Dynamics of colloidal self-organization

Margarida Telo da Gama

Center for Theoretical and Computational Physics and Department of Physics, Faculty of Sciences, University of Lisbon, Lisbon, Portugal
mmgama@fc.ul.pt

Colloidal particles are considered ideal building blocks to produce materials with designed physical properties. The state-of-the-art techniques for synthesizing these particles provide control over shape, size, and directionality of the interactions. In spite of these advances, there is still a huge gap between the synthesis of individual components and their spontaneous organization towards the desired structures. The challenge is controlling the dynamics of self-organization. In their kinetic route towards thermodynamically stable structures, colloidal particles self-organize into intermediate structures that are much larger than the individual particles and become the relevant units for the dynamics. To follow the dynamics and identify kinetically trapped structures, one needs to develop new theoretical and numerical tools. In this talk, we will discuss these tools along with possible mechanisms to avoid undesirable trapped structures.