The Abdus Salam
International Centre
for Theoretical Physics
50th Anniversary 1964–2014

United Nations Educational, Scientific and Cultural Organization

IAEA
International Atomic Energy Agency

TMB
2014

PROGRAMME

Turbulent Mixing and Beyond Workshop
Mixing in Rapidly Changing Environments – Probing Matter at the Extremes

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Turbulent Mixing and Beyond Workshop

Mixing in Rapidly Changing Environments - Probing Matter at the Extremes

PROGRAMME

04-09 August, 2014

The Abdus Salam International Centre for Theoretical Physics

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http://www.ictp.it/~tmb/, http://tmbw.org

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- UNESCO- IAEA International Centre for Theoretical Physics (ICTP), Italy
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- Institute for Laser Engineering (ILE), Japan
- Institute of Physics Publishing (IOP), UK
- Physica Scripta, The Journal of the Royal Swedish Academy of Sciences for the Science Academies and the Physical Societies of the Nordic Countries

When?

Routine

9.00 – 10.00	lectures, talks
10.00 – 10.30	*coffee break*
10.30 – 12.30	lectures, talks
12.30 – 14.00	*lunch*
14.00 – 16.00	lectures, talks
16.00 – 16.30	*coffee break*
16.30 – 18.30	lectures, talks

Parallel sessions

05 August 2014	Tuesday	14.00 – 16.00
06 August 2014	Wednesday	14.00 – 16.00
07 August 2014	Thursday	14.00 – 16.00
08 August 2014	Friday	14.00 – 16.00

Poster session:	05 August 2014	Tuesday	17.35 – 19.00
Round Table Discussions:	07 August 2014	Thursday	17.55 – 19.00

Where?

Adriatico Building, ICTP

Lectures, Talks:	Kastler Lecture Hall
Lectures, Talks:	Giambiagi Lecture Hall
Poster Sessions:	Poster area near Kastler Lecture Hall
Round Tables:	Lundqvist Lecture Hall
Others:	Seminar room and office
Computer/Internet:	Computer rooms, wireless

Coffee, Receptions, Banquet

Adriatico Building

Bar (coffee, tea):	Mon–Fri	07.30 – 16.00, 18.30-21.30
Coffee Breaks:	Mon–Fri	10.00-10.30, 16.00-16.30
Receptions:	Sunday 03 August 19.00-21.00; Friday 08 August 19.00 – 21.00	
Formal Reception:	Wednesday 06 August 19.00 – 21.00	

03 August 2014 Sunday

Theme: Free time, Registration

09.00-19.00 Free time

19.00-21.00 Registration

19.00-21.00 Reception

04 August 2014 Monday

Kastler Lecture Hall

Theme: Introduction

8.00-8.30	Registration	
8.30-9.00	Welcome – TMBW-2014 Welcome – ICTP	

Theme: Plasmas and fusion plasmas

9.00-9.30	Self-organization and transport processes (e.g. momentum) in high energy plasmas	Coppi, B.
9.30-10.05	Explosive mixing in magnetized plasmas	Cowley, S.
10.05-10.30	*Coffee Break*	

Theme: Turbulence and stochastic processes

10.30-11.00	Structural instability of a subdiffusive fractional equation and its regularization	Fedotov, S.
11.00-11.35	Streamline segments in turbulent flows and their statistics	Peters, N.
11.35-12.10	Experimental Investigation of the emergence of chaos in the dynamics of current sheets and flux ropes	Gekelman, W.
12.10-12.40	An energy-enstrophy method for global stability in two-dimensional hydrodynamics	Tsang, Y.-K.
12.40-14.00	*Lunch*	

04 August 2014 Monday

Kastler Lecture Hall

Theme: High energy density physics

14.00-14.35	Novel regimes of fluid flows, instabilities, and mixing in high energy density settings	Remington, B.A.
14.35-15.05	Self-generated magnetic fields in Rayleigh-Taylor unstable laser produced plasmas	Igumenshchev I.V.
15.05-15.35	Multiphase equations of state for metals under intense pulsed influences	Khishchenko, K.V.
15.35-16.10	Suppression of Rayleigh-Taylor instability and its application to impact ignition	Azechi, H.

