

The Department of Mechanical Engineering presents:

Dr. Douglas Altshuler

Assistant Professor

Department of Biology

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Friday, October 9th

11:10AM-12:00PM

Bourns Hall A265

Biomechanics and Neural Control of Flight Through the Lens of Evolution

Abstract: One of the most remarkable adaptations in animals is the ability to fly. Birds, bats and insects are among the most successful of terrestrial organisms, and their colonization of diverse habitats and ecological roles provides a rich context for studies of animal behavior and ecology. The study of how animals fly is an intrinsically multidisciplinary field that involves aspects of aerodynamics, physiology, and neuroscience. Although most flight research concerns either mechanisms or ecological interactions, flight behavior provides a powerful yet experimentally tractable system with which to merge reductionist and comparative approaches to understand how complex locomotion is accomplished, and how variation in locomotor performance influences higher-order behaviors. In my laboratory, we aim to integrate approaches ranging from laboratory experiments to evolutionary comparisons because understanding the mechanisms of flight control also requires understanding the historical forces that have shaped it. Conversely, to evaluate the mechanisms by which ecological changes result in biological adaptations requires a well-described system that can be studied in different environments.

Bio: Doug Altshuler began his academic career studying the history of religion with a special emphasis on the Indian subcontinent. He spent his junior year abroad at the University of Delhi and graduated from the University of California, Santa Cruz in 1992. At the very end of his undergraduate studies, Doug took a field course in tropical biology and realized that although biology poses simpler questions than religion, it also provides more tractable answers. Continuing his quest for field work and travel, Doug performed master's research on the interactions between plants and animals in the tropical setting of the Panama Canal. This work was supervised by Rick Howard at Purdue University, where Doug was awarded a M.Sc. in biology in 1994. His Ph.D. research was completed in Robert Dudley's laboratory at University of Texas and concerned the influence of flight performance on hummingbird evolutionary ecology. This project involved laboratory studies in Austin as well as field work in the Peruvian Andes and the Colorado Rockies. Upon graduation in 2001, Doug joined Michael Dickinson's laboratory, first at UC Berkeley, and then helped move the lab to Caltech. As a postdoc, he worked on the aerodynamics and neurophysiology of flight in hummingbirds, zebra finches, and honeybees. He joined the faculty at UC Riverside in 2006 as an assistant professor of biology, where he studies the integrative biology of animal flight.

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