Mathematics of Turbulence

Monday September 15, 2014

10:30–12:00 **Gregory Eyink** (Johns Hopkins University)
Mathematical Analysis of Turbulence: III

Tuesday September 16, 2014

10:30–11:00 **Vincent Martinez** (Indiana University)
On Gevrey regularity of equations in fluid mechanics

11:00–11:15 *Discussion and Break*

11:15–11:45 **Gregory Eyink** (Johns Hopkins University)
Publicly available turbulence DNS data base

Wednesday September 17, 2014

10:30–12:00 **Sergei Chernyshenko** (Imperial College)
Polynomial sum of squares in fluid dynamics; for global stability, bounds for time averages, and nonlinear control

Thursday September 18, 2014

10:30–11:00 **Diego Ayala** (University of Michigan)
Optimal vortex states and singularity formation in incompressible flows

11:00–11:15 *Discussion and Break*

11:15–11:45 **Maurits Silvis** (University of Groningen)
The higher-order gradient model for large-eddy simulation of turbulent flows

Friday September 19, 2014

10:30–12:00 **Dwight Barkley** (University of Warwick)
Transitional turbulence in shear flows

Monday September 22, 2014

10:30–12:00 **John Gibbon** (Imperial College)
Regimes of nonlinear depletion and regularity in the 3D Navier-Stokes equations

Tuesday September 23, 2014

10:30–11:00 **Karen Zaya** (University of Illinois at Chicago)
Regularizing Effect of the Forward Energy Cascade in the Inviscid Dyadic Model

Wednesday September 24, 2014

10:30–12:00 **Robert Kerr** (University of Warwick)
Leray scaling in Navier-Stokes reconnection

3:30–4:00 **Aseel Farhat** (Indiana University)
Data Assimilation

4:00–4:30 **Michael Jolly** (Indiana University)
Determining Forms

Thursday September 25, 2014

10:30–11:00 **Andre Souza** (University of Michigan)
Truncated models of optimal heat transport

11:00–11:15 *Discussion and Break*

11:15–11:45 **Theodore Drivas** (Johns Hopkins University)
Spontaneous Stochasticity and Anomalous Dissipation in Burgers Equation

Friday September 26, 2014

10:30–12:00 **Thomas Bewley** (University of California, San Diego (UCSD))
Fundamental performance limitations for NS systems

Monday October 6, 2014

10:30–12:00 **Martin Oberlack** (Technische Universität Darmstadt)
What can Lie symmetry groups teach us on statistical turbulence theory?

2:00–3:00 **David Levermore** (University of Maryland)
Exploring Well-Posedness for Gibbon-Fokas-Doering (GFD) solutions of the Incompressible Navier-Stokes System

Tuesday October 7, 2014

10:30–11:00 **Pooja Rao** (SUNY Stony Brook)
Mixing in 2D Richtmyer-Meshkov instability in high Reynolds number regime

11:00–11:15 *Discussion and Break*

11:15–11:45 **Chuntian Wang** (Indiana University)
Time Discrete Approximation of Weak Solutions for Stochastic Equations of Geophysical Fluid Dynamics and Applications

Wednesday October 8, 2014

10:30–12:00 **Yohann Duguet** (Centre National de la Recherche Scientifique (CNRS))
Laminar-turbulent coexistence in transitional shear flows

2:00–3:00 **Martin Oberlack** (Technische Universität Darmstadt)
Tutorials on Symmetry

Thursday October 9, 2014

10:30–11:30 **Yi-Kang Shi** (Johns Hopkins University)
Toward a Rigorous Derivation of Kinetic Wave Turbulence

Friday October 10, 2014

10:30–12:00 **Philipp Schlatter** (Royal Institute of Technology (KTH))
DNS of turbulent flow in straight and bent pipes

Monday October 20, 2014

10:30–12:00 **Annick Pouquet** (National Center for Atmospheric Research)
Dual constant flux energy cascades to large scales and to small scales in rotating stratified turbulence

2:00–3:00 **David Levermore** (University of Maryland)
Local Approximations of the Pressure Hessian near Vorticity Concentrations in Incompressible Flows

Tuesday October 21, 2014

10:30–11:00 **Nikolaos Bakas** (University of Ioannina)
Self-organization of planetary turbulence. What can we learn by studying the statistical state dynamics

