

Extended CV

Viktor Kurasov

1. General data

- Name:
Viktor Kurasov
- Date of birth:
August 18, 1961
- email:
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- Phone:
+46 73-850 18 36
- Language skills
 - * Russian - native speaker
 - * English - fluent
 - * Swedish, French, German - speaking and understanding
- Computer skills
 - * Scientific calculation programs for solution of mathematical equations
 - * Computer simulation of real physical systems
 - * Numerical methods - knowledge, usage and teaching
 - * All main computer languages of a high level - knowledge, usage and teaching
- Uniqueness of competence
 - * Unique combination of experience in precise scientific programming and analytic capacities
 - * Unique combination of theoretical research and computer simulation for confirmation of results
 - * Unique combination more than 25 years of St.Petersburg university teaching, administrative activity and scientific research.
 - * Uniqueness of extremely large range of applicability of the attained scientific results in practice.

2. Scientific degrees

- 2006 Doctor of Sciences (*scientific degree higher than PhD given for creation of a new direction in science or for solution of fundamental problems*) in Theoretical Physics (decision by Supreme Attestation Collegium of Russia after the appeal of St. Petersburg Univ.)
- 2001 Docent in Computational Physics (decision by the Ministry of Education of Russia after the appeal of St.Petesburg Univ.)

- 1993 Dr.Rer.Nat. for equivalence of PhD (decision by Senat of Berlin after the appeal of the Free University of Berlin)
- 1987 PhD in Theoretical and Mathematical Physics (decision by Supreme Attestation Collegium of USSR after the appeal of St. Petersburg (Leningrad) Univ.)
- 1984 Diploma with award for special merits for the Full course (6 years) in Physics at St. Petersburg (Leningrad) Univ., Faculty of Physics. *Diploma certifies the ability to teach both at the university and at school level.*

3. Employments

- 2015 - 2023, Adviser for Rector Administration Department of St. Petersburg Univ.
- 2015 - 2018 Affilierad forskare vid Stockholms Universitet (Affiliated researcher at Stockholm's University)
- 2007 - 2014 Full professor (Department of Computational Physics St. Petersburg Univ.)
- 1998 - 2007 Associated professor (Department of Computational Physics, St. Petersburg Univ.)
- 1996 - 1998 Senior Lecturer (Department of Computational Physics, St. Petersburg Univ.)
- 1990 - 1996 Assistant professor (Department of Computational Physics St. Petersburg Univ.)
Leave of absence: 1993 - 1994 guest researcher at Freie Universität (Berlin)
- 1987 - 1990 Scientific Researcher (Department of Mathematical Physics Computational Physics Institute for Physics, St. Petersburg Univ.)

4. Scientific activity

Research areas

- * **Statistical Physics**
- * Mechanics of continuous media
- * Condensed Matter Physics
- * Density Functional Approaches
- * Quasi-Classical Decompositions. Asymptotic methods
- * Solid State Physics
- * General Methodology of Physics
- * Information Processing
- * Numerical Algorithms in Physics
- * Computer Simulations in Physics
- * Statistical Analysis in Physical kinetics
- * Mathematics and Physics didactics

Methods of Scientific research

- * Analytical derivations of formulas
- * Computer simulations of various physical models
- * Usage of the computer systems of analytical computations (Maple, MathLab).
- * Programming. Programs written in Fortran, Pascal, C.

Publications

Articles

More than 100 publications including articles in Physical Reviews, Physica A, etc. in

- Asymptotic decompositions of Quantum Statistical Sums
- Properties of Bernoulli numbers
- General features of the First Order Phase Transition kinetics
- Phase Transitions in particular systems and situations

Since 2016 instead of being presented in articles the scientific results are published in monographs which contain only the original and unpublished results of the author.

The majority of articles are written under the single authorship.

Scientific monographs

From 1997 up to the present time **12 Monographs** were published at different Publishing Houses in Russia. All of them are written in English and are attainable for readers all over the world.

All monographs are written under the single authorship. These monographs contain besides the overview only the original scientific results of the author.

Since 2016 the monographs edition became the major way of the spreading of information about the scientific achievements of the author since the volume of the scientific theories presented there strongly exceeds the allowed volume of articles in journals.

Since 2020 the total volume of books is more than 1500 pages.

