Turbulent Mixing and Beyond

Second International Conference and Advanced School

PROGRAM

27 July – 07 August, 2009

The Abdus Salam International Centre for Theoretical Physics

Strada Costiera 11, 34014 Trieste, Italy

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When?

Routine

8.30 – 10.00	lectures, talks, tutorials
10.00 – 10.30	*coffee break*
10.30 – 12.30	lectures, talks, tutorials
12.30 – 14.00	*lunch*
14.00 – 16.00	lectures, talks, tutorials
16.00 – 16.30	*coffee break*
16.30 – 18.30	lectures, talks, tutorials

Poster sessions:	Friday	10.30 – 12.30	31 July (I) and 07 August (II)
Round Tables:	Thursday	16.30 – 18.30	30 July (I) and 06 August (II)
Exhibits:		10.00 – 16.30	28 – 29 July

Where?

Leonardo da Vinci (Main) Building

Lectures, Talks, Tutorials:	Main Lecture Hall
Poster Sessions:	Poster Hallway near Main Lecture Hall
Round Tables:	Meeting Room
Exhibits:	Lobby near Main Lecture Hall
Others:	Seminar room and office
Computer/Internet:	Computer rooms, wireless

Coffee, Receptions, Dinner

Bar (coffee, tea):	Mon–Fri	08.00 – 17.00	Main Building, 4th flour
Coffee Breaks:	Mon–Fri	10.30 and 16.00	near Main Lecture Hall
Receptions:	Tue and Fri	19.00 – 21.00	28 July, 04 Aug, 07 Aug
Banquet:	Fri	19.00 – 21.00	31 July

Special presentations

Remote presentations

Theme: ***High-performance computing and cyber – infrastructure***

GLOSS: Collaborative tagging for scientific data
Svetlozar Nestorov
The University of Chicago, Chicago, Illinois, USA
Time and place to be announced at the Conference

Exhibits

Themes: ***Experimental diagnostics and cyber – physical systems***

Fast-speed imaging
Tim Nicholls
Photron (Europe) Ltd., UK
28 – 30 July 2009, Lobby near Main Lecture Hall

27 July 2009, Monday

8.30 – 9.00 Registration

9.00 – 9.20 Welcome from TMB & ICTP

Themes: Wall–bounded flows, Experimental diagnostics

9.20 – 9.55 Invariant solutions and state–space dynamics in wall–bounded flows
Predrag Cvitanović
Georgia Institute of Technology, USA

9.55 – 10.30 Shock tube investigations of the instability of a two–gas interface accelerated by a shock wave
Evgeny E. Meshkov
Russian Federal Nuclear Center – VNIIEF, Russia

10.30 – 11.00 break

Themes: Material science, Combustion

11.00 – 11.25 High pressure Rayleigh–Taylor experiments at OMEGA and the National Ignition Facility
Hye–Sook Park (talk is given by Bruce Remington)
Lawrence Livermore National Laboratory, USA

11.25 – 11.45 Experimental, theoretical and numerical investigation into Richtmyer–Meshkov instability in condensed matter
Inna Myshkina
Russian Federal Nuclear Center – VNIIEF, Russia

11.45 – 12.30 Development of the ReaxFF reactive force fields and applications to combustion (tutorial)
Adri van Duin
Penn State University, USA

12.30–14.00 lunch

27 July 2009, Monday

Themes: Advanced numerical simulations, Non–equilibrium processes

14.00 – 14.25 Turbulence modeling and Large Eddy Simulations for shock–induced instability and transition to turbulence
Dimitris Drikakis
Cranfield University, UK

14.25 – 15.00 High–order WENO simulation of shock vortex interactions
Chi–Wang Shu
Brown University, USA

15.00 – 15.25 Numerical simulations of the development of regular local perturbations and turbulent mixing behind a shock wave for various shock wave strengths
Yuri Yanilkin
Russian Federal Nuclear Center – VNIIEF, Russia

15.25 – 16.00 Variable–density Rayleigh–Taylor turbulence
Daniel Livescu
Los Alamos National Laboratory, USA

16.00 – 16.30 break

Theme: Canonical turbulence and turbulent mixing

16.30 – 16.55 Non–standard homogenization theory for transport by a strong mean flow and periodic fluctuations
Adnan Khan
Lahore University of Management Sciences, Pakistan

16.55 – 17.30 Examination of Kolmogorov's idea of universality in turbulence by computational approaches
Yukio Kaneda
Nagoya University, Japan

