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Temperature control of attractive interactions in colloids PETER SCHALL, University of Amsterdam, ZHIBING HU, University of North Texas — Attractive colloidal systems have attracted increasing interest recently: They exhibit phase behavior with solid, liquid, and gas phases, and various metastable states, ranging from gel-like to glassy. These colloidal systems offer a convenient way to investigate important phenomena such as phase formation and kinetic arrest. The most prominent colloidal systems are colloid-polymer mixtures, in which the attractive strength is fixed by the concentration of the added polymer. We present a colloidal system that allows variation of the attractive potential with external control: a binary liquid solvent gives rise to temperature-dependant particle attractions close to the demixing temperature of the liquid mixture. This allows us to use temperature control to induce transitions from gas to liquid to solid, or to form metastable gel-like or glassy states. Variation of the heating rate allows us to investigate the kinetics of these transitions. In this talk, I will focus on a novel system, in which close index- and density matching of the solvent and the particles is possible; this enables us to study bulk processes with temperature control.

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