

Assistant Professor

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Personal

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Education, Degrees

- 2000: Ph. D. (Physics), P.L. Kapitza Institute for Physical Problems, Moscow, Russia
Thesis title: *“Superfluid and normal properties of two-dimensional Fermi systems with repulsion”*
Scientific adviser: Prof. M.Yu. Kagan
- 1994: M. Sc. (Physics), Moscow Institute of Physics and Technology

Employment and Education History

- 2006 – present: Assistant Professor, Department of Physics and Astronomy, Hofstra University, Hempstead, NY
- 2005 – 2006: Research Associate, Department of Physics, Brock University, St. Catharines, Ontario, Canada
- 2001 – 2005: Postdoctoral researcher and Research Associate, Département de physique and Regroupement québécois sur les matériaux de pointe, Université de Sherbrooke, Sherbrooke, Québec, Canada
- 2000 – 2003: Researcher, Institute of Radio Engineering and Electronics, Russian Academy of Sciences, Moscow, Russia
- 1994 – 2000: Postgraduate Researcher, P.L. Kapitza Institute for Physical Problems, Russian Academy of Sciences, Moscow, Russia
- 1989 – 1994: Student, Department of General and Applied Physics of Moscow Institute of Physics and Technology, Russia
- 1987 – 1989: Student, Physics Department of Tomsk State University, Tomsk, Russia

Scientific Interests

Condensed matter theory. More specifically:

- **Solid state physics:** unconventional and exotic superconductivity including HTSC and organic materials, quantum phase transition, fluctuations and transport in low-dimensional superconductors;
- **Low temperature physics:** quantum liquids, ultracold gases in traps, superfluidity;
- **Mesoscopic physics:** Kondo physics of quantum dots, Josephson and tunnel junctions, Andreev tunneling.

Research Visits

- Kavli Institute for Theoretical Physics, University of California, Santa Barbara (KITP Scholar and Program on Strongly Correlated Phases in Condensed Matter and Degenerate Atomic Systems), June 2007.
- Department of Physics, Brock University, St. Catharines, Ontario, Canada (Prof. K.V. Samokhin), June 2006.
- Kavli Institute for Theoretical Physics, University of California, Santa Barbara (Quantum Phase Transition Program), February – March 2005.
- Low Temperature Group, Royal Holloway University of London, UK (Prof. J. Saunders), October – December 1997.
- Quantum Fluids Group, Kamerlingh Onnes Laboratory, University of Leiden, the Netherlands (Prof. G. Frossati, Prof. R. Jochemsen), November – December 1996.

Talks given

- Kavli Institute for Theoretical Physics, University of California, Santa Barbara, CA, June 2007.
- Condensed Matter Seminar, Department of Physics, Purdue University, IN, March 2005.
- Theory Seminar, Department of Physics, University of Illinois at Urbana-Champaign, IL, March 2005.
- Condensed Matter Physics Seminar, Department of Physics, University of Toronto, Toronto, ON, Canada, January 2004.
- Theoretical Division Seminar, Los Alamos National Laboratory, Los Alamos, NM, October 2003.
- Condensed Matter Seminar, Department of Physics at University of Massachusetts, Amherst, MA, April 2002.
- Condensed Matter Seminar, Department of Physics and Astronomy at Northwestern University, Evanston, IL, January 2002.

- Various talks in P.L. Kapitza Institute, Moscow, Russia, 1994-2001.
- Departement de Physique Theorique, Universite de Geneve, Switzerland, March 2001.
- Theoretical Physics Group, Department of Applied Physics, Delft University of Technology, The Netherlands, October 2000.
- Condensed Matter Physics Group, Department of Physics, Loughborough University, UK, April 2000.
- Low Temperature Group, Royal Holloway University of London, UK, November 1997.
- Quantum Fluids Group, Kamerlingh Onnes Laboratory, University of Leiden, The Netherlands, November 1996.