Major scientific results

1. Analytical establishing of the **Self consistency of thermodynamic description in the first order phase transitions (FOPT)**. Instead of the strong dependence on microscopic corrections for the critical cluster free energy the smooth dependence of the asymptotic characteristics of the phase transition was shown by exact formulas.
2. Analytical derivation of **Precise universality of FOPT under the arbitrary given regime of the substance exchange**.
3. Analytical establishing of **Similarity of FOPT with respect to the different regimes of substance exchange and appearance of the metastability profiles**.
4. Analytical theory for **Multi-component FOPT kinetics**.
5. Analytical theory for **Heterogeneous FOPT kinetics**.

6. Analytical consideration of **Stochastic effects in FOPT.** with construction of the corresponding theory.
7. Analytical consideration **Coagulation in FOPT** with creation of the complete analytical description of the corresponding kinetics.
8. Creation of the theory for kinetics of **FOPT for retardation regimes of the embryos growth**
9. Consideration of **Coagulation in FOPT kinetics** with creation of the corresponding theory.
10. Analytical theory for the description of **Solid bodies destruction kinetics.**
11. **Reconsideration of the Lifshic-Slezov theory of coalescence.** and creation of a new theoretical description.
12. Theoretical reconsideration of **quantum mechanical aspects in signals transmission** and **methodological basis for quantum and classical evolution equations** in physics.
13. New version of the teleportation problem posing.
14. Derivation of physics equations from probability theory results as well as from general principles of cognitive theory.

International Scientific activity

Research visits

- 2015 - 2018 Affilierad forskare vid Stockholms Universitet (Affiliated researcher in Stockholm's Univ.)
- September 2011 - Helsinki Univ.
- July, August 2005 - Stockholms universitet
- June 1998 - Stockholms universitet
- December 1995 - Luleå universitet
- July 1994 - Oct. 1994 - Free Univ., Berlin
- November 1993 - Sorbonne, Paris
- July 1993, November 1993 - Rostock Univ.
- March 1993 - December 1993 - Free University, Berlin
- Sept. 1991 - Manne-Siegbahn Institute, Stockholm
- Sept. 1990 - Trondheim, Oslo, Norway

Conferences

Talks and Reports at **more than 30** International Conferences and Research Workshops.

5. Pedagogical experience

Pedagogical activity at the University level

Teaching experience

- **Activity as a lecturer in St. Petersburg Univ.**

(lectures are given both in English and Russian, namely at the Russian-German faculty all course were in English)

· **Principal Lecturer**

General courses

2007-2014 Advanced numerical methods (4-th year students)

2001-2010 Informatics (1-st year students)

2001-2010 Numerical methods (2-nd year students)

2001-2010 Methods of computational physics (4-th year students)

1998 - 2005 Advanced numerical methods for students specializing in computational physics (5-th year students)

1994-2001 Computer Languages (5-th year students)

Special courses

2000-2014 Methods of calculations for students specializing in computational physics (5-th year students)

2005-2014 Numerical methods in statistical physics for students specializing in computational physics (5-th year students)

1999-2014 Introduction into mathematical statistics (3 and 4-th year students)

2008-2014 System analysis and data processing in physics (5-th year students)

Courses combining theory and exercises

- Lectures and practice in "Computer soft and computer systems" (2001-2011):

1. FORTRAN, Pascal, ALGOL, COBOL C
2. Assembler for 8087,
3. HTML, PHP, CSS
4. Java
5. Javascript
6. Python
7. Maple, MathLab, R

Seminars

1986, 1988-1992 - practical training in Statistical Physics and thermodynamics (4-th year students, 1 group)

1989 - 1992, 1994-1999 - practical training in Computer Languages (1-st year, 2-5 groups)

1990 - 2000 Practical training in numerical methods (2-nd year, 2-5 groups)

Assistant Lecturer

1986 - Statistical physics and thermodynamics (course of lectures for 4-th year students)

Demonstrative lectures

(in branches of Physics other than Computer Science)

- History of physics
- The Vavilov-Cherenkov effect
- Electromagnetic properties of polymers

Publication of textbooks and manuals

- Author of **4 printed textbooks** written together with colleagues from St. Petersburg Univ.
These textbooks concern the Numerical Methods, Languages of programming, First order phase transition kinetics.
- Single author of **several electronic manuals** written for St. Petersburg Univ. students.
These manuals concern the First order Phase Transition kinetics, Numerical methods in Physics, Problems of Computer Simulations in Physics.