16.10-16.30 *Coffee Break*

Theme: Experimental diagnositcs, Physics of atmosphere, Magneto-hydrodynamics

16.30-17.00	Flow and grow: simultaneous global measurement of velocity fields and reaction fronts	Kelley, D.H.
17.00-17.35	Angular momentum "unmixing" and anisotropic turbulence - laboratory experiments	Galperin, B.
17.35-18.10	Rayleigh-Taylor Instabilities and non-equilibrium plasma dynamics in rapidly changing ionospheric environments	Mahalov, A.
18.10-18.40	Turbulence spreading in magnetized plasmas	Hahm, T.S.

05 August 2014 Tuesday

Kastler Lecture Hall

Theme: Interfacial and turbulent mixing

9.00-9.30	Rayleigh-Taylor instability and accelerated interfacial mixing	Abarzhi, S.I.
9.30-10.05	Turbulent (?) mixing zone	Meshkov, E.E. Video-conference

10.05-10.30 *Coffee Break*

Theme: Plasmas, Magneto-hydrodynamic instabilities, Material Science

10.30-11.05	Staircases in fluids and plasmas-structure formation from inhomogeneous mixing	Diamond, P.H.
11.05-11.35	Richtmyer-Meshkov instability in plasmas - magnetohydrodynamic evolutions and the dependence on equation of state	Sano, T.
11.35-12.05	Nonlinear dynamics of non-uniform current-vortex sheets in magnetohydrodynamic flows	Matsuoka, C.
12.05-12.40	Two-phase expansion of tin droplet heated by a short laser pulse: cavitation, foaming and formation of shell in streched metastabel liquid	Nishihara, K.

12.40-14.00 *Lunch*

05 August 2014 Tuesday

Kastler Lecture Hall

Theme: Turbulence, Hydrodynamic instabilities, Interfacial and turbulent mixing

14.00-14.30	Theoretical study of anisotropic MHD turbulence with low magnetic Reynolds number	Sukoriansky, S.
14.30-15.05	Direct numerical simulation and implicit large eddy simulation of Rayleigh-Taylor mixing	Youngs, D. L.
15.05-15.40	Perturbation theory and numerical modeling of weakly and moderately nonlinear dynamics of the incompressible Richtmyer-Meshkov instability	Herrmann, M.
15.40-16.10	Lessons learned from numerical simulations of interfacial instabilities over the past decade	Cook, A.W.

Giambiagi Lecture Hall

Theme: Astrophysics, Magneto-hydrodynamics

14.00-14.30	Neutrino radiation transport in core-collapse supernovae	Endeve, E.
14.30-15.05	Evolution and observational signatures of primordial magnetic fields	Kahniashvili, T.
15.05-15.35	Turbulent mixing in plasma astrophysics. Weakly compressible turbulence in local interstellar medium	Petrosyan, A.
15.35-16.05	Azimuthal and helical magnetorotational instabilities to non-axisymmetric perturbations	Fukumoto, Y.

16.05-16.30 *Coffee Break*

Kastler Lecture Hall

Theme: Geophysics, Turbulence, Mathematical aspects

16.30-17.00	Stretching, coalescence and mixing in porous media	Le Borgne, T.
17.00-17.35	Lagrangian coherent structures in turbulence	Haller, G.

Poster area near Kastler Lecture Hall

17.35-19.00 Poster presentations

06 August 2014 Wednesday

Kastler Lecture Hall

Theme: Shocks and instabilities

9.00-9.30	New growth rates of non-uniformities for a spherically converging shock	Murakami, M.
9.30-10.00	On the mechanism of Kelvin-Helmholtz instability supression in high speed flows	Girimaji, S.

