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Aging of a Binary Colloidal Glass JENNIFER M. LYNCH, GIANGUIDO C. CIANCI, ERIC R. WEEKS, Department of Physics, Emory University — After having undergone a glass transition, a glass is in a non-equilibrium state, and its properties depend on the time elapsed since vitrification. We study this phenomenon, known as aging. In particular, we study a colloidal suspension consisting of micron-sized particles in a liquid — a good model system for studying the glass transition. In this system, the glass transition is approached by increasing the particle concentration, instead of decreasing the temperature. We observe samples composed of particles of two sizes ($d_1 = 1.0\mu m$ and $d_2 = 2.0\mu m$) using fast laser scanning confocal microscopy, which yields real-time, three-dimensional movies deep inside the colloidal glass. We then analyze the trajectories of several thousand particles as the glassy suspension ages. Specifically, we look at how the size, motion and structural organization of the particles relate to the overall aging of the glass. We find that areas richer in small particles are more mobile and therefore contribute more to the structural changes found in aging glasses.

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