

## Publications of Professor Alexander Bobylev:

- # Bobylev, A. V.; Gamba, I. M. Upper Maxwellian bounds for the Boltzmann equation with pseudo-Maxwell molecules. *Kinet. Relat. Models* 10 (2017), no. 3, 573–585.
- # Bobylev, A.; Gamba, I.; Potapenko, I. On some properties of the Landau kinetic equation. *J. Stat. Phys.* 161 (2015), no. 6, 1327–1338.
- # Bobylev, A. V.; Potapenko, I. F.; Karpov, S. A. Monte Carlo simulation of the kinetic collisional equation with external fields. *Translation of Mat. Model.* 26 (2014), no. 5, 79–98. *Math. Models Comput. Simul.* 6 (2014), no. 6, 598–611.
- # Bobylev, A.; Brantov, A.; Bychenkov, V.; Karpov, S.; Potapenko, I. DSMC modeling of a single hot spot evolution using the Landau-Fokker-Planck equation. *Acta Appl. Math.* 132 (2014), 107–116.
- # Bobylev, A.; Esposito, R. Transport coefficients in the 2-dimensional Boltzmann equation. *Kinet. Relat. Models* 6 (2013), no. 4, 789–800.
- # Bobylev, A. V.; Potapenko, I. F. Monte Carlo methods and their analysis for Coulomb collisions in multicomponent plasmas. *J. Comput. Phys.* 246 (2013), 123–144.
- # Bobylev, A. V.; Pulvirenti, M.; Saffirio, C. From particle systems to the Landau equation: a consistency result. *Comm. Math. Phys.* 319 (2013), no. 3, 683–702.
- # Bobylev, A. V.; Potapenko, I. F.; Karpov, S. A. The Monte Carlo method for a two-component plasma. (Russian) *Mat. Model.* 24 (2012), no. 9, 35–49.
- # Bobylev, A. V.; Potapenko, I. F.; Karpov, S. A. DSMC Methods for Multicomponent Plasmas. 28th International Symposium on Rarefied Gas Dynamics 2012, M. Mareschal and A. Santos, eds., AIP Conference Proceedings 1501, American Institute of Physics, 2012, 541-548.
- # Bobylev, A. V.; Vinerean, M. C. Symmetric extensions of normal discrete velocity models. 28th International Symposium on Rarefied Gas Dynamics 2012, M. Mareschal and A. Santos, eds., AIP Conference Proceedings 1501, American Institute of Physics, 2012, 254-261.
- # Bobylev, A. V.; Windfäll, Å. Boltzmann equation and hydrodynamics at the Burnett level. *Kinet. Relat. Models* 5 (2012), no. 2, 237–260.
- # Bobylev, A. V.; Gamba, I. M. Solutions of the linear Boltzmann equation and some Dirichlet series, *Forum Math.* 24 (2012), no. 2, 239--252.
- # Bobylev, A. V.; Bisi, M.; Cassinari, M. P.; Spiga, G. Shock wave structure for generalized Burnett equations. *Phys. Fluids* 23 (2011), no. 3, 030607 (10 pages).
- # Bobylev, A.; Windfäll, Å. Kinetic modeling of economic games with large number of participants. *Kinet. Relat. Models* 4 (2011), no. 1, 169--185.
- # Vinerean, M. C.; Windfäll, Å.; Bobylev, A. V. Construction of normal discrete velocity models of the Boltzmann equation. *Nuovo Cim.* 33 C (2010), no. 1, 257--264.
- # Bobylev, A.; Vinerean, M.; Windfäll, Å. Discrete velocity models of the Boltzmann equation and conservation laws. *Kinet. Relat. Models* 3 (2010), no. 1, 35--58.
- # Bobylev, A. V.; Cercignani, C.; Gamba, I. M. On the self-similar asymptotics for generalized non-linear kinetic Maxwell models. *Comm. Math. Phys.* 291 (2009), no. 3, 599--644.
