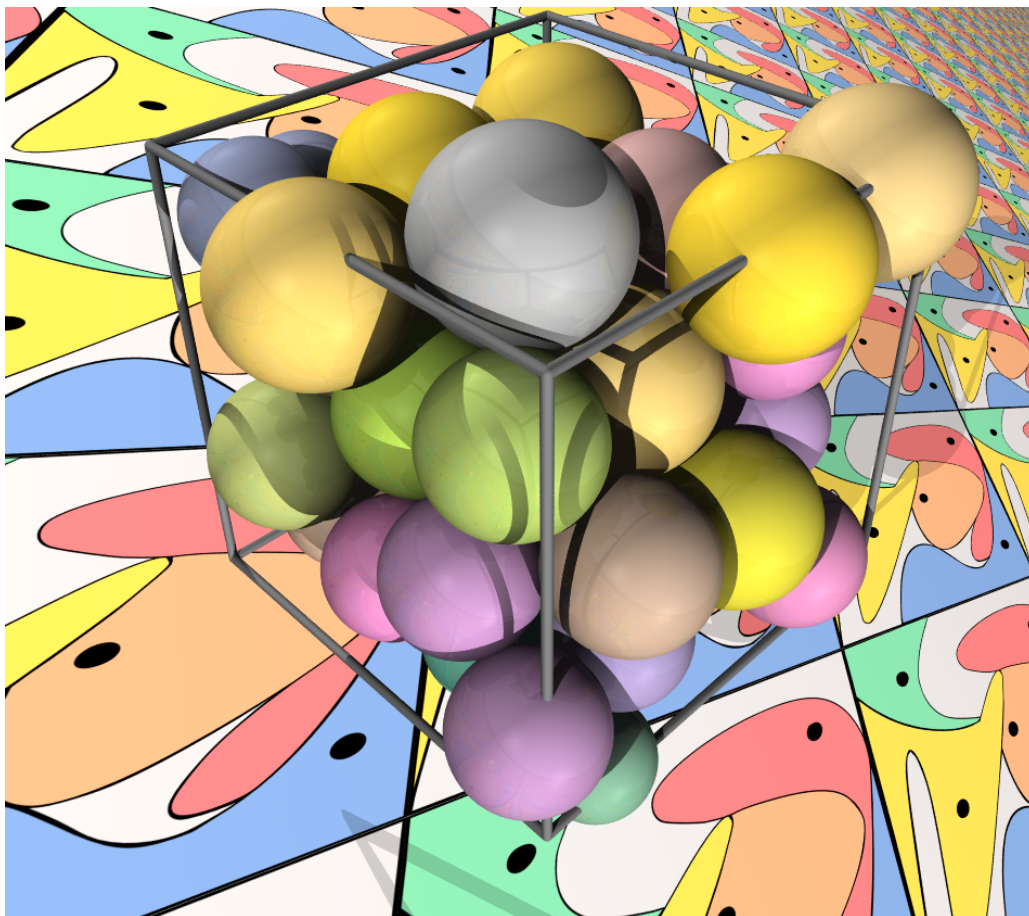


Turning intractable counting into sampling: the mean basin volume method

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In this talk I will present a method to compute the total number of disordered jammed configurations accessible to N repulsive three-dimensional spheres in a fixed volume V . To do so, we will map the intractable problem of explicitly enumerating all configurations to a Monte Carlo sampling task on top of a potential energy landscape (PEL). This enables us to compute different configurational entropies S from first principles and to assess their physical merits, such as extensivity. We can then extend this principle to the generalised Edwards' ensemble of granular statistical mechanics by analysing S as a function of pressure. A simple power-law relationship is observed between the pressure of a configuration and the volume of its basin of attraction in the PEL. En route I will also present a new and more convenient method for accurately computing high dimensional volumes. This methodology should be applicable to a range of enumeration problems which can be described by a PEL.

