

# QFS 2010 - Program

## Sunday, August 1<sup>st</sup>

17:00 – 21:00      *Check-in and reception (Grenoble World Trade Center – Atrium)*

## Monday, August 2<sup>nd</sup>

8:00 – 9:00      *Check-in*

### **Opening Session**

**Chair: George R. Pickett**

9:00 – 9:10      Welcome/announcements

9:10 – 9:20      Announcements: Journal of Low Temperature Physics  
*Horst Meyer*

9:20 – 9:40      Superfluidity yesterday, today and tomorrow  
*Philippe Nozières, membre de l'Académie des Sciences*

### **Session: Hydrogen**

**Chair: Horst Meyer**

9:40 – 10:00      Matrix isolation of H atoms at low temperatures  
*David Lee, Cornell University*

10:00 – 10:20      Exchange tunneling chemical reactions of hydrogen isotopes in  
nanoclusters immersed in superfluid helium  
*Vladimir Khmelenko, Texas A&M University*

10:20 – 10:40      Magnetic resonance study of H atoms in solid H<sub>2</sub> at temperatures below 1K  
*Sergey Vasiliev, University of Turku*

10:40 – 11:10      *Coffee break*

### **Session: Theory I**

**Chair: Philippe Nozières**

11:10 – 11:50      Quantum fluids and solids as seen by Path Integrals  
*David Ceperley, University of Illinois*

11:50 – 12:10      Metastable liquid para-H<sub>2</sub> at very low temperatures  
*Jordi Boronat, Universitat Politècnica de Catalunya*

12:10 – 12:30      Ground-state of spin-polarized hydrogen and its isotopes: from bulk  
properties to small clusters  
*Leandra Vranjes Markic, University of Split*

12:40 – 14:00      *Lunch*

### **Session: New trends in <sup>4</sup>He**

**Chair: Minoru Kubota**

14:00 – 14:40      Giant coupling effects in confined He-4 near T-lambda  
*Francis Gasparini, Buffalo, SUNY*

14:40 – 15:00      Polarization effects in superfluid <sup>4</sup>He  
*Vladimir Mineev, INAC \ SPSMS – CEA Grenoble*

15:00 – 15:20      Mass flux and solid growth in solid <sup>4</sup>He: 60 mK - 700 mK  
*Robert B. Hallock, University of Massachusetts, Amherst*

- Session: Turbulence** **Chair: Ladislav Skrbeck**
- 15:20 – 15:40 Quantum and classical turbulence in superfluids in the zero temperature limit  
*Victor L'vov, Weizmann Institute of Science*
- 15:40 – 16:00 Non-classical velocity statistics in superfluid turbulence  
*Carlo Barenghi, Newcastle upon Tyne*
- 16:00 – 16:20 Dynamics of vortex tangles in superfluid  $^4\text{He}$  at low temperatures  
*Andrei Golov, University of Manchester*
- 16:20 – 16:40 Classical turbulence on the surface of quantum liquids  
*Leonid Abdurakhimov, ISSP-RAS Chernogolovka*
- 16:40 – 17:10 *Coffee break*
- Session: Superfluid  $^3\text{He}$**  **Chair: John Saunders**
- 17:10 – 17:50 NMR studies of superfluid phases of  $^3\text{He}$  in aerogel  
*Vladimir V. Dmitriev, Kapitza Institute, Moscow*
- 17:50 – 18:10 Proximity induced odd frequency pair in liquid  $^3\text{He}$  in aerogel  
*Seiji Higashitani, Hiroshima University*
- 18:10 – 18:30 Fourth sound of superfluid  $^3\text{He}$  in aerogel  
*Ken Obara, Osaka City University*
- 18:30 – 18:50 Branes, strings and boojums; defects in  $^3\text{He}$  and the Cosmos  
*Richard Haley, Lancaster University*

