Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Scaling theory of the jamming transition[1] ANDREA LIU, University of Pennsylvania, Department of Physics and Astronomy, CARL GOODRICH, SEAS, Harvard University, JAMES SETHNA, Cornell University, Department of Physics, SIDNEY NAGEL, University of Chicago, James Franck Institute — The concept of jamming was first introduced at the University of Chicago by Sid Nagel and Tom Witten. By now we know that there is a zero-temperature critical jamming transition that marks the onset of rigidity in packings of soft repulsive spheres. In contrast to the perfect fcc crystal state, which is the maximally stable state for such systems, the jammed state is only marginally stable mechanically, and thus represents an opposite extreme to the perfect crystal. This marginal stability gives rise to power law scalings and diverging length scales at the transition. Here I will discuss recent developments that put the jamming transition in the same place that the Ising transition was when Leo Kadanoff introduced the ideas of coarse-graining and rescaling into critical phenomena.

[1]Supported by DOE-DE-FG02-05ER46199

Andrea Liu
University of Pennsylvania, Department of Physics and Astronomy

Date submitted: 06 Nov 2015 Electronic form version 1.4