



Thomas Truskett
Department Chair
Bill L. Stanley Leadership Chair in Chemical Engineering
Les and Sherri Stuewer Endowed Professorship in Chemical
Engineering
McKetta Department of Chemical Engineering
The University of Texas at Austin

Engineering via Targeted Assembly

Nanometer-scale particles suspended in a fluid can self-assemble into different structures depending on the nature of their effective interparticle interactions. In many cases, these interactions are tunable via physical or chemical modification of the particle surfaces or changes in the composition of the suspending solvent. For example, fluid dispersions of particle clusters can result from a balance between short-range interparticle attractions and longer-range repulsions. In this talk, we explore how to use inverse methods of statistical mechanics to design such interactions. We also discuss how the ability to tune nanoparticle interactions can lead to novel solutions to technological challenges in drug delivery and other biomedical applications.