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Experimental study of dynamic rearrangements in repulsive and attractive glasses ZEXIN ZHANG, Soochow University, PETER YUNKER, University of Pennsylvania, PIOTR HABDAS, Saint Joseph's University, ARJUN YODH, University of Pennsylvania — The influence of interparticle attraction versus repulsion on heterogeneous glass dynamics is explored with colloidal particles suspended in water-lutidine mixtures. The mixtures permit interparticle potentials to be tuned in situ from short-range repulsive to short-range attractive. Thus, a direct comparison of colloidal glass dynamics in samples composed of the same particles at the same volume fraction is possible. In both types of glasses, dynamics are found to be heterogeneous, and particles rearrange in a cooperative manner. By comparison to repulsive glasses, attractive glasses exhibit dynamics that are heterogeneous over a wider range of time and length scales, and involve more particles. Clusters of rearranging particles form string-like structures in repulsive glasses, and more compact clusters in attractive glasses. The experiments demonstrate explicitly that interparticle interactions affect glass dynamics.

Zexin Zhang
Soochow University

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