

Curriculum Vitae

Sergey Utev:

Professor in Mathematics,
University of Leicester, Department of Mathematics.

Previous Appointments:

01/01/2013 - 31/07/2013: Reader/Associate Professor in Probability, University of Leicester,
Department of Mathematics

08/12/2000 - 31/12/2012: Lecturer, *School of Mathematical Sciences, University of Nottingham, Nottingham, UK*

11/09/1999-06/12/2000: Research Fellow, *The National Centre for Epidemiology and Population Health, The Australian National University, Canberra, Australia*

1996-1996: Research Fellow, *School of Statistical Sciences, La Trobe University, Melbourne, VIC, Australia*

1992-1996: Leading Research Fellow *Laboratory of Probability and Statistics, Institute of Mathematics, Novosibirsk, Russian Academy of Sciences, Russia*

1990-1992: Senior Research Fellow, same institution

1984-1990: Research Fellow, same institution

1979-1984: Junior Research Fellow, same institution

see also **Visiting Positions**, some of them included contracts of 3 months or more.

Qualifications:

Doctor of Sciences (Dr.Sci.) May 1992, from the Institute of Mathematics, the Siberian Branch of the Russian Academy of Sciences, Novosibirsk. Thesis Title: *Extremal problems, Characterization, and Limit Theorems of Probability Theory.*

Candidate of Sciences (equivalent to PhD) December 1984, from the Novosibirsk State University. Thesis Title: *Inequalities and limit theorems for sequences of weakly dependent random variables.*

Master of Sciences June 1979, from the Novosibirsk State University. Thesis Title: *On the rate of convergence in the invariance principle.*

RESEARCH

Research supervision

Graduate Supervision:

Supervised 14 PhD (principal supervisor for 12):

Novak, Serguei (1989, principal supervisor, Probability Theory): currently at Middlesex University, published 40 papers and a book according to MathSciNet.

Daly, Fraser (2008, principal supervisor, Probability Theory): currently at Heriot-Watt in Edinburgh, published 10 papers.

Sakkas, Efstathios (2009, second supervisor, Financial Mathematics); published 1 paper.

Deligiannidis, George (2010, first/second supervisor, Probability Theory and Financial Mathematics): currently at the University of Oxford, published 10 papers.

Mudakkar, Syeda Rabab (2011, principal supervisor, Probability Theory and Non-commutative Probability): currently at Lahore School of Economics, published 20 papers (according to Google Scholar).

Mengdi Li: (2012, principal supervisor, Stochastic Modelling, Optimization in Actuarial Sciences): currently at insurance company in China.

Xiaojuan Ma: (2012, principal supervisor, Stochastic Modelling in Finance): currently at insurance company in China, published 1 paper.

Vytaute Zabarskaite: (2014, principal supervisor, Exponential Transforms of Markov Switching Processes, Large Deviations Theory, Applications to Finance): currently at the investment company in London.

Ahmet Kaya: (2016, principal supervisor, Modern Mathematical Methods for Actuarial Sciences).

Rukiye Samci Karadeniz: (2017, principal supervisor, Modelling Share Prices): currently a research fellow at the University of Borsuk in Turkey, published 2 papers.

Muhsin Tamturk: (2018, principal supervisor, Ruin probability, Quantum Mechanics Approach to Insurance), published 4 papers.

Wenyan Hao: (2018, principal supervisor, Quantum Mechanics Approach to Option Pricing): currently at the investment company in London, published 1 paper.

Jun Fan: (2019 , principal supervisor, Differential dynamics, Malliavin calculus and Applications to Finance), submitted 1 paper.

Kuo Wang, (2019, principal supervisor, Stochastic Calculations with Applications to Finance).

In addition, 2 students had passed successfully their PhD viva's.

Currently 5 PhD students, (principal supervisor), working on:

"Machine learning for Quantum Data",
"Game theory, portfolio selection and insurance",
"Game theory and Finance",
"Combinatorial structures and Path calculations",
"Random Graph Dynamics".

One graduated PhD student was funded by Pakistan Higher Education Commission.
Two graduated students were totally funded and one student was partially funded by the Turkish government.

Four students were funded by the Department of Mathematics of the University of Nottingham.
One student has been funded by the special grant of the University of Nottingham.
All other students were self funded.

