



BROWN

Boris L. Rozovsky
Professor of Applied Mathematics

Address: Brown University
Division of Applied Mathematics
182 George Str. RI 02912

Tel.: (401)-863-9246,

FAX: (401)-863-1355
Email: rozovsky@dam.brown.edu
www.dam.brown.edu/people/rozovsky.html

Education 1968 M.S. Probability and Statistics
Moscow State (Lomonosov) University,

1972 Ph.D. Physical and Mathematical Sciences
Moscow State (Lomonosov) University

Research Interests

Stochastic processes and random fields, stochastic partial differential equations, nonlinear filtering and target tracking, uncertainty quantification, stochastic numerics, statistics of stochastic processes, stochastic fluid dynamics, mathematical modeling of high speed computer networks, financial mathematics.

Professional Experience

2009- Ford Foundation Professor, Division of Applied Mathematics, Brown University

2007- Member of the Lefschetz Center for Dynamical Systems, Brown University

- 2006- Professor, Division of Applied Mathematics, Brown University
- 1991-2006 Professor, Department of Mathematics, University of Southern California
- 1992-2006 Director, Center for Applied Mathematical Sciences,
University of Southern California
- 1995-98 Professor, Dept. of Electrical Engineering Systems (secondary
appointment) University of Southern California
- 1989-91 Professor, Department of Mathematics,
The University of North Carolina at Charlotte
- 1988-89 Visiting Distinguished Professor, Department of Mathematics
The University of North Carolina at Charlotte
- 1985-88 Full Professor, Department of Computer Science and Economic
Mathematics. Moscow Institute for Advanced Studies for Chemistry
Managers and Engineers, Moscow
- 1985-88 Scientific Head of the Laboratory of Informatics
Moscow Institute for Advanced Studies for Chemistry Managers and
Engineers, Moscow
- 1980-85 Associate Professor, Moscow Institute for Advanced Studies for
Chemistry Managers and Engineers, Moscow
- 1971-80 Senior Lecturer, Moscow Institute for Advanced Studies for Chemistry
Managers and Engineers, Moscow
- 1970-71 Junior Researcher, Moscow State (Lomonosov) University, Kolmogorov's
Statistics Laboratory, Moscow

Ph.D. Students

- M. Huebner (USC; 1993, Presently—Associate Professor, Michigan State)
- K. Owens (USC; 1994, Presently—Researcher, Jet Propulsion Laboratory, NASA)
- A. Fung (USC; 1995, Presently—Engineer, Tellab Systems, Los Angeles, CA)
- S. Lototsky (USC; 1996, Presently—Professor, USC)
- C. Rao (USC; 1998, Presently—Senior Consultant, Optum, Costa Mesa, CA)
- S. Kligys (USC; 1998, Presently—Senior Engineer, Oracle, Los Angeles, CA)
- A. Petrov, (USC; 2000, Presently—Statistical Analyst, BioDiscovery, Inc., Marina
Del Rey, CA)
- B. G. Yaralov (USC; 2000 Presently—Senior Researcher, New Engine, Santa
Monica, CA)

- C. A. Papanicolaou (Brown, 2007-)
- D. C.-Y. Lee (Brown, 2007-)

Post Doctoral Associates

- A. Figotin (UNCC, 1990, Presently—Professor, UCI, Irvine).
- R. Sowers (USC, 1991-1993, Presently—Assistant Professor, University of Illinois, Urbana-Champaign)
- S. Leonov (USC, 1996-1998, Presently—Researcher, SmithKline Beecham Pharmaceuticals, Collegeville, PA)
- S. Assing (USC, 2000, Presently—Lecturer, University of Edinburgh, UK)
- H. Kim (USC, 2000-2002, Presently—Assistant Professor, University of Korea, Seoul)

Honors/Awards

- Doctor of Physical and Mathematical Sciences
Vilnius State University, 1984
- Institute of Mathematical Statistics, Fellow, 1997
- International Academy of Natural and Social Sciences, Peter-the-Great Medal, 1997
- Kolmogorov Centennial Conference, Kolmogorov Medal, 2003

Editorial Work

- Stochastic Modeling and Applied Probability*, Springer-Verlag (2001-present, Editor)
- SIAM J. on Mathematical Analysis* (2001-present, Associate Editor)
- Asymptotic Analysis* (2006-present, Member of Advisory Board)
- Annals of Probability* (1997-2002, Associate Editor)
- Electronic Journal of Probability* (1995-2002, Associate Editor)
- Stochastic Processes and their Applications* (1996-1998, Associate Editor)

Professional Societies

- American Mathematical Society
- Institute of Mathematical Statistics
- Society for Industrial and Applied Mathematics

Invited Talks and Courses of Lectures (1990-2008)

1. International Conference in Stochastic Partial Differential Equations, Trento, Italy, 1990.
2. 2nd World Congress of the Bernoulli Society for Mathematical Statistics, Uppsala, Sweden, 1990.
3. University of Paris VI, 1990.

