3:30 pm • Friday March 16, 2012 • 2241 Chamberlin Hall • Coffee at 4:30 pm

Pupa Gilbert

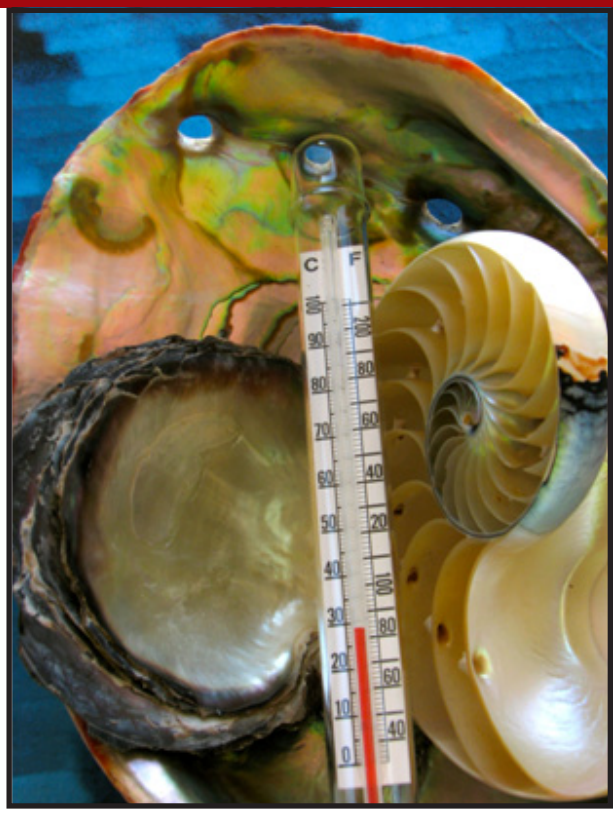
University of Wisconsin
Department of Physics

Kelvin, Pascal, and mollusk shells

Department of Physics Colloquium

WISCONSIN

Nacre is the tough, iridescent layer lining the inner side of some mollusk shells. We found strong correlation between nacre crystal orientations (1) and environmental temperature (2), and this has far-reaching consequences: nacre angle spread could be used as a thermometer (3). But the implications of this finding are more profound: an equation links environment and bio-structure. This equation suggests that one could predict a biological structure based on the environment in which the organism forms it.



1. RA Metzler, M Abrecht, RM Olabisi, D Ariosa, CJ Johnson, BH Frazer, SN Coppersmith, PUPA Gilbert. Architecture of columnar nacre, and implications for its formation mechanism. Phys. Rev. Lett. 98, 268102, 2007.

2. IC Olson, R Kozdon, JW Valley, PUPA Gilbert. Mollusk shell nacre ultrastructure correlates with environmental temperature and pressure. J Am Chem Soc in press, 2012.

3. IC Olson, PUPA Gilbert. Nacre as a temperature proxy. RSC Faraday Discussions submitted, 2012.

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