VORTICES, SUPERFLUID DYNAMICS, AND QUANTUM TURBULENCE

SYMPOSIA ON SUPERFLUIDS UNDER ROTATION
11 – 16 April, 2010

Venue: Biological research station of the University of Helsinki, Lammi, Finland
http://www.helsinki.fi/lammi/english

Arrival: Sunday, April 11, afternoon & evening
Transportation from Helsinki airport starting during afternoon & evening

Departure: Friday, April 16, afternoon
Transportation to Helsinki airport, arrival there at 14:00

Status: confirmed titles in roman
unconfirmed titles in italics

Sunday, April 11

Evening Informal get-together in common room: snacks, salad & beer

Monday, April 12

07:30 – 08:45 Breakfast

Reviews: Introduction to turbulence

08:45 – 09:00 Opening of symposium
09:00 – 09:45 **W. Vinen**, University of Birmingham, UK
Quantum turbulence: achievements and challenges
09:45 – 10:30 **V. L´vov**, Weizmann Institute of Science, Rehovot
Energy cascades in quantum turbulence

10:30 – 11:00 Coffee break

Reports: Measurements of quantum turbulence in *T* -> 0 limit

11:00 – 11:30 **V. Tsepelin**, Lancaster University
Studies of turbulence in 3He-B in T → 0 limit
11:30 – 12:00 **P. Walmsley**, University of Manchester, UK
Studies of turbulence in superfluid 4He in T → 0 limit

12:00 – 14:00 Lunch

Reports: Quasiparticle excitations & vortices

14:00 – 14:30 **N. Kopnin,** Helsinki University of Technology

Vortex motion and mutual friction in Fermi superfluids

14:30 – 15:00 **Yu. Sergeev**, Newcastle University, UK
Thermal flux of quasiparticles incident upon vortex clusters and the transition from a gas of vortex rings to a dense tangle in 3He-B

15:00 – 15:30 Coffee break

Reports: Calculation of vortex dynamics

15:30 – 16:00 **M. Tsubota**, Osaka City University, Japan
Numerical studies of quantum turbulence

16:00 – 16:30 **C. Barenghi**, Newcastle University, UK
Velocity statistics in classical and quantum turbulence

16:30 – 17:00 **R. Hänninen**, Helsinki University of Technology
Numerical studies of superfluid spin down from rotation

17:00 – 19:00 Dinner

19:00 – 20:00 **Evening Colloquium**

V. Lebedev, Landau Institute of Theoretical Physics, Moscow
Viscous turbulence: Introduction & outstanding research questions

20:00 – 23:00 **Sauna & beer**
Snacks, salad & beer in common room

Tuesday, April 13

07:30 – 08:45 Breakfast

Reviews: Quantum turbulence in *T* –> 0 limit: Methods & measurements

08:45 – 09:30 **A. Golov**, Manchester University, UK
Experiments on the dynamics of turbulence in superfluid 4He at low temperatures

09:30 – 10:15 **G. Pickett**, Lancaster University

Quantum turbulence in 3He-B

10:15 – 10:45 Coffee break

Reports: Theory of quantum turbulence

10:45 – 11:15 **E. Kozik**, ETH, Zurich
Decay of quantum turbulence

11:15 – 11:45 *unconfirmed*
Kelvin-wave cascades

12:00 – 14:00 Lunch

Reports: Measurements on 3He-B in *T* -> 0 limit

14:00 – 14:30 **V. Eltsov**, Helsinki University of Technology
Propagating vortex front in rotating 3He-B in $T \rightarrow 0$ limit

14:30 – 15:00 **R. Haley**, Lancaster University, UK
Quartz tuning forks and the transition to turbulence in superfluid 4He

15:00 – 15:30 Coffee break

Brief Reports: Vortices in 3He-B and 4He-II

15:30 – 15:50 **J. Hosio**, Helsinki University of Technology
Quasiparticle scattering from a vortex cluster in rotating 3He-B

15:50 – 16:10 **David Schmoranzer**, Charles University, Prague
Quartz tuning fork measurements and turbulence in superfluid 4He

16:10 – 16:30 **R. de Graaf**, Helsinki University of Technology
NMR measurement of vortices in 3He-B on approaching T->0 limit

16:30 – 16:50 *unconfirmed*

17:00 – 19:00 Dinner

19:00 – 21:00 **Poster Session**
5 min oral presentations of each poster, followed by informal discussions around all posters simultaneously (5 – 10 posters)

20:00 – 23:00 **Sauna & beer**
Snacks, salad & beer in common room

Wednesday, April 14

07:30 – 08:45 Breakfast

Reviews: Vortices in Bose condensates

08:45 – 09:30 **A. Fetter**, Stanford University, USA
Vortices and dynamics in rotating trapped Bose-Einstein condensates