11:00–11:15 *Discussion and Break*

11:15–11:45 **Navid Constantinou** (National and Kapodistrian University of Athens)
Emergence of large-scale structure in planetary turbulence as an instability of the homogeneous turbulent state

2:00–3:00 *Optimization & Control Working Group*

Wednesday October 22, 2014

11:30–12:45 **Roger Temam** (Indiana University)
Boundary layers in the presence of characteristic points

2:00–3:00 **Thomas Bewley** (University of California, San Diego (UCSD))
Hybrid (Variational / Kalman) ensemble methods for state estimation in NS Systems

Thursday October 23, 2014

11:15–11:45 **Julia Stawarz** (University of Colorado Boulder)
The Dissipation of Turbulence in the Earth's Magnetotail

2:00–3:00 *Optimization & Control Working Group*

Friday October 24, 2014

10:30–12:00 *Tour of Jon Aurnou's Lab (Meet in IPAM Lobby)*

Monday November 3, 2014

10:30–11:00 **Jonathan Cheng** (University of California, Los Angeles (UCLA))

11:00–11:15 *Discussion and Break*

11:15–11:45 **Alex Grannan** (University of California, Los Angeles (UCLA))

Tuesday November 4, 2014

10:30–12:00 **Anna Mazzucato** (Pennsylvania State University)
Ensemble dynamics and bred vectors

2:00–3:00 **Thomas Bewley** (University of California, San Diego (UCSD))
On the regularity of spatial convolution kernels for linear feedback control & estimation of perturbations to nearly-parallel flows

Wednesday November 5, 2014

10:30–11:15 **Sebastian Reuther** (Technische Universität Dresden)
Simulation of Active Fluids on Vesicle Membranes

2:00–3:00 **Friedrich Busse** (Universität Bayreuth)
Quasi-Geostrophic Approximation of Anelastic Convection in Spherical Fluid Shells

Thursday November 6, 2014

10:30–12:00 **Joseph Klewicki** (University of New Hampshire)
Self-similarity in the inertial region of wall turbulence

2:00–3:00 **Colm-cille Caulfield** (University of Cambridge)
Cautionary tales about convergence to optimal flow

Monday November 10, 2014

10:30–12:00 **Friedrich Busse** (Universität Bayreuth)
Understanding turbulence through sequences of bifurcations

2:00–3:00 **Peter Schmid** (Imperial College)
Structure identification using DMD

Wednesday November 12, 2014

10:30–12:00 **Alan Kerstein** (Sandia National Laboratories)
Hierarchical parcel-swapping (HiPS) representation of turbulent flow and mixing

Thursday November 13, 2014

10:30–11:00 **Gianluca Meneghello** (University of California, San Diego (UCSD))
Coordinated in-situ observation of developing hurricanes using atmospheric balloons – a Model Predictive Control approach
11:00–11:15 *Break*

11:15–11:45 **Daniele Cavaglieri** (University of California, San Diego (UCSD))
Low-storage implicit/explicit Runge-Kutta schemes for the simulation of turbulent flows

11:45–12:00 *Break*

12:00–12:30 **Pooriya Beyhaghi** (University of California, San Diego (UCSD))
Uncertainty Quantification of an ergodic process, and its application in Simulated-Based Optimization problems

Friday November 14, 2014

10:30–12:00 **Brian Farrell** (Harvard University)
Applying Statistical State Dynamics to Understand Turbulence at Large Scale in Planetary Atmospheres

Monday December 1, 2014

10:30–12:00 **Colm-cille Caulfield** (University of Cambridge)
Too much of a good thing? Destabilisation and mixing induced by stratification in shear flows

Tuesday December 2, 2014

10:30–11:00 **Adolfo Ribeiro** (University of California, Los Angeles (UCLA))
Laboratory-numerical investigation of Rayleigh-Benard convection and magnetoconvection in liquid gallium
11:00–11:15 *Discussion and Break*

11:15–11:45 **Daniel Lithio** (Indiana University)
Synchronization by Determining Forms with Data Assimilation by Feedback Control: A computational study on the Lorenz, KSE, and 2D NSE

Wednesday December 3, 2014

10:30–12:00 **Robert Martin** (Air Force Research Laboratory)
Particle merger and splitting

Friday December 5, 2014

10:30–12:00 **Carolyn Salafia** (Placental Analytics)
Is optimization healthy during life before birth?: Understanding placental network structure and function