Development of "specialized original lecture courses"

(the courses with no analogues in other educational programs completely created by the lecturer)

- 2005 Numerical methods in statistical physics (5-th year students)
- 2008 System analysis and data processing in physics (5-th year students)

These courses are based on the modern scientific investigations including scientific contributions by the author. No monographs were available for these courses.

* Pedagogical leadership

- **Supervising** for more than 10 students both in statistical physics and numerical methods
- **Coordinator** for the exchange program between the St. Petersburg Univ. and Grenoble Univ. (1994-1998). Supervisor for the education of French students.
- **Developer** of the student programm for the joint Russian - German faculty at the St. Petersburg Univ.

Methodological supervising

- 2015 - 2023. The duties of **Rector Administration Adviser** means the constant work in the area of the **Methodological Supervising in the Education Process in St. Petersburg University**.

Pedagogical activity at the school level

School level practice

- * Lecturer at the St.Petersburg university branch for school children "Small physics faculty" (1986-1988)

School level supervising activity

- * Supervising of physical olympiad for school-level pupils
- * Supervising of school diplomas examinations at the City Palace of youth creativity (1991-1992)

Pedagogic professional education

Pedagogic basic skills

- The full course of St. Petersburg Univ. at the Physics Faculty. The pedagogical skills teaching is incorporated in all disciplines studies during six years. (This education allows to teach at the school and university levels)
- Higher education pedagogic practice - the course included in the program of the university education.
- Pedagogical practice at the post-graduate studying

Pedagogic skills refinement

- Regular seminars and meetings devoted to pedagogic problems at the Department of computational physics during the corresponding activity.
- Regular courses to improve professional competence in St.Petersburg Univ. with emphasis on foreign languages: (1998,1999, 2000, 2001, 2003, 2005, 2006, 2011, 2012, 2014) - approx 100 hours every year
This gives the ability to teach in foreign languages.

Appendix: List of scientific papers

(textbooks and manuals are not included)

Articles in scientific refereed journals

1. A.P. Grinin and V. Kurasov, Towards kinetics of homogeneous condensation in open system, *Vestnik (Herald) of Leningrad university*, 1984, issue 2, p.100 (in Russian, 2 pages).
2. A.P. Grinin, F.M. Kuni, and V.B. Kurasov, Determination of main parameters of the process of heterogeneous condensation of vapor on nucleus in dynamic conditions, *Vestnik (Herald) of Leningrad university* 1986, series 4, issue 4 (in Russian, 4 pages).
3. A.P. Grinin, F.M. Kuni, and V.B. Kurasov, Method of moments in kinetics of homogeneous condensation, *Vestnik (Herald) of Leningrad university*, 1987, series 4, issue 2 , N11 (in Russian, 4 pages).
4. A.P. Grinin, F.M. Kuni, and V.B. Kurasov, Kinetic theory of heterogeneous condensation in dynamic conditions.1. System of condensation equations, *Colloid journal*, v.52, N 3, 1990 (in Russian, 6 pages).
5. A.P. Grinin, F.M. Kuni, and V.B. Kurasov, Kinetic theory of heterogeneous condensation in dynamic conditions.2. Spectrum of droplets sizes, *Colloid journal*, v.52, N 3, 1990 (in Russian, 6 pages).