10.00-10.30 *Coffee Break*

Theme: Turbulence, Turbulent mixing

10.30-11.05	Basics of turbulent mixing	Sreenivasan, K.R.
11.05-11.30	Turbulence in the presence of thermal non-equilibrium	Donzis, D. A.
11.30-12.00	Small scale statistics in fully developed turbulence - in light of high resolution direct numerical simulations	Kaneda, Y.
12.00-12.30	Mixing of active scalars in variable-viscosity flows	Luminita, D.D.

12.40-14.00 *Lunch*

06 August 2014 Wednesday

Kastler Lecture Hall

Theme: Turbulence, Physics of Atmosphere, Geophysics

14.00-14.25	Coriolis-induced redistribution of turbulent kinetic energy and atmospheric scintillations	Petty, C. A.
14.25-14.50	Non-Newtonian turbulence and a generalized phase transition	Baumert, H.Z.
14.50-15.15	Turbulent transport at a simplified clear air/cloud interface	Gallana, L.
15.15-15.40	Mixing-induced dissolution in unstable reactive flow	Hidalgo, J.J.
15.40-16.05	Solute blob evolution in a Darcy scale heterogeneous porous medium: topological controls of mixing	Dentz, M.

Giambiagi Lecture Hall

Theme: High energy density physics, Turbulence, Interfacial mixing, Combustion

14.00-14.25	Numerical study of effect of initial perturbation spectrum on the development of gravitational turbulent mixing	Statsenko, V.P.	TMB4U, Video-conference
14.25-14.50	Reduced modeling for exact coherent structures in parallel shear flows	Beaume, C.	TMB4U
14.50-15.15	The local structure of scalar fields with varying diffusivities at high Reynolds numbers	Gauding, M.	TMB4U
15.15-15.40	Rayleigh-Taylor unstable flames: instability, turbulence and burning	Hicks, E.P.	TMB4U
15.40-16.05	Numerical investigation of relatvistic shock-vortex interaction	Konyukhov, A.V.	

16.10-16.30 *Coffee Break*

Kastler Lecture Hall

Theme: Turbulence

16.30-17.00	Universality of small scale statistics of passive scalar in turbulence	Gotoh, T.
17.00-17.35	Evolution of a neutron-initiated micro-Big-Bang in superfluid 3He.	Procaccia, I.
17.35-18.10	Cryogenic thermal convection - experimental investigation	Skrbek, L.
18.10-18.35	The influence of confinement shape on the scaling of turbulent fluctuations in convection	Niemela, J.J.

19.00-21.00 *Formal Reception*

07 August 2014 Thursday

Kastler Lecture Hall

Theme: Plasmas, Interfacial mixing

9.00-9.30	Self-organization by maximizing entropy on a foliated phase space	Yoshida, Z.
9.30-10.00	Stability of a hydrodynamic discontinuity	Abarzhi, S.I.

10.00-10.30 *Coffee Break*

Theme: High energy density physics, Material science

10.30-11.00	Diagnosing hot-spot mix with x-Ray spectroscopy	Regan, S.P.
11.00-11.35	Simulating and diagnosing shell RhoR perturbations and hot-spot mix in NIF capsule implosions	Hammel, B.A.
11.35-12.10	Instability of a planar detonation front in condensed-phase explosives: from laminar to turbulent detonation via a cellular detonation regime	Zhakhovsky, V.
12.10-12.40	Rayleigh-Taylor in accelerated solids	Piriz, A.R.

12.40-14.00 *Lunch*

07 August 2014 Thursday

Kastler Lecture Hall

Theme: Experimental diagnostics, Geophysics

14.00-14.30	Probing the interface between a plasma jet and an ambient plasma	Vincena, S.
14.30-15.00	Understanding biolocomotion in fluids: swimming and flying	Zhang, J.
15.00-15.30	A platform for high-energy-density hydrodynamic shear experiments on the NIF	Doss, F.W.
15.30-16.05	Geostrophic turbulence in rotating Rayleigh-Benard convection	Ecke, R.E.