17.30 – 17.55 Effect of helicity and rotation on the free decay of turbulent flows
Tomas Teitelbaum
University of Buenos Aires, Argentina

17.55 – 18.30 Eulerian and Lagrangian statistics from high resolution numerical simulations of weakly compressible turbulence
Luca Biferale
University of Rome tor Vergata & Natl Institute of Nuclear Physics, Italy

28 July 2009, Tuesday

Theme: Geophysics and Earth science

8.30 – 9.15 Anisotropic large–scale circulations and transport and zonostrophic turbulence (tutorial)
Boris Galperin
University of South Florida, USA

9.15 – 10.00 A quasi–normal theory of turbulence and its applications in geophysical fluid dynamics (tutorial)
Semion Sukoriansky
Ben–Gurion University of the Negev, Israel

10.00 – 10.30 break

Themes: Non–equilibrium processes, Magneto–hydrodynamics, Experimental Diagnostics

10.30 – 11.05 On the limits of Navier–Stokes theory and kinetic extensions for gaseous hydrodynamics
Nicolas Hadjiconstantinou
Massachusetts Institute of Technology, USA

11.05 – 11.40 Recent results on magneto–hydrodynamic turbulence
Stanislav Boldyrev
University of Wisconsin at Madison, USA

11.40 – 12.20 Cryogenic techniques applied to fluid turbulence (tutorial)
Joseph J. Niemela
International Center for Theoretical Physics, Trieste, Italy

12.30 – 14.00 lunch

28 July 2009, Tuesday

Themes: ***Mathematical aspects of non–equilibrium dynamics, Canonical turbulence and turbulent mixing, Stochastic processes and probabilistic description***

14.00 – 14.35 Freak waves and modulational instability in ocean
Vladimir E. Zakharov
University of Arizona, USA & Lebedev Inst. Physical Sciences, Russia

14.35 – 15.10 Quantum and classical turbulence in superfluids
Victor L'vov
The Weizmann Institute of Science, Israel

15.10 – 15.35 Evidence of turbulence power laws from image data
Patrick Heas
INRIA Center of Rennes – Bretagne Atlantique, France

15.35 – 16.10 Fluctuations of dissipation scale and turbulent mixing
Victor Yakhot
Boston University, USA

16.10 – 16.30 break

Themes: ***Mathematical aspects of non–equilibrium dynamics, Canonical turbulence and turbulent mixing, Stochastic processes and probabilistic description***

16.30 – 17.05 Lagrangian approach to weakly nonlinear stability of an elliptical flow
Yasuhide Fukumoto
Kyushu University, Japan

17.05 – 17.30 Vortex dynamics in turbulent flows: a Lagrangian viewpoint
Andrea Scagliarini
University of Rome tor Vergata & National Inst. Nuclear Physics, Italy

17.30 – 18.05 Conditional strain rates along gradient trajectories from various scalar fields in turbulence
Lipo Wang
RWTH–Aachen, Germany

18.05 – 18.30 Analyzing transient turbulence in a stenosed carotid artery by proper orthogonal decomposition
Alexander Yakhot
Ben–Gurion University, Israel

19.00 – 21.00 Reception

29 July 2009, Wednesday

Theme: Magneto–hydrodynamics

8.30 – 9.15 Laboratory experiment on colliding plasmas
Walter Gekelman
University of California at Los Angeles, USA

9.15 – 10.05 Nonlinear gyrokinetics: A powerful tool for the description of microturbulence in magnetized plasmas
John A. Krommes (tutorial)
Princeton University, USA

10.05 – 10.30 break

Theme: Stochastic processes and probabilistic description

10.30 – 11.15 Fractional kinetics (tutorial)
Alexander Nepomnyashchy
Technion – Israel Institute of Technology, Israel

11.15 – 11.55 What can be simulated by using particles with mixing and competition?
Alexander Y. Klimenko
The University of Queensland, Australia

11.55 – 12.35 Hybrid stochastic–statistical strategies in climate science
Andrew Majda
Courant Institute of Mathematical Sciences, New York University, USA

12.35 – 14.00 lunch

29 July 2009, Wednesday

Themes: ***Interfacial dynamics,***
Experiments diagnostics

14.00 – 14.35 A PDF of molecular mix measurements in high Schmidt number Rayleigh–Taylor turbulence
Malcolm J. Andrews
Los Alamos National Laboratory, USA

