Curriculum Vitae

Personal Information

First Name:	Yegor
Last Name:	Vekhov
Sex:	Male
Date of Birth:	December 21, 1981
Place of Birth:	Kharkov, UKRAINE
Citizenship:	UKRAINE
Home Address:	ap. 88, 10 Aidemana Str., Kharkov 61112, UKRAINE
Email:	vekhov@ilt.kharkov.ua
Mobile Phone:	+38-066-1333989

Education

Master of Science, 2005 (Diploma with honors)
Qualification: Engineer-Researcher in Physics
Thesis Title: *Kinetics of the bcc-hcp Structure Phase Transition in Solid Mixtures ^{3}He-^{4}He*
Bachelor of Science, 2003 (Diploma with honors)
Qualification: Engineer in Material Science
National Technical University ”Kharkov Polytechnical Institute”. www.kpi.kharkov.ua
Department for Physics and Technique
Major Subject: Physical material science

Work experience

November 2004 – Present

PhD Student, Junior Researcher

B.Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine, Kharkov www.ilt.kharkov.ua

***Responsibility*:** Working in low temperature experimental physics area. Studying kinetic and thermodynamic properties of solid helium-4 and solid isotopic mixtures ^{3}He - ^{4}He at 1 – 2 K temperature range and 25-50 bar pressure range. Working out the automation system for support of experimental investigations.

Core Skills

- Work with low temperature techniques.
- Quick Basic, Turbo Pascal, Delphi, LabView.

Scientific Interests

Area of my scientific interests is fundamental and applied low temperature physics. Most interesting for me at present is study of kinetic and thermodynamic properties of helium crystals under structure phase transition. Also I am interested in studying of phonons and vacancies role in solid helium.

Effect of “supersolid” in solid helium is attracted my interest too.

Language skills

English	Good
Russian	Mother tongue
Ukrainian	Second mother tongue

Important Publications

- **E. Ya. Rudavskii, N. P. Mikhin, A. V. Polev, and Ye. O. Vekhov. Kinetics of Phase Transition at the BCC-HCP-Liquid Triple Points of ^{4}He // In: 24th International Conference on Low Temperature Physics, August 10-17, 2005, Orlando, Florida USA, P.154 (American Institute of Physics, Conference Proceeding (2005), V. 850, P. 343).**
- **V.A. Maidanov, M.I. Mil'chenko, N.P. Mikhin, A.S. Neoneta, A.V. Polev, V.N. Repin, S.P. Rubets, A.S. Rybalko, S.F. Semenov, E.V. Syrnikov, V.A. Shilin, and Ye.O. Vekhov. Crystallization thermometer for ultralow temperatures with a cooled FET Oscillator // Low Temperature Physics 31, 998 (2005).**
- **Ye.O. Vekhov, N.P. Mikhin, A.V. Polev, and E.Ya. Rudavskii. Kinetic processes at the triple points on the melting curve of ^{4}He // Low Temperature Physics 31, 1017 (2005).**
- **Ye. Vekhov, N Mikhin, A. Polev, E. Rudavskii, A. Birchenko. The Kinetics Asymmetry of the BCC-HCP Phase Transition in Solid Helium-4 // In: 21st General Conference EPS Condensed Matter Division, March 27-31, 2006, Dresden, Germany, P. 555.**
- **N. Mikhin, A. Polev, E. Rudavskii, and Ye. Vekhov. Effect of Crystal Quality on HCP-BCC phase transition in solid He // In: International Symposium on Quantum Fluids and Solids QFS2006, August 1-6, 2006, Kyoto, Japan; Journal of Low Temperature Physics, 2007 Vol. 148, Nos.5/6.**
- **N. Mikhin, E. Rudavskii, and Ye. Vekhov. New Features of the BCC-HCP Transition in Solid Helium // In: Sixth International Conference on Cryocrystals and Quantum Crystals CC-2006, September 3-7, 2006, Kharkov, Ukraine, P. 13.**
- **Ye. Vekhov, N. Mikhin, and E. Rudavskii. The Kinetic Features of Supercooled BCC Helium-4 // In: Sixth International Conference on Cryocrystals and Quantum Crystals CC-2006, September 3-7, 2006, Kharkov, Ukraine, P. 70.**
- **V.N. Grigor'ev and Ye. Vekhov. The universality of energy spectrum parameters of phonon and vacancion excitations in solid helium // Journal of Low Temperature Physics 149, 41, 2007.**
- **Ye. Vekhov, V.N. Grigor'ev, N. Mikhin, and E. Rudavskii. The bcc-hcp Phase Transition in ^{4}He: Comparison with Theory of Homogeneous Nucleation // In: International Symposium on Quantum Fluids and Solids QFS2007, August 1-6, 2007, Kazan, Russia; Journal of Low Temperature Physics 150, 47, 2008.**

