

ANNOUNCEMENT

Soft Matter Seminar Series

When: *Monday, April 16, 2012 at 3:00 PM*

Where: *Livermore Center 101*

Towards Predictive Assembly of Colloidal Shapes

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A fundamental characteristic of matter is its ability to form ordered structures under the right thermodynamic conditions. Predicting these structures and their properties from the attributes of a material's building blocks is the holy grail of materials science. In systems governed by weak energetic or entropic forces, building block shape plays a key role in assembly and packing. In this talk we present simulation studies of the self-assembly of 145 polyhedra whose thermodynamic behavior arises solely from their anisotropic shape. Our results demonstrate a remarkably high propensity for self-assembly and an unprecedented structural diversity, including plastic rotator crystals, liquid crystals, Bravais and topologically close-packed crystals, quasicrystals, glasses, and some of the most complex crystalline phases yet observed in a non-atomic system. We show that from simple measures of particle shape and local order in the disordered fluid, the class of ordered structure can be predicted