

# CURRICULUM VITA

Anatolii A. Puhalskii

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## EDUCATION AND DEGREES

Institution	Date	Degree	Major
Moscow Institute of Physics and Technology	1979	M.Sc.	Physics and Control Science
Moscow Institute of Physics and Technology	1984	Ph.D.	Mathematics and Operations Research
Institute for Problems in Information Transmission	2007	Dr. Sci.	Mathematics and Physics

## PROFESSIONAL EXPERIENCE

- 1990 - present** Senior researcher, Institute for Problems in Information Transmission of the Russian Academy of Sciences, Moscow, Russia
- 1996** Associate professor, Moscow Institute of Radio-engineering, Electronics and Automation, Moscow, Russia
- 1993-1994** Associate professor, State Jewish Academy, Moscow, Russia
- 1991** Research associate, Newcastle University, Newcastle, UK
- 1990** Assistant professor, Moscow Institute of Physics and Technology, Moscow, USSR
- 1979-1990** Researcher, Institute of Control Science of the USSR Academy of Sciences, Moscow, USSR
- 1997 - 2019** Associate professor, Crooked University in the City (a.k.a. CU Denver)

## VISITING POSITIONS

- 2006** A Marie Curie fellow at the Heriot-Watt University, Edinburgh, UK.
- 2005** Visiting researcher at Cork college, Cork, Ireland.
- 2001, 1997** Visiting researcher, Weierstrass Institute of Applied Analysis and Stochastics, Berlin, Germany
- 1997** Visiting researcher, Basic Research Institute in Mathematical Sciences, Bristol, UK
- 1997** Visiting researcher, Dublin Institute of Advanced Studies, Dublin, Ireland

**1996** Visiting researcher, INRIA, Sophia-Antipolis, France

**1996, 1994, 1993** Visiting researcher, Bell Laboratories, Murray Hill, NJ, USA

**1994-1995** Visiting associate professor, University of Colorado at Denver, Denver, CO, USA

#### RESEARCH INTERESTS

Stochastic Processes

Large Deviations

Diffusion Approximation

Queueing

Mathematical Finance

Idempotent Probability

#### REFEREED PUBLICATIONS

**2022** Moderate deviation asymptotics of the GI/G/n queue in the Halfin–Whitt regime, Queueing Systems, v.100, pp. 341–343

**2022** On the metastability of a loss network with diminishing rates, Markov Processes and Related Fields, v.28, pp.365–398

**2019** The geometry of big queues, Problems of Information Transmission, v. 55, no. 2, pp. 174–200

**2019** Large deviations of the long term distribution of a non-Markov process, Electronic Communications in Probability, v. 24, no. 35, pp. 1–11

**2019** On long term investment optimality, Applied Mathematics and Optimization, v. 80, no. 1, pp. 1–62

**2016** On large deviations of coupled diffusions with time scale separation, Annals of Probability, v. 44, no. 4, pp. 3111–3186

**2015** Non-Markovian state-dependent networks in critical loading, Stochastic Models, v. 31, no. 1, pp. 43–66 (with C. Lee)

**2013** On the number of isolated vertices in a growing random graph, Rocky Mountain Journal of Mathematics, v.43, no.6, pp. 1941-1989

**2013** On the  $M_t/M_t/K_t + M_t$  queue in heavy traffic, Mathematical Methods of Operations Research, v.78, no.1, pp. 119-148

**2012** Discrete Evolutionary Birth-Death Processes and their Large Population Limits, Stochastic Models, v. 28, no. 3, pp. 388–412 (with B.Simon)

**2011** On Portfolio Choice by Maximizing the Outperformance Probability, Mathematical Finance, v. 21, no. 1, pp. 145-167.

