

Amgen Seminar Series in Chemical Engineering
in
Cherry Auditorium, Kirk Hall, 12:45 PM

Presents on Thursday, September 20, 2018

Understanding and harnessing entropy in colloids

By



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I will discuss what we have learned about entropy from experiments on micrometer-scale colloidal particles, which can be seen under an optical microscope. From experiments on small colloidal systems (clusters of interacting spherical particles), we find that entropy has a complex relationship with order and symmetry, but one that can be understood within a simple framework—so long as we allow that entropy is a measure of the number of states that we as observers choose not to distinguish, rather than of those that are fundamentally indistinguishable. I will then show how a better understanding of entropy allows us to design new materials and nanomachines.

BIO:

Vinothan N. Manoharan is the Wagner Family Professor of Chemical Engineering and Professor of Physics at Harvard University. His research focuses on understanding how systems containing many particles suspended in a liquid -- such as nanoparticles, proteins, or cells -- organize themselves into ordered structures like crystals, viruses, and even living tissues. His lab uses optical microscopy and holography to watch these systems self-assemble in real time. The goal is to discover new, general physical principles that underlie complex systems and to apply these principles to practical problems in materials science, nanotechnology, and medicine. Manoharan received his Ph.D. from the University of California, Santa Barbara in 2004 and worked as a postdoctoral researcher at the University of Pennsylvania before arriving at Harvard in 2005.

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