6. A.P. Grinin, F.M. Kuni, and V.B. Kurasov, Kinetic theory of heterogeneous condensation in dynamic conditions.3. Condensation of surplus substance. Non-isothermal effects of condensation, *Colloid journal*, v.52, N 3, 1990 (in Russian, 6 pages).
7. A.A. Melikhov, F.M. Kuni, V.B. Kurasov, and Yu.S. Djikaev, Two-component nucleation, *Russian Chemical physics*, v.9, N 12, 1990 (in Russian, 8 pages).
8. A.A. Melikhov, F.M. Kuni, V.B. Kurasov, and Yu.S. Djikaev, Kinetics of two-component nucleation, *Journal of technical physics*, v. 61, N 1, 1991 (in Russian, 7 pages).
9. V.B. Kurasov and P.P. Pavinsky, Asymptotic decompositions for quantum rotator of identical atoms, *Vestnik (Herald) of Leningrad university*, issue 1, N 4, 1991, (in Russian, 5 pages).
10. V.B. Kurasov, Kinetic theory for condensation of multicomponent vapor in dynamic conditions, *Physica A*, vol.207, p.541, 1994 (10 pages).
11. V.B. Kurasov, Kinetic theory for condensation in dynamic conditions, *Physical Review E*, vol 49, p.3948, 1994 (8 pages).
12. A.P. Grinin, F.M. Kuni, and V.B. Kurasov, Heterogeneous nucleation in conditions of stabilization of ideal supersaturation, *Vestnik (Herald) of St.Petersburg State university*, Series 4, issue 2, p. 76, 1992 (in Russian, 5 pages).
13. V. Kurasov, Density profiles in the theory of condensation, *Physica A* 226 (1996) (20 pages).
14. A.B. Mikhailova and V. Kurasov, Heterogeneous condensation in dynamic conditions with arbitrary Knudsen numbers (mean field approximation), *Vestnik (Herald) St.Petersburg State university*, Series 4, 1998, issue 4 (25) (in Russian, 5 pages).
15. A.V. Pavlov and V. Kurasov, Algorithm of calculation of main characteristics of the process of heterogeneous condensation with existence of several types of heterogeneous centers in the system, *Vestnik (Herald) of St.Petersburg State university*, Series 4, 1999, issue 2, N 11, p.76-79 (in Russian, 4 pages).
16. A.V. Pavlov and V. Kurasov, Description of the stage of the droplets formation on the ions of different signs simultaneously presented in the system, *Colloid journal*, vol. 62 (2000), N 3 , p.381-388 (in Russian, 8 pages).
17. V. Kurasov, Stationary profiles of condensation, *Vestnik (Herald) of St.Petersburg university*, Series 4, 1999, issue 2 (N 11), p.80-83 (in Russian, 4 pages).
18. V. Kurasov, Multicomponent nonisothermal nucleation, *Physica A* 280 (2000) 219-255 (37 pages).
19. V. Kurasov, Overlapping of characteristic regions in kinetics of nucleation, *Vestnik (Herald) of St.Petersburg university*, Series 4, issue 2 (12), 2002, p.27-35 (in Russian, 8 pages).

20. V. Kurasov, Calculations of the profile around the growing droplet, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 3 (20), 2002, p. 19-31 (in Russian, 11 pages).
21. V. Kurasov, Method to determine the form of the spectrum of activities, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 1 (2), 2002, p. 72-77 (in Russian, 5 pages).
22. V. Kurasov, Kinetics of the nucleation process on several types of centers. Construction of external supersaturation, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 2 (12), 2003, p. 3-21 (in Russian, 17 pages).
23. V. Kurasov, Application of monodisperse approximation in strong asymmetry of activities spectrum, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 3 (20), 2003, p. 3-15 (in Russian, 12 pages).
24. V. Kurasov, Description of condensation in dynamic conditions in polynomial approximation of the spectrum of activities of vacancies, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 4 (28), 2003, p. 23-30 (in Russian, 8 pages).
25. V. Kurasov, Form of the spectra of nucleus dimensions in first-order phase transitions, *Theoretical and mathematical physics*, vol. 131, N 3, p.503-528 (in Russian, English translation, 26 pages).
26. V. Kurasov, Parameters of the embryos distribution, *Russian chemical physics*, vol. 77, N 10, 2003 (in Russian, English translation, 4 pages).
27. V. Kurasov, Helmholtz' energy of multi-component embryo, *Russian chemical physics*, vol 77, additional issue (suppl.1), p.154-157 , 2003 (in Russian, English translation, 4 pages).
28. V. Kurasov, Kinetics of condensation on several types of heterogeneous centers in limit situations, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 1 (4), 2004, p. 14-22 (in Russian, 8 pages).
29. V. Kurasov, Heterogeneous condensation in dense media, *Physical Review E* 63056123 (2001) (18 pages).
30. V. Kurasov, Kinetic effects of multi-component nucleation, *Physica A*, 8612, 2005 (38 pages).
31. V. Kurasov, Heterogeneous centers as an obstacle in experiment for homogeneous condensation in dynamic conditions, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 3, 2005, p. 3-8 (in Russian, 5 pages).
32. V. Kurasov, Method of disbalanced iterations on the base of universal solution for description of heterogeneous nucleation, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 3 (20), 2005, p. 85-89 (in Russian, 4 pages).

