PHYSICS & ENVIRONMENTAL STUDIES COLLOQUIUM

Assembling new coral-based tools for reconstructing ancient environmental change

Records of ancient environmental variability can provide unique context for evaluating modern global change and also offer insight into the dynamics of the Earth system. To access times far in the past for which we do not have instrumental records, scientists must rely on 'proxies' (generally defined as indirect indicators of a climatic or environmental variable). The geochemical signatures present in coral skeletons have been particularly fruitful proxies and have been applied to understand past ocean temperatures, ocean circulation and sea level. However, uncertainties in coral proxy applications still exist due to (1) ambiguities concerning the resilience of coral skeletons to physical and chemical alteration during fossilization, and (2) our incomplete understanding of the chemistry, physics and biology of skeletal mineralization. This talk will demonstrate how mineralogical and geochemical tools can be used together to identify fossil coral samples as old as 200 million years that have remained resistant to alteration. It will also discuss how these samples can be applied to reconstruct ocean change through consideration of the controls on skeletal mineralization.

Monday, March 13
3:10-4:10 p.m.
RNS 210

Cookies and Apple Cider Served!

Anne Gothmann

Anne Gothmann graduated with a B.A. in Physics and Geosciences from Williams College in 2010 where she developed a passion for paleoclimate science. While obtaining her Ph.D. at Princeton University with Michael Bender and John Higgins, she was able to pursue this interest further by assembling a new suite of well preserved fossil corals and applying them to reconstruct past ocean change. Currently, Anne is a postdoctoral associate at the Joint Institute for the Study of the Atmosphere and Ocean (JISAO), University of Washington, working with Alex Gagnon. She now conducts experiments with live cold-water coral -to develop paleoclimate proxies and understand the mechanisms driving carbonate biomineralization.

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