

Abstract Submitted
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Random sphere packing lattices YOAV KALLUS, Santa Fe Institute — Bravais lattices have always been an important special case of the high-dimensional sphere packing problem, but from the statistical mechanics and random packing perspectives, they have not been studied much until recently. I will discuss the statistical mechanical phenomena exhibited by a system of one sphere under periodic boundary conditions, where the only degrees of freedom are the unit cell parameters. Equilibrium behavior includes a “crystallization” transition, but most of the interest comes from studying non-equilibrium behavior: glass transition, random packing, and hysteresis. The random-packed lattices exhibit surprising properties, including a density remarkably higher than amorphous random packing and a quasicontact divergence.

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