Professor Albert N. Shiryaev

Steklov Mathematical Institute of the Russian Academy of Sciences
and
Moscow State University

RESEARCH ACHIEVEMENTS (2001–2007)

I. Publications (in the period 2001–2007): 35 papers, 12 monographs and textbooks. By years:

2001 6 papers and
monograph *"Statistics of Stochastic Processes"*,
vol. 1 (427 pp.); vol. 2 (402 pp.),
2-nd, revised and expanded ed. (with R. Sh. Liptser),
Springer, Appl. Math. Stoch. Modelling Appl. Probab., **6**

2002 8 papers

2003 9 papers and
(a) monograph *"Limit Theorems for Stochastic Processes"*,
2-nd expanded ed., 661 pp. (with J. Jacod),
Springer, Grundlehren Math. Wiss., **288**
(b) textbook *"Theory of Stochastic Processes"* (Russian), 400 pp.
(with A. V. Bulinsky) Fizmatlit, Nauka, Moscow
(c) 3 volumes dedicated to the centenary of A. N. Kolmogorov,
380 pp., 672 pp., 232 pp. (edited and composed by A. N. Shiryaev),
Fizmatlit, Nauka, Moscow

2004 2 papers and
monograph *"Essentials of Stochastic Finance"* (Russian),
vol. 1 (489 pp.); vol. 2 (528 pp.), 2-nd ed., Phasis, Moscow

2005 2 papers and
textbook *"Problems on Probability Theory"* (Russian),
416 pp., MCCME, Moscow

2006	6 papers and **(a)** monograph *"Optimal Stopping and Free-Boundary Problems"*, (with G. Peskir), 500 pp., Birkhäuser, Basel, Lecture Math. ETH Zürich; **(b)** book *"Kolmogorov in the Memory of Pupils"* (Russian), 472 pp. (edited and composed by A. N. Shiryaev) MCCME, Moscow; **(c)** book *"Stochastic Finance"* (Russian), 472 pp. (edited by A. N. Shiryaev et al., and with a preface by A. N. Shiryaev) Springer, New York
2007	2 papers and textbook *"Probability"* (Russian), vol. 1 (552 pp.); vol. 2 (415 pp.), 416 pp., MCCME, Moscow
In print	3 papers and **(a)** English edition of the textbook *"Probability"*, vol. 1, 2, Springer; **(b)** English edition of the textbook *"Problems on Probability Theory"*, Springer

II. Main research achievements (2001–2007)

A. *Stochastic Calculus*:

- explicit integral representations for a wide class of functionals of a Brownian motion;
- new predictable criteria of existence of stochastic integral with respect to semimartingales (conditions on the integrand);
- definitions and properties of the vector stochastic integrals.

B. *Mathematical Finance*:

- effective solutions for the nonlinear exotic options ("power options"; "Russian options" under condition of possible price "freeze"; "barrier version of the Russian option");
- construction of the cumulant processes for semimartingale models with application to the Esscher's change of measures.

C. *General Theory of Optimal Stopping*:

- the monograph "Optimal Stopping and Free-Boundary Problems" (with G. Peskir) gives comprehensive treatment of the optimal stopping theory and contains many new results for concrete problems of the general interest;

D. *Quickest Detection Problems*:

- new results on the structure of optimal stopping in the generalised Bayesian formulations;
- new results on the quickest detection of the unpredictable times for the Brownian motion.

III. Editorial work related with the memory and legacy of A. N. Kolmogorov:

– composing and editing 3 volumes dedicated to the centenary of A. N. Kolmogorov (Nauka, Moscow, 2003);

– composing and editing 4 volumes of *Selected Papers* of A. N. Kolmogorov (Nauka, Moscow, 2005–2006);

– composing and editing the book *Kolmogorov in the Memory of Pupils* (MCCME, Moscow, 2006);

– creation of the film *"To the centenary of a great Russian scientist Andrei Nikolaevich Kolmogorov"* (Steklov Mathematical Institute of the Russian Academy of Sciences, 2004).

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ESTEEM INDICATORS (2001–2007)

A. *Titles and Awards*:

- Head of the Probability Theory Department at the Moscow State University (since 1996);
- Correspondent member of the Russian Academy of Sciences (since 1997);
- Doctor *Rerum Naturalium Honoris Causa* of Albert Ludwigs University of Freiburg im Breisgau, Germany (2001);
- Professor *Honoris Causa* of Amsterdam University (2002);
- Distinguished Professor of M. V. Lomonosov Moscow State University (2003);
- Honored scientific worker of the Russian Federation (2005);
- The Shiryaev Festschrift: *"From Stochastic Calculus to Mathematical Finance"*. Proceeding of the 2nd Bachelier Colloquium dedicated to Albert N. Shiryaev. Springer, Berlin, 2006.