33. V. Kurasov, Kinetics of decay and condensation in dynamic conditions for multicomponent system, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 4, 2005, p. 35-41 (in Russian, 6 pages).
34. A.V. Pavlov and V. Kurasov, Towards a question of nucleation in the super-saturated vapor in the presence of heterogeneous centers of different nature, *Colloid journal* vol 64, 2002, p.1-7 (in Russian, English translation, 7 pages)
35. V. Kurasov and S.I. Zolotukhin, Approximate investigation of the effect of overlapping of the exhausted regions in kinetics of embryos formation, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 2, 2010 (in Russian, 5 pages).
36. V. Kurasov, Self-similarity of the nucleation conditions as a tool of refinement of statistical characteristics of the process of nucleation, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 2, 2014, (in Russian, 9 pages).
37. V. Kurasov, Determination of statistical characteristics of the decay of metastable state with the help of monodisperse approximation, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 3 , 2014, (in Russian, 9 pages).
38. V. Kurasov, Dispersion of the droplet number in nucleation in dynamic conditions, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 3, 2014 (in Russian, 9 pages).
39. V. Kurasov, Corrections for the total number of droplets in kinetics of nucleation under the dynamic action of external conditions, *Vestnik (Herald) of St.Petersburg State university*, series 4, issue 3, 2014 (in Russian, 5 pages)
40. V. Kurasov, The interference of fluctuations in the kinetics of metastable phase decay
Colloid. journal, vol. 76, issue 6, pp.694-700, 2014 (In Russian, translation in English)
41. V. Kurasov, The distribution of the super-critical embryos in kinetics of nucleation
Letters to the Russian Journal of Technical Physics, 2015, 5 pages (In Russian, translation in English).
42. V. Kurasov, Gibbs thermodynamics of the Renninger-Wilemski problem
Journal of Thermodynamics Volume 2015(2015) Article ID 639572 (13 p)
43. V. Kurasov, Different methods to describe the stage of nucleation in the decay of the metastable state
Colloid. journal, vol. 77, issue 4, pp.1-10, 2015 (In Russian, translation in English)
44. V. Kurasov, Self-similarity of the nucleation conditions as a tool to refine the statistic characteristics of the nucleation process. *St.Petersburg university Herald*, Issue 4, Physics, Chemistry, 2014. Ò. 1. žă2. Ñ. 214-223 ISSN:ă1024-8579

45. V. Kurasov, Determination of the statistic characteristics of the metastable state decay process with the help of the monodisperse approximation, St.Petersburg university Herald, Issue 4, Physics, Chemistry, 2014. Ò. 1. žă3. Ñ. 269-279. ISSN:ă1024-8579
46. V. Kurasov, Dispersion of the droplets number in the nucleation under the dynamic conditions. St.Petersburg university Herald, Issue 4, Physics, Chemistry, 2014. Ò. 1. žă3. Ñ. 280-288 ISSN:ă1024-8579
47. V. Kurasov, Corrections to the total number of droplets in kinetics of nucleation under the dynamic external conditions, St.Petersburg university Herald, Issue 4, Physics, Chemistry, 2014. Ò. 1. žă3. Ñ. 408-413. ISSN:ă1024-8579
48. Kurasov V., Distribution of the supercritical embryos in nucleation kinetics Letters in Russian Technical Physics 2015, ò.41, issue. 7, ñ.89-96 ISSN:ă0320-0116
49. Kurasov V., Gibbs Thermodynamics of the Renninger-Wilemski Problem ñòàòüß Journal of Thermodynamics Volume 2015 (2015), Article ID 639572 DOI: 10.1155/2015/639572 ISSN:ă1687-9244
50. Kurasov V., Kinetics of nucleation with decreasing rate of growth Physica A, vol.436, pages 200-215 DOI: 10.1016/j.physa.2015.05.003 ISSN:ă0378-4371
51. Kurasov V., Mutual influence of fluctuations in kinetics of the metastable phase decay, Russian Colloid. journ., 2014. vol. 76. žă6. p. 745. ISSN:ă0023-2912
52. . Kurasov V., Different ways to describe the nucleation period under the decay of the metastable state, Russian Colloid. journ., vol. 77, ž 4, p. 501 ISSN:ă0023-2912
53. Kurasov V., Decay of Metastable State with Account of Agglomeration and Relaxation Processes Advances in Physical Chemistry Volume 2016 (2016), Article ID 9468050, 9 pages ISSN: 1687-7993
54. Kurasov V., Theoretical description of the glass preparation with the Necessary Optical Properties, Advances in Optical Technologies Volume 2016 (2016) Article ID 7561952, 13 pages
55. Kurasov V., Approximations of the embryos size spectrum in kinetics of nucleation under the smooth varying external conditions, Russian Colloid. journ., vol. 78, 2016, p.152-162 ISSN 0023-2912
56. V.Kurasov, Approximate method for solution of the balance equation under the known number of formations of a new Phase in kinetics of the first order phase transitions, News of RAN, Mechanics of solid body 2020, n.1, p.159-157
57. V.Kurasov Approximate method of description of evolution preceding the coalescence, Solid body physics 2020, vol, 62 issue 1 p.36-40