4. University of Provence, Marseille, France, 1990, 1991.
5. U.S.-Russian Conference on MHD Stability and Dynamos, University of Chicago, Chicago, IL, 1992.
6. Workshop on White Noise Models and Stochastic Systems, Twente, The Netherlands, 1992.
7. Workshop on Stochastic Control, Montreal, Canada, 1992.
8. ONR Workshops. Random Fields for Oceanographic Modeling, Washington, D.C., 1990; Santa Barbara, CA, 1991; Miami, FL, 1992.
9. 10th Annual Joint Summer Research Conferences in the Mathematical Sciences, Control and Identification of Partial Differential Equations, Mount Holyoke College, South Hadley, MA, 1992.
10. Conference on Stochastic Partial Differential Equations, Rochester, NY, 1992.
11. Workshop on Stochastic PDE and Superprocesses (AMS Direction in Probability Workshops), Medford, MA, 1992.
12. University of Minnesota, Minneapolis, MN, 1992.
13. 4th International Conference on Advances in Communication and Control Rhodes, Greece, 1993.
14. AMS Summer Institute, Stochastic Analysis, Ithaca, NY, 1993.
15. Southern California Annual Conference in Probability and Statistics, Los Angeles, CA, 1993.
16. Sixth Annual Copper Mountain Conference on Multigrid Methods (session organizer), Copper Mountain, CO, 1993.
17. ONR Workshop on Random Fields for Oceanographic Modeling (organizer), Los Angeles, CA, 1993.
18. USC-Hughes Workshop on Stochastic Modeling and Simulation (organizer), Los Angeles, CA, 1993.
19. Naval Ocean Systems Center, San Diego, CA, 1993.
20. International conference, "Stochastic Partial Differential Equations and Random Media," Marseille, France, 1994.
21. Fourth Eugene Lukas Symposium, Bowling Green, OH, 1994.
22. Hughes-USC Workshop on Stochastic Modeling and Simulation in Material Science, Los Angeles, CA, 1994.
23. Southern California Conference on PDE's and Analysis, Los Angeles, CA, 1994.
24. U.S.-Japan Bilateral Seminar on Stochastic Analysis in Infinite Dimensional Spaces, University of Louisiana, New Orleans, LA, 1994.
25. Workshop in Nonlinear Filtering, Chapel Hill, NC, 1994.
26. 3rd World Congress of the Bernoulli Society, Chapel Hill, NC, 1994.
27. 1994 SIAM Annual Meeting, San Diego, CA, 1994.
28. 1994 ONR Workshop on Random Fields, Santa Barbara, CA, 1994.
29. University of Minnesota, Minneapolis, MN, 1995.
30. American Mathematical Society--Israel Mathematical Union, Joint Meeting, 1995.
31. Technion, Haifa, Israel, 1995.
32. University of Tel Aviv, Israel, 1995.
33. Third IEEE Mediteranean Symposium on New Directions in Control and Automation, Limasol, Cyprus, 1995.

34. Joint Meeting of Southern California Sections of MAA and SIAM, San Diego, CA, 1996.
35. Fourth World Congress of Bernoulli Society, Vienna, Austria, 1996.
36. International Workshop on Computational and Statistical Issues for Stochastic Processes, Cremona, Italy, 1996.
37. Conference on Stochastic Analysis, Random Fields and Applications, Ascona, Switzerland, 1996.
38. 1996 SIAM Annual Meeting, Kansas City, MO, 1996.
39. Workshop on Stochastic Control and Nonlinear Filtering, North Carolina State University, Charlotte, NC, 1996.
40. 36th IEEE Conference on Decision and Control, Kobe, Japan, 1996
41. Some Problems of Stochastic Analysis, Workshop, Michigan State University, East Lansing, MI, 1996.
42. Topics on Stochastic Control, Workshop, Osaka University, Osaka, Japan, 1996.
43. Instructional Conference on Stochastic Partial Differential Equations, Edinburgh, UK, 1997.
44. Imperial College, London, UK, 1997.
45. University of Chicago, Chicago, IL, 1997.
46. Stanford University, Stanford, CA, 1997.
47. University of California, San Diego, CA, 1997
48. MSRI Mini-course of Lectures: “SPDE’s and Nonlinear Filtering” at the NSF Mathematical Research Institute, Berkeley, CA, 1997.
49. Symposium on Stochastic Control and Nonlinear Filtering, Los Angeles, CA, 1997.
50. American Mathematical Society Spring Western Section Meeting, Davis, CA, 1998.
51. Scuola Normale Superiore, Pisa, Italy, 1998.
52. University “La Sapienza,” Rome, Italy, 1998.
53. IEEE 6th Mediterranean Conference on Estimation and Control, Alghero, Italy, 1998
54. Workshop on Industrial Mathematics, Northeastern University, Boston, MA, 1998.
55. 36th Allerton Conference on Communication, Control, and Computing, University of Illinois, Urbana-Champaign, IL, 1998.
56. 4th US Army Conference on Applied Statistics, El Paso, Texas, 1998.
57. Irving S. Reed Symposium, USC, Los Angeles, CA, 1999.
58. 2nd ONR/GTRI Workshop on Target Tracking and Sensor Fusion, Georgia Tech Research Institute, Atlanta, GA, 1999.
59. SPIE 44th Annual Meeting, Denver, CO, 1999.
60. 3rd Seminar on Stochastic Analysis, Random Fields and Applications, Ascona, Switzerland, 1999.
61. UCLA, Los Angeles, CA, 1999.
62. Stanford University, Stanford, CA, 2000.
63. Princeton University, Princeton, NJ, 2000.
64. Conference on Stochastic partial Differential Equations and Applications, Trento, Italy, 2000.

