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### **Order in amorphous solids**

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A solid is a system which has density modulations that are not erased by thermal motion, even on long timescales. The typical example is a crystal. Particles with soft, inter-penetrable cores may form such a solid. The remarkable fact that one can build a hard building with soft bricks can only be explained by the cooperation between an infinite number of particles. If soft particles may form a true, glassy solid phase, then we are forced to accept that an infinite coherence length must also exist for them. And yet, when we look at glass configurations, they appear definitely disordered, liquid-like. This is the mystery of glasses, which motivates the quest for a hidden order. I shall describe a coherence length that is accessible experimentally, and should diverge in an ideal glass state.