- # Bobylev, A. V.; Dorodnitsyn, V. Symmetries of evolution equations with non-local operators and applications to the Boltzmann equation. *Discrete Contin. Dyn. Syst.* 24 (2009), no. 1, 35--57.
- # Potapenko, I. F.; Bobylev, A. V.; Mossberg, E. Deterministic and stochastic methods for nonlinear Landau-Fokker-Planck kinetic equations with applications to plasma physics. *Transport Theory Statist. Phys.* 37 (2008), no. 2-4, 113--170.
- # Bobylev, A. V.; Cercignani, C.; Gamba, I. Generalized kinetic Maxwell type models of granular gases. *Mathematical models of granular matter*, 23--57, Lecture Notes in Math., 1937, Springer, Berlin, 2008.
- # Bobylev, A. V.; Mossberg, E. On some properties of linear and linearized Boltzmann collision operators for hard spheres. *Kinet. Relat. Models* 1 (2008), no. 4, 521--555.

- # Bobylev, A. V. Generalized Burnett hydrodynamics. *J. Stat. Phys.* 132 (2008), no. 3, 569--580.
- # Bobylev, A. V.; Vinerean, M. C. Construction of discrete kinetic models with given invariants. *J. Stat. Phys.* 132 (2008), no. 1, 153--170.
- # Bernhoff, N.; Bobylev, A. V. Weak shock waves for the general discrete velocity model of the Boltzmann equation. *Comm. Math. Sci.* 5 (2007), no. 4, 815--832.
- # Bobylev, A. V.; Vinerean, M. C. Construction and classification of discrete kinetic models without spurious invariants. *Riv. Mat. Univ. Parma* 7 (2007), no. 7, 1--80.
- # Bobylev, A. V.; Gamba, I. M. Boltzmann equations for mixtures of Maxwell gases: exact solutions and power like tails. *J. Stat. Phys.* 124 (2006), no. 2-4, 497--516.
- # Bobylev, A. V. Instabilities in the Chapman-Enskog expansion and hyperbolic Burnett equations. *J. Stat. Phys.* 124 (2006), no. 2-4, 371--399.
- # Bobylev, A. V.; Vinerean, M. C. Discrete kinetic models and conservation laws. *Modelling and Numerics of Kinetic Dissipative Systems*, 147-162, *Nova Sci. Publ.*, 2006.
- # Bobylev, A. V.; Gamba, I. M.; Panferov, V. A. Moment inequalities and high-energy tails for Boltzmann equations with inelastic interactions. *J. Statist. Phys.* 116 (2004), no. 5-6, 1651--1682.
- # Bobylev, A. V.; Cercignani, C.; Toscani G. Proof of an asymptotic property of self-similar solutions of the Boltzmann equation for granular materials. *J. Statist. Phys.* 111 (2003), no. 1-2, 403--417.
- # Bobylev, A. V.; Bernhoff, N. Discrete velocity models and dynamical systems. *Lecture notes on the discretization of the Boltzmann equation*, 203-222. Series on Advances in Mathematics for Applied Sciences, 63. *World Scientific Publishing Co.*, 2003.
- # Bobylev, A. V.; Cercignani, C. Self-similar asymptotics for the Boltzmann equation with inelastic and elastic interactions. *J. Statist. Phys.* 110 (2003), no. 1-2, 333--375.
- # Acedo, L.; Santos, A.; Bobylev, A. V. On the derivation of a high-velocity tail from the Boltzmann-Fokker-Planck equation for shear flow. *J. Statist. Phys.* 109 (2002), no. 5-6, 1027--1050.
- # Bobylev, A. V.; Cercignani, C. Self-similar solutions of the Boltzmann equation and their applications. *J. Statist. Phys.* 106 (2002), no. 5-6, 1039--1071.
- # Bobylev, A. V.; Cercignani, C. Exact eternal solutions of the Boltzmann equation. *J. Statist. Phys.* 106 (2002), no. 5-6, 1019--1038.
