Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

**Potential of mean force of DNA guided assemblies past Debye-Hckel regime** MARTIN GIRARD, SOYOUNG SEO, YAOHUA LI, CHAD MIRKIN, MONICA OLVERA DE LA CRUZ, Northwestern University — Many of the bioinspired systems make use of biopolymers such as polypeptides or DNA. The latter is widely used in self-assembled systems, from colloidal crystals to origami construction. In these systems, salt is commonly required to screen the electrostatic repulsion between the strands. In the classical Debye-Hckel picture, salt ions are point particles and the screening distance is a decreasing monotonic function of salt concentration. This picture breaks down at moderate salt concentrations, where the behavior becomes non-monotonic. In this talk, we will show results for potential of mean force of DNA grafted colloids obtained through multiscale molecular dynamics. In this picture, the highly charged DNA causes non-trivial behavior at moderate salt concentrations ($c \sim 0.3 - 0.7$M), namely increase of repulsion for non-complementary DNA strands while repulsion decreases for complementary strands. We will show spatial cluster distribution as function of size and charge as well as implications for experimental systems.

Martin Girard
Northwestern University

Date submitted: 11 Nov 2016 Electronic form version 1.4