What Can Animals Teach Us About Aerodynamics?

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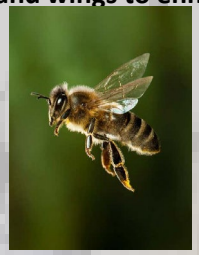
Brown University

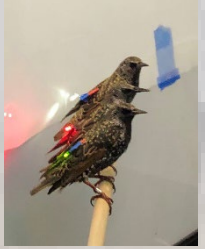
Friday, February 10, 2023
12:30 PM

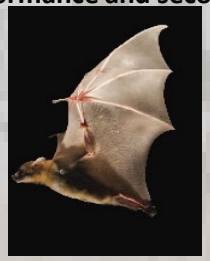
Maeder Hall Auditorium

MAE Seminar Series

Who amongst us has not marveled at flight in nature? While humans have been flying for barely 100 years, insects, birds and bats have ruled the air for over 300 million years, and we are just beginning to understand some of the secrets that have enabled them to fly with such elegance, economy, and agility. In this talk I will outline some of the work in my lab on animal flight and bio-inspired aerodynamic design. I will describe on our experiments characterizing, modelling and emulating bat, bird and insect flight. I will focus firstly on how insects and bats exploit and control their flexible bodies and wings to enhance their flight performance and secondly on the benefits of group flight in birds.







Kenny Breuer received his Sc.B. from Brown University in Mechanical Engineering (1982) and his Ph.D. from MIT in Aeronautics and Astronautics (1988). He spent two years back at Brown as a Post Doctoral Fellow in Applied Mathematics and nine years on the faculty at MIT, before finally returning to Brown in 1999, where he is currently a Professor of Engineering. In 2010 he received a courtesy appointment as a Professor of Ecology and Evolutionary Biology. From 2011 to 2014, he served as Senior Associate Dean of Engineering for Academic Programs. Professor Breuer's research interests are in the broad field of Fluid Dynamics and cover a wide range of diverse topics. At the micron-scale, he has been active in developing diagnostic techniques for micron-scale and near-surface velocimetry, in the characterization of slip flows, the mechanics of bacterial motility and flagellar mechanics, and the nanoscale flow near a moving contact line. At the macro-scale, he has worked on the mechanics of animal flight (particularly bat flight), vortex interactions with compliant structures and energy harvesting from fluid flows.

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