14.35 – 15.10 Dispersion of liquid drops under effect of an air shock wave with intensity from 0.2 atm to up to 42 atm
Nikolay Nevmerzhitsky
Russian Federal Nuclear Center – VNIIEF, Russia

15.10 – 16.00 Holographic optical diagnostics of fluid flows (tutorial)
George Barbastathis
Massachusetts Institute of Technology, USA & Singapore–MIT Alliance for Research and Technology (SMART) Center, Singapore

16.00 – 16.20 break

Theme: ***Astrophysics***

16.20 – 16.55 Applications of Braid theory in vortex dynamics and in solar astrophysics
Mitchell Berger
University of Exeter, UK

16.55 – 17.30 Ambipolar diffusion drifts and dynamos in turbulent gases
Ellen Zweibel
University of Wisconsin at Madison, USA

17.30 – 17.55 Turbulent instabilities in the interstellar medium
Robin Williams
Atomic Weapons Establishment, UK

17.55 – 18.30 Transport in hydro–magnetic turbulence and dynamos
Axel Brandenburg
Nordic Institute for Theoretical Physics, Stockholm, Sweden

30 July 2009, Thursday

Themes: ***Experimental diagnostics,***
High–performance computing and cyber–infrastructure

8.30 – 9.15 New technologies for fluid dynamics experiments and advanced optical diagnostics (tutorial)
Sergei S. Orlov
Stanford University& InPhase Technologies, Inc., USA

9.15 – 10.00 Visualizing peta–scale data sets with VisIt
Henry R. Childs
Lawrence Berkeley National Laboratory & University of California at Davis, USA

10.00 – 10.30 break

Themes: ***Experimental diagnostics,***
Interfacial dynamics,
Canonical plasmas

10.30 – 11.05 Experimental study of compressible turbulent mixing
Kazuyoshi Takayama
Institute of Fluid Science, Tohoku University, Japan

11.05 – 11.30 ICF–related Richtmyer–Meshkov instability: Mach 10 experiments
Devesh Ranjan
Texas A&M University, USA

11.30 – 11.55 Molecular dynamic simulations of hydrodynamic instabilities of shocked interface in planar and cylindrical geometries
Katsunobu Nishihara
Institute of laser Engineering, Japan

11.55 – 12.30 Instabilities and turbulent mixing in electro–hydrodynamics
Eduard Son
Joint Inst. for High Temperature of Academy of Sciences & Moscow Institute of Physics and Technology, Russia

12.30 – 14.00 lunch

30 July 2009, Thursday

Themes: ***Advanced numerical simulations,***
Canonical turbulence and turbulent mixing

14.00 – 14.25 A turbulent mixing Reynolds stress model fitted to match linear interaction: analysis predictions
Jerome Griffond
CEA, DAM, DIF, France

14.25 – 14.50 The three–dimensional multimode Richtmyer–Meshkov instability
B. Thornber
Cranfield University, UK

14.50 – 15.15 Comparison of different approaches to shock–capturing turbulent flow simulations
Asiya Guzhova
Russian Federal Nuclear Center – VNIIEF, Sarov, Russia

15.15 – 15.40 Rayleigh–Taylor instability with localized perturbations
Robin Williams
Atomic Weapons Establishment, UK

15.40 – 16.05 Clustering of inertial particles in free jets
Carlo Massimo Casciola
Università di Roma La Sapienza, Italy

16.05 – 16.30 break

16.30 – 18.30 Round Table - I

31 July 2009, Friday

Themes: ***Advanced numerical simulations,***
Canonical plasmas,
Interfacial dynamics

8.30 – 8.55 Numerical simulations of turbulent flow through a fine screen
Alexander Shklyar
The Volcani Center, Israel

8.55 – 9.30 Controlled study of ionospheric plasma turbulence in radio–wave injection experiments
Min–Chang Lee
Boston University & Massachusetts Institute of Technology, USA

9.30 – 9.55 Shock wave instability with interaction of the shock wave with a region of lowered density in a glow discharge column
Alexander Baryshnikov
Ioffe Physical Technical Institute of Russian Academy of Sciences, Russia

9.55 – 10.30 Oscillation and pinching phenomenon in the Rayleigh–Taylor and Richtmyer–Meshkov instabilities with surface tension
Chihiro Matsuoka
Ehime University, Japan

