

wpi

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Workshop on "Quantized Vortices in Superfluidity and Superconductivity and Related Problems"

**Location: Room C206/207
WPI Nordbergstr. 2nd floor**

Mon, 01. Jul (Opening: 10:00) - Fri, 5. Jul 13

Organisers

Weizhu Bao (NUS/Beijing CSRC)

Claude Bardos (Univ Paris)

Qiang Du (Penn State University)

Norbert J. Mauser (WPI c/o U. Wien)

Monday, July 1, 2013

Morning Session

09:00 – 10:00 Registration

10:00 – 10:10 Welcome by **N. J. Mauser** and **W. Bao**

10:10 – 10:50 **Israel M. Sigal**: Magnetic Vortices, Nielsen-Olesen - Nambu strings and theta functions

10:50 – 11:20 Coffee break

11:20 – 12:00 **Peter Sternberg**: Kinematic Vortices in a Thin Film Driven by an Electric Current

12:00 – 02:00 Lunch (on your own)

Afternoon Session

02:00 – 02:40 **Patricia Bauman**: Analysis of Energy Minimizers for Nematic Liquid Crystals with Disclination-Line Defects

02:40 – 03:10 Coffee break

03:10 – 03:50 **Jean-Claude Saut**: New results on the dispersive blow-up for NLS type equations

03:50 – 04:30 **Christof Sparber**: On nonlinear Schrödinger type equations with nonlinear damping

Tuesday, July 2, 2013

Morning Session

09:00 – 09:30 Registration

09:30 – 10:10 **Leonid Berlyand:** Phase Separation of Multiple Ginzburg-Landau Vortices Pinned by Small Holes

10:10 – 10:40 Coffee break

10:40 – 11:20 **Daniel Phillips:** Analysis of defects in minimizers for a planar Frank energy

11:20 – 12:00 **Yann Brenier:** Diffusion of knots and magnetic relaxation

12:00 – 02:00 Lunch (on your own)

Afternoon Session

02:00 – 02:40 **Francis Nier:** Artificial gauge adiabatic Ansatz for Bose-Einstein condensates

02:40 – 03:10 Coffee break

03:10 – 03:50 **Qiang Du:** Phase diagrams for quantized vortex states in superconductors

03:50 – 04:30 **Nicolas Besse:** On the Cauchy problem for the waterbag continuum

Wednesday, July 3, 2013

Morning Session

09:30 – 10:10 **Ionut Danaila:** Minimization methods for computing stationary vortex states of fast rotating Bose-Einstein condensates

10:10 – 10:50 **Qinglin Tang:** Numerical studies on the quantized vortex dynamics and interaction in superfluidity and superconductivity

Trip to Wachau (Valley of Danube) (Bus to Melk (paid by WPI), Abbey Melk (optionally), Boat trip, Walk/Hike, Heurigen, Train back to Vienna)

Thursday, July 5, 2013

Morning Session

09:30 – 10:10 **Jie Shen:** Fast Spectral-Galerkin Methods for High-Dimensional PDEs and Applications to the electronic Schrödinger equation

10:10 – 10:40 Coffee break

10:40 – 11:20 **Shidong Jiang:** Fast and accurate evaluation of dipolar interactions in Bose-Einstein condensates

11:20 – 12:00 **Mechthild Thalhammer:** Convergence analysis of high-order time-splitting generalized-Laguerre-Fourier-Hermite pseudo-spectral methods for rotational Gross-Pitaevskii equations

12:00 – 02:00 Lunch (on your own)

Afternoon Session

02:00 – 02:40 **Dieter Jaksch:** Laser control of Josephson phases in heterostructures

02:40 – 03:10 Coffee break

03:10 – 03:50 **Igor Mazets:** Many-body physics with ultracold-atomic 1D quasicondensates

03:50 – 04:30 **Hanns-Christoph Nägerl:** Quench dynamics in strongly correlated Bose-Hubbard chains

6:30—9:00 **Banquet** (Volunteer and food self-paid, drinks on the WPI)

Friday, July 5, 2013

Morning Session

09:30 – 10:10 **Yang Xiang:** Modeling and simulation of dislocations at different scales

10:10 – 10:40 Coffee break

10:40 – 11:20 **Weiqing Ren:** Modeling rare events in complex systems

11:20 – 12:00 **Shouhong Wang:** Unified Field Theory of Four Interactions

12:00—04:00 Closing Remarks

12:00 – 02:00 Lunch (on your own)

Afternoon Session outside workshop programme: grad students talks

02:00 – 02:40 **Thomas Moser** : The young person's guide to numerics for NLS

02:40 – 03:10 **Florian Kogelbauer** : Quantum Hydrodynamics and Quantum Trajectories