Prizes, invitations to address conferences, consultations, research grants or contracts:

Visiting Positions, supported by the invited sites

3/10/91-4/11/91: *University of Athens, Greece*, Visiting Professor
15/11/92-20/12/92 : *University of Groningen, The Netherlands*, Visiting Research Fellow
3/7/93-1/8/93: *University of Zurich, Switzerland*, Visiting Professor
01/08/93 - 30/11/93 : *University of Brussels, Belgium*, Visiting Research Fellow
1/12/93 - 30/3/94: *University of Groningen*, Visiting Research Fellow
04/11/94 - 15/3/95: *University of Brussels*, Visiting Research Fellow
8/01/95 - 15/01/95 : *University of Zurich*, Visiting Professor
21/07/95 - 31/10/95: *University of Brussels*, Visiting Research Fellow.
1/11/95 - 30/11/95 : *University of Zurich* , Visiting Professor.
04/09/96 - 11/10/96: *University of Brussels*, Visiting Research Fellow.
12/10/96 - 19/10/96: *National University of Singapore* , Visiting Professor
27/07/97 - 30/9/97: *University of Brussels*, Visiting Research Fellow
17/03/00 - 14/06/00: *University of Brussels*, Visiting Research Fellow.
19/05/00 - 24/05/00: *University of Cyprus*, Visiting Professor

24/05/00-26/05/00: *University of Athens*, Visiting Professor
 8/04/02 - 15/04/02 : *University of Zurich*, Visiting Professor
 21/06/02 - 08/07/02: *University of Brussels*, Visiting Professor
 25/08/02 - 20/09/02: *University of Brussels*, Visiting Professor
 22/03/04 - 27/03/04: *University of Cincinnati*, Visiting Professor
 29/03/04 - 18/04/04: *University of Brussels*, Visiting Professor
 13/06/05 - 26/06/05: *University of Cincinnati*, Visiting Professor
 29/08/05 - 11/09/05: *University of Brussels*, Visiting Professor
 24/03/06 - 31/03/06: *University of Brussels*, Visiting Professor
 09/11/09 - 15/11/09: *University of Zurich*, Visiting Professor
 12/04/10 - 24/04/10: *University of Singapore*, Visiting Professor
 09/04/11 - 30/04/11: *University of Brussels*, Visiting Professor
 01/04/13 - 30/04/13: *University of Brussels*, Visiting Professor
 1/04/16 - 30/04/16: *University of Brussels*, Visiting Professor
 27/03/17 - 31/03/17: *University of Brussels*, Visiting Professor
 05/04/18 - 17/04/18: *University of Brussels*, Visiting Professor
 01/04/19 - 130/04/19: *University of Brussels*, Visiting Professor

Visitors

November 2001: Andrew Barbour (University of Zurich).
 June 2005: Herold Dehling (University of Bochum).
 June 2007: Herold Dehling (University of Bochum).
 June 2011: Fraser Daly (University of Bristol).
 July-August 2011: Syeda Rabab Mudakkar (University of Lahore).
 November 2012: Fraser Daly (University of Bristol).
 June 2019: Fraser Daly (Edinburgh, Heriot-Watt University).

Refereeing And Reviewing:

Editorial Duties

Associate Editor, International Journal of Stochastic Analysis;
 Associate Editor, Mathematical Biosciences and Engineering AIMS.

Grants:

Referee for the Czech Science Foundation;
 Referee for the NSA-AMS (Mathematical Sciences Program, National Security Agency and American Mathematical Society).
 Referee for FNRS (Brussels).

Referee for:

Ars Combinatoria,
Australian and New Zealand journal of Statistics,
Bernoulli,
Biometrics,
Communications in Statistics - Theory and Methods,
Computers and Mathematics with Applications,
Discrete Dynamics in Nature and Society,
Electronic journal of Probability,
Electronic communication in Probability,
ESAIM,
Journal of Applied Mathematics and Stochastic Analysis,
Journal of Applied Probability,
Journal of Inequalities and Applications,
Journal of Mathematical Physics,
Journal of Multivariate Analysis,
Journal of Statistical Planning and Inference,
Journal of Theoretical Probability,
Lithuanian Mathematical Journal,
Mathematical Inequalities and Applications,
Mathematical Methods in Biology,
Mathematical Methods in Statistics,
Probability Theory and Related Fields,
Proceedings of the Sobolev Institute of Mathematics,
Proceedings of the Indian Academy of Sciences,
Random Structures and Algorithms,
Siberian Advances in Mathematics,
Siberian mathematical journal,
Slovakia Mathematical journal,
Statistical papers,
Test,
The Annals of Applied Probability,
The Annals of Probability.

Reviewer for Mathematical Reviews.