65. IMA Workshop, “Modeling and analysis of Noise in Integrated Circuits and Systems” (organizer), Minneapolis, MN, 2000.
66. 39th IEEE Conference on Decision and Control, Sydney, Australia, 2000.
67. Workshop on Stochastic Partial Differential Equations: Statistical Issues and Applications, Center for Mathematical Physics and Stochastics, Copenhagen, Denmark, 2001.
68. Conference on Stochastic Analysis: Geometric Aspects and Applications, Eurandom, Eindhoven, The Netherlands, 2001.
69. Workshop on Computational Stochastic Differential Equations, Warwick University, UK, 2001.
70. Conference on Partial Differential Equations and Probability (organizer), University of Minnesota, Minneapolis, MN, 2001.
71. 33rd Symposium on the Interface: Computing Science and Statistics, Costa Mesa, CA, 2001.
72. 5th SIAM Meeting on Control and Applications, San Diego, CA, 2001.
73. Northwestern University, Evanston, IL, 2001
74. 1st Southern California Applied Mathematics Symposium (organizer), Caltech, Pasadena, CA, 2001.
75. Warwick Symposium on Stochastic Partial Differential Equations, Warwick, UK, 2001.
76. Mini-course of Lectures: “Stochastic Fluid Mechanics,” Mathematics Research Center, Warwick University, Warwick, UK, 2001.
77. Southern California Annual Conference in Probability and Statistics, Irvine, CA, 2001.
78. 2nd Southern California Applied Mathematics Symposium (organizer), IPAM, Los Angeles, CA, 2002.
79. Joint Meeting of AMS and Unione Matematica Italiana, Pisa, Italy, 2002.
80. 8th International Vilnius Conference on Probability Theory and Mathematical Statistics (organizer), Vilnius, Lithuania, 2002.
81. Caltech, 2002.
82. University of California, San Diego, 2003.
83. University of California, Irvine, 2003.
84. Interface 2003 Conference, Salt Lake City, Utah, 2003.
85. Conference on Stochastic Partial Differential Equations, IAS, Princeton, 2003
86. Workshop on Probability and Partial Differential Equations in Modern Applied Mathematics, IMA, Minneapolis, 2003.
87. International Conference “Kolmogorov and Contemporary Mathematics”, Moscow, Russia, 2003 (plenary lecture).
88. Workshop on Stochastic Partial Differential Equations, BIRS, Banff, Canada, 2003.
89. International Conference on Stochastic Partial Differential Equations, Levico, Italy, 2004.
90. Caltech, 2004.
91. University of Minnesota, 2004, 2 Lectures.
92. Centro di Ricerca Matematica Ennio De Giorgi, Italy, 2004.

93. Mini-course of lectures “Stochastic Fluid Dynamics”, Institut de Matematica, University of Barcelona, 2004
94. Workshop “Stochastics in Fluid Models”, ETH, Zurich, 2005
95. Workshop “Deterministic and Stochastic Navier-Stokes Equations”, American Institute of Mathematics, Palo Alto, 2005
96. 2nd Bachelier Colloquium on Stochastic Analysis and Mathematical Finance, Metabief, France, 2005.
97. Workshop “Stochastic Flows”, CIRM (Lumigny), France, 2005.
98. 7th Workshop on Stochastic Numerics, RIMS, Kyoto University, 2005.
99. University of Osaka, 2005.
100. Mathematical Encounters XXIX, University of Madeira, 2005.
101. 5th Southern California Conference on Applied Mathematics, USC, Los Angeles, 2005 (organizer).
102. Analytical and Stochastic Fluid Dynamics Workshop, MSRI (Berkeley), 2005 (co-organizer).
103. Geophysical Fluid Dynamics Workshop, American Institute of Mathematic, Palo Alto, 2006 (co-organizer).
104. University of California, Irvine, 2006.
105. UCLA, 2006.
106. Mini-course on Stochastic PDE, University of Utah, 2006.
107. Conference on Asymptotic Analysis in Stochastic Processes, Wayne State University, 2006.
108. SPDE Workshop on Advances and Challenges in the Solution of Stochastic Partial Differential Equations, Brown University, 2006 (co-organizer).
109. 96th Statistical Mechanics Conference, Rutgers University, 2006.
110. Rensselaer Polytechnic Institute, 2007
111. Stanford University, 2007.
112. Princeton University, 2007.
113. Columbia University, 2007.
114. Conference on Stochastic PDEs, Cornel University,2007.
115. Conference “Stochastic Partial Differential Equations and Applications”, Mittag-Leffler Institute, Sweden, 2007
116. Workshop on Nonlinear Filtering and Control, Warwick University, UK, 2007
117. Mini-Conference on Stochastic Analysis, Brown University, 2007 (organizer).
118. International Conference on Stochastic Partial Differential Equations, Levico, Italy, 2008.
119. University of Kansas (Lawrence), 2008.
120. University of Michigan (Ann Arbor), 2008.
121. Workshop on Stochastic PDEs and Numerical Analysis, Zurich, 2008.
122. “Stochastic Analysis and Applications: from Mathematical Physics to Mathematical Finance”, Conference, Princeton University, 2008
123. 8th World Congress on Computational Mechanics, Venice, Italy, 2008
124. London Mathematical Society Short Course of Lectures on Stochastic PDEs, Imperial College, London, 2008.

125. SIAM conference on Computational Science and Engineering, Maiami, 2009
126. 7th ISAAC Congress, London, 2009.
127. International Conference on Spectral and High Order Methods, 2009, Trondheim, Norway.

