PRINCETON
Mechanical & Aerospace Engineering

Friday, February 12, 2016
ACEE, Maeder Hall
3:30 PM

Deconstructing and Reconstructing Wall Turbulence Using a "Linear" Template

BEVERLEY McKEON
Professor of Aeronautics
Graduate Aerospace Laboratories
California Institute of Technology

The systems analysis of turbulent pipe flow proposed by McKeon & Sharma (*J. Fluid Mech, 2010*) provides a simple model by which to understand both qualitative and quantitative aspects of the structure of wall turbulence. In this talk I will expand the approach, describing its mathematical foundations and the benefits of deconstructing the full turbulence field into a linear combination of (interacting) modes. I will then demonstrate that our model can be used to (re)construct known features, yielding important predictive information about the statistical and structural make-up of wall turbulence. Implications for both the classical picture of wall turbulence and control of turbulent flows will be discussed.

Beverley McKeon is Professor of Aeronautics and Associate Director of the Graduate Aerospace Laboratories at Caltech (GALCIT). 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 a Presidential Early Career Award (PECASE) in 2009 and an NSF CAREER Award in 2008, and is an AIAA Associate Fellow. She currently serves as an editor-in-chief of Experimental Thermal and Fluid Science and on the editorial boards of the AIAA J., Annual Review of Fluid Mechanics, Experiments in Fluids and Physics Review Fluids.

Graduate Aerospace Laboratories of the California Institute of Technology (GALCIT)

Social Period outside of Maeder Hall following the seminar

ALL VISITORS ARE WELCOME