PhD examination

I was an external examiner for PhD theses at Universite Libre de Bruxelles. In addition, I was several times an internal PhD examiner at the Nottingham University and at the University of Leicester.

Invited Papers at International Conferences:

Workshop on Limit Theorems of Probability Theory (April 1990, Warsaw, fully funded)
Conference on Asymptotic methods in mathematical statistics (April 1991, Dresden, fully funded)
Kolmogoroff Semester on Probability and Mathematical Statistics (March 1993, St Petersburg, fully funded)
6th Vilnius conference on Probability Theory and Statistics (June 1993, Vilnius, fully funded)
Symposium on Epidemic Modelling (September 1998, Canberra, fully funded)
"Design and Analysis of Infectious Disease Studies", (Nov 28 - Dec 4, 1999, Oberwolfach, Germany, partly funded)
"Highly Dimensional probability IV", (June 20 - June 24, 2005, Santa Fe, partly funded)
"New Directions in Applied Probability: Stochastic Networks and Beyond" (Edinburgh, Heriot-Watt University, July 10-14, 2006, fully funded)
"Dependence in Probability, Analysis and Number Theory", (Graz, Austria, June 17-20, 2009, fully funded).
Workshop on limit theorems (Prague, August 3 - 6, 2009.)
Workshop on limit theorems for dependent data and applications (Paris, June 21-23, 2010, partly funded.)
Dependence in Probability and Statistics Marseille - Luminy, 04.0 - 08. April 2011, partly funded.
Workshop on Stein method; Edinburgh University, September 12 th., 2014(fully funded)
A 1-day conference in honour of Claude Lefevre, Lyon, France, Sept. 5th 2016. (fully funded)
Third Melbourne-Singapore Probability meeting, September 2017. (partly funded)

Invited Papers which were not delivered due to some technicalities (such as visa problems, teaching duties, family issues, insufficient financial support)

International conference on "Recent Advances in Probability and Statistics, Athens, Greece, June 1999.
Workshop "Recent advances in Probability and Statistics", Department of Mathematical Sciences, Brunel University of West London, 17.12.2002. (partly funded)
Special Session on Weak Dependence in Probability and Statistics, AMS meeting at Indiana University, April 4-6, 2003.
Program: "Stein's Method and Applications: A program in honor of Charles Stein" National University of Singapore, 28 Jul - 31 Aug 2003 (fully funded).
Program: "Workshop on Stein's Method ", National University of Singapore, 31 Mar - 4 Apr 2008 (fully funded).
Program: "Workshop on Stein's Method ", National University of Singapore, January 2009 (fully funded).
Probability Theory Symposium, University of Cincinnati, March 2009 (partly funded).
Limit theorems for Probability Theory and Their applications, August, 2011, Novosibirsk, Russia.
High Dimensional Probability, October 9 - 14, 2011, BIRS, Canada (partly funded).
Special Session on Weak Dependence in Probability and Statistics, AMS meeting at the University of Louisville, USA, October 5-6, 2013.

Workshop on Dependence methods, Bochum University (Germany), January, 2015. (fully funded)
 International Summer Campus (ISC) program, June -August, Seoul.
 7th Annual International Conference on Qualitative and Quantitative Economics Research (QQE 2017), June, Singapore.
 Probabilistic Limit Theorems for Dynamical Systems, CIRM, Luminy, October, 2018 (partly funded).
 6th Annual International Conference on Operations Research and Statistics (ORS 2018), April 2018, Singapore.
 International Conference on Quantum Mechanics and Applications, Atlanta, July, 2018. (partly funded).
 World Quantum Physics Congress, Stockholm and Helsinki, December 10-13, 2018.
 Symposium in Memory of Charles Stein [1920-2016], Charles Stein's Influence on Probability, Singapore, 24 - 28 June 2019, (partly funded).
 The 4th Combinatorics and Graph Theory Conference (CGT 2019), July 19-21, 2019 in Guilin, China.

