

Physical Chemistry Seminar

Tuesday,
September 3, 2013

11:00 am

Room 1315
Chemistry Building

High-dimensional surprises near the glass and the jamming transitions



Professor Patrick Charbonneau

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Host: Professor Arun Yethiraj

The glass problem is notoriously hard and controversial. Even at the mean-field level there is little agreement about how a fluid turns sluggish while exhibiting but unremarkable structural changes. It is clear, however, that the process involves self-caging, which provides an order parameter for the transition. It is also broadly assumed that this cage should have a Gaussian shape in the mean-field limit. We show that this ansatz does actually not hold, and explore some of its consequences, notably in the jamming limit of infinitely compressed hard spheres. We also examine how low-dimensional fluctuations result in the breakdown of the Stokes-Einstein relation. We thus obtain clear mileposts for the emergence of a mean-field theory of the glass and jamming transitions.

Refreshments will be available prior to the seminar at 10:45 a.m. outside room 1315

Graduate Students may meet with the speaker at 1:00 p.m. in Room 8335