Publications

Books and Edited Volumes

a. Books:

1. *Stochastic Partial Differential Equations* (with S. Lototsky), Springer (to appear).
2. *Stochastic Navier-Stokes Equation. Modeling and Analysis* (with R. Mikulevicius), Springer (to appear).
3. *Stochastic evolution systems. Linear theory and applications to the statistics of random processes* (in Russian). Moscow: "Nauka," 1983.
4. *Data analysis in chemical research. Statistical foundations* (in Russian), Moscow: "Khimija," 1984.
5. *Stochastic evolution systems. Linear theory with applications to non-linear filtering*. Mathematics and its Applications (Soviet Series) 35. Dordrecht: Kluwer Academic Publishers, 1990.

b. Edited Volumes:

1. *Handbook on Nonlinear Filtering*, (Ed. D. Crisan and B. Rozovskii) Oxford University Press (to appear in 2009)
2. *Applied Mathematics & Optimization. Special issue on Approximation in Stochastic Partial Differential Equations*, (Guest Ed. B. Rozovskii), Springer, 2006.
3. *Stochastic partial differential equations: six perspectives*. (Ed. R. Carmona and B. L. Rozovskii) Mathematical Surveys and Monographs Series 64. Providence, RI: American Mathematical Society, 1998.
4. *Statistics and control of stochastic processes. The Liptser festschrift: papers from the Steklov Seminar (Moscow, 1995/1996)*. Ed. Yu. M. Kabanov, B. L. Rozovskii, and A. N. Shiryaev. River Edge, NJ: World Scientific, 1997.

5. *Stochastic modeling in oceanography*. Ed. R. Adler, P. Muller, and B. L. Rozovskii. Progress in Probability 39. Boston: Birkhauser, 1996.
6. *Stochastic partial differential equations and their applications. Proceedings of the IFIP WG 7/1 International Conference (Charlotte, NC, 1991)*. Ed. B. L. Rozovskii and R. B. Sowers. Lecture Notes in Control and Information Sci. **176**. Berlin: Springer-Verlag, 1992.

Papers (in refereed journals/books)

1. Elliptic equations of higher stochastic order (with S. Lototsky and X. Wan), *J. Math. Modeling and Numerical Anal.* (submitted), 2009.
2. Randomization of forcing in large systems of PDE for improvement of energy estimates (with C.-Y. Lee and H. M. Zhou) *SIAM J. Multiscale Modeling and Simulation*. (submitted), 2009.
3. A new stochastic modeling methodology based on weighted Wiener chaos and Malliavin calculus, (with G. Karniadakis and X. Wan), *Proc. Natl. Acad. Sc. USA*, **106** (2009), no. 34, 14189-14104.
4. A unified approach to stochastic evolution equations using the Skorokhod integral, (with S. Lototsky), *Teoriya Veroyatnostey (Probability Theor., Appl.)*, **54** , no. 2, 2009.
5. Stochastic differential equations driven by purely spatial noise, (with S. Lototsky), *SIAM Journal on Mathematical Analysis*, **41**, no.4, 1295-1322, 2009.
6. Stochastic parabolic equations of full second order (with S. Lototsky). Book chapter in "*Topics in Stochastic Analysis and Nonparametric Estimation* " (Ed. P.- L. Chow et al.). 199--210, *The IMA Volumes in Mathematics and its Applications*, Springer, 2007.
7. Wiener chaos solutions of linear stochastic evolution equations (with S. Lototsky). *Annals. of Prob.*, **34** (2006), no. 2, 638--662.
8. Wiener chaos expansions and numerical solutions of randomly forced equations of fluid mechanics (with T. How et al.), *J. Comput. Phys.* **216** (2006), no. 2, 687--706.
9. Stochastic differential equations: A Wiener chaos approach (with S. Lototsky). Book chapter in "*From Stochastic Calculus to Mathematical Finance* " (Ed. Y. Kabanov et al.). 433--506, Springer, Berlin, 2006

10. Strong solutions of stochastic generalized porous media equations: Existence, uniqueness and ergodicity. (with G. Da Prato et al.) *Comm. Partial Dif. Eq.*, **31** (2006), no. 1-3, 277--291.
11. A novel approach to detection of intrusions in computer networks via adaptive sequential and batch-sequential change-point detection methods (with R. Blazek et al.), *IEEE Transactions on Signal Processing*, **54**, (2006) no. 9, 3372--3382.
12. Detection of intrusions in information systems by sequential change-point methods (with A. Tartakovsky et al.). *Statistical Methodology*, **3** (2006), no. 3, 252--293.
13. Detection of intrusions in information systems by sequential change-point methods. Authors' response (with A. Tartakovsky et al. *Stat. Methodol.* **3** (2006), no. 3, 329--340
14. A filtering approach to tracking volatility from prices observed at random times (with J. Cvitanic et al). *Annals of Applied Prob*, **16** (2006), no. 3, 1633—1652
15. Numerical estimation of volatility values from discretely observed diffusion data. (with J. Cvitanic and Il. Zalyapin) *J. Comp. Finance*, **9** (2006), no. 4,1-36
16. Global L_2 -solutions of stochastic Navier-Stokes equations (with R. Mikulevicius). *Annals of Prob.*, **33** (2005), No. 1, 137-176
17. A nonparametric multichart CUSUM test for rapid detection of DOS attacks in computer networks." *International Journal of Computing and Information Science*, **2** (2004), no. 3, 149--158.
18. Passive Scalar Equation in a Turbulent Incompressible Gaussian Velocity Field (with S. Lototsky), *Russian. Math. Surveys*. **59** (2004), No.2, 297--312
19. Stochastic Navier-Stokes equations for turbulent flows (with R. Mikulevicius). *SIAM J. Math. Anal.* **35** (2004), No. 5, 1250-1310.
20. A diffusion model of roundtrip time (with S. Bohacek). *Computational Statistics and Data Analysis, Computational Statistics and Data Analysis*, vol. **45** (2004) no. 1, 25-50.
21. On martingale problem solutions for stochastic Navier-Stokes equations (with R. Mikulevicius). In *Stochastic partial differential equations and applications*, ed. G. Da Prato and L. Tubaro. Lecture Notes in Pure and Applied Mathematics Series 227. New York: Marcel Dekker, 2002.
22. A note on Krylov's L_p -theory for systems of SPDEs (with R. Mikulevicius). *Electron. J. Probab.* **6**, no. 12 (2001): 1-35.

