

Abstract for an Invited Paper
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Geometric interpretation of pre-vitrification in hard sphere glasses

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I will derive a geometric condition for the stability of hard sphere configurations, and I will show empirically that this condition is saturated in the glass phase. The marginal stability observed explains the presence of slow modes in the short term dynamics of the glass, and supports a microscopic interpretation for the rapid initial rise of the viscosity, or pre-vitrification, when the packing fraction increases. This observation also suggests a possible cause for the collective nature of the structural relaxation near the glass transition.