Responsibilities

- Carrying out low temperature experiments with solid helium.
- Servicing and improving the experimental set-up.
- Software developing for automation system (Quick Basic, Turbo Pascal, Delphi, LabView…).

Significant Projects

Project Title: Neutral and Charged Nanostructures in Liquid and Solid Helium
Support Organization: Scientific & Technology Center in Ukraine
Role: Researcher
Duration: October 2007 – September 2010
Team Size: 12
Brief Description: Comprehensive experimental and theoretical investigations of the conditions for formation of new neutral nanosystems in solid and superfluid helium under different phase transitions will be carried out. It is expected that the conditions for realization of spinodal decay of ^{3}He-^{4}He quantum solid solutions, as a means for obtaining various nanostructures and testing the theory of homogeneous nucleation, will be determined. For such systems we suggest to perform a search and a study of nanoclusters formed by various ways under a phase separation. It is also assumed that nanoclusters may be formed under structural phase transitions when the lattice symmetry of helium undergoes drastic changes; we contemplate investigating kinetics of this process.

Project Title: "Phenomenon of Supersolidity of Helium-4"
Support Organization: Civilian Research & Development Foundation
Role: Researcher
Duration: March 2007 – February 2009
Team Size: 11
Brief Description: Experimental and theoretical investigation of new possibilities for observation of "supersolid" state in solid helium. Precise pressure measurement and NMR technique are used for studying the quantum. In phase-separated solid mixtures of ^{3}He in ^{4}He the anomalously fast mass transfer under transition of the system to homogeneous state is studied. The connection of this unknown non-diffusion mechanism of transport in quantum crystal with "supersolid" problem is elucidated. A large concentration of vacancies may be created also on the boundaries between bcc and hcp phases of solid helium. Experimental investigation of the bcc-hcp transition is compared with the theory. Study of pressure variation in solid ^{4}He during step-wise cooling/heating below 200 mK gives new insights in thermodynamic properties and relaxation processes in the temperature region where the "supersolid" state was observed by torsional technique.

In charge of experimental searching of “supersolid” state in helium crystals under bcc-hcp structure phase transition.
Creating new experimental cell for studying solid helium by both NMR and precise pressure measurement techniques.

Project Title: “Macroscopic quantum phenomena under polymorphous phase transitions in solids at low temperatures”
Project Type: Grant of the President of Ukraine for Support of Scientific Studies of Young Scientists
Role: Researcher
Duration: February 2007 – December 2007
Team Size: 6
Brief Description: The cycle of experimental researches of new manifestations of macroscopic quantum effects under polymorphous transitions condition in solids by precise barometry and thermal potentiometer techniques. New principal experimental data on phase separation kinetics of solid mixtures of helium isotopes. Under low temperature crystallographic phase transition condition, studying the correlation between diffusion and kinetic processes. Also investigation of the bcc-hcp phase transition at temperature range of 1-2 K in dilute solid mixtures ^{3}He in ^{4}He.

Project Title: “The Clusters Formation and Evolution in Rare Gas Cryosystems”
Project Type: Collective Project of the Research Scientific Work
Role: Researcher
Duration: July 2005 – December 2006
Team Size: 4

Recommendations

Professor Eduard Ya. Rudavskii,
tel.: (+38) 057 340 3163, rudavskii@ilt.kharkov.ua

Professor Vladimir A. Maidanov,
tel.: (+38) 057 341 0829, maidanov@ilt.kharkov.ua

Dr Nikolay P. Mikhin,
tel.: (+38) 096 123 4986, mikhin@ilt.kharkov.ua

B.Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine, Kharkov,

Sincerely yours,

Yegor Vekhov.