MAR13-2012-020098

Abstract for an Invited Paper
for the MAR13 Meeting of
the American Physical Society

Gradual ordering in mollusk shell nacre: theoretical modeling and experimental results[1]

SUSAN N. COPPERSMITH, Department of Physics, University of Wisconsin-Madison

Biominerals have attracted the attention of materials scientists, biologists, and mineralogists as well as physicists because of their remarkable mechanical properties and incompletely elucidated formation mechanisms. Nacre, or mother-of-pearl, is a layered biomineral composite that is widely studied because of its self-assembled, efficient and accurately ordered architecture results in remarkable resistance to fracture. New experimental tools enable us to obtain new information about the organization and structure of the mineral tablets in nacre. Our experimental and theoretical investigations yield strong evidence that orientational ordering of these tablets is the result of dynamical self-organization.

[1]This work was supported by NSF award CHE&DMR-0613972, DOE award DE-FG02-07ER15899, UW-Graduate School Vilas Award to P.U.P.A. Gilbert, and NSF awards DMR-0209630 and DMR-0906951 to SNC.