Materials of conferences

58. A.P. Grinin, F.M. Kuni, and V.B. Kurasov, Heterogeneous nucleation in flow of gas, *Mechanics of inhomogeneous systems*, Institute of theoretical and applied mechanics of Siberian branch of Academy of Sciences USSR, Novosibirsk, 1985 (in Russian, 25 pages).
59. A.P. Grinin, A.S. Kabanov, V. Kurasov, I.V. Tupchieva, About the role of source of sulphuric acid in the fluctuational process of formation of sulphuric-acid aerosol, *Selected papers of the institute of experimental meteorology, physics of climate, series: physics of low stratosphere*, issue 35 (113), Moscow, 1985, p. 84 (in Russian, 5 pages).
60. A.P. Grinin, F.M. Kuni, V.B. Kurasov, and V.B. Sovkov, Kinetics of condensation and properties of liquids in small volume, *Physics of liquid state*, issue 13, Kiev, 1985 (in Russian, 12 pages).
61. A.P. Grinin, F.M. Kuni, and V.B. Kurasov, A simple method to determine the characteristics of heterogeneous condensation in dynamic conditions, *Problems of physics of forms-formation and phase transformations*, Kalinin, 1986, Kalinin state university, (in Russian, 5 pages).
62. V.B. Kurasov, Kinetics of thin film growth, Materials of the 12-th International Vacuum Congress 8-th International Conference on Solid Surfaces, Hague, Elsevier, Holland, 1992 (1 page).
63. V.B. Kurasov, The influence of the binary surface characteristics on the process of nucleation, Materials of the 12-th European Conference on Surface Science (ECOSS-12), Stockholm, 1991 (1 page).
64. V.B. Kurasov, Analytical theory of binary condensation, Materials of The Lars Onsager Symposium. Coupled Transport and Phase Transitions, ed. P.C.Hemmer, Trondheim, Norway, 1993 (1 page).
65. V.B. Kurasov, Analytical description of the condensation process in the atmosphere, Materials of Twelfth Annual Meeting of the American Association for Aerosol Research, Oak Brook, Illinois, USA, ed. F.Hopke, 1993 (1 page).
66. A.P. Grinin, F.M. Kuni, and V.B. Kurasov, Heterogeneous condensation under the dynamic conditions in the atmosphere, Materials of the 12-th international Symposium on Gas Kinetics, Reading, United Kingdom, 1992 (3 pages).
67. V.B. Kurasov, Simultaneous action of heterogeneous and homogeneous mechanisms in nucleation under the dynamic conditions in atmosphere, Materials of the 12-th international Symposium on Gas Kinetics, Reading, United Kingdom, 1992 (3 pages).