23. On equations of stochastic fluid mechanics (with R. Mikulevicius). In *Stochastics in finite and infinite dimensions: in honor of Gopinath Kallianpur*, ed. T. Hida et al., 285•302. Trends Math. Boston: Birkhauser, 2001.
24. Stochastic Navier-Stokes equations: propagation of chaos and statistical moments (with R. Mikulevicius). In *Optimal control and partial differential equations: in honor of Professor Alain Bensoussan*, ed. J. L. Menaldi et al., 258•267. Amsterdam: IOS Press, 2001.
25. Approximation of the Kushner equation of nonlinear filtering (with K. Ito). *SIAM J. Control Optim.* **38**, no. 3 (2000): 893•915.
26. Parameter estimation for stochastic evolution equations with non-commuting operators (with S. Lototsky). In *Skorokhod's ideas in probability theory*, ed. V. Korolyuk, N. Portenko, and H. Syta, 271•280. Kiev: Institute of Mathematics of the National Academy of Sciences of Ukraine, 2000.
27. Fourier-Hermite expansions for nonlinear filtering (with R. Mikulevicius). *Teor. Veroyatnost. i Primenen.* **44**, no. 3 (1999): 675•680. Translation in *Theory Probab. Appl.* **44**, no. 3 (2000): 606•612.
28. Spectral asymptotics of some functionals arising in statistical inference for SPDE's (with S. Lototsky). *Stochastic Process. Appl.* **79**, no. 1 (1999): 69•94.
29. Recursive nonlinear filter for a continuous-discrete time model (with S. Lototsky). *IEEE Trans. Automatic Cont.* **48**, no. 8 (1998): 1154•58.
30. Martingale problems for stochastic PDE's (with R. Mikulevicius). In *Stochastic partial differential equations: six perspectives*, ed. R. Carmona and B. L. Rozovskii, 243•325. Mathematical Surveys and Monographs Series 64. Providence, RI: American Mathematical Society, 1998.
31. Normalized stochastic integrals in topological vector spaces (with R. Mikulevicius). In *Seminaire de Probabilités XXXII*, 137•165. Lecture Notes in Math. **1686**. Berlin: Springer-Verlag, 1998.
32. Linear parabolic stochastic PDE's and Wiener chaos (with R. Mikulevicius). *SIAM J. Math. Anal.* **29**, no. 2 (1998): 452•480.
33. Weighted stochastic Sobolev spaces and bilinear SPDE's driven by space-time white noise (with D. Nualart). *J. Funct. Anal.* **149**, no. 1 (1997): 200•225.
34. On asymptotic problems of parameter estimation in stochastic PDE's: discrete time sampling (with L. Piterbarg). *Math. Methods Statist.* **6**, no. 2 (1997): 200•223.

35. Nonlinear filtering revisited: a spectral approach (with S. Lototsky and R. Mikulevicius). *SIAM J. Control Optim.* **35**, no. 2 (1997): 435•461.
36. On asymptotic properties of an approximate maximum likelihood estimator for stochastic PDEs (with M. Huebner and S. Lototsky). In *Statistics and control of stochastic processes. The Liptser festschrift: papers from the Steklov Seminar (Moscow, 1995/1996)*, ed. Yu. M. Kabanov, B. L. Rozovskii, and A. N. Shiryaev, 139•155. River Edge, NJ: World Scientific, 1997.
37. Recursive multiple Wiener integral expansion for nonlinear filtering of diffusion processes (with S. Lototsky). In *Stochastic processes and functional analysis*, ed. J. Goldstein et al., 199•208. Lecture Notes in Pure and App. Math **186**. New York: Marcel Dekker, 1997.
38. Maximum likelihood estimators in the equations of physical oceanography (with L. Piterbarg). In *Stochastic modelling in oceanography*, ed. R. Adler et al., 397•421. Progress in Probability **39**. Boston: Birkhauser, 1996.
39. On asymptotic properties of maximum likelihood estimators for parabolic stochastic PDE's (with M. Huebner). *Probab. Theory Related Fields* **103**, no. 2 (1995): 143•163.
40. On stochastic integrals in topological vector spaces (with R. Mikulevicius). *Stochastic analysis (Ithaca, NY, 1993)*, 593•602. Proc. Sympos. Pure Math. **57**. Providence, RI: American Mathematics Society, 1995.
41. Estimates of turbulent parameters from Lagrangian data using a stochastic particle model (with A. Griffa et al.). *Journal of Mar. Res.* **53**, no. 3 (1995): 371•401.
42. Statistics and physical oceanography (with A. Griffa et al.). *Stat. Sci.* **9**, no. 2 (1994): 167•201.
43. Uniqueness and absolute continuity of weak solutions for parabolic SPDE's (with R. Mikulevicius). *Acta Appl. Math.* **35**, no. 1-2 (1994): 179•192.
44. Soft solutions of linear parabolic SPDE's and the Wiener chaos expansion (with R. Mikulevicius). In *Stochastic analysis on infinite-dimensional spaces*, ed. H. Kunita and H.-H. Kuo, 211•220. Pitman Res. Notes Math. Ser. **310**. Baton Rouge, LA: Longman Sci. Tech, Harlow, 1994.
45. Kinematic dynamo and intermittence in a turbulent flow. Magnetohydrodynamic stability and dynamos (with P. Baxendale). *Geophys. Astrophys. Fluid Dynam.* **73**, no. 1-4 (1993): 33•60.