- 2011** On the Limit Law of a Random Walk Conditioned to Reach a High Level, Stochastic Processes and their Applications, v. 121, no. 2, pp. 288–313 (with S.G. Foss)
- 2010** On Many-Server Queues in Heavy Traffic, Annals of Applied Probability, v. 20, no. 1, pp. 129–195 (with J.E Reed)
- 2007** The Action Functional for the Jackson Network, Markov Processes and Related Fields, v. 13, no. 1, pp. 99–136,
- 2007** A Large Deviation Principle for Join the Shortest Queue, Mathematics of Operations Research, v. 32, no. 3, pp. 700–710 (with A.A. Vladimirov).
- 2005** Stochastic Processes in Random Graphs, Annals of Probability, v. 33, no. 1, pp. 337–412.
- 2004** On Some Degenerate Large Deviation Problems, Electronic J. of Probability, v. 9, pp. 862–886.
- 2003** On Large Deviation Convergence of Invariant Measures, J. Theoret. Probability, v. 16, no. 3, pp. 689–724.
- 2000** The multiclass GI/PH/N queue in the Halfin-Whitt regime, Advances in Applied Probability, v. 32, no. 2, pp. 564–595 (with M.I. Reiman)
- 2000** Non-ergodicity of queueing networks when their fluid models are unstable, Problems in Informaion Transmission, v. 36, no. 1, 26–46 (with A.N. Rybko) (in Russian).
- 1999** Large deviations of semimartingales: A maxingale problem approach. II. Uniqueness for the maxingale problem. Applications, Stochastics and Stochastics Reports, v. 68, pp. 65–143.
- 1999** Moderate deviations for queues in critical loading, Queueing Systems, v. 31, no. 3–4, pp. 359–392.
- 1998** Estimating functions evaluated by simulation: a Bayesian/analytic approach, The Annals of Applied Probability, v. 8, no. 4, pp. 1184–1215 (with J.R. Koehler and B. Simon).
- 1998** Functional large deviation principles for waiting and departure processes, Probability in the Engineering and Information Sciences, v. 12, pp. 479–507 (with W. Whitt).
- 1998** On large-deviation efficiency in statistical inference, Bernoulli, v. 4, no. 2, pp. 203–272 (with V. Spokoiny).
- 1998** A critically loaded multirate link with trunk reservation, Queueing Systems, v. 28, no. 1–3, pp. 157–190 (with M.I. Reiman).

- 1998** Polling systems in heavy traffic: a Bessel process limit, *Mathematics of Operations Research*, v. 23, no.2, pp. 257-304 (with E.G. Coffman, Jr., and M.I. Reiman).
- 1997** Large deviations of semimartingales: a maxingale problem approach I. Limits as solutions to a maxingale problem, *Stochastics and Stochastics Reports*, v. 61, pp. 141-243.
- 1997** A heavy-traffic analysis of a closed queueing system with a  $GI/\infty$  service center, *Queueing Systems*, v. 25, pp. 235-280 (with E.V. Krichagina).
- 1997** Functional large deviation principles for first-passage-time processes, *The Annals of Applied Probability*, v. 7, no. 2, pp. 362-381 (with W. Whitt).
- 1995** Large deviation analysis of the single server queue, *Queueing Systems*, v. 21, pp. 5-66.
- 1995** Polling systems with zero switchover times: a heavy-traffic averaging principle, *The Annals of Applied Probability*, v. 5, no. 3, pp. 681-719 (with E.G. Coffman, Jr., and M.I. Reiman).
- 1994** The method of stochastic exponentials for large deviations, *Stochastic Processes and their Applications*, v. 54, pp. 45-70.
- 1994** Large deviations of semimartingales via convergence of the predictable characteristics, *Stochastics and Stochastics Reports*, v. 49, pp. 27-85.
- 1994** On the invariance principle for the first passage time, *Mathematics of Operations Research*, v. 19, no. 4, pp. 946-954.
- 1993** On the theory of large deviations, *Theory of Probability and Applications*, v. 38, no. 3, pp. 490-497.
- 1993** Limiting results for multiprocessor systems with breakdowns and repairs, *Queueing Systems*, v. 14, no. 3-4, pp. 291-311 (with I. Mittrani).
- 1992** Limit theorems on large deviations for semimartingales, *Stochastics and Stochastics Reports*, v. 38, pp. 201-249 (with R.Sh. Liptser).
- 1992** A mean-field limit for a class of queueing networks, *Journal of Statistical Physics*, v. 66, no. 3/4, pp. 803-806 (with F. Baccelli, F.I. Karpelevich, M.Ya. Kelbert, A.N. Rybko, and Yu.M. Suhov).
- 1991** Storage limited queues in heavy traffic, *Probability in the Engineering and Informational Sciences*, v. 5, pp. 499-522 (with E.G. Coffman, Jr. and M.I. Reiman).
- 1991** Modelling of a modified Omega network in the regime with the reissuing of blocked requests, *Automation and Remote Control*, no. 9 (with G.G. Veselovskii and A.Yu. Zolozhnev).

