



Order through Disorder: Entropy Driven Self-Assembly

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Abstract:

Although the idea that entropy alone is sufficient to produce an ordered state is an old one, the notion remains counter-intuitive and it is often assumed that attractive interactions are necessary to generate phases with long-range order. Over the past 20 years entropy driven phase transitions have been experimentally demonstrated in both colloidal suspensions of rods and spheres. In the first part of this talk I will provide a general overview of these experiments. I will also introduce an entropy driven isotropic-nematic phase transition of colloidal rods, first described in a seminal work by Lars Onsager in 1949. In the second part of the talk I will discuss recent extensions of entropy driven phase transitions to binary mixtures. In this context I will focus on recently discovered highly complex yet very regular structures found to self-assemble in mixtures of monodisperse rods and non-adsorbing viruses.

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