Giambiagi Lecture Hall

Theme: Mathematical aspects of non-equilibrium dynamics

14.00-14.30	A path integral formalism for non-equilibrium Hamiltonian statistical systems	Kleeman, R.
14.30-15.00	Quasi-solution approach to nonlinear problems	Tanveer, S.
15.00-15.30	Instabilities of the sidewall boundary layer in a rapidly rotating split cylinder	Lopez, J.M.
15.30-16.00	Mass transfer in drug delivery systems	Nepomnyashchy, A.A.

16.00-16.30 *Coffee Break*

Kastler Lecture Hall

Theme: Plasmas, Magneto-hydrodynamics, Turbulence

16.30-16.55	Turbulence in the solar wind, spectra from Voyager-2 data	Fraternale, F. TMB4U
16.55-17.20	Minimal flow units for passive scalars or MHD turbulence	Paolo, O.
17.20-17.55	Numerical and experimental study of the free flow speed increase in a set of guiding surfaces	Ktitorov, L. TMB4U

Lundqvist Lecture Hall

17.55-19.00 Round table discussions

08 August 2014 Friday

Kastler Lecture Hall

Theme: Physics of Atmosphere, Geophysics

9.00-9.25	Flow fine structure around an impermeable obstacle in a continuously stratified environment	Zagumennyi, Ia.V.
9.25-10.00	Differential fluid mechanics - coupled analytical, numerical and laboratory modeling of environmental processes	Chashechkin, Y. D.

10.00-10.30 Coffee Break

Theme: High energy density physics, Magneto-hydrodynamics

10.30-11.05	Transient effects in unstable mixing layers and ablation fronts in HEDP	Gauthier, S.
11.05-11.35	Energetics, mixing and acceleration in spontaneously reconnecting environments	Beresnyak, A.
11.35-12.05	Three-dimensional simulations of National Ignition Facility implosions with mix and low-mode shape perturbations	Spears, B. K.
12.05-12.40	Progress in the understanding of instability growth in Inertial Confinement Fusion implosions on the National Ignition Facility	Robey, H. F.

12.40-14.00 Lunch

08 August 2014 Friday

Kastler Lecture Hall

Theme: Interfacial and turbulent mixing, Turbulence

14.00-14.20	Solving self-similar equations of k-epsilon model in the shear turbulent mixing problem and its numerical simulation	Tretyachen-ko, Y.V.	TMB4U. Video-conference
14.20-14.40	Schmidt and Prandtl number dependence of RT mixing at large Reynolds number	Hutchinson, M.L.	TMB4U
14.40-15.00	Effect of initial conditions on late-time evolution to turbulence of Rayleigh Taylor instability under variable acceleration histories	Aslangil, D.	TMB4U
15.00-15.20	Vortex ring induced stratified mixing	Olsthoorn, J.;	TMB4U
15.20-15.40	Exploring the effects of a rigid body on the evolution of the Rayleigh Taylor instability	Brown, C.	TMB4U
15.40-16.00	Turbulence and mixing layers in Rayleigh-Taylor instability	Schneider, N.	TMB4U

Giambiagi Lecture Hall

Theme: Stochastic processes, Turbulence, Numerical modeling, Combustion and reactive flows

14.00-14.20	Using geometric representations to find periodic orbits in the Lorenz system.	Nicholson, S. B.	TMB4U
14.20-14.40	Sheared stably stratified turbulence and large-scale waves in a lid driven cavity	Cohen, N.	TMB4U
14.40-15.00	Disrupting bacteria accumulation by chemotaxis in heterogeneous flow structures and incomplete mixing conditions	de Anna, P.	TMB4U
15.00-15.20	Numerical modeling of collisionless magnetized turbulence	Bernard, T.N.	TMB4U
15.20-15.40	Front propagation in cellular flows for fast reaction and small diffusivity	Tzella, A.	TMB4U
15.40-16.00	Numerical investigation of Al2O3-water nanofluid turbulent convection flow through an internally ribbed pipe	Ziaei-Rad, M.	TMB4U
16.00-16.30	*Coffee Break*		

Kastler Lecture Hall

Theme: Stochastic processes, Turbulence, Numerical modeling, Combustion and reactive flows