10.20 – 11.00 break

10.30 – 12.30 Poster Session - I

12.30 – 14.00 lunch

31 July 2009, Friday

Themes: ***Interfacial dynamics,***
Non–equilibrium processes,
High energy density physics

14.00 – 14.25 Specific features of Richtmyer–Meshkov instability growth with 2D and 3D initial perturbation geometry
Oleg Ol'khov
Russian Federal Nuclear Center – VNIIEF, Sarov, Russia

14.25 – 15.00 Reactive dynamics of materials and interfaces at non–equilibrium conditions using first–principles based force fields
William A. Goddard III
California Institute of Technology, USA

15.00 – 15.35 Coherence and randomness in non–equilibrium turbulent processes
Snezhana I. Abarzhi
The University of Chicago, USA

15.35 – 16.10 Probing matter at the extremes: new frontiers in high energy density dynamics
Bruce Remington
Lawrence Livermore National Laboratory, USA

16.10 – 16.30 break

Themes: ***Interfacial dynamics,***
Advanced numerical simulations,
Experimental diagnostics

16.30 – 17.05 The density ratio dependence of self–similar Rayleigh–Taylor mixing
David L. Youngs
Atomic Weapons Establishment, UK

17.05 – 17.30 Lag modeling of subgrid–scale dissipation in Large Eddy Simulation
Sergei Chumakov
Center for Turbulence Research, Stanford University, USA

17.30 – 18.05 Understanding experimental diagnostics and results for code and model validation
Katherine P. Prestridge
Los Alamos National Laboratory, USA

18.05 – 18.30 New models to capture evolution of molecular mix and de–mix in variable–density flows
Krista Stalsberg–Zarling
Los Alamos National Laboratory, USA

19.00 – 21.00 Conference and School Banquet

Poster Presentations

Sessions I and II

- ***Canonical turbulence and turbulent mixing***

P–1

Study of the influence of micromixing model properties on an averaged chemical reaction rate in a turbulent flow
Andrei Chorny
A. V. Luikov Heat and Mass Transfer Inst of National Academy of Sciences, Belarus

P–2

Polymer additives in two–dimensional turbulence
Anupam Gupta
Indian Institute of Science at Bangalore, India

P–3

Energy spectrum and fluxes in Rayleigh–Benard convection
Pankaj K. Mishra
Indian Institute of Technology at Kanpur, India

P–4

Inertial particles in a two–dimensional random flow
Benjamin Pergolizzi
Observatoire de la Cote d'Azur, Nice, France
Rayleigh instability in a vortex–induced unsteady boundary layer

- ***Wall–bounded flows***

P–5

Rayleigh instability in a vortex–induced unsteady boundary layer
Alexander Obabko
Argonne National Laboratory, USA

P–6

Suppression of turbulent vortex shedding from a square cylinder in proximity to a wall
Mehrdad Raisee Dehkordi
University of Tehran, Tehran, Iran

P–7

Development of velocity and pressure disturbances in the near–wall region over deforming absorbing surface
Yaroslav Zagumennyi
Institute of Hydromechanics of National Academy of Sciences, Ukraine

- ***Interfacial dynamics & Non–equilibrium processes***

P–8

Turbulent mixing at gas–liquid interface with the width of the mixing zone up to 200 mm
Nikolay Nevmerzhitsky
Russian Federal Nuclear Center – VNIIEF, Sarov, Russia

- ***High energy density physics***

P–9

Evolution of small perturbations in the inertial confinement fusion (ICF) targets
Lev Ktitorov
Keldysh Inst. Applied Mathematics & Lomonosov Moscow State University, Russia

- ***Material science***

P–10

Rayleigh–Taylor instability in a visco–plastic fluid
Aleksey Doludenko
Moscow Institute for Physics and Technology, Russia

P–11

Experimental, theoretical and numerical investigation into Richtmyer–Meshkov instability in condensed matter
Oleg Olkhov
Russian Federal Nuclear Center – VNIIEF, Russia

- ***Astrophysics***

P–12

Application of control theory to expanding turbulent media
Gregory Vesper
The University of Chicago, USA

- ***Magneto–hydrodynamics***

P–13

Turbulent interchange mixing in a dipole–confined plasma
Brian Grierson
Columbia University, USA

P–14

Two–fluid magnetic reconnection
Leonid Malyshkin
The University of Chicago, USA

- ***Canonical plasmas***

P–15

Waves in expanding laser–produced plasmas
Andrew Collette
University of California at Los Angeles, USA

