Weekly CEAFM Seminar: Spring 2016

JOHNS HOPKINS
Center for Environmental & Applied Fluid Mechanics

Date: **Friday, February 12, 2016**

Time: 11:00 AM

Location: Gilman Hall # 50

Speaker: **Prof. Scott Turner** (State University of New York - ESF)

Title: ***"Life in the Transients"***

Abstract

Life, as well as adaptation of life to its environment, can be expressed as an energetic phenomenon: life is a dynamic disequilibrium sustained by organized and highly specified flows of matter and energy. Biologists are accustomed to think of these flows as steady or quasi-steady flows—"DC" flows, where a stream of energy and matter flow are governed by steady or quasi-steady potential energy gradients. "DC" flows are easy to analyze because there is no storage term for energy or matter flow. However, the natural world is an "AC" world, where drivers of mass and energy flow are non-steady and where storage of energy and matter become significant determinants of adaptation and survival. I outline several examples of such non-steady flows, centering on use of turbulent wind to power gas exchange in animal burrow systems. An explicitly "AC" approach to this phenomenon opens of a rich vein of new insights into adaptation.

Bio

Scott Turner is Professor of Biology at the State University of New York College of Environmental Science and Forestry (SUNY-ESF) in Syracuse, New York. His principal research focus is the emergence of superorganismal structure and function in the mound building termites of southern Africa, but this is motivated by a larger interest in the interface between physiology, evolution and design. He is the author of two acclaimed books: The Extended Organism. The Physiology of Animal-Built Structures (2000) and The Tinkerer's Accomplice. How Design Emerges from Life Itself (2007), both published by Harvard University Press.