

Curriculum Vitae

Full name: Alexei V. Penskoi

Year of birth: 1973

Place of birth: Sverdlovsk region, USSR

Nationality: Russian Federation

Address: Independent University of Moscow, Bolshoy Vlasievskiy pereulok 11, 119002 Moscow Russia

Web-page: <http://www.mccme.ru/~penskoi>

Languages: English, French, Russian

Education:

M.Sc., Mathematics (with highest honours), 1995, Moscow State University

Title of Thesis: Discrete Lagrangian systems on the Virasoro group

Advisor: Prof. A. P. Veselov

Cand.Sc., Mathematics, 1998, Moscow State University

Title of Thesis: Geometry and Hamiltonian formalism of integrable lattices

Advisor: Prof. A. P. Veselov

Ph.D., Mathematics, 2001, Université de Montréal

Title of Thesis: Nonlinear ordinary differential equations with superposition principles

Advisor: Prof. P. Winternitz

Positions held since receiving the Ph.D.:

2001 – 2004 Postdoctoral Fellow, Centre de Recherches Mathématiques, Université de Montréal

Current Positions:

Associate Professor, Moscow State University (2007–...)

Lecturer, Independent University of Moscow (2004–...)

Director of Graduate & Undergraduate Studies, Independent University of Moscow (2008–...)

Associate Professor, Bauman Moscow State Technical University
(2004–...)

Research Interests: Mathematical Physics

- (i) Integrable systems and their geometry (especially methods of algebraic geometry in integrable systems, integrable Hamiltonian PDEs, integrable systems on lattices, discrete Lagrangian systems).
- (ii) Applications of Lie groups and algebraic groups to differential equations.
- (iii) Related areas (Spectral Theory, Algebraic Geometry, Representation Theory, Lie Groups etc).

Teaching experience:

Associate Professorship at Moscow State University: Analytic Geometry, Linear Algebra and Geometry, Differential Geometry, Classical Differential Geometry; Proseminar on Topology & Geometry for undergraduate students.

Lectureship at the Independent University of Moscow: Equivariant Cohomology and Localization Theorem, Geometric Quantization, Differential Geometry, Integrable Systems, Advanced Geometry, Geometry in Mechanics and Physics, 1st year Differential and Integral Calculus, Analysis on Manifolds, Complex Analytic Manifolds and Holomorphic Vector Bundles, Riemann Surfaces.

Lectureship at the Independent University of Moscow for the Math in Moscow program (one semester program for U.S. and Canada undergraduate students): Linear Algebra, Advanced Linear Algebra and Elements of Representation Theory, Differential Geometry, Equations of Mathematical Physics, Topology I.

Associate Professorship at Bauman Moscow State Technical University: 1st year Mathematical Analysis, 2nd year Mathematical Analysis and Complex Analysis, Linear Algebra, Operational Calculus and Partial Differential Equations, Numerical Methods, Analytic Geometry, Ordinary Differential Equations.

Teaching assistantship at the Moscow State University, Faculty of Sociology: Calculus for sociologists, Probability for sociologists, Statistics for sociologists.

Teaching assistantship at the Université de Montréal: Differential Geometry, Ordinary Differential Equations, Advanced Calculus, Calculus, Calculus II, Linear Algebra.

Selected recent talks:

August 2007: International Conference on Differential Equations "Equadiff-2007", Vienna University of Technology.

May 2007: International Conference "Differential Equations and Related Topics" dedicated to I. G. Petrovskii, Moscow State University.

January 2007: International Workshop on Classical and Quantum Integrable Systems (CQIS-2007), Bogoliubov Laboratory of Theoretical Physics, JINR, Dubna, Russia.

September 2006: Geometry, Topology and Mathematical Physics Seminar, Moscow State University.

May 2006: International Conference GIMP'06 (Geometry and Integrability in Mathematical Physics), Independent University of Moscow.

March 2005: Seminar on Homological Methods in Geometry of Differential Equations, Independent University of Moscow.

September 2004: Geometry, Topology and Mathematical Physics Seminar, Moscow State University.

April 2004: Séminaire "Analyse non-linéaire / Systèmes dynamiques" Université de Montréal.

January 2004: Joint Mathematics Meeting (including the 110th National Annual Meeting of the American Mathematical Society), Phoenix, AZ, USA.

November 2003: Séminaire "Physique Mathématique," Université de Montréal.

June 2003: Fifth International Conference "Symmetry in Nonlinear Mathematical Physics", Kyiv (Kiev), Ukraine.

September 2002: Workshop on Superintegrability in Classical and Quantum Systems, Centre de Recherches Mathématiques, Université de Montréal.