P–16

Non–stationary turbulent mixing of multichannel discharge plasma and electrolyte
Almaz Gaysin
A. N. Tupolev Kazan State Technical University, Russia

P–17

Turbulent mixing of plasma and electrolyte in multi–channel discharge between a droplet and electrolyte
Rushan Kayumov
A. N. Tupolev Kazan State Technical University, Russia

P–18

Correlation analyses of simultaneously excited large–scale ionospheric plasma turbulence and magnetic field fluctuations produced by a high–frequency heater at Gakona, Alaska
Rezy Pradipta
Massachusetts Institute of Technology, USA

- ***Physics of atmosphere & Geophysics and Earth sciences***

P–19

One–dimensional vertical model for the atmospheric boundary layer
Arpad Bordas
University of Novi Sad, Serbia

- ***Combustion***

P–20

Selectivity of competitive – consecutive reactions depending on turbulent mixing conditions in a co–axial jet mixer
Andrei Chorny
A.V. Luikov Heat and Mass Transfer Inst National Academy of Sciences, Belarus

P–21

The effects of burning on the development of 2D turbulence
Elizabeth Hicks
The University of Chicago, USA

P–22

Effects of dissipation rate models of mixture–fraction on stable and unstable solutions of SLFM
Jian Zhang
LNM, Institute of Mechanics, National Academy of Sciences, China

P–23

Turbulent mixing and large–scale coherent vortical structures inside the vortex chamber with fixed dead–end
Andrey Voskoboinick
Institute of Hydromechanics, National Academy of Sciences, Ukraine

- ***Mathematical aspects of non–equilibrium dynamics & Stochastic processes and probabilistic description***

P–24

The kinematic instability in nonstationary gasdynamics
Sergey Kholin
Russian Federal Nuclear Center – VNIIEF, Russia

- ***Advanced numerical simulations***

P–25

On modeling of Saffman–Taylor instability with regularization
Marina Belotserkovskaya
Institute for Computer Aided Design of Russian Academy of Sciences, Russia

P–26

On vortex cascades in shear flow instabilities
S.V. Fortova
Institute for Computer Aided Design of Russian Academy of Sciences, Moscow, Russia

P–27

Numerical simulation of reacting flows using spectral deferred corrections
Candace Gilet
University of California at Berkeley & Lawrence Berkeley National Laboratory, USA

P–28

On the assessment of Large Eddy Simulation of particle–pair statistics in turbulence
Guodong Jin
LNM, Institute of Mechanics, Chinese Academy of Sciences, China

P–29

Numerical investigation of the turbulent mixing in a converging shock tube
Yi Liu
Atomic Weapons Establishment, UK

P–30

Compressibility effects on single–mode Rayleigh–Taylor instability
Scott James Reckinger
University of Colorado, Boulder, USA

P–31

Direct numerical simulation of scalar transfer in regular and fractal grid turbulence
Hiroki Suzuki
Nagoya University, Japan

- ***Experimental diagnostics***

P–32

Experimental investigation of a twice–shocked spherical density inhomogeneity
Nick Haehn
University of Wisconsin – Madison, USA

P–33

The dispersion of lines written in a turbulent jet flow
Mehrnoosh Mirzaei
Applied Molecular Physics, Radboud University, Nijmegen, Netherlands

P–34

The influence of the Mach number of a shock wave on turbulent mixing growth at the interface
Nikolay Nevmerzhitsky
Russian Federal Nuclear Center – VNIIEF, Russia

P–35

High Schmidt number scalar transfer in regular and fractal grid turbulence
Hiroki Suzuki
Nagoya University, Nagoya, Japan

1 August 2009, Saturday

Theme: ***Free Time***

2 August 2009, Sunday

Theme: ***Free Time***

3 August 2009, Monday

Theme: ***Astrophysics***

8.30 – 9.00 Turbulence and turbulent mixing in natural fluids
Carl Gibson
University of California at San Diego, USA

9.00 – 9.25 Magnetohydrodynamic simulations of local solar supergranulation
Sergey Ustyugov
Keldysh Institute of Applied Mathematics, Russia

9.25 – 10.00 Joys of highly turbulent solar convection and magnetic dynamos
Juri Toomre
University of Colorado at Boulder, USA

