Workshop IV: Turbulence in Engineering Applications

Monday November 17, 2014

8:00–8:55 *Check-In/Light Breakfast (Hosted by IPAM)*

8:55–9:00 *Welcome and Opening Remarks*

9:00–9:40 **Alexander Smits** (Princeton University)
Statistics and spectra in high Reynolds number pipes and boundary layers

10:00–10:15 *Break*

10:15–10:55 **Javier Jimenez** (Universidad Politécnica de Madrid)
Whorls on whorls. Turbulent cascades of individual eddies

11:15–11:30 *Break*

11:30–12:10 **Bassam Bamieh** (University of California, Santa Barbara (UCSB))
Wall Turbulence as an Open Dynamical System The Input-Output View

12:30–2:00 *Lunch (on your own)*

2:00–2:40 **Mihailo Jovanovic** (University of Minnesota, Twin Cities)
Dynamics and control of wall-bounded shear flow

3:00–3:15 *Break*

3:15–3:55 **Martin Oberlack** (Technische Universität Darmstadt)
Scaling laws of near wall-turbulence

4:15–4:30 *Break*

4:30–5:10 **Ivan Marusic** (University of Melbourne)
Wall-Bounded Turbulence in Engineering Applications

5:30–7:00 *Poster Session & Reception (Hosted by IPAM)*

Tuesday November 18, 2014

8:00–9:00 *Continental Breakfast*

9:00–9:40 **Philippe Spalart** (The Boeing Company)
Philosophies and Fallacies in Turbulence Modeling

10:00–10:15 *Break*

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10:15–10:55 **Dan Henningson** (Royal Institute of Technology (KTH))
Direct numerical simulations of complex turbulent boundary layers

11:15–11:30 *Break*

11:30–12:10 **Charles Meneveau** (Johns Hopkins University)
Using LES of turbulent boundary layer flows to develop wind energy engineering tools

12:30–2:00 *Lunch (on your own)*

2:00–2:40 **John Kim** (University of California, Los Angeles (UCLA))
Physics and Control of Wall Turbulence

3:00–3:15 *Break*

3:15–3:55 **Koji Fukagata** (Keio University)
Some integral relationships and their applications to flow control

4:15–4:30 *Break*

4:30–5:10 **Thomas Bewley** (University of California, San Diego (UCSD))
Methods for solution of large optimal control problems that bypass open-loop model reduction

Wednesday November 19, 2014

8:00–9:00 *Continental Breakfast*

9:00–9:40 **Sergei Chernyshenko** (Imperial College)
Relationship between large-scale structures and near-wall turbulence: a theory and implications

10:00–10:15 *Break*

10:15–10:55 **Peter Schmid** (Imperial College)
Nonlinear model reduction for fluid flows with applications

11:15–11:30 *Break*

11:30–12:10 **John Doyle** (California Institute of Technology)
Universal laws in flows, brains, hearts, cells, grids and nets

12:30–2:00 *Lunch (on your own)*

2:00–2:40 **Clarence Rowley** (Princeton University)
Dynamic mode decomposition and the Koopman operator: algorithms and applications

3:00–3:15 *Break*

3:15–3:55 **Brian Farrell** (Harvard University)
Applying Statistical State Dynamics to Understand Wall-Turbulence

4:15–4:30 *Break*

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4:30–5:10 **Dennice Gayme** (Johns Hopkins University)
Rolls, streaks and a restricted nonlinear model of self sustaining turbulence

Thursday November 20, 2014

8:00–9:00 *Continental Breakfast*

9:00–9:40 **Beverley McKeon** (California Institute of Technology)
A framework for surface-based control of wall turbulence

10:00–10:15 *Break*

10:15–10:55 **Ati Sharma** (University of Southampton)
Towards a low-dimensional representation of wall turbulence

11:15–11:30 *Break*

11:30–12:10 **Phil Hall** (Monash University)
Towards a high Reynolds number description of coherent structures: vortex-wave interactions and exact freestream coherent structures

12:30–2:00 *Lunch (on your own)*

2:00–2:40 **Joseph Klewicki** (University of New Hampshire)
Properties of the mean dynamical equation and the statistical structure of turbulent wall flows

3:00–3:15 *Break*

3:15–3:55 **Michael Graham** (University of Wisconsin-Madison)
Drag reduction and the dynamics of turbulence in simple and complex fluids

Friday November 21, 2014

8:00–9:00 *Continental Breakfast*

9:00–9:40 **Bruno Eckhardt** (Philipps-Universität Marburg)
Bypass transition in plane Poiseuille flow and boundary layers

10:00–10:15 *Break*

10:15–10:55 **Rich Kerswell** (University of Bristol)
Triggering Turbulence Efficiently: Nonlinear Transient Growth, Minimal Seeds and Passive Control

11:15–11:30 *Break*

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11:30–12:10 **Fabian Waleffe** (University of Wisconsin-Madison)
Heat transport by coherent Rayleigh-Benard convection

12:30–2:00 *Lunch (on your own)*

2:00–2:40 **Paolo Luchini** (Università di Salerno)
An emerging singularity in the linear response of a turbulent flow to infinitesimal wall waviness

3:00–3:15 *Break*

3:15–3:55 **Laurette Tuckerman** (École Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI))
Dynamics of turbulent-laminar banded patterns in Poiseuille and Couette flow