List of Publications:

- [1] Penskoi, A. V. Integrable systems and the topology of isospectral manifolds. *Teor. Mat. Fiz.* 155 (2008), no 1, 140-146 (Russian). Translation in *Theor. Math. Phys.* 155 (2008), no 1, 627–632. Preprint [arXiv:0705.0805](https://arxiv.org/abs/0705.0805).
- [2] Penskoi, A. V. The Volterra system and topology of the isospectral variety of zero-diagonal Jacobi matrices. *Uspekhi Mat. Nauk* 62 (2007), no 3, 213-214 (Russian). Translation in *Russian Math. Surveys*, 62 (2007), no 3, 626–628. Preprint [math-ph/0701061](https://arxiv.org/abs/math-ph/0701061).
- [3] Oblomkov, A.A., Penskoi, A. V. Laplace transformations and spectral theory of two-dimensional semi-discrete and discrete hyperbolic Schrödinger operators. *Int. Math. Res. Not.* 2005, no. 18, 1089–1126. MR 2006e:47070. Preprint [math-ph/0311036](https://arxiv.org/abs/math-ph/0311036).
- [4] Penskoi, A. V. Canonically conjugate variables for the periodic Camassa-Holm equation. *Nonlinearity* 18 (2005), no. 1, 415–421. MR 2005h:37168. Preprint [math-ph/0211048](https://arxiv.org/abs/math-ph/0211048).
- [5] Penskoi, A. V. Symmetries and Lagrangian time-discretizations of Euler equations, *Superintegrability in classical and quantum systems*, 145–153, CRM Proc. Lecture Notes, 37, *Amer. Math. Soc., Providence, RI*, 2004. MR 2005h:37146. Preprint [math-ph/0407029](https://arxiv.org/abs/math-ph/0407029).
- [6] Penskoi, A. V., Winternitz, P. Discrete matrix Riccati equations with superposition formulas. *J. Math. Anal. Appl.* 294 (2004), no. 2, 533–547. MR 2006a:34007. Preprint [math-ph/0305053](https://arxiv.org/abs/math-ph/0305053).
- [7] Penskoi, A. V., Veselov, A. P. Discrete Lagrangian systems on the Virasoro group and Camassa-Holm family. *Nonlinearity* 16 (2003), no. 2, 683–688. MR 2004a:37108. Preprint [math-ph/0209037](https://arxiv.org/abs/math-ph/0209037).
- [8] Penskoi, A. V. Lagrangian time-discretization of the Hunter-Saxton equation. *Phys. Lett. A* 304 (2002), no. 5-6, 157–167. MR 2003j:35283. Preprint [math-ph/0201035](https://arxiv.org/abs/math-ph/0201035).
- [9] Penskoi, A. V. Ordinary differential equations with superposition formulae, II: Parabolic subgroups of the symplectic group. *J. Phys. A* 35 (2002) 425–434. MR 2003k:34019.
- [10] Penskoi, A. V. Generalized matrix Riccati equations with superposition formulae. *J. Phys. A* 34 (2001), no. 3, 609–615. MR 2003k:34023.
- [11] Oblomkov, A. A.; Penskoi, A. V. Two-dimensional algebro-geometric difference operators. *J. Phys. A* 33 (2000), no. 50, 9255–9264. MR 2002e:39056. Preprint [math-ph/0010024](https://arxiv.org/abs/math-ph/0010024).
- [12] Penskoi, A. V. Lagrangian time-discretization of the Korteweg-de Vries equation. *Phys. Lett. A* 269 (2000), no. 4, 224–229. MR 2001d:37118.

- [13] Veselov, A. P.; Penskoi, A. V. Algebro-geometric Poisson brackets for difference operators, and the Volterra system. (Russian) *Dokl. Akad. Nauk* 366 (1999), no. 3, 299–303. Translation in *Doklady Mathematics* 59 (1999), no. 3, 391–394. MR 2001b:37105.
- [14] Penskoi, A. V. The Volterra lattice as a gradient flow. *Regul. Khaoticheskaya Din.* 3 (1998), no. 1, 76–77. MR 99j:58157. Preprint [math-ph/0011041](#).
- [15] Veselov, A. P.; Penskoi, A. V. On algebro-geometric Poisson brackets for the Volterra lattice. *Regul. Chaotic Dyn.* 3 (1998), no. 2, 3–9. MR 2000d:37091. Preprint [math-ph/0010027](#).
- [16] Penskoi, A. V. Canonically conjugate variables for the Volterra system with periodic boundary conditions. (Russian) *Mat. Zametki* 64 (1998), no. 1, 115–128. Translation in *Math. Notes* 64 (1998), no. 1-2, 98–109. MR 2000f:37103.
- [17] Penskoi, A. V. Discrete Lagrangian systems on the Virasoro group. (Russian) *Vestnik Moskov. Univ. Ser. I Mat. Mekh.* 1996, no. 4, 99–102. Translation in *Moscow Univ. Math. Bull.* 51 (1996), no. 4, 52–54. MR 99g:58064.