10.00 – 10.30 break

Themes: ***Combustion,***
Material science

10.30 – 10.55 Two–point closure method for turbulence with reacting and mixing chemical elements of type A + B → C
Mayoordhwaj Meshram
Rashtrasant Tukadoji Maharaj Nagpur University, India

10.55 – 11.20 Analogy of meteorite impacts in laboratory conditions
Tara Desai
Università Milano–Bicocca, Italy

11.20 – 11.55 Melt–dispersion mechanism for reaction of aluminum nano– and micron–scale particles
Valery I. Levitas
Iowa State University, USA

11.55 – 12.30 Atomistic simulations of material dynamics and interfaces under high–rate mechanical or thermal loading
Sergey Zybin
California Institute of Technology, USA

12.30 – 14.00 lunch

3 August 2009, Monday

Themes: Physics of atmosphere, Wall–bounded flows

14.00 – 14.25 Forecasting atmospheric turbulence for adaptive optics application: models comparison of vertical turbulence profile

Lidia Bolbasova

Institute of Atmospheric Optics of the Siberian Branch of the Russian Academy of Sciences, Russia

14.25 – 15.00 Using satellite measurements of stellar scintillation for mapping turbulence in the stratosphere

Viktoria Sofieva

Finnish Meteorological Institute, Finland

15.00 – 15.35 The quest for high Reynolds number wall – bounded experiments – why, where and how?

Henrik Alfredsson

Royal Institute of Technology (KTH), Sweden

15.35 – 16.10 Turbulence modeling for flow control

Jurgen Seidel

United States Air Force Academy, USA

16.10 – 16.30 break

Theme: High energy density physics

16.30 – 17.05 Nonlinear non–stationary self–organized asymptotic structures in high energy density plasmas and non–equilibrium Euler turbulence

Bedros Afeyan

Polymath Research Inc., USA

17.05 – 17.30 Turbulence generation by a shock wave interacting with a random density inhomogeneity field

Cesar Huete Ruiz de Lira

University of Castilla La Mancha, Spain

17.30 – 18.05 Magnetically driven supersonic plasma jets in high energy density experiments

Sergey Lebedev

The Imperial College London, UK

18.05 – 18.30 Dynamics of laser–driven shock waves in solid targets observed with monochromatic X–ray imaging

Yefim Aglitskiy

Naval Research Laboratory & Science Applications Int. Corporation, USA

4 August 2009, Tuesday

Themes: ***Canonical turbulence and turbulent mixing,***
High energy density physics,
Magneto–hydrodynamics

8.30 – 8.55 Lagrangian statistical theory of fully–developed hydrodynamic turbulence
Valeria Sirota
P. N. Lebedev Physical Institute, Russian Academy of Sciences, Russia

8.55 – 9.25 Suppression of Rayleigh–Taylor instability and impact ignition
Hiroshi Azechi
Institute of Laser Engineering, Japan

9.25 – 10.10 Gyrokinetic simulation of turbulent transport in fusion plasmas
Ronald Waltz
General Atomics Corporation, San Diego, USA

10.10 – 10.30 break

Theme: ***Astrophysics***

10.30 – 11.05 Shock generated vorticity in the interstellar medium and origins of the stellar initial mass function
Ralph E. Pudritz
McMaster University, Canada

11.05 – 11.30 Weakly compressible turbulence in local interstellar medium and three–dimensional modeling using Large Eddy Simulations method
Arakel Petrosyan
Space Research Institute of the Russian Academy of Sciences, Russia

11.30 – 12.05 Transitional solar dynamics, cosmic rays, and global warming
Alexander Bershadskii
Institute for Cosmology and Astrophysical Research, Israel

12.05 – 12.30 The statistics of supersonic isothermal turbulence
Alexei Kritsuk
University of California at San Diego, USA

12.30 – 14.00 lunch

4 August 2009, Tuesday

Theme: Geophysics and Earth science

14.00 – 14.35 Rotating turbulent flows in the presence of helicity
Annick Pouquet
National Center for Atmospheric Research, USA

14.35 – 15.05 Recent developments in stratified turbulence
Aline Cotel
University of Michigan at Ann Arbor, USA

15.05 – 15.35 Dynamics of oceanic zonal jets
Balu Nadiga
Los Alamos National Laboratory, USA

15.35 – 16.00 Statistical properties of wind wave breaking crests from field measurements
Alexei Mironov (a.k.a. Oleksii Myronov)
Marine Hydro–physical Institute, Sevastopol, Ukraine

