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Glassy dynamics of geometrically frustrated colloidal system¹ JENNIFER M. LYNCH, PETER YUNKER, ZEXIN ZHANG, University of Pennsylvania, YAIR SHOKEF, Weizmann Institute of Science, YILONG HAN, Hong Kong University of Science and Technology, TOM LUBENSKY, ARJUN YODH, University of Pennsylvania — Geometric frustration arises when lattice structure prevents simultaneous minimization of local interaction energies. It leads to highly degenerate ground states and, subsequently, to complex phases of matter. Recently, a simple geometrically frustrated system composed of closely packed colloidal spheres confined between parallel walls was studied. Diameter-tunable microgel spheres are self-assembled into a buckled triangular lattice with either up or down displacements, analogous to an antiferromagnetic Ising model on a triangular lattice. This tunable soft-matter system provides a means to directly visualize the dynamics of frustration. In the present study, we probe spin dynamics on the single particle level by quenching our system to large packing fractions at different rates. Spin dynamics are found to exhibit behaviors characteristic of glasses.

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