

URAL STATE UNIVERSITY  
Professional Record  
**GRIGORI NOAH MILSTEIN**  
Department of Mathematics

**Areas of Research: Stochastic Numerics for Mathematical Physics; Stochastic Dynamics; Estimation, Control and Stability Theory**

**Office Address:**

Lenin str. 51,  
Ural State University,  
620083 Ekaterinburg, Russia

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**PRESENT RANK & DATE OF RANK:** Professor, 9/1989

**USU APPOINTMENT HISTORY**

1963-1965 - Assistant  
1966-1988 - Docent  
1989-1993 - Professor  
1998 to present - Senior Researcher

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**CITIZEN OF:** Russia (b. 6 June 1937, Dashev, Ukraine, USSR)

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**EDUCATION:**

1955-1960 - Undergraduate of Ural State University  
  
1960-1963 - Postgraduate of Ural State University  
  
1965 - Candidate of science in physics and mathematics, Ural State University  
  
1988 - Doctor of science in physics and mathematics, Institute of Mathematics and Mechanics, Russian Academy of Sciences

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**FACULTY APPOINTMENTS AT OTHER INSTITUTIONS**

1993-1998, 2000-2003 - Senior Researcher, Weierstrass Institute for Applied Analysis and Stochastics, Berlin  
  
March 2004-October 2004 - Visiting Professor, University of Leicester, Leicester, UK

**PROFESSIONAL SOCIETY MEMBERSHIPS**

American Math. Society, 1975, Ural Math. Society, 1985.

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**PUBLICATIONS**

**A. Scholarly Books Published**

1. Milstein G.N.  
Numerical Integration of Stochastic Differential Equations. Ural. Gos. Univ., Sverdlovsk, 1988, 224 pp. MR 90k: 65018.

2. Milstein G.N.  
Numerical Integration of Stochastic Differential Equations. Kluwer Academic Publishers, Mathematics and its Applications, v. 313, 1995, 170 pp. MR 96e:65003.
3. Milstein G.N., Tretyakov M.V.  
Stochastic Numerics for Mathematical Physics. Springer, 2004.

## B. Journal Articles Published in 2001-06

1. Khasminskii R., Milstein G.N.  
On estimation of the linearized drift for nonlinear stochastic differential equations. Stochastic and Dynamics, vol. 1(2001), no. 1, 23-43.
2. Milstein G.N., Tretyakov M.V.  
Noise-induced unidirectional transport. Stochastic and Dynamics, vol. 1(2001), no. 3, 361-375.
3. Milstein G.N., Tretyakov M.V.  
Numerical solution of the Dirichlet problem for nonlinear parabolic equations by a probabilistic approach. IMA J. of Numerical Analysis, vol. 21(2001), no. 4, pp. 887-917.
4. Milstein G.N., Nussbaum M.  
Maximum likelihood estimation of a nonparametric signal in white noise by optimal control. Statistic and Probability Letters, vol. 55/2(2001), pp. 193-203.
5. Milstein G.N., Repin Yu.M, Tretyakov M.V.  
Symplectic integration of Hamiltonian systems with additive noise. SIAM J. on Numerical Analysis, vol. 39(2002), no. 6, pp. 2066-2088.
6. Milstein G.N., Tretyakov M.V.  
The simplest random walks for the Dirichlet problem. Theor. Prob. Appl., vol. 47(2002), no. 1, pp. 39-58.
7. Imkeller P., Milstein G.N.  
Moment Lyapunov exponent for conservative systems with small periodic and random perturbations. Stochastic and Dynamics, vol. 2(2002), no. 1, pp. 25-48.
8. Milstein G.N.  
The probability approach to numerical solution of nonlinear parabolic equations. Numerical Methods for Partial Differential equations, vol. 18(2002), no. 4, pp. 490-522.
9. Milstein G.N., Tretyakov M.V.  
A probabilistic approach to the solution of the Neumann problem for nonlinear parabolic equations. IMA J. of Numerical Analysis, vol. 22(2002), no. 4, pp. 599-622.
10. Milstein G.N., Schoenmakers J.G.M.  
Numerical construction of a hedging strategy against the multi-asset European claim. Stochastics and Stochastics Reports, vol. 73(2002), no. 1-2, pp. 125-157.
11. Milstein G.N.  
The asymptotic behavior of semi-invariants for linear stochastic systems. Stochastic and Dynamics, vol. 2(2002), no. 2, pp. 281-294.
12. Milstein G.N., Repin Yu.M., Tretyakov M.V.  
Numerical methods for stochastic systems preserving symplectic structure. SIAM J. on Numerical Analysis, vol. 40(2002), no. 4, pp. 1583-1604.
13. Milstein G.N., Tretyakov M.V.  
Quasi-symplectic methods for Langevin type equations. IMA J. of Numerical Analysis, vol. 23(2003), pp. 593-626.
14. Belopolskaya Ya., Milstein G.N.  
An approximation method for Navier-Stokes equations by probabilistic approach. Statistic and Probability Letters, vol. 64(2003), no. 2, pp. 201-211.
15. Milstein G.N., Schoenmakers J.G.M., Spokoyny V.  
Transition density estimation for stochastic differential equations via forward-reverse representations. Bernoulli, vol. 10(2004), No. 2, 281-312.