16.30-16.55	The Rayleigh-Taylor instability of the Newtonian and non-Newtonian fluids	Doludenko, A.N.	TMB4U
16.55-17.20	Linking 1D Stellar Evolution to 3D Hydrodynamic Simulations	Cristini, A.J.	TMB4U

Theme: Conclusion

17.20-17.50 Closing remarks – TMBW-2014

09 August 2014 Saturday

Theme: Free time

09.00-21.00 Free time

Poster Presentations

1	About some possibilities of PDV method application in hydrodynamic instabilities research.	Baranov, V.K.	
2	Cumulation effect in gas-hydraulic analogy of the shock wave	Baryshev, A.S.	
3	Numerical and experimental study of the unsteady flow visualization method using polystyrene markers	Bashurin, V.P.	
4	The application of the overhead projection method for the microparticles optical detection	Bazarov, Y.B.	
5	Spectral modelling of unstably homogeneous stratified turbulence	Burlot, A.	TMB4U
6	Energy and cross-helicity measurements of two magnetic flux ropes embedded in a argon magnetoplasma	de Haas, T.	
7	Effect of initial amplitude on the interfacial and bulk dynamics in the Richtmyer-Meshkov instability under conditions of high energy density	Dell, Z.R.	TMB4U
8	Diffusion-driven flows on a wedge-shaped obstacle	Dimitrieva, N.F.	
9	Transformation and explosive decay of flying cylindrical water shell	Fedorenko, Ia.V.	
10	Numerical simulation of vortex cascade of instabilities in shear layers	Fortova, S. V.	TMB4U
11	Statistics, scaling laws and the local structure of scalar fields at high Reynolds numbers	Gauding, M.	
12	Examples of extremely intermittent turbulent mixing	Gibson, C.H.	
13	Generation of capillary waves on the surface of droplet dipping into a liquid layer	Ilinykh A.Yu.	TMB4U
14	Turbulent mixing of a passive scalar in grid turbulence	Ito, Y.	
15	The relay model of the bubble-front dynamics	Kamchibekov M.D.	TMB4U
16	Pore-scale origin of anomalous transport in 3D porous media	Kang, P.K.	TMB4U
17	Numerical simulation of pendant drop dynamics after detachment	Korshunov, A.I.	
18	Acoustic gravity waves generated in HF heated ionospheric plasmas	Pradipta, R.	TMB4U
19	Accelerated dynamics of blast wave driven Rayleigh-Taylor instabilities in high energy density plasmas	Swisher, N.	TMB4U
20	The role of the magnetic field in the evolution of the stellar rotation of young low mass stars	Vargas, M.	
21	Implicit large eddy simulation of a scalar mixing layer in fractal-grid generated turbulence	Watanabe, T.	TMB4U
22	Generation of ionospheric plasma waveguides/ducts above Arecibo, Puerto Rico using HF and microwave transmitters	Whitehurst, L.N.	
23	Active flow control by local periodic forcing on surface of a tested model	Yurchenko, N.F.	
24	The influence of confinement shape on the scaling of turbulent fluctuations in in convection	Foroozani, N.	

Reserved Presentations

1	Non-equilibrium accelerating turbulence in round tubes:inhibition of Reynolds stress	Adrian, R.J.
2	Nonhelical inverse transfer of a decaying turbulent magnetic field	Brandenburg, A.
3	Hydrodynamics and acoustics of drops: detachment, falling and impact	Chashechkin, Y.D.
4	"Motion" and "Fluid Flow" - conventional and modern concepts	Chashechkin, Y.D.
5	Effects of differential diffusion on the flame structure of oxygen enhanced turbulent non-premixed jet flames	Dietzsch, F.
6	Mixing in phase-space due to the two-stream and filamentation instabilities of ion and electron beams propagating in background plasma	Kaganovich, I.D.
7	Controlled study of VLF and HF wave interactions with space plasma at Arecibo observatory	Lee, M.C.
8	Forecasting extreme events by combining observations and high-resolution numerical simulations using a Bayesian hierarchical model	Werne, J.
9	Statistics of turbulent mixing	Williams, R.J.R

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