- # Bobylev, A. V.; Cercignani, C. The inverse Laplace transform of some analytic functions with an application to the eternal solutions of the Boltzmann equation. *Appl. Math. Lett.* 15 (2002), no. 7, 807--813.
- # Bobylev, A. V.; Cercignani, C. Self-similar solutions of the Boltzmann equation for non-Maxwell molecules. *J. Statist. Phys.* 108 (2002), no. 3-4, 713--717.
- # Bobylev, A. V.; Cercignani, C. Moment equations for a granular material in a thermal bath. *J. Statist. Phys.* 106 (2002), no. 3-4, 547--567.
- # Bobylev, Alexandre V.; Groppi, Maria; Spiga, Giampiero Approximate solutions to the problem of stationary shear flow of smooth granular materials. *Eur. J. Mech. B Fluids* 21 (2002), no. 1, 91--103.
- # Bobylev, A. V.; Hansen, Alex; Piasecki, J.; Hauge, E. H. From the Liouville equation to the generalized Boltzmann equation for magnetotransport in the 2D Lorentz model. *J. Statist. Phys.* 102 (2001), no. 5-6, 1133--1150.
- # Bobylev, A. V.; Grzhibovskis, R.; Heintz, A. Entropy inequalities for evaporation/condensation problem in rarefied gas dynamics. *J. Statist. Phys.* 102 (2001), no. 5-6, 1151--1176.
- # Bobylev, A. V.; Ohwada, T. The error of the splitting scheme for solving evolutionary equations. *Appl. Math. Lett.* 14 (2001), no. 1, 45--48.

- # Bobylev, Alexandre V.; Caraffini, Gian Luca; Spiga, Giampiero Non-stationary two-dimensional potential flows by the Broadwell model equations. *Eur. J. Mech. B Fluids* 19 (2000), no. 2, 303--315.
- # Cercignani, Carlo; Bobylev, A. V. Discrete velocity models: the case of mixtures. *Proceedings of the International Conference on Models and Numerical Methods in Transport Theory and in Mathematical Physics (Rome, 1998)*. *Transport Theory Statist. Phys.* 29 (2000), no. 1-2, 209--216.
- # Bobylev, A. V.; Rjasanow, S. Numerical solution of the Boltzmann equation using a fully conservative difference scheme based on the fast Fourier transform. *Proceedings of the Fifth International Workshop on Mathematical Aspects of Fluid and Plasma Dynamics (Maui, HI, 1998)*. *Transport Theory Statist. Phys.* 29 (2000), no. 3-5, 289--310.
- # Bobylev, Alexander V.; Cercignani, Carlo Discrete velocity models without nonphysical invariants. *J. Statist. Phys.* 97 (1999), no. 3-4, 677--686.
- # Bobylev, A. V.; Ohwada, T. On the generalization of Strang's splitting scheme. *Riv. Mat. Univ. Parma* (6) 2\* (1999), 235--243 (2000).
- # Bobylev, A. V.; Carrillo, J. A.; Gamba, I. M. On some properties of kinetic and hydrodynamic equations for inelastic interactions. *J. Statist. Phys.* 98 (2000), no. 3-4, 743--773.
- # Bobylev, A. V.; Rjasanow, S. Fast deterministic method of solving the Boltzmann equation for hard spheres. *Eur. J. Mech. B Fluids* 18 (1999), no. 5, 869--887.
- # Bobylev, Alexander V.; Illner, Reinhard Collision integrals for attractive potentials. *J. Statist. Phys.* 95 (1999), no. 3-4, 633--649.
- # Bobylev, Alexander V.; Cercignani, Carlo On the rate of entropy production for the Boltzmann equation. *J. Statist. Phys.* 94 (1999), no. 3-4, 603--618.
- # Bobylev, A. V. Relationship between discrete and continuous kinetic theories. *Rarefied Gas Dynamics vol 1*, 19-30, *Cepaduès-Éditions*, 1999.