## Tuesday, August 3<sup>rd</sup>

- Session: Helium and Charges** **Chair: Paul Leiderer**
- 9:00 – 9:40 Ripplonic Lamb shift for electrons on the Helium surface  
*Mark Dykman, Michigan State University*
- 9:40 – 10:00 Radiation-induced zero-resistance states in surface electrons on He  
*Denis Konstantinov, Low Temperature Physics Laboratory, RIKEN*
- 10:00 – 10:20 Phase transitions in 2D electron system over liquid Helium  
*Vitaliy Syvokon, B. Verkin Institute, Kharkov*
- 10:30 – 11:00 *Coffee break*
- Session: Low Dimensional QFS** **Chair: Susana Hernández**
- 11:00 – 11:40 Novel phases of quantum fluids near solid surfaces  
*Milton Cole, Penn State University*
- 11:40 – 12:00 Adsorption on a single nanotube  
*Oscar Vilches, University of Washington*
- 12:00 – 12:20 Quantum gases on graphene  
*Carmen Gordillo, Universidad Pablo de Olavide de Sevilla*
- 12:20 – 12:40 Superfluidity in one-dimensional state of  $^4\text{He}$  fluid nanotubes  
*Nabuo Wada, Nagoya University*
- 12:40 – 14:00 *Lunch*

14:00 – 16:40 **POSTER SESSION I**

16:40 – 17:10 *Coffee break*

**Session: Topological Superfluids** **Chair: William Halperin**  
17:10 – 17:50 Topological superconductors and Majorana fermions  
*Shoucheng Zhang, Stanford University*  
17:50 – 18:10 Surface Andreev states and surface Majorana states on superfluid  $^3\text{He-B}$   
*Yuichi Okuda, Tokyo Institute of Technology*  
18:10 – 18:30 Majorana edge modes of superfluid  $^3\text{He-A}$  and B phases confined in a thin film  
*Kazushige Machida, Okayama University*  
18:30 – 18:50 NMR measurements of the deformed superfluid  $^3\text{He-B}$  confined in a single 0.6 micron slab  
*Andrew Casey, Royal Holloway, University of London*

### Wednesday, August 4<sup>th</sup>

**Session: Magnetism** **Chair: Hiroshi Fukuyama**  
9:00 – 9:40 Multiple-spin exchange in correlated-fermion systems  
*Michel Roger, CEA IRAMIS SPEC Saclay*  
9:40 – 10:00 Solid-liquid interface magnetic ordering  
*Igor Todoshchenko, LTL, Aalto University, Helsinki*  
10:00 – 10:20 Bilayer Hubbard model for  $^3\text{He}$ : a cluster dynamical mean-field calculation  
*Fakher F. Assaad, University of Würzburg*  
10:30 – 11:00 *Coffee break*  
**Session: Vortices** **Chair: Makoto Tsubota**  
11:00 – 11:40 Dissipation in vortex dynamics in superfluid  $^3\text{He-B}$  at low temperatures  
*Vladimir Eltsov, LTL, Aalto University, Helsinki*  
11:40 – 12:00 Experiments on quantum vortices in superfluid  $^3\text{He-B}$  in the  $T \sim 0$  limit  
*Shaun N. Fisher, Lancaster University*  
12:00 – 12:20 Excitations and characterization of quantum turbulence in an atomic superfluid  
*Vanderlei Bagnato, University of Sao Paulo - IFSC*  
12:20 – 12:40 Observation of some interesting objects in superfluid Helium-4 and their interaction with vortices  
*Humphrey Maris, Brown University*  
12:40 – 14:00 *Lunch*  
14:00 – 18:00 **Excursions** (meeting point depends on the excursion, see instructions)

