Classical and Quantum Turbulence Workshop

MAY 2–5, 2011 | INTERCONTINENTAL HOTEL, ABU DHABI

Turbulence is one of the great mysteries in Nature and a great challenge in technology. It poses challenging open questions, covering flows of Galaxies and natural Earth flows of clouds and rivers on the one hand, down to Angstrom-size quantized vortices in superfluid helium on the other. Quantum turbulence in superfluids promises to enrich understanding of turbulence in fluids.

Convened by

Victor S. L'vov
Professor, Department of Chemical Physics, Weizmann Institute of Science

Ladislav Skrbek
Professor, Faculty of Mathematics and Physics, Charles University in Prague

K.R. Sreenivasan
University Professor, New York University

William F. Vinen
Emeritus Professor and Honorary Senior Research Fellow, University of Birmingham

DAY 1 MONDAY, MAY 2

9:00 – 9:30 am
COFFEE & REGISTRATION

9:30 – 9:50 am
OPENING REMARKS

Philip Kennedy, New York University Abu Dhabi

K. R. Sreenivasan, New York University

Ladislav Skrbek, Charles University in Prague

9:50 – 10:50 am
SESSION I: AN INTRODUCTION TO SUPERFLUIDITY AND QUANTUM TURBULENCE

Chair: Gary Ihas, University of Florida

Carlo Barenghi, University of Newcastle

10:50 – 11:50 am
SESSION II: AN INTRODUCTION TO CLASSICAL TURBULENCE I: Up to Kolmogorov

K.R. Sreenivasan, New York University

11:50 am – 12:20 pm
BREAK & REFRESHMENTS

12:20 – 1:30 pm
SESSION III: CLASSICAL HOMOGENEOUS TURBULENCE II: Beyond Kolmogorov, including simulations

Chair: Victor Tsepelin, University of Lancaster

Roberto Benzi, University of Rome

1:30 – 2:30 pm
LUNCH

2:30 – 3:30 pm
SESSION IV: DISCUSSION: Interplay of classical and superfluid turbulence

Discussion Leader: **Joseph Niemela**, Abdus Salam International Centre for Theoretical Physics

3:30 – 4:30 pm
SESSION V: SIMULATIONS OF QUANTUM TURBULENCE: Achievements and prospects

Chair: Sergei Nemirovskii, Institute for Thermal Physics

Makoto Tsubota, Osaka City University

4:30 – 5:30 pm
SESSION VI: DISCUSSION: More about simulations of quantum turbulence

Discussion Leader: **Risto Hanninen**, Aalto University

6:30 – 8:30 pm
DISTINGUISHED LECTURE

"From Angstroms to Light Years: What is the Connection?"

K. R. Sreenivasan, University Professor, New York University

Al Mamoura Auditorium

Immediately followed by a public reception

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DAY 2 TUESDAY, MAY 3

9:00 – 9:30 am
COFFEE

9:30 – 10:30 am
SESSION VII: EXPERIMENTS ON HOMOGENEOUS QUANTUM TURBULENCE IN ^{4}HE: What do we really know, and what can we hope to do in the future?

Chair: Hideo Yano, Osaka City University

Andrei Golov, University of Manchester

10:30 – 11:30 am
SESSION VIII: EXPERIMENTS ON HOMOGENEOUS QUANTUM TURBULENCE IN ^{3}HE: What do we really know, and what can we hope to do in the future?

Shaun Fisher, Lancaster University

11:30 am – 12:00 pm
BREAK & REFRESHMENTS

12:00 – 1:30 pm
SESSION IX: DISCUSSION: Old and new experiments on developed turbulence in superfluids

Discussion Leader: **Ladislav Skrbek**, Charles University in Prague

1:30 – 2:30 pm
LUNCH

2:30 – 3:30 pm
SESSION X: ENERGY SPECTRA OF DEVELOPED HOMOGENEOUS SUPERFLUID TURBULENCE: From classical hydrodynamics to quantum Kelvin waves region

Chair: George Pickett, Lancaster University

Victor L'vov, Weizmann Institute

3:30 – 4:30 pm
SESSION XI: DISCUSSION: The present state and perspectives of theory of superfluid turbulence

Discussion Leader: **Marc Brachet**, National Center for Scientific Research, Paris

4:30 – 5:00 pm
BREAK & REFRESHMENTS

5:00 – 5:50 pm
SESSION XII: TRANSITIONS TO CLASSICAL TURBULENCE

Chair: Julien Salort, National Center for Scientific Research, Grenoble

Konrad Bajer, University of Warsaw

5:50 – 6:40 pm
SESSION XIII: TRANSITIONS TO QUANTUM TURBULENCE

William F. Vinen, University of Birmingham

6:40 – 7:30 pm
SESSION XIV: DISCUSSION: More about transition to turbulence

Discussion Leader: **Philippe Roche**, National Center for Scientific Research, Grenoble

DAY 3 WEDNESDAY, MAY 4

1:30 – 2:30 pm
LUNCH

2:30 – 3:30 pm
SESSION XV: VISUALIZATION OF QUANTUM TURBULENCE WITH SOLID PARTICLES (including future prospects and a brief introduction to visualization in classical turbulence)

Chair: Angela White, University of Newcastle

Daniel Lathrop, University of Maryland

3:30 – 4:15 pm
SESSION XVI: VISUALIZATION OF QUANTUM TURBULENCE WITH He_2 EXCIMER MOLECULES

Wei Guo, Yale University

4:15 – 4:45 pm
BREAK & REFRESHMENTS

4:45 – 5:45 pm
SESSION XVII: INTERPRETATION OF VISUALIZATION EXPERIMENTS

Chair: David Schmoranzer, Charles University

Carlo Barenghi, University of Newcastle

5:45 – 7:00 pm
SESSION XVIII: DISCUSSION: More about visualization

Discussion Leader: **Steven Van Sciver**, Florida State University

8:30 – 9:30 pm
PRIVATE INFORMAL DISCUSSIONS

DAY 4 THURSDAY, MAY 5

9:00 – 9:30 am
COFFEE

9:30 – 10:30 am
SESSION XIX: SPIN-UP AND SPIN-DOWN of classical fluids, cyclone-anticyclone asymmetry, inertial modes and anisotropic energy transfers in classical rotating turbulence

Chair: Paul Walmsley, University of Manchester

Frédéric Moisy, University of Paris-Sud

10:30 – 11:30 am
SESSION XX: SPIN-UP, SPIN-DOWN AND PROPAGATION of turbulent fronts in superfluids

Vladimir Eltsov, Aalto University

11:30 am – 12:00 pm
BREAK & REFRESHMENTS

12:00 – 1:30 pm
SESSION XXI: DISCUSSION: Laminar and turbulent regimes in classical and quantum rotating flows

Discussion Leader: **Matti Krusius**, Aalto University

1:30 – 2:30 pm
LUNCH

2:30 – 4:00 pm
SESSION XXII: CLOSING REMARKS: The future of quantum turbulence, and why study it?

William F. Vinen, University of Birmingham