- 1990** A multiphase system with blocking in heavy traffic, Automation and Remote Control, no. 8.
- 1988** Tandem queue with finite intermediate waiting room and blocking in heavy traffic, Problems in Control and Information Theory, v. 17, no. 1 (with Ya.A. Kogan).
- 1988** Diffusion approximation for a system with queue dependent input and arbitrary service, Theory of Probability and Applications, v.33, no.1 (with E.V. Krichagina and R.Sh. Liptser).
- 1986** Stability of a multiphase queueing system with holding, Journal of Soviet Mathematics, v. 34, no. 2, pp. 1528-1534.
- 1982** Some inequalities for a multiphase queueing system, Problems in Information Transmission, no. 4.
- 1982** Ergodicity and stability of a multiphase system with blocking and an infinite input queue, Automation and Remote Control, no. 11.
- 1981** Ergodicity of a multiphase queueing system with blocking, Bulletin of the USSR Academy of Sciences, ser. Engineering Cybernetics, no. 3.

#### BOOKS

- 2005** Large Deviations of Stochastic Dynamical Systems. Theory and Applications. (In Russian). Fizmatlit, Moscow.
- 2001** Large Deviations and Idempotent Probability, Chapman & Hall/CRC Press.

#### PRESENTATIONS AT MEETINGS OR SEMINARS PRESENTED

- 2021** Large deviation limits of invariant measures, Conference Chebyshev -200, Moscow
- 2017** On long term investment optimality, 39th conference on Stochastic Processes and their Applications, Moscow
- 2010** Compactness methods in large deviations. – Invited lectures, Heath Lectures series, Carnegie Mellon University, Pittsburgh, PA, May.
- 2009** On the many server queue in heavy traffic. – Invited seminar, Colorado State University, September, 2009.
- 2009** On the asymptotics of a biased random walk conditioned to reach a high level. – Dobrushin's conference, Institute for Problems in Information Transmission, Moscow, Russia, July.
- 2006** Some asymptotics for random graphs. – Invited seminar, Ecole normale superieure, Paris, France.
- 2006** Some asymptotics for random graphs. – Invited seminar, Hamilton Institute, Maynooth, Ireland.

- 2006** Some asymptotics for random graphs. – Invited seminar, Leeds University, Leeds, UK.
- 2006** Large deviations of stochastic systems with discontinuous dynamics. – Invited talk. New directions in Applied Probability: Stochastic Networks and Beyond, 2006, Heriot-Watt University, Edinburgh, UK.
- 2006** A large deviation principle for the Jackson network. – Invited talk IVth Conference on Limit Theorems in Probability Theory and Their Applications, 21–25 August, 2006, Novosibirsk, Russia. Invited talk.
- 2005** Stochastic Processes in Random Graphs - Invited seminar, University of Southern California.
- 2002** Large deviations of semimartingales - Invited seminar, University of Colorado at Colorado Springs.
- 2002** Idempotent Ito equations - Invited seminar, New Mexico State University at Las Cruces.
- 2002** Large Deviation Convergence - Invited seminar, Bowling Green University, Bowling Green, Ohio.
- 2001** Large deviation convergence - Plenary lecture, 27th Conference on Stochastic Processes and Their Applications, Cambridge, UK
- 2000** Idempotent probability and large deviations - Invited lecture, AMS meeting, Toronto, Canada.
- 2000** Large deviations of semimartingales - Invited seminar, University of Illinois at Urbana-Champaign.
- 2000** Large and moderate deviation asymptotics for many server queues - Invited talk, INFORMS Conference, Salt Lake City.
- 1999** Maxingales and maxingale problems - Invited seminar, University of California at San Diego.
- 1998** On large deviation efficiency in statistical inference - Invited seminar, Stanford University.
- 1998** Large deviations, idempotent semigroups and max-plus calculus - Invited seminar, Wyoming University, Laramie.
- 1997** A weak convergence approach to large deviations - Invited Seminar, Dublin Institute of Advanced Studies, Dublin, Ireland.
- 1996** Moderate deviations for queues in critical loading - Conference in memory of R.L. Dobrushin, Paris, France.

- 1995** A functional Sanov theorem and large deviations of the statistical empirical process - INFORMS Conference, Paris, France.
- 1990** On functional principle of large deviations - Conference on Stochastic Processes, Bakuriani, USSR

## RECOGNITIONS, HONOURS, ETC.

- 2001** The INFORMS Applied Probability Society Best Publication Award (with M.I. Reiman and E.G. Coffman).
- 2019** Terminated by the University of the Crooked, for the Crooked and by the Crooked (a.k.a. University of Colorado), <https://pbulldp.wixsite.com/crookeduinthecity>, <https://www.linkedin.com/in/anatolii-puhalskii-1674bb63/>