- # Illner, R.; Victory, H. D.; Dukes, P.; Bobylev, A. V. On Vlasov-Manev equations. II. Local existence and uniqueness. *J. Statist. Phys.* 91 (1998), no. 3-4, 625--654.
- # Bobylev, A. V.; Victory, H. D. Additive invariant functionals for dynamical systems. *J. Statist. Phys.* 92 (1998), no. 1-2, 269--299.
- # Bobylev, Alexander V.; Cercignani, Carlo Discrete velocity models for mixtures. *J. Statist. Phys.* 91 (1998), no. 1-2, 327--341.
- # Bobylev, A. V. Moment inequalities for the Boltzmann equation and applications to spatially homogeneous problems. *J. Statist. Phys.* 88 (1997), no. 5-6, 1183--1214.
- # Palczewski, Andrzej; Schneider, Jacques; Bobylev, Alexandre V. A consistency result for a discrete-velocity model of the Boltzmann equation. *SIAM J. Numer. Anal.* 34 (1997), no. 5, 1865--1883.
- # Bobylev, A. V.; Spiga, G. On a model transport equation with inelastic scattering. *SIAM J. Appl. Math.* 58 (1998), no. 4, 1128--1137 (electronic).
- # Bobylev, A. V.; Dukes, P.; Illner, R.; Victory, H. D., Jr. On Vlasov-Manev equations. I. Foundations, properties, and nonglobal existence. *J. Statist. Phys.* 88 (1997), no. 3-4, 885--911.
- # Bobylev, A. V.; Toscani, G. Two-dimensional half-space problems for the Broadwell discrete velocity model. *Contin. Mech. Thermodyn.* 8 (1996), no. 5, 257--274.
- # Bobylev, A. V. Exact solutions of discrete kinetic models and stationary problems for the plane Broadwell model. *Math. Methods Appl. Sci.* 19 (1996), no. 10, 825--845.
- # Bobylev, A. V.; Maaø, Frank A.; Hansen, Alex; Hauge, E. H. There is more to be learned from the Lorentz model. *J. Statist. Phys.* 87 (1997), no. 5-6, 1205--1228.
- # Bobylev, A.; Rjasanow, S. Difference scheme for the Boltzmann equation based on the fast Fourier transform. *European J. Mech. B Fluids* 16 (1997), no. 2, 293--306.
- # Bobylev, A. V.; Spiga, G. Exact and asymptotic stationary solutions of the semicontinuous Boltzmann equation. *Appl. Math. Lett.* 9 (1996), no. 3, 47--52.

- # Bobylev, A. V.; Struckmeier, J. Implicit and iterative methods for the Boltzmann equation. *Transport Theory Statist. Phys.* 25 (1996), no. 2, 175--195.
- # Bobylev, A. V.; Caraffini, G. L.; Spiga, G. On group invariant solutions of the Boltzmann equation. *J. Math. Phys.* 37 (1996), no. 6, 2787--2795.
- # Bobylev, A. V.; Vilasi, G. Projective invariance for classical and quantum systems. *J. Group Theory Phys.* 3 (1995), no. 1, 35--48.
- # Bobylev, A. V. Quasistationary hydrodynamics for the Boltzmann equation. *J. Statist. Phys.* 80 (1995), no. 5-6, 1063--1083.
- # Bobylev, A. V.; Struckmeier, J. Numerical simulation of the stationary one-dimensional Boltzmann equation by particle methods. *European J. Mech. B Fluids* 15 (1996), no. 1, 103--118.
- # Sone, Yoshio; Aoki, Kazuo; Takata, Shigeru; Sugimoto, Hiroshi; Bobylev, A. V. Inappropriateness of the heat-conduction equation for description of a temperature field of a stationary gas in the continuum limit: examination by asymptotic analysis and numerical computation of the Boltzmann equation. *Phys. Fluids* 8 (1996), no. 2, 628--638.
