

## Articles Published and Accepted in referred Journals

1. "A Network Model of Geometrically Constrained Deformations of Granular Materials" (with K.A. Ariyawansa and A. Panchenko), *Netw. and Heter. Media*, v. 3, pp. 125-148 (2006).
2. "Asymptotic statistics of shape-deforming phase transitions in random laminated polycrystals" (with O. Bruno and A. Novikov), accepted *SIAM J. Math. Analysis* (2007).
3. "Fictitious Fluid Approach and Anomalous Blow-up of the Dissipation Rate in a 2D Model of Concentrated Suspensions" (with Y. Gorb and A. Novikov), accepted to *Arch. Rat. Mech. Anal* (2007).
4. "Nonlinear Dielectric Response of Periodic Composite Materials" (with A. Kolpakov, A. Tagantsev, and A. Kanareikin), *J. of Electroceramics*, v. 18, pp. 129-137 (2007).
5. "Strong and weak blow up of the viscous dissipation rates for concentrated suspensions" (with A. Panchenko), *Journal of Fluid Mechanics*, v. 578, pp. 1-34 (2007).
6. "Asymptotic analysis of an array of absolutely conducting holes" (with G. Cardone, Y. Gorb, and G. Panasenko), *Networks and Heterogenous Media*, 1:3, pp. 353-377 (2006).
7. "Nonexistence of Ginzburg-Landau minimizers with prescribed degree on the boundary of a doubly connected domain" (with D. Golovaty and V. Rybalko), *C. R. Acad. Sci, Paris*, 343/1, pp.63-68 (2006).
8. "Ginzburg-Landau minimizers with prescribed degrees. Capacity of the domain and emergence of vortices" (with P. Mironescu), *J. Functional Analysis*, v. 239, n. 1, pp.76-99 (2006).
9. "Continuum limit for three-dimensional mass-spring networks and discrete Korn's inequality" (with M. Berezhnyy), *Journal of Mechanics and Physics of Solids*, 54:3, pp. 635-669 (2006).
10. "Methodology, theory and practice of sociological analysis of modern society" (with O. Kutsenko and V. Sherstobitov), in collection of papers *A theoretical model to explain support of terrorist actions*, Kharkov State University, pp 63-69 (2005).

11. “Ginzburg-Landau model of a liquid crystal with random inclusions” (with E. Khruslov), *Journal of Mathematical Physics*, 46, pp. 095107-1—095107-15 (2005).
12. “Network approximation for effective viscosity of concentrated suspensions with complex geometry” (with L. Borcea and A. Panchenko), *SIAM Journal on Mathematical Analysis*, 36:5, pp 1580-1628 (2005).
13. “Asymptotics of the Effective Conductivity of Composites with Closely Spaced Inclusions of Optimal Shape” (with Y. Gorb), *Quarterly Journal of Mechanics and Applied Mathematics*, 58 (1), pp. 83-106 (2005).
14. “Homogenization of a Ginzburg-Landau functional” (with D. Cioranescu and D. Golovaty), *C. R. Acad. Sci, Paris*, 340/1 pp 87-92 (2005).
15. “Discrete Network Approximation for Highly-Packed Composites with Irregular Geometry in Three Dimensions” (with Y. Gorb and A. Novikov), in *Lecture Notes in Computational Science and Engineering*, editors B. Engquist, P. Lotstedt and O. Runborg, Springer Verlag (2004).
16. “Increase and Decrease of the Effective Conductivity of Two Phase Composites due to Polydispersity” (with V. Mityushev), *Journal of Statistical Physics*, 118, 3/4 pp 481-509 (2005).
17. “Transport properties of densely packed composites. Effects of shapes and spacings of inclusions” (with D. Golovaty, A. Movchan, and J. Phillips) *The Quarterly Journal of Mechanics and Applied Mathematics*, 57, pp. 495-528 (2004).
18. “The Effective Conductivity of Densely Packed High Contrast Composites with Inclusions of Optimal Shape” (with Y. Gorb) *Proceedings of Continuum Models and Discrete Systems (CMDS10) Conference*, Tel-Aviv, Israel (2004).
19. “Homogenization of a Ginzburg-Landau model for a nematic liquid crystal with inclusions” (with D. Cioranescu and D. Golovaty), *Journal des Mathematiques Pures et Appliquees* 84:1, pp. 97-136 (2005).
20. “Homogenized Non-Newtonian Viscoelastic Rheology of a Suspension of Interacting Particles in a Viscous Newtonian Fluid” (with E. Ya.

