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Dynamic Facilitation in Colloidal Glasses SCOTT V. FRANKLIN, Rochester Institute of Technology, ERIC R. WEEKS, Emory University — Dense colloidal suspensions share many characteristics with molecular glasses and, because easily visualized, are a model system for investigating the transition to the glassy state. An important feature of glasses is the presence of spatially heterogeneous dynamics; at any given time only a small subset of particles (clusters) are significantly mobile. To explain the origin and spatiotemporal correlation of clusters, Garrahan and Chandler proposed *dynamic facilitation*, in which motion at one location facilitates subsequent (in time) motion at adjacent regions. We use confocal microscopy to investigate dynamic facilitation in binary mixtures of micron-sized PMMA spheres in two and three dimensions. Dynamic facilitation is identified with spatial correlations between the most mobile particles at two subsequent time intervals, a measure used previously by Vogel and Glotzer to analyze simulations of glass-forming liquids. This provides a critical test of how mobility propagates through the sample in space-time and the spatial and temporal correlation of mobile clusters.

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