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Nucleation and Freezing of Colloidal Microgel Monolayer ZIREN WANG, Physics Department, Hong Kong University of Science and Technology, AHMED ALSAYED, University of Pennsylvania, ARJUN YODH, YILONG HAN, Physics Department, Hong Kong University of Science and Technology — We studied the crystallization of two-dimensional colloidal crystals composed of diameter tunable microgel spheres. The critical nucleation size, surface and line tensions were measured, and four empirical 2D criteria for freezing were experimentally tested. These freezing criteria, usually applied in the context of single crystals, were demonstrated to apply to the formation of polycrystals. At the freezing point, we also observed a peak in the fluctuations of the orientational order parameter and a percolation transition associated with caged particles. Speculation about these percolated clusters of caged particles casts light on solidification mechanisms and dynamic heterogeneity in freezing.

Yilong Han
Physics Department, Hong Kong University of Science and Technology

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