- Khruslov) *SIAM Journal of Applied Mathematics*, 64:3, pp. 1002-1034 (2004).
21. "Random network model for heat transfer in high contrast composite materials" (with D. Gerenrot and J. Phillips), *IEEE Transactions on Advanced Packaging*, 26:4, pp. 410-417 (2003).
  22. "Ginzburg-Landau Minimizers with Prescribed Degrees: Dependence on Domain" (with P. Mironescu) *C. R. Acad. Sci, Paris*, 337 (6), pp. 375-380 (2003).
  23. "Geometric patterns and effective conductivity of highly packed two-phase composites" (with A. Novikov), *Homogenization 2001, (Naples)*, 113-129 *GAKUTO Internat. Ser. Math. Sci. Appl.*, 18, Tokyo (2003).
  24. "Error of the network approximation for densely packed composites with irregular geometry" (with A. Novikov), *SIAM Journal on Mathematical Analysis*, 34(2), pp. 385-408 (2002).
  25. "Competition between the surface and the boundary layer energies in a Ginzburg-Landau model of a liquid crystal composite" (with E. Ya. Khruslov), *Asymptotic Analysis*, 29, pp. 185-219 (2002).
  26. "On uniqueness of vector-valued minimizers of the Ginzburg-Landau functional in annular domains" (with D. Golovaty), *Calculus of Variations*, 14, 213-232 (2002).
  27. "Network Approximation in the Limit of Small Interparticle Distance of the Effective Properties of a High-Contrast Random Dispersed Composite" (with A. Kolpakov), *Archive for Rational Mechanics and Analysis*, 159, pp. 179-227 (2001).
  28. "Generalized Clausius-Mosotti formula for random composite with circular fibers" (with V. Mityushev), *Journal of Statistical Physics*, 102, 1/2 pp. 115-145 (2001).
  29. "Homogenization of harmonic maps with large number of vortices and applications in superconductivity and superfluidity" (with E. Ya. Khruslov), *Advances in Differential Equations*, v. 6/2, pp. 229-256 (2001).

30. “Symmetry Breaking in Annular Domains for a Ginzburg-Landau Superconductivity Model” (with K. Voss), *Proceedings of IUTAM 99/4 Symposium*, Sydney, Australia, January, Kluwer Academic Publishers, 189-200 (2001).
31. “Frequency-dependent acoustics of composites with interfaces” (with M. Avellaneda and J. Clouet), *SIAM Journal of Applied Mathematics*, 60:6, 2143–2181 (2000).
32. “Homogenization. In Memory of Sergei Kozlov. Edited by V. Berdichevsky, V. Jikov and G. Papanicolaou”, *Series on Advances in Mathematics for Applied Sciences*, 50, pp. xiv+418 (1999).
33. “Homogenization of the Ginzburg-Landau functional with a surface energy term”, *Asymptotic Analysis*, 37-59, 21 (1999).
34. “Asymmetric Strain-Stress Distribution Function for Crystal with Random Point Defects”, In the book *Homogenization*, ed. V. Berdichevsky, V. Jikov and G. Papanicolaou, World Scientific, 179-192 (1999).
35. “Homogenization of harmonic maps and superconducting composites” (with E. Ya. Khruslov), *SIAM Journal of Applied Mathematics*, 59, 5 pp. 1892-1916 (1999).
36. “Effective Properties of Superconducting and Superfluid Composites”, *International Journal of Modern Physics B*, 12, 29, 3063-3073 (1999).
37. “First-Passage Percolation, Semi-Directed Bernoulli Percolation, and Failure in Brittle Materials” (with M. Rintoul and S. Torquato) *Journal of Statistical Physics*, 91, 3/4, 603-623 (1998).
38. “Non-Gaussian Limiting Behavior of the Percolation Threshold in a Large System” (with J. Wehr), *Communications in Mathematical Physics*, 185, 73-92 (1997).
39. “Renormalization Group Technique for Asymptotic Behavior of a Thermal Diffusive Model with Critical Nonlinearity” (with J. Xin), in *Pitman Research Notes*, No. 324 “Recent Development in Evolution Equations”, 76–85 (1995).

