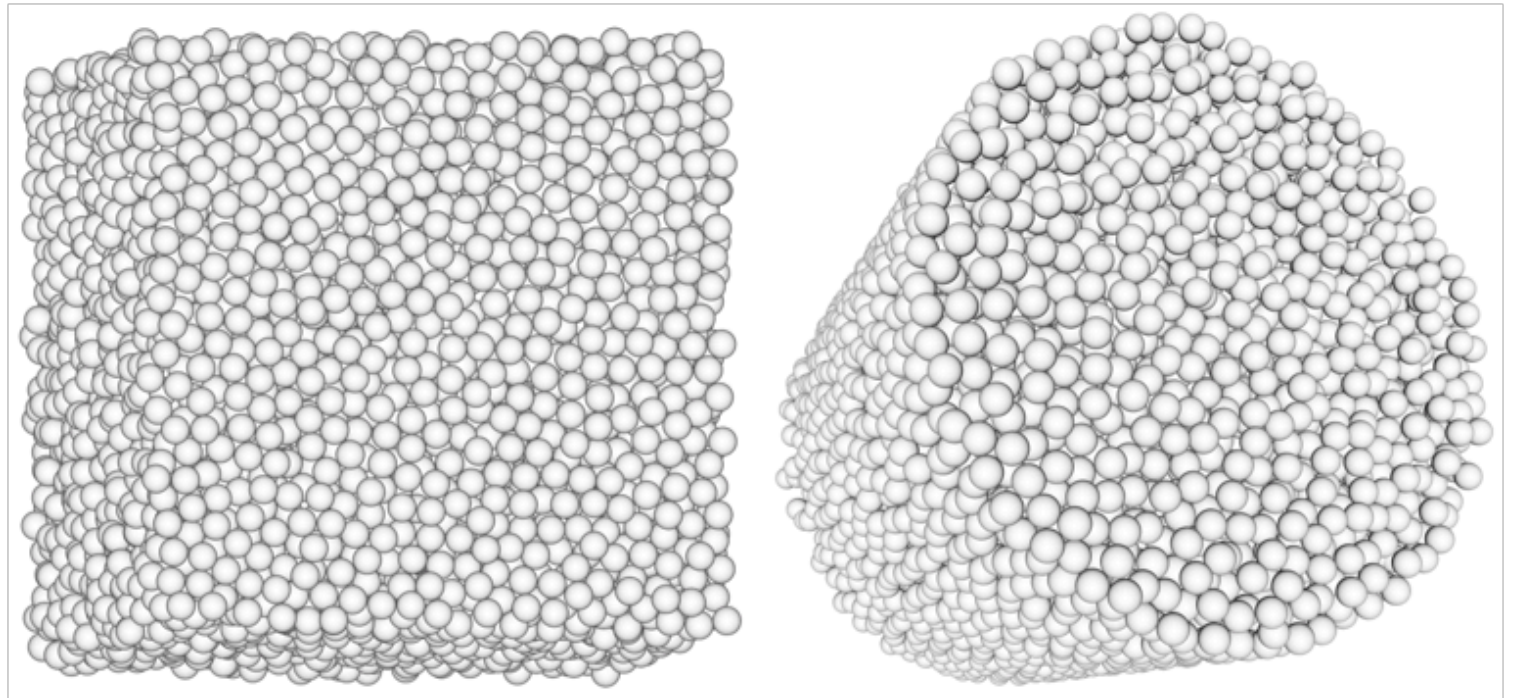


How to estimate a lower bound on the Edwards entropy

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In this talk, I will present a method to estimate a lower bound S_{lb} on the Edwards entropy, i.e., the logarithm of the number of mechanically stable configurations for a given density and boundary conditions. We do this by writing equivalents of thermodynamic relations for granular matter and applying the analogue of the Widom particle insertion method. We use computer-generated and experimentally obtained three-dimensional monodisperse sphere packings with volume fractions φ in the range 0.551 to 0.65. We find that S_{lb} has a maximum in the vicinity of the Random Loose Packing Limit $\varphi_{RLP}=0.55$ and decreases then monotonically with increasing φ to reach a minimum at $\varphi=0.65$. Further on, S_{lb} does not distinguish between real mechanical stability and packings in close proximity to mechanically stable configurations.