16.00 – 16.30 break

Themes: Interfacial dynamics, Canonical turbulence and turbulent mixing

16.30 – 17.15 Compressibility effects in fluid flows (tutorial)
Serge Gauthier
CEA/DAM/DIF, France

17.15 – 17.40 Oscillatory behavior in the Rayleigh–Taylor instability for compressible fluids
Xavier Barthelemy
CEA/DAM/DIF, France

17.40 – 18.15 Transition to turbulence for flows without linear criticality
Masato Nagata
Kyoto University, Japan

18.15 – 18.40 Velocity and concentration fields in turbulent buoyant mixing inside a tilted tube
Jemil Znaien
University of Paris–Sud, France

19.00 – 21.00 Reception

5 August 2009, Wednesday

Theme: High energy density physics

8.30 – 8.55 The model of energy transport in turbulent sub–critical laser plasmas of porous targets
Ivan Lebo
Moscow State Institute of Radio–engineering, Electronics and Automation (Technical University – MIREA), Russia

8.55 – 9.20 Blast–wave–driven Rayleigh–Taylor instabilities
Bruce Fryxell
University of Michigan at Ann Arbor, USA

9.20 – 10.05 Instabilities, turbulence and energy coupling into Z–pinch plasmas (tutorial)
Alexander Velikovich
Naval Research Laboratory, USA

10.05 – 10.30 break

Theme: Advanced numerical simulations

10.30 – 11.05 Turbulent mixing, transport and subgrid models
James J. Glimm
State University at Stony Brook & Brookhaven Natl. Laboratory, USA

11.05 – 11.40 Entropy stable approximations of Navier–Stokes equations with no artificial numerical viscosity
Eitan Tadmor
University of Maryland at College Park, USA

11.40 – 12.05 On temperature in a rotating gas tube
Oleg Troshkin
Inst. Computer Aided Design of Russian Academy of Sciences, Russia

12.05 – 12.30 Transition to chaos: numerical experiment
Oleg Belotserkovskii
Inst. Computer Aided Design of Russian Academy of Sciences, Russia

12.30 – 14.00 lunch

5 August 2009, Wednesday

Theme: Advanced numerical simulations

14.00 – 14.45 Implicit Large Eddy Simulation methods (tutorial)
Fernando Grinstein
Los Alamos National Laboratory, USA

14.45 – 15.20 Using and abusing computational fluid dynamics
Robert Rosner
The University of Chicago, USA

15.20 – 15.55 Geometric structure and subgrid–scale modeling in turbulence
Dale Pullin
Graduate Aerospace Laboratories
California Institute of Technology, USA

15.55 – 16.20 break

Theme: Stochastic processes and probabilistic description

16.20 – 16.55 Dynamics of droplets bouncing on a liquid interface: a macroscopic type of wave–particle duality
Yves Couder
Université Paris Diderot – Paris, France

16.55 – 17.20 Long–time behavior of stochastic flows
Leonid Koralov
University of Maryland, College Park, USA

17.20 – 17.55 Anomalous transport and reactions in turbulent flow
Sergei Fedotov
The University of Manchester, UK

17.55 – 18.20 Probability distribution function for self–organization of shear flows
Eun–jin Kim
The University of Sheffield, Western Bank, Sheffield, UK

6 August 2009, Thursday

Themes: ***Stochastic processes and probabilistic description, Interfacial dynamics, Magneto–hydrodynamics***

8.30 – 8.55 Large–scale flows in natural and mixed convection
Jorge Bailon–Cuba
Technische Universität Ilmenau, Germany

8.55 – 9.30 Kinetic theoretical approach to the mixing process due to Rayleigh–Taylor instability
Giora Hazak
Nuclear Research Center, Israel

9.30 – 10.05 Turbulence spreading in magnetically confined plasmas
Taik Soo Hahm
Plasma Physics Laboratory, Princeton University, USA

10.05 – 10.30 break

Theme: ***Mathematical aspects of non–equilibrium dynamics***

10.30 – 11.05 Dynamics on shocks and the optimal transport problem
Konstantin Khanin
University of Toronto, Canada

11.05 – 11.30 Velocity and energy profiles in two– versus three–dimensional channels: effects of inverse versus direct energy cascade
Oleskii Rudenko
The Weizmann Institute of Science, Israel

11.30 – 12.05 The helicity cascade in isotropic and homogeneous turbulence
Pablo D. Mininni
University of Buenos Aires, Argentina & National Center for Atmospheric Research, Boulder, Colorado, USA

