

# V.I. Kalikmanov

## List of publications

### Books

- Statistical physics of fluids. Basic concepts and applications* (Author: V.I. Kalikmanov, Springer Verlag, Berlin, 2001);  
*Nucleation theory* (Author: V.I. Kalikmanov, Springer Verlag, Dordrecht, 2013)

### Refereed journals

#### *Nucleation and condensation in real gases*

- **Binary nucleation beyond capillarity approximation.**- V.I. Kalikmanov, *Phys. Rev. E*, **81**, 050601(R) (2010).
- **Efficient approach to nucleation and growth dynamics: Stationary Diffusion Flux model** - D.S. van Putten and V.I. Kalikmanov, *J. Chem. Phys.*, **130**, 164508 (2009).
- **Argon nucleation: bringing together theory, simulations and experiment.** - V.I. Kalikmanov, J. Wölk, and T. Kraska, *J. Chem. Phys.*, **128**, 124506 (2008).
- **Generalized Kelvin equation and pseudospinodal in nucleation theory.** -V.I. Kalikmanov, *J. Chem. Phys.*, **129**, 044510 (2008).
- **Theory of anomalous critical-cluster content in high-pressure binary nucleation.**- V.I. Kalikmanov and D.G. Labetski, *Phys. Rev. Lett.*, **98**, 085701 (2007).
- **Mean-field kinetic nucleation theory.**- V.I. Kalikmanov, *J. Chem. Phys.*, **124** , 124505 (2006).
- **Crossover model for the work of critical cluster formation in nucleation theory.** - V.I. Kalikmanov, *J. Chem. Phys.*, **121**, 8916 (2004).
- **Semiphenomenological effective medium theory of multicomponent nucleation.** - V.I. Kalikmanov and M.E.H. van Dongen, *Phys. Rev. E*, **55**, 1607 (1997).
- **Multicomponent nucleation: an effective medium approach.** - V.I. Kalikmanov and M.E.H. van Dongen, In: *Nucleation and Atmospheric Aerosols 1996* (eds. M. Kulmala and P. Wagner), Pergamon Press, 1996. p.188.
- **Semi-phenomenological kinetic theory of binary nucleation.** - V.I. Kalikmanov and M.E.H. van Dongen, *Europhysics Letters*, **29**, 129 (1995).
- **Quasi-one-component theory of homogeneous binary nucleation.** - V.I. Kalikmanov and M.E.H. van Dongen, *Phys. Rev. E*, **51**, 4391 (1995).
- **Semi-phenomenological theory of homogeneous vapor-liquid nucleation.** - V.I. Kalikmanov and M.E.H. van Dongen, *J. Chem. Phys.*, **103**, 4250 (1995).

- **On mist formation in natural gas.** - M.J. Muijtjens, V.I. Kalikmanov, M.E.H. van Dongen, A. Hirschberg and P. Derks, *Revue de l'Institut Français du Pétrole*, **49**, 63 (1994).
- **Cluster approach to the kinetic theory of homogeneous nucleation.** - V.I. Kalikmanov and M.E.H. van Dongen, *Europhys. Letters*, **21**, 645 (1993).
- **Self-consistent cluster approach to the homogeneous kinetic nucleation theory.** - V.I. Kalikmanov and M.E.H. van Dongen, *Phys. Rev. E*, **47**, 3532 (1993).

### ***Bulk and interfacial properties of fluids***

- **Soft depletion in binary fluids.** - V.I. Kalikmanov, *Phys. Rev. E*, **68** 010101(R) (2003).
- **Algebraic perturbation theory for polar fluids. A model for the dielectric constant.** - V.I. Kalikmanov, *Phys. Rev. E*, **59**, 4085 (1999).
- **One-fluid theory of liquid-vapor surface tension in simple multicomponent mixtures.** - V.I. Kalikmanov, *J. Chem. Phys.*, **108**, 3678 (1998).
- **Semiphenomenological theory of the Tolman length.** - V.I. Kalikmanov, *Phys. Rev. E*, **55**, 3068 (1997).
- **The perturbation approach to the statistical theory of surface tension: new analytical results.** - V.I. Kalikmanov and G.C.J. Hofmans, *J. Physics: Condensed Matter*, **6**, 2207 (1994).

### ***Intercalation compounds. Lithium-ion batteries***

- **Role of elasticity forces in thermodynamics of intercalation compounds: self-consistent mean-field theory and Monte Carlo simulations.** - V.I. Kalikmanov and S.W. de Leeuw, *J. Chem. Phys.*, **116**, 3083 (2002).
- **Phase diagram of an intercalation compound in the presence of elastic interactions: a mean-field approach.** - V.I. Kalikmanov and S.W. de Leeuw, *Solid State Ionics*, **154-155**, 195 (2002).
- **Theory of anomalous voltage-discharge behavior for topotactic intercalation.** - V.I. Kalikmanov, M.V. Koudriachova and S.W. de Leeuw, *Solid State Ionics* **127**, 163 (2000).
- **Lattice-gas model for intercalation compounds.** - V.I. Kalikmanov, M.V. Koudriachova, and S.W. de Leeuw, *Solid State Ionics*, **136-137**, 1373 (2000).