46. Two examples of parameter estimation for stochastic partial differential equations (with M. Huebner and R. Khasminskii). In *Stochastic processes. A festschrift in honor of Gopinath Kallianpur*, 149•160. New York: Springer-Verlag, 1993.
47. Some results on a diffusion approximation to the induction equation. In *Stochastic partial differential equations and applications (Trento, 1990)*, ed. G. Da Prato and L. Tubaro, 268•81. Pitman Res. Notes in Math. Ser. 268. Baton Rouge, LA: Longman Sci. Tech, Harlow, 1992.
48. A simple proof of uniqueness for Kushner and Zakai equations. In *Stochastic analysis*, ed. E. Mayer-Wolf, 449•58. Boston: Academic Press, 1991.
49. Measure-valued solutions of second-order stochastic parabolic equations (with O.G. Purtukhiya) (in Russian). In *Statistics and control of random processes*, ed. A. N. Shiryaev, 177•79. Moscow: "Nauka," 1989.
50. On the mathematical theory of a hydromagnetic dynamo in a random flow (in Russian). *Dokl. Akad. Nauk SSSR* **293**, no. 6 (1987): 1311•1314.
51. On the statistic estimation of reliability of determining aqueous solution pH by acid-base indicator paper (with V.M. Ostrovskaja et al.) (in Russian). *J. of Analit. Chem. USSR Acad. of Sci.* **V(XLII)**, 1987.
52. Nonnegative L_1 -solutions of second order stochastic parabolic equations with random coefficients. In *Statistics and control of stochastic processes: papers from the Steklov Seminar (Moscow, 1984)*, ed. N. V. Krylov, R. S. Liptser, and A. A. Novikov, 410•427. Translation Series in Math and Engineering. New York: Optimization Software, 1985.
53. Filtering interpolation and extrapolation of degenerate diffusion processes. Backward equations (in Russian). *Teor. Veroyatnost. i Primenen* **28**, no. 4 (1983): 725•737.
54. Stochastic partial differential equations and diffusion processes (with N. V. Krylov)(in Russian). *Uspekhi Mat. Nauk* **37**, no. 6 (1982): 75•95.
55. Characteristics of second-order degenerate parabolic Ito equations (with N. V. Krylov)(in Russian). *Trudy Sem. Petrovsk.* **8** (1982): 153•168.
56. Smoothness of solutions of stochastic evolution equations and the existence of a filtering transition density (with A. Shimizu). *Nagoya Math. J.* **84** (1981): 195•208.
57. On the first integrals and Liouville equations for diffusion processes (with N. V. Krylov). In *Stochastic differential systems (Visegrad, 1980)*, 117•125. Lecture Notes in Control and Information Sci. **36**. New York: Springer-Verlag, 1981.

58. On the total integral of Ito equations (with N.V. Krylov). *Russian Math. Surveys (UMN)* **4**: 1980.
59. A note on the strong solutions of stochastic differential equations with random coefficients. In *Stochastic differential systems. Proceedings of the IFIP-WG 7/1 Working Conference (Vilnius, Lithuania, 1978)*, 287•296. Lecture Notes in Control and Information Sci. **25**. New York: Springer-Verlag, 1980.
60. Conditional distributions of degenerate diffusion processes (in Russian). *Teor. Veroyatnost. i Primenen.* **25**, no. 1 (1980): 149•154.
61. Ito equations in Banach spaces and strongly parabolic stochastic partial differential equations (with N. V. Krylov)(in Russian). *Dokl. Akad. Nauk SSSR* **249**, no. 2 (1979): 285•289.
62. Stochastic evolution equations (with N. V. Krylov)(in Russian), 71•147. Current Problems in Mathematics **14**, 71•147. Moscow: Akad. Nauk SSSR, Vsesoyuz. Inst. Nauchn. i Tekhn. Informatsii, 1979.
Translated into the English: *J. Soviet Math.* Vol. 16, No 4, 1981, pp 1233-1277
63. Fundamental solutions of stochastic partial differential equations and the filtering of diffusion processes (with L. G. Margulis) (in Russian). *Uspekhi Mat. Nauk* **33**, no. 2 (1978): 197.
64. Conditional distributions of diffusion processes (with N. V. Krylov)(in Russian). *Izv. Akad. Nauk SSR Ser. Mat.* **42**, no. 2 (1978): 356•378.
65. The Cauchy problem for linear stochastic partial differential equations (with N. V. Krylov)(in Russian). *Izv. Akad. Nauk SSR Ser. Mat.* **41**, no. 6 (1977): 1329•1347.
66. Stochastic partial differential equations (in Russian). (*Mat. Sb. (N.S.)*) **96**, no. 138 (1975): 314•341.
67. Stochastic differential equations in infinite-dimensional spaces and filtering problems (in Russian). In *Proceedings of the School and Seminar on the Theory of Random Processes (Druskininkai, 1974), Part II*, 147•194. Vilnius: *Inst. Fiz. i Mat. Akad. Nauk Litovsk. SSR*, 1975.
68. The Ito-Wentzell formula (in Russian). *Vestnik Moskov. Univ. Ser. i Mat. Meh.* **28**, no.1 (1973): 26•32.
69. On infinite systems of stochastic differential equations that arise in the theory of optimal nonlinear filtering (with A.N. Shiryaev)(in Russian). *Teor. Veroyatnost. i Primenen.* **17** (1972): 228•237.

