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Rejuvenation and memory in a 2D colloidal glass JENNIFER M. LYNCH, Physics Dept., Emory University, ZEXIN ZHANG, PETER YUNKER, ARJUN G. YODH, Physics Dept., University of Pennsylvania, ERIC R. WEEKS, Physics Dept., Emory University — We work with a 2D colloidal system that has a glass transition and use this system to experimentally observe memory and rejuvenation effects as the sample ages. In particular, we study a system of colloidal particles made of thermosensitive poly(N-isopropylacrylamide) (NIPA) polymer. The sample is confined in a narrow quasi-2D gap between parallel glass plates, which allows easy observation and rapid temperature response. Lowering temperature increases the size of the colloidal particles, which can induce the glassy state due to the crowding of the particles. When our colloidal sample is quenched into the glassy state, particle motion slows over time; this is aging. In molecular glasses, prior experiments studied how aging is modified when the temperature is changed while the sample ages, finding that aging at a first temperature T_1 and aging at a later time with second temperature T_2 are mostly independent. “Memory” relates to the case $T_1 < T_2$ and “rejuvenation” to the opposite case. Our colloidal system allows us to observe both of these effects.

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