The glass/jamming transition from the mean-field perspectives

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The replica theory and mode-coupling theory (MCT) are believed to be the static and dynamic mean-field theoretic description of the glass transition, respectively. According to this mean field scenario, the fluid should undergo the dynamic non-ergodic transition at a dynamic (MCT) transition point prior to the true RSB transition point. If this scenario is correct, one should expect that MCT should work better in the mean-filed-limit such as (1) the long-range interacting or (2) the higher dimensional systems, and (3) the dynamic transition point should match with a point at which the inherent structure (or the jamming transition point for the hard spheres) changes qualitatively. In my talk, I shall present our resent numerical results which support above (1)--(3).