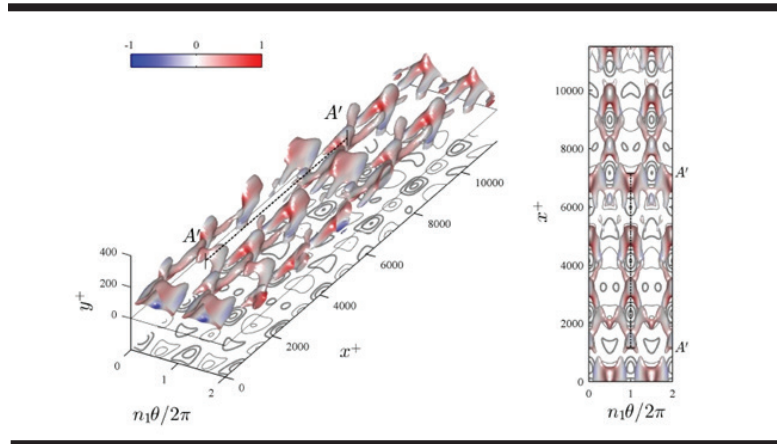


THE WILLIAM E. BOEING DEPARTMENT OF AERONAUTICS & ASTRONAUTICS

welcomes

Beverly McKeon

Theodore von Karman Professor of Aeronautics
California Institute of Technology



Systems analysis of wall turbulence: Characterizing natural and synthetic self-sustaining processes

The financial and environmental cost of turbulence is staggering: manage to quell turbulence in the thin boundary layers on the surface of a commercial airliner and you could almost halve the total aerodynamic drag, dramatically cutting fuel burn, emissions and cost of operation. Yet systems-level tools to model scale interactions or control turbulence remain relatively under-developed. The resolvent analysis for turbulent flow proposed by McKeon & Sharma (J. Fluid Mech, 2010) provides a sim-

ple, but rigorous, approach by which to deconstruct the full turbulence field into a linear combination of (interacting) modes. After a brief review of some key results that can be obtained by analysis of the linear resolvent operator concerning the statistical and structural make-up of wall turbulence, I will describe some of our recent progress towards determining how to reconstruct self-sustaining turbulent systems, both natural and synthetic. Implications for both the classical picture of wall turbulence and control of turbulent flows will be discussed.

Monday, January 22, 2018

4:00 - 5:00 pm

Johnson Hall 075

UW Campus, Seattle, WA



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THE WILLIAM E. BOEING DEPARTMENT OF AERONAUTICS & ASTRONAUTICS

...Distinguished Guest Speaker...



Beverly McKeon
California Institute of Technology

**Theodore von Karman Professor
of Aeronautics**

Beverly McKeon is Theodore von Karman Professor of Aeronautics at 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 Vannevar Bush Faculty Fellowship from the DoD in 2017, the Presidential Early Career Award (PECASE) in 2009 and an NSF CAREER Award in 2008, and is an APS Fellow and AIAA Associate Fellow. She is the past editor-in-chief of *Experimental Thermal and Fluid Science* and currently serves as an associate editor of *Physical Review Fluids*, and on the editorial boards of the *AIAA J.*, *Annual Review of Fluid Mechanics* and *Experiments in Fluids*. She is the APS representative to the US National Committee on Theoretical and Applied Mechanics.

The William E. Boeing Chair's Distinguished Seminar Series brings scholars of national and international reputation who have made an impact in the field of aerospace engineering and beyond. This seminar series will cover a diversity of topics of current interest to those in academia, industry and the general public. It is our hope that these seminars will encourage an exchange of ideas and bring aerospace engineering and science to the forefront.



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