40. “Large Time Asymptotics of Solutions to a Model Combustion System with Critical Nonlinearity” (with J. Xin), *Nonlinearity*, 8:161–178 (1995).
41. “The Probability Distribution of the Percolation Threshold in a Large System” (with J. Wehr), *Journal of Physics A: Mathematics and General*, 28:24, 7127–7133 (1995).
42. “The accuracy of O’Doherty-Anstey approximation for wave propagation in highly disordered stratified media” (with R. Burridge), *Wave Motion*, 21:3, 357–373 (1995).
43. “Effective Elastic Moduli of a Soft Medium with Hard Polygonal Inclusions and Extremal Behavior of Effective Poisson’s Ratio” (with K. S. Promislow), *Journal of Elasticity*, 40:1, 45–73 (1995).
44. “Exact Result for the Effective Conductivity of a Continuum Percolation Model” (with K. Golden), *Physical Review B*, 50 (4):2114–2117 (1994).
45. “Asymptotics of the Homogenized Moduli for the Elastic Chess-Board Composite” (with S. Kozlov), *Archive for Rational Mechanics and Analysis*, 118, 95–112 (1992).
46. “Exactly solvable random model and IR spectroscopy of strained defective lattice” (with N. Chukanov and V. Dubovitskii), *Chemical Physics Letters*, 181, No. 5:450–454 (1991).
47. “The localization problem for a random elastic continuum with dispersion” (with S. Molchanov), *Mathematics Notes, USSR Academy*, 49, No. 3:346–348 (1991).
48. “The averaging of the diffusion equation in porous medium with weak absorption” (with M. Goncharenko), *Journal of Soviet Mathematics*, 53, No. 5:3428–3435 (1990).
49. “Operational separation of variables” in problems of short wave asymptotic behavior for differential equations with fast oscillating coefficients” (with S. Yu. Dobrokhotov), *Sov. Phys. Dokl.*, 32 (9):714–716 (1987).

50. “Homogenization and short wave asymptotics for solutions of an initial value problem for the Schroedinger equation with a rapidly oscillating potential” (with S. Yu. Dobrokhotov), *Uspekhy Mat. Nauk.*, 41 (4):195–196 (in Russian, 1986).
51. “Asymptotic behavior of solutions of the Dirichlet boundary value problem in elasticity for domains with fine-grained boundaries”, *Uspekhy Mat. Nauk.*, 38, No. 6 (234), 107–108 (in Russian, 1983).
52. “Averaging of elasticity equations in domains with fine-grained boundaries, Part 1–2”, *Functional theory, functional analysis and applications*, Kharkov, 39:16–25 – Part 1; 40:16–23 – Part 2 (in Russian, 1983).
53. “An asymptotic description for a thin plate with a large number of small holes”, *Ukrainian Academy of Science Reports*, Ser. A., No. 10:5–8 (in Russian, 1983).
54. “Averaging of boundary value problems for higher order differential operators in domains with holes” (with I. Yu. Chudinovich), *Soviet Math. Dokl.*, 28, No. 2:427–430 (1983).
55. “An averaged description of an elastic medium with a large number of small absolutely solid inclusions” (with A. Okhotsimskii), *Soviet Phys. Dokl.*, 28 (1):81–84 (1983).
56. “On the vibration of an elastic body with a large number of small holes”, *Ukrainian Academy of Science reports*, Ser. A, 2:3–5 (in Russian, 1983).
57. “On convergence of spectral families of operators for Neumann boundary value problems”, *Function theory, functional analysis and applications*, Kharkov, 33:3–8 (in Russian, 1980).

## Articles Submitted to Referred Journals

- “Effective Viscosity of Dilute Bacterial Suspensions: A Two-Dimensional Model” (with B.M. Haines, I.S. Aranson, D.A. Karpeev), *submitted*, (2008).
- “A model of hydrodynamic interaction between swimming bacteria” (with V.T. Gyrya, I.S. Aranson, D.A. Karpeev), *submitted*, (2008).
- “The Homogenized Model of Small Oscillations of Complex Fluids” (with M. Berezhnyy and E. Khruslov), Submitted to *Networks and Heterogenous Media* (2007).