### ***Magnetic fluids***

- **Statistical thermodynamics of ferrofluids.** - V.I. Kalikmanov, *Physica A*, **183**, 25 (1992).
- **A statistical theory of surface tension of magnetic fluids.** - V.I. Kalikmanov, *Europhys. Letters*, **13**, 745 (1990).
- **On a statistical thermodynamics of magnetic fluids. Monte Carlo calculations of magnetic properties.**- B.M. Berkovsky, V.I. Kalikmanov and V.S. Filinov, *High Temp.*, **26**,

51 (1988).

- **On a statistical thermodynamics of magnetic fluids. Equilibrium properties and the phase diagram.**- V.I. Kalikmanov and V.S. Filinov, *High Temp.*, **26**, 1077 (1988).
- **Statistical theory of magnetic fluids.**- B.M. Berkovsky, V.I. Kalikmanov and V.S. Filinov, *Magnetohydrodynamics*, **23**, 150 (1987).
- **On a statistical thermodynamics of magnetic fluids. A cell model of magnetic fluid.**- B.M. Berkovsky, V.I. Kalikmanov and V.S. Filinov, *High Temp.*, **25**, 1126 (1987).
- **Temperature dependence of magnetic free surface equilibrium conditions in an annular gap.**- V.I. Kalikmanov, *J. Eng. Physics*, **48**, 843 (1985).
- **A method of investigating the stability of the free surface of a magnetic liquid in an annular gap.**- V.I. Kalikmanov, *Magnetohydrodynamics*, **21**, 235 (1985).
- **Topological instability of magnetic fluids.**- B.M. Berkovsky and V.I. Kalikmanov, *J. Physique-Lettr. (Paris)*, **46**, L-483 (1985).
- **On a statistical theory of magnetic fluids.**- B.M. Berkovsky, V.I. Kalikmanov and V.S. Filinov, *J. Phys. C*, **18**, L941 (1985).
- **A single exact solution of the equilibrium surface equation of a magnetized fluid in an annular gap.**- B.M. Berkovsky and V.I. Kalikmanov, *Magnetohydrodynamics*, **20**, 7 (1984).
- **Some problems of statistical thermodynamics of magnetic fluids.** - V.I. Kalikmanov, Ph.D. Thesis, IVTAN, Moscow (1986)

### ***Suspensions of superconducting particles***

- **Suspensions of high- $T_c$  superconducting particles: properties in alternating magnetic fields.** - V.I. Kalikmanov, *J. Magn. Magn. Mater.*, **122**, 154 (1993).
- **Parametric resonance in suspensions of superconducting particles.** - V.I. Kalikmanov, P.P.J.M. Schram and S.V. Zybin, *J. Magn. Magn. Mater.* , **110**, 91 (1992).
- **A dynamic behavior of a suspension of superconducting particles in an alternating magnetic field.** - V.I. Kalikmanov and P.P.J.M. Schram, *J. Phys.: Condensed Matter*, **3**, 8903 (1991).
- **Magnetic fluids and high- $T_c$  superconductivity: a new trend of research.** - V.I. Kalikmanov and D.I. Sementsov, *J. Magn. Magn. Mater.*, **85**, 71 (1990).
- **On the properties of fluids with dispersed superconducting particles.**- V.I. Kalikmanov and I.G. Dyadkin, *J. Phys.: Condensed Matter*, **1**, 993 (1989).
- **On superdiamagnetic fluids.**- V.I. Kalikmanov and I.G. Dyadkin, *J. Techn. Phys.-Lett.*, **13**, 1345 (1987).

## ***Applied optics***

- **Ill-posed inverse problem in diffraction optics. Tolerance analysis of diffractive lenses and gratings.** - V.I. Kalikmanov and E.A. Sokolova, *J. Optical Society of America A*, **23**, 497 (2006).
- **Spectrometers consisting of a diffractive lens and a concave diffraction grating.** - E. Sokolova and V.I. Kalikmanov, *J. Modern Optics*, **51**, 2191 (2004).

## **Lecture course notes**

- **Statistical mechanics. Theoretical Physics III. Lecture course notes.** - V.I. Kalikmanov, Delft University of Technology (1999, 2000).
- **Statistical thermodynamics of liquids. Lecture course notes.** - (V.I. Kalikmanov, Eindhoven University of Technology, 1993; 1994; 1995).

## **Invited lectures**

- **Nucleation theory beyond capillarity approximation.** - 85th ACS Colloid and Surface Science Symposium, Montreal, Canada, June 2011.
- **Mean-field kinetic nucleation theory.**- Institute of Physical Chemistry, University of Cologne, Germany, November 2006.
- **Algebraic perturbation theory of ferrofluids.** - Moscow International Symposium on Magnetism, Moscow, June 2002.
- **Semi-phenomenological nucleation theory.** - University College London, University of London, UK, 1998.
- **Statistical thermodynamics of ferrofluids.** -Institute for Theoretical Physics, Aachen University, Germany, 1991.
- **Superdiamagnetic fluids.**- University Pierre and Marie Curie, Paris, France, 1990.

