Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Self-Assembled Membranes and Chirality Driven Transitions from 2D Surfaces into 1D Ribbons[1] EDWARD BARRY[2], ZVONIMIR DOGIC, ROBERT MEYER, NADIR KAPLAN, THOMAS GIBAUD, MARK ZAKHARY, Martin Fisher School of Physics at Brandeis University, HAO TU, ROBERT PELCOVITS, Brown University, RUDOLF OLDENBOURG, Marine Biological Laboratory — We briefly outline conditions under which homogeneous non-amphiphilic colloidal rods self-assemble into two-dimensional fluid-like surfaces or membranes. Stabilized by entropic forces, these membranes have properties that are identical to lipid bilayers. We then focus on experiments in which the chirality of the constituent particles induces the transition from achiral 2D membranes into 1D twisted ribbons. The model system developed is unique, both in our ability to tune chiral interactions between constituent particles and directly visualize the structure and fluctuations of the final assemblage on all relevant lengthscales. These features allow us to test the theoretical model describing the transition from chiral ribbons to achiral membranes in great detail.

[1]Supported by NSF, MRSEC at Brandeis University, and NIH.
[2]Supported by the HHMI-NIBIB Quantitative Biology Program

Edward Barry
Martin Fisher School of Physics at Brandeis University

Date submitted: 25 Nov 2009 Electronic form version 1.4