International Conferences Attendance

- APS March meetings: Denver, CO, 2007; Baltimore, MD, 2006; Los Angeles, CA, 2005; Montreal, QC, 2004; Austin, TX, 2003; Indianapolis, IN, 2002.
- CIAR Quantum Materials and Superconductivity Meetings, Toronto, ON, May 2002; Vancouver, BC, May 2003; l'Estereel, QC, October 2003; Toronto, ON, May 2004.
- Nanoquebec: Quebec Workshop on Nanoscience and Nanotechnology, Montreal, QC, November 2001 and November 2002.
- International Symposium on Quantum Fluids and Solids QFS'2001, Konstanz, Germany, July 2001.
- International Symposium on Ultralow Temperature Physics ULT'99, St. Petersburg, Russia, August 1999.
- XXII International Conference on Low Temperature Physics LTXXII, Helsinki, Finland, August 1999.
- Condensed Matter and Materials Physics Conference CMMP'97, Exeter, UK, December 1997.
- XXI International Conference on Low Temperature Physics LTXXI, Prague, Czech Republic, August 1996.

International Workshops and Schools

- Strongly Correlated Phases in Condensed Matter and Degenerate Atomic Systems, KITP, UCSB, CA, June 2007.
- Gordon Research Conference on Correlated Electron Systems, South Hadley, MA, June 2006 and 2004.
- Workshop on Evolution of Quantum Effects from the Nano to the Macroscale, Cargese, Corsica, France May 2004.

- Seminar and Workshop on Quantum Phase Transitions, MPIPKS Dresden, Germany, July 2003.
- CIAR School on Superconductivity and Quantum Materials, Hamilton, ON, May 2002; Vancouver, BC, May 2003; Toronto, ON, May 2004.
- NATO Advanced Study Institute on Field Theory of Strongly Correlated Fermions and Bosons in Low-Dimensional Disordered Systems, Windsor, UK, August 2001.
- Training Course in the Physics of Correlated Systems and High-Tc Superconductors, Vietri sul Mare, Salerno, Italy, October 2000 and October 1999.
- NATO Advanced Research Workshop on Open Problems in Strongly Correlated Electron Systems Bled 2000, Bled, Slovenia, April 2000.
- NATO Advanced Study Institute/EC Summer School on New Theoretical Approaches to Strongly Correlated Systems, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, April 2000.
- International Workshop on Spin, Charge and Orbital Ordering in Complex Magnetic Oxides, Dubna, Russia, July 1999.
- Jerusalem Winter School for Theoretical Physics on Concepts and Trends in Condensed Matter Physics, Jerusalem, Israel, January 1999.
- Landau Summer School '94, Chernogolovka, Russia, July 1994.
- Spring College on Condensed Matter, International Center for Theoretical Physics, Trieste, Italy, May 1994.

Teaching Experience

- 2006 – present: General Physics Lecture Course, 4 s.h., and General Physics Lab, 4 s.h. (Fundamental laws and principles of mechanics, sound, light, electricity and magnetism) at Hofstra University.

Courses taught include:

- Fall semester 2006-2007: PHYS11A General Physics Lectures (Mechanics), two groups of about 50 students total, 4 s.h. 4 cred. each; PHYS11B General Physics Lab, 20 students, 4 s.h. 4 cred.
- Summer semester of 2006: PHYS12A General Physics Lectures (Sound, light, electricity and magnetism), 14 students, 4 s.h. 4 cred.
- Spring semester, 2006-2007: PHYS12A General Physics Lectures (Sound, light, electricity and magnetism), two groups of about 50 students total, 4 s.h. 4 cred. each.
- Fall 2007: Supervising two students at Hofstra University Honors College.
- 2005: Teaching Assistant, PHYS 1P21 General Physics (Mechanics and Waves) at the Department of Physics, Brock University, St. Catharines, Ontario, Canada.

- 1994 – 2000: Teaching Assistant, Physics and Mathematics at Phys-Tech College, the center for extra-curricular study for high school students in Moscow.
- 2000 – 2001: Teaching mentor for graduate students in the research group at P.L. Kapitza Institute, Moscow.

Honors and grants

- 2007 – 2009: KITP Scholar. This award funds a total of three research visits to Kavli Institute for Theoretical Physics, University of California, Santa Barbara, to be used over a period of up to three years. About seven scholars are selected each year.
- 2006: HCLAS Faculty Research and Development Grant and Presidential Research Award, Hofstra University.
- 1994 – 2001: Recipient of individual research and conference grants from INTAS, grants from Russian Foundation for Basic Research, from Russian Ministry of Science and Technology, and from the Committee at the Russian Academy of Sciences aimed to promote the research made by young scientists in Russia.
- 1994 and 1995: Individual research grants from Open Society Institute and Soros Foundation in Moscow.

All these publications are in refereed journals or books.

