LPHYS'21

LPHYS'21. PROGRAM:

Seminar 6: Physics of Cold Trapped Atoms

Co-chairs:


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All time-slots in this schedule indicate the Central European Time (CET) (e.g. Paris time)

Monday, 19 July, 2021

S6.1 **(16:00 – 17:30)** **Chairs**: Alice Sinatra (France) and Klaus Ziegler (Germany)

16:00 – 16:20 J Han (Department of physics, Osaka City University, Osaka, Japan), M Tsubota (Department of physics, Osaka City University, Osaka, Japan; The OCU Advanced Research Institute for Natural Science and Technology (OCARINA), Osaka City University, Osaka, Japan; Nambu Yoichiro Institute of Theoretical and Experimental Physics (NITEP), Osaka City University, Osaka, Japan)
Annihilation and Recurrence of Vortex-Antivortex Pairs in Two-Component Bose-Einstein Condensates Abstract

16:20 – 16:40 Y Sano (Department of physics, Osaka City University, Osaka, Japan), M Tsubota (Department of physics, Osaka City University, Osaka, Japan; The OCU Advanced Research Institute for Natural Science and Technology (OCARINA), Osaka City University, Osaka, Japan; Nambu Yoichiro Institute of Theoretical and Experimental Physics (NITEP), Osaka City University, Osaka, Japan)
Emergent Isotropy in a Matter-Wave Turbulent Cascade Abstract

16:40 – 17:00 A Richaud (Scuola Internazionale Superiore di Studi Avanzati, Trieste, Italy), V Penna (Applied Science and Technology, Politecnico di Torino, Turin, Italy), A L Fetter (Stanford University, Stanford CA, USA)
Dynamics of Point Vortices with Massive Cores in a Boson Bynary Mixture Abstract

17:00 – 17:30 B A Malomed (Tel Aviv University, Tel-Aviv, Israel)
Singular Nonlinear Bound States and Vortices in Attractive Potentials Abstract

(Joint Quantum Centre (JQC) Durham-Newcastle, School of Mathematics, Statistics and Physics, Newcastle University, Newcastle upon Tyne, UK)
Dynamical Phase Diagram of Ultracold Josephson Junctions Abstract

***S6.9* (20:00 – 21:30)** **Chairs**: Boris Svistunov (USA) and Martin Weitz (Germany)

20:00 – 20:30 K Sacha (M. Smoluchowski Institute of Physics, Jagiellonian University, Kraków, Poland)
Anderson Localization and Many-Body Localization in Time Crystals Abstract

20:30 – 21:00 V S Bagnato, A Garcia, M Moreno, G Telles, L Machado, L Madeira, G Roati, P Castilho, P Tavares, A Cedrin (Instituto de Física de São Carlos, Universidade de São Paulo, São Paulo, Brazil)
Turbulent BEC: Experimental Characterization and Universal Scaling Properties for Time/Space Evolution Abstract

21:00 – 21:30 M Olchanyi (Department of Physics, Department of Physics, Boston, USA)
Triangular Gross-Pitaevskii Breathers and Damski-Chandrasekhar Shock Waves Abstract

Thursday, 22 July, 2021

***S6.10* (16:00 – 17:30)** **Chairs**: Doerte Blume (USA) and Kazuya Fujimoto (Japan)

16:00 – 16:20 Y Imaeda (Applied Physics, Nagoya University, Aichi, Japan), K Fujimoto (Applied Physics, Nagoya University, Aichi, Japan; Institute for Advanced research, Nagoya University, Aichi, Japan), Y Kawaguchi (Applied Physics, Nagoya University, Aichi, Japan)
Shapiro Resonance in a Spinor Bose-Einstein Condensate Abstract

16:20 – 16:35 Y Watanabe, S Watabe, T Nikuni (Department of Physics, Faculty of Science, Tokyo University of Science, Tokyo, Japan)
Dynamics of Phase-Imprinted Solitons of Ultracold Bosons in an Optical Lattice Abstract

16:35 – 17:05 S I Mistakidis (Physics, Center for Optical Quantum Technologies, Department of Physics, University of Hamburg, Luruper Chaussee 149, 22761 Hamburg Germany, Hamburg, Germany; ITAMP, Center for Astrophysics | Harvard & Smithsonian, Cambridge, MA 02138 USA, Boston MA, USA), T Mithun, P G Kevrekidis (Department of Mathematics and Statistics, University of Massachusetts, Amherst MA, USA), H R Sadeghpour (ITAMP, Center for Astrophysics | Harvard & Smithsonian, Cambridge, MA 02138 USA, Boston MA, USA), P Schmelcher (Physics, Center for Optical Quantum Technologies, Department of Physics, University of Hamburg, Luruper Chaussee 149, 22761 Hamburg Germany, Hamburg, Germany)
Correlation Effects in the Ground State and Nonequilibrium Dynamics of One-Dimensional Quantum Droplets Abstract

17:05 – 17:25 A Hammond, L Lavoine (Laboratoire Charles Fabry, Institut d'Optique, Palaiseau, France), A Recati (INO-CNR BEC Center, University of Trento, Trento, Italy), D Petrov (LPTMS, CNRS, Univ. Paris Sud, Université Paris-Saclay, Orsay, France), T Bourdel (Laboratoire Charles Fabry, Institut d'Optique, Palaiseau, France)
Beyond-Mean Field Effects in Rabi-Coupled Two-Component Bose-Einstein Condensate Abstract

Turbulent BEC: Experimental Characterization and Universal Scaling Properties for Time/Space Evolution

V S Bagnato[1], A Garcia[1], M Moreno[1], G Telles[1], L Machado[1], L Madeira[1], G Roati[1], P Castilho[1], P Tavares[1], and A Cedrin[1]

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One of the out-of-equilibrium states of great interest in superfluids is the state of turbulence. In this state, the proliferation of vortices or waves, creates one of several known states of turbulence. From equilibrium, with energy injection, there is evolution establishing a cascade of energy/particles that causes migration of energy to high moments, resulting in a dependence of power law type in the energy spectrum. The reason the system evolves this way has to do with its quest for equilibrium, reaching possibly a stationary state. If the energy injection is ceased, the system evolves in time. Observing the high moment component in the distribution allows us to verify its dependence by determining whether it is a non-thermal state. We detected in our experiment regions of excitation, where exponential (rather than Gaussian) dependence reveals the presence of non-thermalizing states. Such out-of-equilibrium states exhibit universal behavior when scaled in time and space. This universal behavior is of great interest, especially if associated with turbulent states. (Financial support from FAPESP, CNPq and CAPES)