16. Milstein G.N., Tretyakov M.V.  
Evaluation of conditional Wiener integrals by numerical integration of stochastic differential equations. *J. of Computational Physics*, vol. 197(2004) Issue 1, 275-298.
17. Khasminskii R., Milstein G.N.  
Stability of gyroscopic systems under small random excitations. *Stochastics and Dynamics*, vol. 4(2004), no. 1, 107-133.
18. Milstein G.N., Reiß O., Schoenmakers J.  
A new Monte Carlo method for American options. *International J. of Theoretical and Applied Finance*, vol. 7(2004), no. 5, 591-614.
19. Milstein G.N., Tretyakov M.V.  
Numerical analysis of Monte Carlo evaluation of Greeks by finite differences. *J. of Computational Finance* vol. 8(2005), 1-33.
20. Spivakovskaya D., Heemink A.W., Milstein G.N., Schoenmakers J.G.M.  
Simulation of particle concentrations in coastal waters using forward and reverse time diffusion. *Advances in Waterresources* vol. 28(2005), 927-938.
21. Milstein G.N., Tretyakov M.V.  
Numerical integration of stochastic differential equations with nonglobally Lipschitz coefficients. *SIAM J Num. Anal.* vol. 43(2005), no. 3, 1134-1154.
22. Milstein G.N., Tretyakov M.V.  
Numerical algorithms for forward-backward stochastic differential equations. *SIAM J Sci. Comp.* vol. 28(2006), no. 2, 561-582.
23. Belomestny D., Milstein G.N.  
Monte Carlo evaluation of American options using consumption processes. *International J. of Theoretical and Applied Finance* vol. 9(2006), no. 4, 1-27.
24. Milstein G.N., Tretyakov M.V.  
Discretization of forward-backward stochastic differential equations and related quasi-linear parabolic equations. *IMA J. of Numer. Anal.* (2006), doi:10.1093/imanum/drl019 .

### C. Journal Articles Submitted and in Preparation

- 1. Belomestny D., Milstein G.N.  
Adaptive simulation algorithms for pricing American and Bermudan options by local analysis of the financial market. Preprint No. 1022, WIAS, Berlin, 2005, submitted.
- 2. Milstein G.N., Tretyakov M.V.  
Computing ergodic limits for Langevin equations. Tech. Report No. MA-05-09. School of Mathematics and Computer Science, University of Leicester, 2005, submitted.
- 3. Milstein G.N., Schoenmakers J., Spokoiny V.  
Forward and reverse representations for Markov chains. Preprint No. 1125, WIAS, Berlin, 2006, submitted.
- 4. Belomestny D., Milstein G.N., Spokoiny V.  
Regression methods in pricing American and Bermudan options using consumption processes. Preprint No. 1145, WIAS, Berlin, 2006, submitted.
- 5. Milstein, G.N. and Tretyakov, M.V.  
Monte Carlo algorithms for backward equations in nonlinear filtering. Technical Report No. MA-06-13. School of Mathematics and Computer Science, University of Leicester, 2006, submitted.
- 6. Milstein, G.N. and Tretyakov, M.V.  
Practical variance reduction via regression for simulating diffusions. Technical Report No. MA-06-19. School of Mathematics and Computer Science, University of Leicester, 2006.
- 7. Belomestny D., Milstein G.N., Schoenmakers J.  
Sensitivities for Bermudan options by regression methods. Manuscript in preparation, 2006.