68. A.A. Melikhov, F.M. Kuni, V.B. Kurasov, and Y.S. Djikaev, Kinetic theory of binary nucleation, Materials of the First Liquid Matter Conference, Lyon, France, 1990 (1 page).
69. V.B. Kurasov, Decay of the multicomponent gaseous mixture into liquid state, Materials of the Second Liquid Matter Conference, Firenze, Italy, 1993 (1 page).
70. A.A. Melikhov, F.M. Kuni, V.B. Kurasov, and Y.S. Djikaev, Thermodynamics of two-component aerosol formation, Materials of the 15-th all-union conference "Actual questions of physics of aerodisperse systems", Odessa, 1989 (1 page).
71. A.A. Melikhov, F.M. Kuni, V.B. Kurasov, and Y.S. Djikaev, Peculiarities of thermodynamic description of two-component embryos formation, Materials of the Second All-union workshop "Metastable states - thermal physical properties and kinetics of relaxation", Sverdlovsk, 1989 (1 page).
72. P. Kurasov, V.B. Kurasov, and B. Pavlov, Calculation of the second virial coefficient in one dimensional system, Micro, Meso and Macroscopic approaches in physics, Materials of the conference "On three levels", Leuven 1993, edited by A.Verbeure, M.Fannes, C.Maes, Belgium, 1993, Plenum publishing corporation, NY (5 pages).
73. A.P. Grinin, F.M. Kuni, and V. Kurasov, Kinetic theory of condensation on identical heterogeneous centers, in: Nucleation and Aerosols, ed. M.Kulmala, P. Wagner, Elsevier, 1996 (3 pages).
74. V. Kurasov, Condensation on spectrum of heterogeneous centers with different activities, in: Nucleation and Aerosols, ed. M.Kulmala, P. Wagner, Elsevier, 1996 (3 pages).
75. A.V. Pavlov and V. Kurasov, Formation of aerosol on ions after the instantaneous creation of the metastable state of vapor, in: Materials of the the Second international conference "Natural and man-made aerosols", St.Petersburg, 1999 (in Russian, 4 pages).
76. V. Kurasov, The modified steepens descent method for the nucleation under the nonlinear conditions, in: Materials of the First Int. workshop "Nucleation and Non-linear problems in the First-Order Phase Transitions, SPb, 1998 (1 page)
77. A.P. Grinin, F.M. Kuni, and V. Kurasov, Kinetics of Condensation under the Gradual Creation of the Metastable State, in: Workshop "Nucleation theory and applications", Joint Institute of Nuclear Researches, 1999 (33 pages).
78. A.V. Pavlov and V. Kurasov, Process of formation of the liquid droplets phase on the simultaneously existing ions of different signs in the system, in: Collection of reports of 6-th International conference "Modern problems of electrophysics and electro-hydrodynamics of liquids", St. Petersburg 2000, p. 143-146 (in Russian, 4 pages).

79. V. Kurasov, Kinetics of condensation under the action of radiation, in: International symposium "Atmospheric radiation" MCAP-02, Collection of abstract reports, p.67 (1 page).
80. V. Kurasov, Heterogeneous decay of metastable phases, in: Nucleation Theory and Applications Ed. J. Schmelzer, G. Roepke, V. Priezhev, Dubna JINR, 2002, p.177 - 214 (37 pages).
81. V. Kurasov, Theoretical justification of balanced character of exhaustion of heterogeneous centers of different activities in the processes of condensation in different external conditions, in: Natural and man-made aerosols. 3. Collection of contributions, St.Petersburg, 2001, Ivlev L. S. (ed.), p. 236-243 (in Russian, 6 pages).
82. V. Kurasov, Properties of the decay of metastable state on heterogeneous centers with rather wide spectrum of activities, in: Natural and man-made aerosols. 3. Collection of contributions, St.Petersburg, 2001, Ivlev L. S. (ed.), p. 243-250 (in Russian, 6 pages).
83. V. Kurasov, Decay of metastable state on the vanishing boundary of the activity spectrum of heterogeneous centers, in: Natural and man-made aerosols. 3. Collection of contributions, St.Petersburg, 2001, Ivlev L. S. (ed.), p. 250-256 (in Russian, 6 pages).
84. V. Kurasov, Kinetics of the metastable phase decay on several types of heterogeneous centers in the common lengths of pseudo-homogeneous processes and strong exhaustion of centers for one group and moderate exhaustion of centers for the other group of centers, in: Natural and man-made aerosols. 4. Collection of contributions, St.Petersburg, 2003, Ivlev L. S. (ed.), p.31 (in Russian, 1 page).
85. V. Kurasov, Structure of the Embryo free energy in frames of Gibbs dividing surfaces in the theory of condensation, in: 14 International Conference on Chemical Thermodynamics in Russia, St. Petersburg, 2002 p. 487 (1 page).
86. V. Kurasov, Nucleation process in the system with many types of heterogeneous centers, in: Second international workshop "Nucleation and non-linear problems in first order phase transitions" NPT-2002. Book of abstracts, SPb, 2002, p.70-71 (2 pages).
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Appendix: Scientific biography

Scientific Biography

My professional life was mainly associated with the Saint Petersburg State University. Being born in Saint Petersburg (Russia) in 1961, it was natural to study at this university. known for its school in theoretical and mathematical physics. So, in 1978 I began my university studies there. The full course education (equivalent to Master degree) in physics at the Saint-Petersburg university took 5 1/2 years and allowed to teach in schools and to work as a researcher. I was awarded diploma with honors which allowed me to start my PhD studies immediately.

My area of specialization was the theoretical studies of the first order phase transitions which is an area with a rather advanced analytical description containing numerous unsolved problems. In 1987 I was the second student from my university graduation year to get a PhD degree (from more than 300 fellows).

