

## Curriculum Vita

### *Valery Pokrovsky*

#### **Education:**

MS: Kharkov University, Ukraine, 1953. Sc. Advisors G.Ya. Lyubarsky, I.M. Lifshitz.

PhD: Tomsk State University, Russia, 1957. Advisor Prof. Yu.B. Rumer.

Doctor of Science: Siberian Branch of Ac. of Science USSR Novosibirsk, 1962 (higher degree, no analogues in US educational system).

#### **Positions held:**

1953-1956 Teacher at a technical school, Novosibirsk

1955-1957 PhD student at Institute of Radiophysics, Siberian branch of Academy of Sciences of USSR, Novosibirsk

1957-1960 Research scientist at the same Institute

1960-1966 Head of theoretical division at the same Institute, then at the Institute of Semiconductors, Novosibirsk.

1966-now Head of a division, then leading scientist at Landau Institute for Theoretical Physics of the Academy of Sciences of USSR, Chernogolovka, Moscow District

1966-1992 Professor of Theoretical Physics at Moscow Institute for Physics and Technology

1992-now Professor (starting from 1998 Distinguished Professor), Department of Physics, Texas A&M University, College Station, TX 77843-4242

#### **Invited professor positions**

1983 Guest Professor at Troisieme Cycle, Lausanne Polytechnique and University of Neuchatel, Switzerland.

1977 Visiting scientist at Nordita, Copenhagen, Denmark.

1979 Guest Professor at Wroclaw Polytechnica, Poland

1982 Visiting scientist at Institute of Physics, Hungarian Ac. of Sc., Budapest.

1990 Visiting scientist at Centre of Nuclear Study Julich, Germany.

1991 Visiting scientist at Brookhaven National Laboratory.

1994-5 Guest Professor at ETH, Zürich, Switzerland.

2000 Guest Professor at University of Cologne, Germany.

2010 Guest Professor at Joint Theoretical Institute of University of Chicago and ANL.

2001-2015 Visiting Scientist at University of Cologne (2 summer months)

#### **Main scientific achievements:**

1. New method in quantum mechanics allowing calculations beyond all orders of the perturbations theory, in particular the overbarrier reflection and scattering amplitudes (1957-1962). This work served as a starting point of a new branch of Mathematical Physics "Asymptotics beyond all orders". It is included in Quantum Mechanics by Landau and Lifshitz. M. Kruskal, H. Segur, B. Shraiman and others used it for study of dendrite growth and other non-linear problems. M.V. Berry started his study of asymptotic series with development of an early work of this series.
2. Formulation of universal scaling hypothesis in general theory of phase transitions (1964-1966). This work was mentioned in the Communication of the Nobel Committee on the Nobel Prize 1982 and the Nobel presentation by K. Wilson. Alexander Polyakov considered the work of 1964 as a starting point of his activity in the field theory (see his book "Gauge fields and strings").
3. Statistical theory of a new topological phase transitions in 2 dimensions (1979-84) that received in literature the name "Pokrovsky-Talapov transition". It has numerous applications in condensed matter physics, quantum chemistry and even in quantum field theory.
4. Theory of stripe structures in ferromagnetic films (1993-96). The theory was verified by several experimental groups in Switzerland, France and USA.
5. Landau-Zener transition in the noisy medium and in cooled gases (2003-2007). This theory is important for future quantum computers and for molecular magnets.

6. Theory of Ferromagnetic-Superconductor hybrids (1998-2005). These hybrids were realized in several experimental groups, in particular at our Department.
7. Bose-Einstein condensation in the random environment (2007-2010). The theory explained experiments with the cooled gas subject to the action of an artificial random field.
8. Bose-Einstein condensation and superfluidity of magnons (2012-). I

**Awards:** Landau Prize of Academy of Sciences of USSR together with A.Z. Patashinskii for pioneering works on theory of phase transitions, 1984; Distinguished Lecturer at Department of Physics, Texas A&M University, 1989; Humboldt Prize 2000 for senior American scientists; Prize for scientific achievement by Alumni Club of Texas AM University, 2001; Onsager prize of American Physical Society for fundamental contribution to statistical physics, 2005. Distinguished Professor at Texas A&M University, 1998; Fellow of American Physical Society, .

***Synergetic activity:***

*Member of Scientific Council of Landau Institute.*

*Conferences co-organizer:* Statphys 22, International Congress of Statistical Physics, Bangalore, India, 2004; Statphys 23, Padova, Italy, 2007; Statphys 24, Cairn, Australia 2010; Statphys 25, Seoul, South Korea 2013; Statphys 26, Lyon, France, 2016. Annual Conference on mesoscopic phenomena in superconductors and ferromagnets, Argonne National Laboratory, Argonne, IL, 2003-2006; Landau Memorial Conference, Moscow-Chernogolovka, Russian Federation, June 2008.

*Co-Editor:* Journal of Modern Physics B and Modern Physics Letters B; Journal of Magnetism and Magnetic Materials.

***Invited participant and speaker (after 2010):*** Workshop on Anderson localization, nonlinearity and turbulence, International Center for Theoretical Physics, Trieste, Italy, August 2010; International Workshop “Disordered Quantum Systems”, Institute H. Poincare, Paris, June-July 2012; Annual Conferences “Landau Days” in Chernogolovka, Russian Federation, 2005-13; International Conference “Frontier in Nanoscience”, ICTP, Trieste, Italy, 2015; International Conference “Magnonics”, Physikzentrum Bad Honnef, Germany, 2016; International workshop “Disorder, Interaction and Coherence; Warps and Delights, Max Planck Institute of Complex Systems, Dresden, Germany, 2016.

***Colloquiums (after 2007):*** University of Maryland and NIST, April 2009; Boston University, February 2011; University of Cologne, Germany, July 2012; Brown University, Providence, October 2014.

***Thesis advisor:*** More than 45 PhD students. Among former PhD students there are 2 full members of Russian Academy of Sciences, 8 professors at USA Universities and National Labs, about 30 professors at Russian Universities and Academic Institutions, one winner of the Mac Arthur prize 2008 and Milner award for fundamental studies (Dr. A.I. Kitaev), 3 winners of the Director Postdoctoral Fellowships at Los Alamos National Laboratory (Ar. Abanov, N. Sintsyn, F. Li). Fuxiang Li has received the Distinguished Graduate Student Award for Excellence in Research in the year 2015.

***Recent publications:***

O.A. Tretyakov, K.S. Tikhonov, V.L. Pokrovsky, *Spin resonance in a Luttinger liquid with spin-orbit interaction*, Phys. Rev. B **88**, 125143 (2013)

F. Li, W.M. Saslow and V.L. Pokrovsky, *Phase Diagram for Magnon Condensate in Yttrium Iron Garnet Film*, Scientific Reports **3**, 1372 (2013)

H. Schenk, V.L. Pokrovsky, T. Nattermann, *Vector Chiral Phases in Frustrated 2D XY Model and Quantum Spin Chains*, Phys. Rev. Lett. **112**, 157201 (2014)

C. Sun and V.L. Pokrovsky, *Spin Correlations in Quantum Wires*, Phys. Rev. B **91**, 161305(R) (2015)

C. Sun, T. Nattermann, and V.L. Pokrovsky, *Unconventional Superfluidity in Yttrium Iron Garnet Film*, Phys. Rev. Lett. **116**, 257205 (2016)