Invited lectures:

St.Petersburg division of Steklov Mathematical Institute - March 1986
 University of Ulan-Bator, - May 1989
 University of Athens - October 1991
 University of Patras - October 1991
 University of Ioannina - October 1991
 Steklov Mathematical Institute - November 1991
 St.Petersburg division of Steklov Mathematical Institute - March 1992
 St.Petersburg University - March 1992
 Moscow State University - March 1992
 University of Utrechts - December 1992
 University of Groningen - November 1992
 University of Brussels - October 1993
 University of Zurich - July 1993
 University of Groningen - February 1994
 University of Melbourne - December 1994
 University of Zurich - January 1995
 University of Zurich - November 1995
 University of Melbourne - August 1996
 National University of Singapore - October 1996
 La Trobe University - October 1996
 Monash University - March 1997
 La Trobe University - March 1999
 University of Athens - May 2000
 University of Cyprus - May 2000
 Nottingham Trent University - November 2001
 University of Zurich - April 2002
 Heriot-Watt University - May 2002
 Oxford University - November 2002

Warwick University - December 2003

University of Cincinnati - March 2004

University of Singapore - March 2010

Other Papers Delivered at Conferences:

11 at conferences in Belgium, Czechoslovakia, Lithuania, Russia, Sweden.

Recent Joint papers Delivered by co-authors

Modelling share prices via the random walk on wreath products, 2016, 9th Conference in Actuarial Science and Finance on Samos, (delivered by Karadeniz R. S.).

Quantum mechanics approach to Option pricing, 2016, 9th Conference in Actuarial Science and Finance on Samos, (delivered by Hao, Wenyan).

Ruin Probability via Quantum Mechanics Approach, 2016 Congress on Insurance: Mathematics and Economics, (delivered by Tamturk, M.).

Quantum Statistical Machine Learning and Quantum Time Series, ICPS 2016 : 18th International Conference on Probability and Statistics, (delivered by Omar Alzeley).

Quantum mechanics approach to the reinsurance with capital injections, 2017, 21st International Congress on Insurance: Mathematics and Economics - IME 2017 (delivered by Tamturk, M.).

Conference Organization:

Summer School on Algebra and Analysis, August 1994, Novosibirsk University.

Afternoon meeting on probability "Large sample results for dependent observations", June 2005.

Organiser of the Oxford-Nottingham postgraduate probability seminar, December 2007.

Organiser of the Invited Session on the theme "Stein-Chen method" at the 26th European Meeting of Statisticians, July 2007.

Organiser of Probability Workshop (November 2012, Nottingham).

Organiser of the Nottingham Postgraduate Probability Seminar, 2006-2012.

Member of Technical Program Committee, 2nd Int'l Conference on Probability and Stochastic Analysis (ICPSA 2016), Suzhou, China.

Awards and grants:

1987 Siberian division Academy of Sciences prize

1993 International Soros Foundation (about \$ 1000)

1994-1996 American Mathematical Society fellowship to mathematicians from the former Soviet Union (about \$ 1000)

2011 Knowledge Transfer Secondments "Markov chains" £22457, (EPSRC secondment).

2011 Industrial Mathematics Shorter KTP £11800 (Technology Strategy board).

Numerous CI for the small grants in Research in Brussels (FNRS).

CI for the NSF grant Spectral analysis of stochastic processes and random fields, award number 1512936 (PI is Prof Magda Peligrad).

Former and Current Collaborators:

Andrew Barbour, University of Zurich.
Niels Becker, Australian Nation University.
Alexander Borovkov, Novosibirsk University.
Richard Bradley, Indiana University.
Teophilos Cacoullous, University of Athens.
Louis Chen, University of Singapore.
Song Chen, La Trobe University.
Fraser Daly, Herriot-Watt, University of Edinburgh.
Jerome Dedecker, Universite Paris VI.
Herold Dehling, University of Bochum.
Michel Denuit, Universite Catholique de Louvain.
George Deligiannidis, Oxford University.
Huing Le, University of Nottingham.
Claude Lefevre, Universite Libre de Bruxelles.
J. Martin Lindsay, Lancaster University.
Stephane Loisel, University of Lyon 1
Florence Merlevede, Universite Paris VI.
Mohammed Mesfiou, University of Laval.
Syeda Rabab Mudakkar, Lahore School of Economics.
Nickos Papadatos, University of Cyprus.
Vasilis Papathanasiou, University of Athens.
Magda Peligrad, University of Cincinnati.
Iosif Pinelis, Michigan Technological University.
Munsub Seoh, Wright State University.

Current Research Interests:

- Probability Theory.
- Mathematical Inequalities and its Applications.
- Analytical and Statistical Methods for Health Studies.
- Stochastic comparison and applications to Actuarial Sciences.
- Quantum probability and stochastic comparisons.
- Quantum Mechanics Approach to Finance and Actuarial Sciences.
- Machine Learning for Quantum Data.

PUBLICATIONS

All publications were subject to peer review.

Journal articles.