70. Stochastic partial differential equations that arise in nonlinear filtering problems (in Russian). *Uspekhi Mat. Nauk* **27**, no. 3 (1972): 213•214.
71. The problem of "disorder" for a Poisson process (with L. I. Galtchuk) (in Russian). *Teor. Veroyatnost. i Primenen.* **16** (1971): 729•734.

Selected Conference Proceedings

72. A nonparametric multichart CUSUM test for rapid intrusion (with K. Shah et al.) *JSM Proceedings (CD Rom)*. Minneapolis, MN, 7-11 August, 2005.
73. Wiener chaos expansions and numerical solutions of randomly forced equations of fluid dynamics (with T. How et al.), Proceedings of the Sixth Hellenic-European Conference on Computer Mathematics and its Applications, HERCMA 2003, Vol. 1, E. A. Lipitakis Editor, pp. 12-22.
74. Novel Approach to Detection of "Denial-of-Service" Attacks via Adaptive Sequential and Batch-Sequential Change-Point Detection Methods (with R. Blazek, H. Kim, and A. Tartakovsky). In *Proceedings of the 2nd Annual IEEE Systems, Man, and Cybernetics Information Assurance Workshop (West Point, NY, 2004)*. New York: Institute of Electrical and Electronics Engineers, 2004.
75. A New Adaptive Batch and Sequential Methods for Rapid Detection of Network Traffic Changes with Emphasis on Detection of "Denial-of-Service" Attacks, (with R. Blazek, H. Kim). In *Proceedings of the 53rd Session of the International Statistical Institute (Seoul, 2001)*. New York: Springer-Verlag, 2001.
76. Tracking Volatility (with J. Cvitanic and R. Liptser). In *Proceedings of the 39th IEEE Conference on Decision and Control, IEEE Control Systems Society (Sydney, 2000)*. New York: Institute of Electrical and Electronics Engineers, 2000.
77. Interactive Banks of Bayesian Matched Filters (with R. Blazek and A. Petrov). In *SPIE Proceedings (Vol. 4048): Signal and Data Processing of Small Targets (Orlando, FL, 2000)*, ed. O. E. Drummond. Bellingham, WA: SPIE (The International Society for Optical Engineering), 2000.
78. Optimal nonlinear filtering for track-before-detect in IR image sequences (with A. Petrov). In *SPIE Proceedings (Vol. 3809): Signal and Data Processing of Small Targets (Denver, CO, 1999)*, ed. O. E. Drummond. Bellingham, WA: SPIE (The International Society of Optical Engineering), 1999.

79. An adaptive Bayesian approach to fusion of imaging and kinematic data (with A.Tartakovsky and G.Yaralov). In *Proceedings of the 2nd International Conference on Information Fusion—Fusion '99 (Sunnyvale, CA,1999)*. Madison, WI: Omnipress, 1999.
80. Matched filters and hidden Markov models with distributed observation (with S. Kligys). In *Proceedings of the Fourth Annual U.S. Army Conference on Applied Statistics (Aberdeen Proving Ground, MD, 1998)*, ed. Barry A. Bodt. ARL-SR-84. Aberdeen, MD: Army Research Laboratory, 1999.
81. State estimation in hidden Markov models with distributed observation (with S. Kligys). In *Theory and Practice of Control Systems: Proceedings of the 6th IEEE Mediterranean Conference (Alghero, Sardinia, 1998)*, ed. A. Tornambe et al. River Edge, NJ: World Scientific, 1998.
82. Splitting-up discretization for Kushner's equation of nonlinear filtering (with K. Ito). In *Proceedings of the 36th IEEE Conference on Decision and Control, IEEE Control Systems Society (San Diego, CA, 1997)*. New York: Institute of Electrical and Electronics Engineers, 1998.
83. Solving hidden Markov problems by spectral approach (with C.P. Fung). In *Proceedings of the 3rd IEEE Mediterranean Symposium, Vol. II (PLACE, 1995)*. New York: Institute of Electrical and Electronics Engineers, 1995.
84. Separation of observations and parameters in nonlinear filtering (with R. Mikulevicius). *Proceedings of the 32nd IEEE Conference on Decision and Control, Vol. 2, IEEE Control Systems Society (San Antonio, TX, 1993)*. New York: Institute of Electrical and Electronics Engineers, 1993.
85. Statistics and physical oceanography (with A. Griffa et al.). *Report of the National Research Council*. Washington, D.C.: National Academy Press, 1993.
86. Nonlinear filtering revisited: A spectral approach II (with S. Lototsky). *Proceedings of the IEEE & SIAM CDC 35th Conference on Decision and Control, Vol. 4 (Kobe, Japan, 1996)*. Madison, WI: Omnipress, 1997.
87. On the kinematic dynamo problem in a random flow. In *Probability Theory and Mathematical Statistics: Proceedings of 5th Vilnius Conference on Probability Theory and Mathematical Statistics, Vol. II (Vilnius, Lithuania, 1985)*. Utrecht: VNU Science Press, 1987.
88. On the kinematic dynamo problem in a random flow. In *Probability Theory and Mathematical Statistics: Proceedings of the 4th Vilnius International Conference on Probability Theory and Mathematical Statistics (Vilnius, Lithuania, 1985)*. Vilnius: Akad. Nauk Litovsk. SSR, Inst. Mat. i Kibernet, 1985.