## **Conference proceedings**

- **Structuring effects in binary nucleation: molecular dynamics simulations and coarse-grained nucleation theory** - S. Braun, T. Kraska and V. Kalikmanov, In: *Nucleation and Atmospheric Aerosols*, AIP Conf. Proc. 1527, 43 (2013).
- **Combining cluster formation and growth dynamics: a novel approach for design and analysis of nucleation experiments.** - D.S. van Putten and V.I. Kalikmanov, In: *Nucleation and Atmospheric Aerosols. 18th International Conference, Prague, Czech Republic*, Eds.: C. O'Dowd, J. Smolik (Springer, 2009) p. 597.
- **Critical-cluster content in high-pressure binary nucleation: compensation pressure effect.** - V.I. Kalikmanov and D.G. Labetski, In: *Nucleation and Atmospheric Aerosols. 17th International Conference, Galway, Ireland* , Eds.: C. O'Dowd, P. Wagner (Springer, 2007) p.

- **New developments in nucleation theory and their impact on natural gas separation.** - V. Kalikmanov, J. Bruining, M. Betting, and D. Smeulders, 2007 SPE Annual Technical Conference and Exhibition, Anaheim, California (USA), November 11-14, 2007, Paper No: SPE 110736.

- **Mean-field kinetic nucleation theory: a semiphenomenological approach nonperturbative in the cluster size.** - V.I. Kalikmanov, *80th ACS Colloid and Surface Science Symposium*, Boulder, Colorado (USA), June 18-21, 2006.

**Initial magnetic susceptibility of concentrated ferrocolloids: algebraic perturbation theory, simulation and experiment.**- V.I. Kalikmanov, A.F. Pshenichnikov, and V.V. Mechonoshin, *9th Intern. Conf. on Magnetic fluids (ICMF9)*, Bremen, Germany (July 23-28, 2001). Abstracts.

- **Phase diagram of an intercalation compound in the presence of elastic interactions: a mean-field approach.**- V.I. Kalikmanov and S.W. de Leeuw, *Solid State Ionics-2001*, Cairns, Australia, (July 13-18, 2001).

- **Lattice-gas model for intercalation compounds: phase diagram and open circuit voltage.** - V.I. Kalikmanov, *Proceedings of the 5th International Meeting "Fundamental problems of solid state ionics"*, Chernogolovka, Russia (May 10-14, 2000).

- **Algebraic perturbation theory for dielectric constant.** - V.I. Kalikmanov, *4th Liquid Matter Conference*, Granada, Spain (July 3-7, 1999).

- **Lattice-gas model for intercalation compounds.** - V.I. Kalikmanov, M.V. Koudriachova, and S.W. de Leeuw, *12th International Conf. on Solid State Ionics*, Thessaloniki, Greece (June 6-13, 1999).

- **Cluster theory of the Tolman length.** - V.I. Kalikmanov, *XXth International Conference on Statistical Physics*, Paris (France), July 20-24, 1998.

- **Effective one-component theory of binary nucleation.** - V.I. Kalikmanov and M.E.H. van Dongen, *Proceedings of the European Aerosol Conference*, (Helsinki, 1995): *J. Aerosol Sci.*, **26** Suppl. 1, S627 (1995).

- **Cluster approach to the kinetic theory of homogeneous nucleation.** - V.I. Kalikmanov and M.E.H. van Dongen, *68th Annual Colloid and Surface Science Symposium*, Stanford University, Stanford (USA), June 19-22, 1994.

- **Semi-phenomenological theory of binary nucleation.** - V.I. Kalikmanov and M.E.H. van Dongen, *XIII Sitges Conference "25 Years of Nonequilibrium Statistical Mechanics"*, Sitges (Spain), June 13-17, 1994.

- **Dynamic behavior and parametric resonance in suspensions of superconducting particles.** - V.I. Kalikmanov, *1<sup>st</sup> European Fluid Mechanics Conference* (Cambridge, England, 1991).

- **High- $T_c$  superconductivity and magnetic fluids: a new trend of research.** - V.I. Kalikmanov, In: *VIII General Conference of European Physical Society - Trends in Physics*

(Amsterdam, 1990), p. S13-10.

- **On superdiamagnetic fluids.**- V.I. Kalikmanov and I.G. Dyadkin, *The 5<sup>th</sup> All-Union Conf. Magn. Fluids*, Moscow, **1**, 112 (1988).

- **On equilibrium properties and phase diagram of magnetic fluids.**- B.M. Berkovsky, V.I. Kalikmanov and V.S. Filinov, *Proceedings of the 5<sup>th</sup> Int. Conf. on Magnetic Fluids* (Riga, Latvia, 1989): *J. Magn. Magn. Mater.*, **65**, 191 (1987).

- **On a statistical theory of aggregate formation in magnetic fluids.**- B.M. Berkovsky, V.I. Kalikmanov and V.S. Filinov, *The 4<sup>th</sup> All-Union Conf. Magn. Fluids. Ivanovo (USSR)*, **1**, 38 (1985).