- # Bobylev, A. V.; Gabetta, E.; Pareschi, L. On stationary solutions to plane Broadwell model. Special issue devoted to the Proceedings of the 13th International Conference on Transport Theory (Riccione, 1993). *Transport Theory Statist. Phys.* 24 (1995), no. 1-3, 289--304.
- # Bobylev, A. V.; Ibragimov, N. Kh. Relationships between the symmetry properties of the equations of gas kinetics and hydrodynamics. *Math. Modeling Comput. Experiment* 1 (1993), no. 3, 291--300.e
- # Bobylev, Alexandre Vasiljevitch; Palczewski, Andrzej; Schneider, Jacques On approximation of the Boltzmann equation by discrete velocity models. *C. R. Acad. Sci. Paris Sér. I Math.* 320 (1995), no. 5, 639--644.
- # Bobylev, A. V.; Gabetta, E.; Pareschi, L. On a boundary value problem for the plane Broadwell model. Exact solutions and numerical simulation. *Math. Models Methods Appl. Sci.* 5 (1995), no. 3, 253--266.
- # Bobylev, A. V.; Spiga, G. On a class of exact two-dimensional stationary solutions for the Broadwell model of the Boltzmann equation. *J. Phys. A* 27 (1994), no. 22, 7451--7459.
- # Bobylev, A. V.; Spiga, G. On the relaxation processes in a mixture of Maxwell gases. *Riv. Mat. Univ. Parma* (5) 1 (1992), 255--264 (1993).
- # Bobylev, A. V. The Boltzmann equation and the group transformations. *Math. Models Methods Appl. Sci.* 3 (1993), no. 4, 443--476.
- # Bobylev, A. V. Formation of Maxwellian tails. *Nonlinear kinetic theory and mathematical aspects of hyperbolic systems* (Rapallo, 1992), 21--27, Ser. Adv. Math. Appl. Sci., 9, World Sci. Publishing, River Edge, NJ, 1992.
- # Bobylev, A. V.; Toscani, G. On the generalization of the Boltzmann H--theorem for a spatially homogeneous Maxwell gas. *J. Math. Phys.* 33 (1992), no. 7, 2578--2586.
- # Bobylev, A. V. The theory of the nonlinear spatially uniform Boltzmann equation for Maxwell molecules. *Mathematical physics reviews*, Vol. 7, 111--233, Soviet Sci. Rev. Sect. C Math. Phys. Rev., 7, Harwood Academic Publ., Chur, 1988.
- # Bobylev, A. V.; Ibragimov, N. Kh. The interconnection between the properties of the symmetry of equations of dynamics, the kinetic theory of gases and hydrodynamics. (Russian) *Mat. Model.* 1 (1989), no. 3, 100--109, 156.
- # Bobylev, A. V. {\cyr Tochnye i priblizhennye metody v teorii neline\u{i} nykh kineticheskikh uravneni\u{i} Bol'cprime tsmana i Landau}. (Russian) [Exact and approximate methods in the theory of nonlinear Boltzmann and Landau kinetic equations] *Akad. Nauk SSSR, Inst. Prikl. Mat.*, Moscow, 1987. 252 pp.
- # Bobylev, A. V. Exact solutions of the nonlinear Boltzmann equation and of its models. Translated from *Molecular gas dynamics* (Russian), 50--54, "Nauka", Moscow, 1982. *Fluid Mech. Soviet Res.* 13 (1984), no. 4, 105--110 (1985).

- # Bobylev, A. V.; Potapenko, I. F. Asymptotic solutions of kinetic equations of Landau type. (Russian) Akad. Nauk SSSR Inst. Prikl. Mat. Preprint 1985, no. 5, 12 pp.
- # Bobylev, A. V. Exact solutions of the nonlinear Boltzmann equation and the theory of relaxation of a Maxwell gas. (Russian) Teoret. Mat. Fiz. 60 (1984), no. 2, 280--310.