1. K.V. Samokhin and M.S. Mar'enko, *Nonuniform mixed-parity superfluid state in dipolar Fermi gases*, Phys. Rev. Lett. **97**, 197003 (2006).
2. K.V. Samokhin and M.S. Mar'enko, *Quantum fluctuations in Larkin-Ovchinnikov-Fulde-Ferrell superconductors*, Phys. Rev. B **73**, 144502 (2006).
3. M.S. Mar'enko, C. Bourbonnais, and A.-M.S. Tremblay, *Effect of superconducting fluctuations on ultrasound in unconventional superconductor*, Phys. Rev. B **72**, 024508 (2005).
4. M.S. Mar'enko, C. Bourbonnais, and A.-M.S. Tremblay, *Superconducting fluctuation corrections to ultrasound attenuation in layered superconductors*, Phys. Rev. B **69**, 224503 (2004).
5. M.A. Baranov, M.S. Mar'enko, Val.S. Rychkov, and G.V. Shlyapnikov, *Superfluid pairing in a polarized Fermi gas*, Phys. Rev. A **66**, 013606 (2002).
6. M.S. Mar'enko, D.V. Efremov, A.V. Ozharovskii, M.A. Baranov, and M.Yu. Kagan, *Superfluid triplet phases in two-dimensional Fermi system with repulsion*, J. Low Temp. Phys. **126**(1), 551 (2002)
7. M.S. Mar'enko, M.Yu. Kagan, D.V. Efremov and M.A. Baranov, *Superfluidity in 2D Fermi systems with repulsion*, in "Open Problems in Strongly Correlated Electron Systems", edited by Janez Bonca, Peter Prelovsek, Anton Ramsak, Sarben Sarkar, NATO Science Series, Kluwer Academic Publishers and IOS Press, Amsterdam (March 2001), ISBN 0-7923-6896-7.
8. M.A. Baranov, D.V. Efremov, M.S. Mar'enko and M.Yu. Kagan, *Superfluid transition temperature in a Fermi gas with repulsion. Higher orders of perturbation theory*, Sov. Phys. JETP **90**, 861 (2000) [Zh. Eksp. Teor. Fiz. **117**, 990 (2000)] (cond-mat/0007334).
9. D.V. Efremov, M.S. Mar'enko, M.A. Baranov and M.Yu. Kagan, *Critical temperature and phase diagram for 2D superfluid Fermi gas with repulsion*, Physica B **284-288**, 216 (2000) (cond-mat/9911167).
10. D.V. Efremov, M.S. Mar'enko, M.A. Baranov and M.Yu. Kagan, *Superfluid critical temperature in 3D Fermi gas with repulsion*, Physica B **284-288**, 397 (2000) (cond-mat/9911169).
11. M.Yu. Kagan, A.V. Chubukov, M.A. Baranov, D.V. Efremov and M.S. Mar'enko, *Superconductivity in correlated electron systems with repulsion*, J. Phys. Chem Solids **59**, 1828 (1998).
12. M.Yu. Kagan, M.A. Baranov, D.V. Efremov and M.S. Mar'enko, *Phase diagram for the superfluid Fermi gas in a strong magnetic field*, Czechoslovak Journal of Physics **46**, 209 (1996).
13. M.A. Baranov, M.Yu. Kagan and M.S. Mar'enko, *Singularity in the quasiparticle interaction function in 2D Fermi gas*, Czechoslovak Journal of Physics **46**, 2519 (1996).
14. M.Yu. Kagan, M.A. Baranov, D.V. Efremov, M.S. Mar'enko, P. Brussaard, Ch.G. van Weert and H.W. Capel, *Phase diagram for a superfluid Fermi gas in a strong magnetic field*, JETP Lett. **62**, 610 (1995) [Pis'ma Zh. Eksp. Teor. Fiz. **62**, 589 (1995)].

15. M.Yu. Kagan, M.A. Baranov, D.V. Efremov, M.S. Mar'enko and H.W. Capel, *Strong coupling corrections in a superfluid Fermi-gas with repulsion*, JETP Lett. **59**, 290 (1994) [Pis'ma Zh. Eksp. Teor. Fiz. **59**, 268 (1994)].
16. M.A. Baranov, M.Yu. Kagan and M.S. Mar'enko, *Singularity in the quasiparticle interaction function in 2D Fermi gas*, JETP Lett. **58**, 709 (1993) [Pis'ma Zh. Eksp. Teor. Fiz. **58**, 734 (1993)].