89. Filtering of degenerate diffusion type processes. Backward equations. In *Stochastic Optimization International Conf. Abstracts, Part II (Kiev, 1984)*
90. Backward equations of conditional and unconditional diffusion. In *Proceedings of the 4th Soviet-Japan Symp. on Probab. Theor. and Math. Stat. Abstracts (Tbilisi, 1982)*.
91. Backward filtering equations. In *15th All-Union School-Colloquium on Probab. Theor. And Math. Stat. Abstracts (Bakuriani, 1981)*. Tbilisi: "Metsniereba," 1981.
92. Liouville equations for a diffusion Markov process (in Russian). In *14th All Union School on Probab. Theor. and Math. Stat. Abstracts (Bakuriani, 1980)*. Tbilisi: "Metsniereba," 1980.
93. On the first integral and Liouville equations. In *Abstracts of 3rd Working Conference on Stochastic Differential Equations (Visegrad, 1980)*, Budapest, SZAMKI, 1980.
94. On the extrapolation of a signal with a martingale type noise (in Russian). In *5th International Symposium on Inform. Theory Abstracts (Tbilisi, 1979)*. [publisher? year of conference same as year of pub?]
95. Non-linear filtering of diffusion processes: an analytical approach. In *International Symposium on Stochastic Differential Equations. Abstracts of Communications (Vilnius, 1978)*. Vilnius: Inst. Math. and Cybernet. Acad. Sci. Lithuanian SSR, 1978.
96. On Ito equations in Hilbert spaces. In *2nd Vilnius Conference on Probability and Mathematical Statistics. Abstracts of Communications (Vilnius, 1977)*. Vilnius: Inst. Mat. i Kibernet. Akad. Nauk Litovsk. SSR, 1977.
97. On Cauchy problem for superparabolic stochastic differential equations (with N.V. Krylov). In *Proceedings of the Third Japan-USSR Symposium on Probability Theory (Tashkent, 1975)*. Lecture Notes in Mathematics 550. New York: Springer-Verlag, 1976.
98. On stochastic differential equations in partial derivatives. In *International Conference on Probability Theory and Mathematical Statistics. Abstracts of Communications (Vilnius, 1973)*. Vilnius: Akad. Nauk Litovsk. SSR, 1973.
99. Reduced form of non-linear filtering equations (with A.N. Shiryaev). In *IFAC Symposium on Stochastic Control. Supplement of abstracts (Budapest, 1974)*.

Selected Technical Reports and Teaching Aids

100. Stochastic Navier-Stokes equations for turbulent flows (with R. Mikulevicius). Warwick Preprint: 21/ 2001.
101. Detection algorithms and track-before-detect architecture based on nonlinear filtering for infrared search and track systems (with S. Kligys and A. Tartakovsky). Technical Report CAMS-98.9.1, Center for Applied Mathematical Sciences, University of Southern California, 1998.
102. Domain pursuit method for tracking ballistic targets (with R. Rao and A. Tartakovsky). Technical Report CAMS-98.9.2, Center for Applied Mathematical Sciences, University of Southern California, 1998.
103. Parameter estimation for stochastic evolution equations with non-commuting operators (with S. V. Lototsky). IMA Preprint Series #1501, University of Minnesota, 1997.
104. Statistics and physical oceanography (with A. Griffa et al.). Report of the National Research Council, National Academy Press, 1993.
105. Lecture notes on stochastic partial differential equations. University of North Carolina, Charlotte, 1990.
106. Real time statistical quality control (with Yu. P. Adler)(in Russian). Znaniye Publishing House, Moscow, 1984.
107. Studies in the theory of stochastic partial differential equations (in Russian). *Doctor of Sci. Dissertation (Vilnius, Lithuania, 1984)*.
108. Statistical methods in chemical industry. Methods and instructions (with B. I. Pashko et al.)(in Russian). Center for Scientific Organization of Labor in Chemistry, Moscow 1983.
109. Mathematical design of experiments in textile industry (with Yu. P. Adler et al.) (in Russian). MIASCME, 1984.
110. Mathematics design of experiments. Methods and instructions (with Yu. P. Adler et al.)(in Russian). MIASCME, 1983.
111. Statistical methods in analytical chemistry. Instructions (with Yu. P. Alder et al.)(in Russian). MIASCME, 1981.

112. Statistical quality control. Methods and instructions (with Yu. P. Alder et al.)(in Russian). MIASCME, 1978.
113. Optimal design of experiments. Methods (with Yu. P. Alder et al.)(in Russian). MIASCME, 1978.
114. Lectures in probability theory (in Russian). MIASCME, 1974.
115. On stochastic equations arising in filtering of Markov processes (in Russian). Ph. D. Dissertation, Moscow State (Lomonosov) University, 1972.

Updated November 4, 2009