12.05 – 12.30 Unstable periodic orbits for the Navier–Stokes equations
Louis Fazendeiro
University College of London, UK

12.30 – 14.00 lunch

6 August 2009, Thursday

Themes: ***Stochastic processes and probabilistic description,***
Mathematical aspects of non-equilibrium dynamics,
Astrophysics,
Advanced numerical simulations

14.00 – 14.45 Concrete problems of chaotic and clustering time–series analysis (tutorial)
Alexander Bershadskii
Institute for Cosmology and Astrophysical Research, Israel

14.45 – 15.10 Transport of pollutions by thermo–convective currents under frozen parametric disorder
Denis Goldobin
Perm State University, Perm, Russia

15.10 – 15.45 Helioseismology, turbulent convection and the solar tachocline
Michael J. Thompson
University of Sheffield, UK

15.45 – 16.10 Implementation of turbulence models in an unstructured hybrid mesh finite volume CFD code and its application for study of a forward facing step
Janardanan Sarasamma Jayakumar
Bhabha Atomic Research Centre, India

16.10 – 16.30 break

16.30 – 18.30 Round Table - II

7 August 2009, Friday

Themes: ***Wall-bounded flows,***
Experimental diagnostics,
Physics of Atmosphere

8.40 – 9.05 Numerical simulation of turbulence transition regimes in pipe flow using solenoidal bases

Ozan Tugluk

Middle East Technical University, Turkey

9.05 – 9.30 A DNS based Tomo–PIV accuracy assessment

Nicholas Worth

University of Cambridge, UK

9.30 – 9.55 Hyper–cooling in the atmospheric surface layer: radiative processes

Vasudevan Mukund

Jawaharlal Nehru Centre for Advanced Scientific Research, India

9.55 – 10.30 A regularized inhomogeneous statistical dynamical turbulence closure and its application to problems in atmospheric dynamics

Terence O'Kane

Commonwealth Scientific and Industrial Research Organization, Marine and Atmospheric Research & Center for Australian Climate and Weather Research, Australia

10.30 – 11.00 break

10.30 – 12.30 Poster Session - II

12.30 – 14.00 lunch

7 August 2009, Friday

Themes: ***Wall–bounded flows,***
Non–equilibrium processes,
Advanced numerical simulations

14.00 – 14.45 Theory of drag reduction by polymers in wall–bounded turbulence
Itamar Procaccia
The Weizmann Institute of Science, Israel

14.45 – 15.20 Vortex reconnections
Katepalli R. Sreenivasan
International Center for Theoretical Physics, Italy & University of Maryland at College Park, USA

15.20 – 16.00 An introduction to uncertainty quantification
Bruce Fryxell
University of Michigan at Ann Arbor, USA

16.00 – 16.20 break

Themes: ***Canonical turbulence and turbulent mixing,***
Interfacial dynamics,
Advanced numerical simulations,
Wall–bounded flows

16.20 – 16.55 Turbulent suspensions of heavy particles
Jeremie Bec
Observatoire de la Côte d'Azur, France

17.05 – 17.30 Analysis of hydrodynamic instability growth in a 2D flow
Victor Sivolgin
Lomonosov Moscow State University, Russia

17.30 – 17.50 On implicit Large Eddy Simulation of material turbulent mixing
Fernando Grinstein
Los Alamos National Laboratory, USA

17.50 – 18.10 A parallel finite volume–finite element method for transient compressible turbulent flows with heat transfer
Masoud Ziaei–Rad
Sharif University of Technology, Iran

18.10 – 18.30 Summary

19.00 – 21.00 Reception

Presentations on waiting list

Tutorials

Abarzhi, Snezhana I.

Barbastathis, George

Brandenburg, Axel

Bershadskii, Alexander

Fukumoto, Yasuhide

Gauthier, Serge

Galperin, Boris

Gekelman, Walter

Grinstein, Fernando

Khanin, Konstantin

Krommes, John A.

Nagata, Masato

Nepomnyashchy, Alexander

O'Kane, Terence

Pouquet, Annick

Procaccia, Itamar

Pullin, Dale

Shu, Chi-Wang

Sukoriansky, Semion

8 August 2009, Saturday

Theme: ***Free Time***

Theme: ***Organizing Committee Meeting***

9 August 2009, Saturday

Theme: ***Free Time***

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