Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Finite Difference Frequency Domain (FDFD) Band Structure Calculations of Diatom Frustules JONATHAN MISHLER, STEPHEN BAUMAN, SALVADOR BARRAZA-LOPEZ, Department of Physics, University of Arkansas, ANDREW ALVERSON, Department of Biology, University of Arkansas, JOSEPH HERZOG, Department of Physics, University of Arkansas — Diatoms are single-celled photosynthetic algae commonly known for their siliceous cell walls, called frustules. Over the last decade, the uncanny resemblance of their frustules to manufactured photonic crystals has led researchers to study their photonic properties with the hope of using them as self-constructing photonic crystals or biomimetic templates for artificial photonic crystals. The 2D photonic band structures of the foramen, areolae, and cribrum of the diatom species *Coscinodiscus* sp. were calculated using the finite difference frequency domain (FDFD) method in both water and air. These calculations revealed the effects of all three layers on a frustule's photonic properties, both in and out of their natural environment.

Jonathan Mishler
Natl Inst of Health - NIH

Date submitted: 08 Nov 2015 Electronic form version 1.4