Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Double twist helical nanofilaments in bent-core liquid crystals[1]
CUIYU ZHANG, NICHOLAS DIORIO, OLEG D LAVRENTOVICH, ANTAL JAKLI, Liquid Crystal Institute, Kent State University, Kent, OH 44242 — Cryo-TEM observations on 40-150 nm films of four bent-core liquid crystal materials in their helical nanofilament (HNF) phase show that the filaments get deformed near the substrate, and the subsequent arrays of nanofilaments are not parallel, but twisted with respect to each other. The effect can explain the mysterious properties of the HNF materials, such as structural color and ambidextrous optical activity. The observed double twist structure was not expected in the previous models of this phase. Being principally different from the packing of molecules in the twist grain boundary (TGB) and blue (BP) phases, the double-twist structure of HNF expands the rich word of nanostructured organic materials.

[1]This work was financially supported by NSF DMR-0964765 and DMR 1104850. The cryo-TEM facility was supported by the Ohio Research Scholars Program. We are grateful for Prof. G. Heppke and Dr. D. Lotsch for providing the PnOPIMB materials for us.

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Date submitted: 15 Nov 2013 Electronic form version 1.4