



**“HADEAN HEAT PIPES AND THE ORIGIN OF PLATE TECTONICS”**

**WILLIAM B. MOORE**  
Hampton University

**Monday, October 29, 2012**  
3:30 PM

Room 3200, Innovation Research Park Building I

Abstract

Analyses of zircons more than four billion years old have suggested that plate tectonics was operating very early in Earth's history, but extending our current understanding of terrestrial heat transport back in time has resulted in conflicting pictures of the Hadean Earth. Volcanism had a larger role in Earth's early thermal evolution than it does today, and models that include the effect of volcanic heat transport on the dynamics of the mantle and lithosphere suggest a different interpretation of the zircon data. By removing hot material from the upper boundary layer and depositing it at the surface where it cools rapidly and buries older flows, volcanic heat pipes diminish the source of convective stress at the same time they thicken the cold lithosphere, suppressing plate tectonics. A natural transition to plate tectonic behavior occurs as heat sources diminish, volcanism wanes, and stresses increase while lithospheric strength decreases.

Biography

Dr. William B. Moore is the Hampton University Professor in Residence at the National Institute of Aerospace, a non-profit research consortium. A graduate of Penn State (B.S., 1991) and UCLA's Earth and Space Sciences Department (Ph.D., 1997), Dr. Moore has participated in NASA missions to Venus, Mars, Jupiter, and Saturn, investigating the processes that drive geological activity in solid planetary bodies using geophysical modeling techniques.

*Reception before seminar at 3:00 PM*