

KAVLI INSTITUTE FOR THEORETICAL PHYSICS
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KITP Conference: Recurrence, Self-Organization, and the Dynamics Of Turbulence

(Jan 9-13, 2017)

Coordinators: Dennice Gayme, John Gibson, and Tobias Schneider
Scientific Advisors: Predrag Cvitanović, Bruno Eckhardt and Mike Graham

Monday, Jan 09, 2017

Invariant Solutions of Navier-Stokes 1, Chair: Fabian Waleffe (Wisconsin)

8:50am	Lars Bildsten (KITP)	Welcome
9:00am	Rich Kerswell (Bristol)	Exact coherent structures in stratified plane Couette flow
9:45am	Genta Kawahara (Osaka)	Periodic solutions representing the origin of turbulent bands in channel flow
10:30am		Morning Break
11:00am	Roman Grigoriev (Georgia Tech)	Streamwise localization of relative periodic solutions in channel & pipe flows
11:45am	Carlo Cossu (Toulouse)	Large-eddy exact coherent structures for wall-bounded turbulent shear flows
12:30pm		Lunch Break

Localizaion and Linearity, Chair: Laurette Tuckerman (ESPCI, Paris)

2:00pm	Marc Avila (Bremen)	Physics and modeling of laminar-turbulent interfaces in pipe flow
2:45pm	Stefan Zammert (Delft)	Coherent structures in boundary layers in the quasilinear approximation
3:30pm		Afternoon Break
4:00pm	Adrian Lozano Duran (Stanford)	Information flow and causality of streak-roll interactions in time-resolved wall-bounded turbulence
4:45pm	Steven Tobias (Leeds)	Application of the generalised quasilinear approximation to jets, the helical magnetorotational instability, and rotating Couette Flow
5:30pm		SHUTTLE TO BWSCI

Tuesday, Jan 10, 2017

Experiments in transitional and non-Newtonian flows, Chair: Mike Schatz (Georgia Tech)

9:00am	Tom Mullin (Manchester)	The sensitivity of transition in a pipe
9:45am	Shmuel Rubinstein (Harvard)	Visualizing the dynamics of colliding vortex rings

10:30am **Morning Break**

11:00am Rob Poole (Liverpool)

Low-drag turbulent states in Newtonian and non-Newtonian fluids

11:45am Eduardo Wesfreid (ESPCI, Paris)

New experiments on the subcritical transition to turbulence in Couette-Poiseuille flow

12:30pm

Lunch Break

Invariant Solutions 2: unstable manifolds, Chair: Bruno Eckhardt (Marburg)

2:00pm Mike Schatz (Georgia Tech)

Forecasting turbulence using the geometry of invariant solutions: Experiments, theory and numerics

2:45pm Cédric Beaume (Leeds)

Transitional shear flows: computing exact coherent states in two dimensions

3:30pm

Afternoon Break

4:00pm Burak Budanur (IST Austria)

Unstable manifolds of recurrent flows in pipe flow

4:45pm Predrag Cvitanovic (Georgia Tech)

Turbulence: How fat is it?

5:30pm

RECEPTION

6:00pm

SPECIAL EVENTS DINNER

8:00pm

SHUTTLE TO BWSCI

Wednesday, Jan 11, 2017

Geophysical and large Reynolds number flows, Chair: Greg Chini (New Hampshire)

9:00am Keith Julien (Colorado)

Quasigeostrophic investigations of non-hydrostatic, stably-stratified and rapidly rotating flows

9:45am Navid Constantinou (UC San Diego)

Understanding self-organization in turbulent flows by studying the statistical state dynamics

10:30am

Morning Break

11:00am Kengo Deguchi (Imperial College)

The high Reynolds-number limit of self-sustained magnetohydrodynamic dynamos

11:45am Joe Klewicki (New Hampshire)

Invariant representation of mean inertia provides a theoretical basis for the log law in turbulent boundary layers

12:30pm

Lunch Break

2:00pm

FREE AFTERNOON Shuttle Available to BWSCI

Thursday, Jan 12, 2017

Reduced-order Models, Chair: Dennice Gayme (Johns Hopkins)

9:00am Beverly McKeon (Caltech)

Self-similarity in the resolvent model: Linear response and nonlinear interactions

9:45am Mihailo Jovanovic (Minnesota)

The Color of turbulence

10:30am **Morning Break**

11:00am Ati Sharma (Southampton) Resolvent modes and invariant solutions

11:45am Clancy Rowley (Princeton) Data-driven methods for identifying nonlinear models of fluid flows

12:30pm **Lunch Break**

Pattern Formation and Coherent Structures, Chair: Colm-cille Caulfield (Cambridge)

2:00pm Melissa Green (Syracuse) Tracking coherent structures in massively-separated and turbulent flows

2:45pm Yongyun Hwang (Imperial College) Self-sustaining attached eddies: Skin-friction generation, pressure, and invariant solutions

3:30pm **Afternoon Break**

4:00pm Edgar Knobloch (UC Berkeley) A nonlinear model of noise-sustained structures in subcritical systems

POSTER SESSION

5:30pm **RECEPTION**

6:00pm **SPECIAL EVENTS DINNER**

8:00pm **SHUTTLE TO BWSCI**

Friday, Jan 13, 2017

Transition to Turbulence, Chair: Beverly McKeon (Caltech)

9:00am Laurette Tuckerman (ESPCI, Paris) Transition to turbulence in Waleffe/Kolmogorovian flow

9:45am Björn Hof (IST Austria) Transition to turbulence in channel flow

10:30am **Morning Break**

11:00am Masaki Sano (Tokyo) Universal transition to turbulence in channel flow

11:45am Dan Henningson (KTH, Stockholm) Dynamical systems analysis of transition in boundary layer flows

12:30pm **Lunch Break**

Discussion: Paths Forward

2:00pm All participants-Discussion

3:00pm **CONFERENCE END-SHUTTLE TO BWSCI*Also available to SB Airport and SB Airbus, Goleta location (See Registration Desk before Friday to sign up.)**