Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

In Situ Visualization of the Growth and Fluctuations of Nanoparticle Superlattice in Liquids ZIHAO OU, BONAN SHEN, QIAN CHEN, University of Illinois at Urbana Champaign, Department of Materials Science and Engineering — We use liquid phase transmission electron microscopy to image and understand the crystal growth front and interfacial fluctuation of a nanoparticle superlattice. With single particle resolution and hundreds of nanoscale building blocks in view, we are able to identify the interface between ordered lattice and disordered structure and visualize the kinetics of single building block attachment at the lattice growth front. The spatial interfacial fluctuation profiles support the capillary wave theory, from which we derive a surface stiffness value consistent with scaling analysis. Our experiments demonstrate the potential of extending model study on collective systems to nanoscale with single particle resolution and testing fundamental theories of condensed matter at a length scale linking atoms and micron-sized colloids.

Qian Chen
University of Illinois at Urbana Champaign

Date submitted: 20 Nov 2016 Electronic form version 1.4