The Science of Dispersing Carbon Nanotubes with Surfactants

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The key bottleneck in the utilization of carbon nanotubes is their dispersion and individualization. One way of achieving this is by coating them with self-assembled surfactant structures. Despite very significant experimental efforts and also a good number of theoretical contributions the underlying physics of the problem remains poorly understood. As a consequence, all know surfactant systems perform unsatisfactorily.

We use mesoscale computer simulations to provide the understanding necessary to enable an informed design process. Mesoscale simulations have the advantage of capturing the relevant physics of the problem. In particular they enable us to simulate the length and time scales required for self-assembling systems.

In this talk I will present some of our key results, link them to experimental observations and draw some conclusion for the design of novel dispersion systems.