## Thursday, August 5<sup>th</sup>

- Session: Supersolids I** **Chair: Matthias Graf**  
9:00 – 9:40 Review of experimental results on supersolidity  
*Moses Chan, Penn State University*
- 9:40 – 10:00 NCRI and shear modulus of solid helium at low temperatures  
*Eunseong Kim, KAIST*
- 10:00 – 10:20 New experiments bearing on the nature of the supersolid state of solid  $^4\text{He}$   
*John D. Reppy, Cornell University*
- 10:30 – 11:00 *Coffee break*
- Session: BEC in Condensed Matter** **Chair: Matti Krusius**  
11:00 – 11:40 BEC of non-equilibrium quasiparticles in  $^3\text{He}$  and beyond  
*Grigori Volovik, LTL, Aalto University, Helsinki*
- 11:40 – 12:00 Exciton polaritons in semiconductors: toward new frontiers of Bose quantum degeneracy  
*Le Si Dang, Institut Néel, CNRS Grenoble*
- 12:00 – 12:20 Superfluidity and vortices in exciton-polariton condensates  
*Natalia G. Berloff, DAMTP, CMS, University of Cambridge*
- 12:20 – 12:40 B-E condensates of magnons in superfluid  $^3\text{He-B}$  and symmetry breaking fields  
*Peter Skyba, Institute of Experimental Physics SAS, Kosice*
- 12:40 – 14:00 *Lunch*
- 14:00 – 16:40 **POSTER SESSION II**
- 16:40 – 17:10 *Coffee break*
- Session: Theory II** **Chair: Jesús Navarro**  
17:10 – 17:30 Two-dimensional  $^3\text{He}$ : a crucial system for understanding fermion dynamics  
*Eckhard Krotscheck, Linz University*
- 17:30 – 17:50 Quantum processes in superconducting-magnetic Josephson junctions  
*James Sauls, Northwestern University, Evanston*
- 18:30 Conference Banquet. *Buses depart from World Trade Center.*  
*Banquet venue: Château du Touvet*
- 23:15 Buses departure from banquet venue.

## Friday, August 6<sup>th</sup>

- Session: Supersolids II** **Chair: Kimitoshi Kono**  
9:00 – 9:20 Non-equilibrium quantum systems - glasses at ultra-low temperatures  
*Christian Enss, Heidelberg University*  
9:20 – 9:40 Quantum dislocations in solid <sup>4</sup>He  
*Anatoly Kuklov, College of Staten Island, CUNY*  
9:40 – 10:00 Elastic properties of solid helium: Is there a phase transition? Is there a critical velocity?  
*John Beamish, University of Alberta*  
10:00 – 10:20 The anomalous softening of helium-4 crystals  
*Sébastien Balibar, ENS and CNRS, Paris*

10:30 – 11:00 *Coffee break*

- Session: NEMs and MEMs** **Chair: Jeevak Parpia**  
11:00 – 11:40 Putting the mechanics into quantum mechanics  
*Andrew Cleland, University of California, Santa Barbara*  
11:40 – 12:00 Nanomechanical measurements of a superconducting qubit  
*Matthew LaHaye, Syracuse University*  
12:00 – 12:20 Scheme to probe the quantum dynamics of a mesoscopic mechanical resonator  
*Miles Blencowe, Dartmouth College, Hanover*  
12:20 – 12:40 Quantum opto-mechanics: how to use micromechanics in quantum experiments  
*Simon Gröblacher, University of Vienna*

12:40 – 14:00 *Lunch*

- Session: Quantum Gases** **Chair: Eckhard Krotscheck**  
14:00 – 14:40 Towards quantum magnetism with ultracold atoms  
*Wolfgang Ketterle, MIT*  
14:40 – 15:00 Single-site and single-atom resolved imaging of correlated quantum states in optical lattices  
*Marc Cheneau, Max-Planck-Institut für Quantenoptik, München*  
15:00 – 15:20 Thermodynamics of strongly interacting Fermi gases  
*Frédéric Chevy, Laboratoire Kastler Brossel, ENS and CNRS, Paris*  
15:20 – 15:40 Non-abelian vortices in spinor Bose-Einstein condensates  
*Michikazu Kobayashi, University of Tokyo*  
15:40 – 16:00 Quantum interference of Bose-Einstein condensates  
*William Mullin, University of Massachusetts*

- Conference closing Session** **Chair: Mikko Paalanen**  
16:00 - 16:20 <sup>3</sup>He supply: information (W.P. Halperin) and discussion  
16:20 - 16:40 Announcements: Conferences and Awards  
Closing ceremony

## Saturday, August 7<sup>th</sup>

### *Satellite Workshops*