- # Bobylev, A. V. Asymptotic properties of solutions of the Boltzmann equation. (Russian) Dokl. Akad. Nauk SSSR 261 (1981), no. 5, 1099--1104.
- # Bobylev, A. V.; Vedenyapin, V. V. The Fourier transform of Boltzmann and Landau collision integrals. (Russian) Akad. Nauk SSSR Inst. Prikl. Mat. Preprint 1981, no. 125, 16 pp.
- # Bobylev, A. V. Method of investigation of nonlinear evolution equations. Applications to equations of Korteweg-de Vries and Boltzmann type. (Russian) Akad. Nauk SSSR Inst. Prikl. Mat. Preprint 1981, no. 141, 16 pp.
- # Bobylev, A. V. Method of investigation of nonlinear evolution equations. Formal theory. (Russian) Akad. Nauk SSSR Inst. Prikl. Mat. Preprint 1981, no. 140, 28 pp.
- # Bobylev, A. V. On the Chapman-Enskog and Grad methods for solving the Boltzmann equation. (Russian) Dokl. Akad. Nauk SSSR 262 (1982), no. 1, 71--75.
- # Bobylev, A. V.; Potapenko, I. F.; Chuyanov, V. A. Completely conservative difference schemes for nonlinear kinetic equations of Landau (Fokker-Planck) type. (Russian) Akad. Nauk SSSR Inst. Prikl. Mat. Preprint 1980, no. 76, 26 pp.
- # Bobylev, A. V. Poincaré's theorem. Boltzmann's equation and Korteweg-de Vries-type equations. (Russian) Dokl. Akad. Nauk SSSR 256 (1981), no. 6, 1341--1346.
- # Bobylev, A. V.; Potapenko, I. F.; Cujanov, V. A. Kinetic equations of Landau type as a model of the Boltzmann equation and completely conservative difference schemes. (Russian) Zh. Vychisl. Mat. i Mat. Fiz. 20 (1980), no. 4, 993--1004, 1086.
- # Bobylev, A. V. Structure of the general solution and classification of partial sums of the Boltzmann nonlinear equation for Maxwellian molecules. (Russian) Dokl. Akad. Nauk SSSR 251 (1980), no. 6, 1361--1365.
- # Bobylev, A. V. On the Green function of the Boltzmann linear equation. (Russian) Dokl. Akad. Nauk SSSR 249 (1979), no. 5, 1087--1091.
- # Bobylev, A. V. The structure of spatially uniform normal solutions of the nonlinear Boltzmann equation for a gas mixture. (Russian) Dokl. Akad. Nauk SSSR 250 (1980), no. 2, 340--344.
- # Bobylev, A. V.; Vedenjapin, V. V. The maximum principle for discrete models of the Boltzmann equation, and the connection between the integrals of direct and inverse collisions of the Boltzmann equation. (Russian) Dokl. Akad. Nauk SSSR 233 (1977), no. 4, 519--522.
- # Bobylev, A. V. The expansion of the Boltzmann collision integral in a Landau series. (Russian) Dokl. Akad. Nauk SSSR 225 (1975), no. 3, 535--538.
- # Bobylev, A. V. A class of invariant solutions of the Boltzmann equation. (Russian) Dokl. Akad. Nauk SSSR 231 (1976), no. 3, 571--574.
- # Bobylev, A. V.; Cujanov, V. A. The numerical solution of Landau's kinetic equation. (Russian) Zh. Vychisl. Mat. i Mat. Fiz. 16 (1976), no. 2, 407--416, 541.
- # Bobylev, A. V. Exact solutions of the Boltzmann equation. (Russian) Dokl. Akad. Nauk SSSR 225 (1975), no. 6, 1296--1299.
- # Bobylev, A. V. The method of the Fourier transform in the theory of the Boltzmann equation for Maxwell molecules. (Russian) Dokl. Akad. Nauk SSSR 225 (1975), no. 6, 1041--1044.