy and jamming behavior in particulate systems composed of anisotropic particles in two and three dimensions. We focus on two classes of anisotropic particle shapes, convex (ellipsoidal) and concave (dimer) particles, which display contrasting structural and mechanical properties even at the same aspect ratio. For example, static packings of convex ellipsoidal particles are hypostatic with fewer contacts than necessary for mechanical stability from naive counting of degrees of freedom, and possess anomalously small static shear moduli. In contrast, packings of dimers are isostatic, where the number of contacts matches the number of degrees of freedom. Does hypostaticity affect the low-temperature glassy dynamics? To investigate this question, we will study stress and structural relaxation times and the linear and nonlinear response to applied shear strain in jammed and glassy systems composed of dimers and ellipsoids.

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