After PhD I became a lecturer at the department of Computational physics of the same university. This step gave me possibility to get a professional knowledge computers and programming. My research interests remain in the kinetics of first order phase transitions and since the phase transitions are rather complex phenomena I widely used computer facilities to perform simulations, and to carry out analytic calculations with computer algebra systems, etc. My research activity is a sophisticated **interplay between analytical abilities of a mathematician or a theoretical physicist and the strength of modern computers.**

It is necessary to stress that the simulations of the first order phase transition is the branch of physics which requires extremely precise calculations since the evolution here is driven not directly by the characteristics of the substances but by the differences in the characteristics of the coexisting phases. That is why it is possible to speak about my **wide experience of computer calculations and simulations combined with careful and critical analytical analysis of results of simulations.**

Being a researcher in the Free university of Berlin (1993. 1994) where I was awarded the degree of the doctor rerum naturalium (1993) by the decision of the Senat of Berlin I enlarged both my computer and theoretical skills. The fruitful scientific atmosphere in the Free university and numerous scientific contacts helped me to make new steps in my scientific growth.

I fruitfully worked in the chosen domain of physics having published more than 200 articles and reports where I developed a clear and self-consistent theory of global kinetics of first order phase transitions. Later it appeared more natural to accumulate my results in scientific monographs and 13 books containing only my own scientific achievements have been published so far. My studies of different phenomena are related with new mathematical studies, therefore it allows to speak about my **skills in formulation of various mathematical models of different phenomena, their approximate analytical solutions and their confirmation by computer simulations.**

My investigations of the first order phase transition led to the solution of the principally new models which showed new general features of the dynamic universality in the first order phase transition kinetics. Some of these advances are contained

in my second dissertation which gives me in 2006 the degree of the Doctor of Science. This degree in Russia is a special degree given for creation of new branch of science or for solution of outstanding problems in science. The degree of Doctor of Sciences confirms **my capability for nontrivial generalizations and my creative capacities.**

During more than 25 years of my pedagogical activity I was a lecturer in mainly analytic disciplines because to my scientific abilities. Since my department belongs to the mathematical branch of the Physics Faculty and I had the education at the department of statistical physics I was chosen as a person for teaching the direction of mathematical statistics at the faculty. This enforces my experience in the statistical methods applied to arbitrary problems going outside the area of physics. Because of my working at the computer science department I am acquainted with computer innovations, I got an overall knowledge of the practically all computer facilities and I was in the first rows in the application of computers in the learning process. This allows to speak about my **ability to combine computer skills and methodological innovations in pedagogic activity.**

Being a professor at the Physics Faculty I spent a lot of time in development of the education and the scientific process trying to make my university the best one. My efforts were awarded and during the last years (2015-2023) I worked directly at the rector department of the Saint Petersburg University administrating the education process. The position at the Administration of the university opened several new perspectives for me in science also. Promoting inspections according to my duties I met with people from various branches of science and I got a material to enlarge the theories I had developed earlier to new domains of science. Visiting different faculties of the university I could meet the leading researches of different faculties and got the true information concerning the application of my ideas in physics to their domains of science. This led to the spreading of the first order phase transition global kinetics onto new domains such as the processes of materials destruction, mechanics of liquid-gas flows, regularization of ill-posed problems, etc. The current tasks which are close to be finished are the applications of the first order phase transition global kinetics to economics, to social evolution, to the processes of machine learning, psychology, etc.

Summarizing it possible to state my **experience as the analytic and computer researcher with applications to wide range of scientific domains.**

The above presented description shows that step by step I attained the position which allowed me to work in the most effective way. The last years were the most productive in science. My style to collect new results in monographs led during the last two years to 6 monographs which contain only my new earlier unpublished original results.

Being now a guest researcher at the Stockholm university I have a wonderful possibility to work in a friendly atmosphere of well qualified researchers. I think that mutual communications can essentially enlarge my capacities in the area which is the goal of my life.

The features of my scientific profile led to the **combination of analytical ability with the high level computer skills in both computer simulation and elaboration of complex algorithms.**

The results of my scientific work can be directly applied in extremely

wide range of the disciplines, namely in Materials and construction
destruction, Computer learning, Social sciences, Economics,
Mechanics of continuous media, Cognitive processes both at neural
micro level and at macro level, Kinetics of decisions elaboration, Ki-
netics of the biological evolution.

I hope that my skills will be fruitfully used in solution of new problems.