09:30 – 10:15 **B. Anderson**, University of Arizona, USA
Vortices in dilute-gas Bose-Einstein condensates: a decade of experiments

10:15 – 10:45 Coffee break

Reports: Bose condensates & topological defects

10:45 – 11:15 **Yu. Bunkov**, Institute Néel, CNRS – UJF, Grenoble
Bose condensation of magnons: new methods for NMR measurement of vortices in 3He-B in T → 0 limit using coherent states of spin precession

11:15 – 11:45 **V. Pietilä,** Helsinki University of Technology
Monopoles and point defects in Bose condensates

12:00 – 14:00 Lunch

Reports: Vortices in Bose condensates

14:00 – 14:30 **V. Bagnato,** University of Sao Paulo, Brazil
Hydrodynamics of a turbulent Bose condensate

14:30 – 15:00 **M. Möttönen**, Helsinki University of Technology
Topological vortex formation

15:00 – 15:30 Coffee break

Reports: Vortices in 3He-A

15:30 – 16:00 **K. Machida**, Okayama University
Fermionic excitations around vortices in rotating in 3He-A

16:00 – 16:30 **T. Mizusaki**, Kyoto University
Vortex core structures of rotating Mermin-Ho textures and detection of the intrinsic angular momentum in 3He-A

16:30 – 17:00 **D. Zmeev**, Manchester University, UK
Vortices and soliton domain walls in rotating 3He-A confined between parallel plates

17:00 – 19:00 Dinner

19:00 – 21:00 **Poster Session**
5 min oral presentations of each poster, followed by informal discussions around all posters simultaneously

20:00 – 23:00 **Sauna & beer**
Snacks, salad & beer in common room

Thursday, April 15

07:30 – 08:45 Breakfast

Reviews: Vortices in Fermi superfluids

08:45 – 09:30 **N. Andersson**, University of Southampton, UK
Vortices in neutron stars

09:30 – 10:15 **G. Volovik**, Helsinki University of Technology
Vortex structure and core states

10:15 – 10:45 Coffee break

Reports: Quasiparticle states in 3He-B

10:45 – 11:15 **M. Silaev**, Institute for the Physics of Microstructures, Nizhny Novgorod
Bound fermion states and resonant magnetic susceptibility of vortex cores in 3He-B

11:15 – 11:45 **Suk Bum Chung,** Stanford University, USA
Detecting the Majorana fermion surface state of 3He-B through spin relaxation

12:00 – 14:00 Lunch

Reports: Condensates of excitations

14:00 – 14:30 *unconfirmed*
14:30 – 15:00 **E. Sonin,** Racah Institute of Physics, Hebrew University of Jerusalem
Gauge-field rotation of an electrically polarized Bose condensate by a radial magnetic field
15:00 – 15:30 Coffee break

Brief reports: Vortices & oscillating sensors

15:30 – 15:50 *unconfirmed*
15:50 – 16:10 **A. Salmela**, Helsinki University of Technology
Quartz tuning fork as high-Q measuring instrument in He liquids
16:10 – 16:30 *unconfirmed*
16:30 – 17:00 **M. Kubota**, Institute for Solid State Physics, University of Tokyo
Vortex state in hcp 4He: the vortex fluid state and its transition to the supersolid state

17:00 – 19:00 Dinner

19:00 – 21:00 **Romp Session**
10 min oral presentation followed by 10 min discussion on open questions – the speakers are asked to reserve their slot in advance during the workshop

20:00 – 23:00 **Sauna & beer**
Snacks, salad & beer in common room

Friday, April 16

07:30 – 08:45 Breakfast

Reports: Superfluid turbulence in 4He-II above 1 K

08:45 – 09:15 **D. Lathrop**, University of Maryland, College Park
Experimental characterization of reconnection, counterflows, and quantum turbulence
09:15 – 09:45 **L. Skrbek**, Charles University, Prague
Quantum turbulence in 4He-II above 1 K – solved and open problems
09:45 – 10:15 **P. Roche**, Institute Néel, CNRS – UJF, Grenoble
DNS modeling of homogeneous superfluid turbulence

10:15 – 10:45 Coffee break

Reports: Onset measurements in 3He-B and 4He-II

10:45 – 11:15 **H. Yano**, Osaka City University
Transition to steady quantum turbulence generated by thin oscillating structure in superfluid 4He
11:15 – 11:45 **M. Krusius**, Helsinki University of Technology

Vortex formation and annihilation in 3He-B
11:45 – 12:00 Closing

12:00 – 13:00 Lunch

12:30 – 13:00 Departure
14:00 – 14:30 Helsinki – Vantaa airport
14:30 – 15:00 Otaniemi – Low Temperature Laboratory