DISTINGUISHED LECTURER SERIES

VCU
MECHANICAL ENGINEERING

Morphing Surfaces for Flow Control

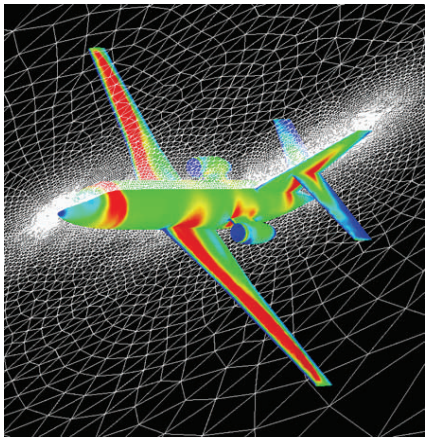
Professor Beverley J. McKeon

California Institute of Technology

30 March 2009
Social Hour: 11:30–12:00 noon
Seminar: 12:00–1:00 pm
Room E2214

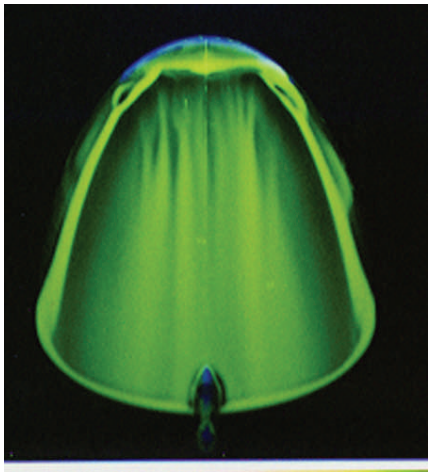
ABSTRACT

This talk will discuss opportunities for performance enhancement of aeronautical configurations using on-demand changes to surface morphology. It is well known that surface roughness can degrade the performance of aerodynamic bodies, for example by triggering early transition of laminar boundary layers or increasing skin-friction drag in turbulent ones, but can we use this knowledge to our advantage? I will describe our work interrogating the response of different receptive flow configurations to this type of actuation, through experiments and computations, and demonstrating novel ways of reconfiguring modern materials to generate "morphing surfaces", or thin skins capable of undergoing dynamic changes in surface roughness in response to low power inputs. Can we actively optimize the dimples on a golf ball for maximum range or directional correction? Not yet …



Bio

Beverley McKeon has been an Assistant Professor of Aeronautics in the Graduate Aerospace Laboratories at Caltech (GALCIT) since 2006. Her research interests include interdisciplinary approaches to manipulation of boundary layer flows using morphing surfaces and fundamental investigations of wall turbulence at high Reynolds number. She was the recipient of an NSF CAREER award in 2008. Prior to joining GALCIT, she was a Royal Society Dorothy Hodgkin Research Fellow and postdoc in the Department of Aeronautics at Imperial College London, after receiving a B.A. and M.Eng. from the University of Cambridge (1996) and Ph.D. in Mechanical and Aerospace Engineering from Princeton University (2003) under the guidance of Lex Smits.



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