B. *Conferences* (as an organizer):

- one of main organizer of the International Conference *"Kolmogorov and Contemporary Mathematics"* (June 16–21, 2003, Moscow, more than 1000 participants);
- Chairman of the Program Committee of the International Conference *"Stochastic Finance-2004"* (September 26–30, 2004, Lisbon, Portugal; 80 participants);
- Co-chairman of the *"School and Symposium on Optimal Stopping with Applications"* (January 17–27, 2006, Manchester);
- Chairman of the Program Committee of the Russian-Scandinavian Symposium *"Probability Theory and Applied Probability"* (August 26–31, 2006, Petrozavodsk, Karelia);
- Chairman of the Program Committee of the International Conference *"Finance and Control"* (April 2007, Portugal).

C. *Conferences* (as a participant):

- Plenary talk at the Conference on Probability Theory and Mathematical Statistics dedicated to the centenary of A. N. Kolmogorov (September 21–27, 2003, Tbilisi, Georgia);
- Plenary talk at the Franco-Russian Colloquium *"Perspectives de coopération en informatiques et mathématiques appliquées"* (October 2003, Moscow);
- Plenary talk at the Princeton–Chicago Conference on Econometrics of High Frequency Financial Data (June 2004, Princeton, USA);
- Plenary talk at the International Conference *"Stochastic Finance-2004"* (26–30 September 2004, Lisbon, Portugal);
- Inaugural lecture and 2 thematic lectures on stochastic calculus, filtration and martingales at the Second Bachelier Colloquium dedicated to Albert N. Shiryaev (January 9–15, 2005, Métabief, France);
- Invited talk at the Workshop on nonlinear stochastic methods (May 2005, Halmstad University, Sweden);
- Plenary talk at *"Conference on stochastic modelling of complex systems"* (July 10–16, 2005, Day Dream Island, Australia);
- Plenary talk at the Conference *"Past, Present and Future in Investment Management"* (August 11–12, 2005, Sydney, Australia);
- Plenary talk at the Russian-Scandinavian Symposium *"Probability Theory and Applied Probability"* (August 26–31, 2006, Petrozavodsk, Karelia);
- Plenary one-and-a-half-hour talk at the *"International Conference on Stochastics in Science"* (March 20–24, 2006, Guanajuato, Mexico);
- Plenary talk on the minimax criteria in the quickest detection problems at the IIASA conference on complex systems (2006, IIASA, Vienna–Laxemburg, Austria);
- Plenary talk "Some explicit stochastic integral representation for Brownian functionals" at the 6th Ritsumeikan International Symposium *"Stochastic Processes and Applications to Mathematical Finance"* (March 6–10, 2006, Ritsumeikan University, Japan);

- Invited lecture at the Workshop on the stochastics and asymptotics in complex systems (August 2006, Japan) in the frame of Russia–Japan two-year program (A. N. Shiryaev is the co-leader from the Russia);

- Talk "On the duality principle in option pricing:semimartingale setting" at the International Winter School (January 2007, Lunteren, Holland);
- Talk "Euler and Probability Theory" at the Meeting of the Mathematics and Mechanics Faculty of the Moscow State University dedicated to 300th anniversary of Leonard Euler (April 25, 2007, Moscow);
- Plenary talk at the Symposium on stochastic calculus and stochastic differential equations (August 2007, Warwick).

D. *Courses of lectures*:

- Columbia University (May 2004): 8 lectures on the applications of stochastic calculus in mathematical finance;
- Princeton University (November–December 2005): 10 lectures on stochastic calculus of semimartingales;
- University South California (Los Angeles, USA, June 2005): 4 lectures on mathematical finance;
- Singapore Institute of Mathematics (August, 2005): 3 lectures on stochastic calculus with applications;
- Halmstad University (Sweden, November–December 2006): 10 lectures on essentials of stochastic finance (discrete and continuous time);
- Amsterdam University, Korteweg–de Vries Istitute (January 2007): 18 lectures on semimartingales, stochastic calculus, mathematical finance;
- Hong Kong Chinese University (May 2007): 10 lectures on optimal stopping.