- 1** (1981) A remark on the rate of convergence in the invariance principle. *Siberian Math. J.* **22**, no.5, p.206-209 (in Russian).
- 2** (1983) (with A.A.Borovkov) On an inequality and a related characterization of the normal distribution. *Theory Probab. Appl.* **28**, 219-228.
- 3 (PR)** (1984) (with I.F.Pinelis) Estimates of the moments of sums of independent random variables, *Theory Probab. Appl.* **29**, 574-577.
- 4** (1984) The law of the iterated logarithm for ϕ -mixing random variables, *Siberian Math. J.* **25**, 144-148.
- 5** (1989) Probability problems connected with a certain integro-differential inequality, *Siberian Math. J.* **30**, 490-493.
- 6** (1989) Cumulants and moment inequalities, *Theory Probab. Appl.* **34**, 742-747.
- 7** (1989) A limit theorem for stationary sequences with φ -mixing. *Siberian Math. J.* **30**, 168-169.
- 8** (1989) (with I.F.Pinelis) Exact exponential bounds for sums of independent random variables, *Theory Probab. Appl.* **34**, 340-346.
- 9** (1990) On the central limit theorem for ϕ -mixing triangular arrays of random variables, *Theory Probab. Appl.* **35**, 131-139.
- 10** (1990) (with S.Yu.Novak) Asymptotics of the distribution of the ratio of sums of random variables, *Siberian Math. J.* **31**, 781-788.
- 11** (1991) Sums of random variables with ϕ -mixing, *Siberian Advances in Math.*, **1**, 124-155 .
- 12** (1991) Sums of weakly dependent random variables, *Siberian Math. J.* **32**, 675-690.
- 13** (with E.V.Bestsennaya) (1991) Supremum of an even moment of sums of independent random variables. *Siberian Math. J.* **32**, 137-139.
- 14** (1992) (with T.Cacoulios and V.Papathanasiou) Another characterization of the normal law and a proof of the central limit theorem connected with it, *Theory Probab. Appl.* **37**, 581-588.

- 15** (1992) An application of integro-differential inequalities in probability theory, *Siberian Advances in Math.* **2**, 164-199.
- 16** (1993) (with A.A.Borovkov) Estimates for distributions of sums stopped at Markov time, *Theory Probab. Appl.*, **38**, 214-225.
- 17** (1993) (with H.Dehling) An exponential inequality for martingales, *Siberian Advances in Math.* **3**, 197 - 203.
- 18** (1994) Characterizational problems connected with an integro - differential functional. *J.Math.Sci.* 69, 1215-1219.
- 19** (1994) (with A.Green') Lower bounds for variances of sums of weakly dependent variables, *Siberian Math. J.* **35**, 192-201.
- 20** (1994) (with T.Cacoullos and V.Papathanasiou) Variational inequalities with examples and an application to the central limit theorem, *The Annals of Probability.* **22**, 1607 - 1618.
- 21** (1995) (with V.Papathanasiou) Integro-differential inequalities and the Poisson approximation, *Siberian Advances in Math.* **5**, 120 - 132.
- 22** (1995) (with C.Lefevre) On a conjecture for the Nonexistence of the Expectation of Randomly Stopped Sums, *Journal of Applied Probability.* **32**, 1138-1141.
- 23** (1995) (with C.Lefevre) Poisson Approximation for the final state of a generalized epidemic processes, *The Annals of Probability.* **23**, 1139-1162.
- 24** (1996) (with C.Lefevre) Comparing sums of exchangeable Bernoulli random variables, *Journal of Applied Probability.* **33**, 285-310.
- 25** (1996) (with C.Lefevre) Asymptotic behaviour of the final number of susceptible individuals in generalized epidemic processes. *Siberian Math. J.* **37**, 858-868.
- 26** (1997) (with M.Peligrad) Central Limit Theorem for Linear Processes. *The Annals of Probability.* **25**, 443-456.
- 27** (1997) (with M.Peligrad and F.Merlevede) Sharp conditions for the CLT of linear processes in a Hilbert Space. *Journal of Theoretical Probability* **10**, 681-693.
- 28** (1997) (with Cl.Lefevre) Mixed Poisson approximation in the collective epidemic models, *Stochastic Processes and Their Applications.* **69**, 217-246.
- 29** (1998) (with N.G.Becker) The effect of community structure on the immunity coverage required to prevent epidemics. *Mathematical Biosciences.* **147**, 23-39.
- 30** (1998) (with A. Barbour) Solving the Stein Equation in compound Poisson approximation, *Advances in Applied Probability.* **30**, 449-475.

- 31 (1998) (with N.G.Becker N.G.) A limit result for U-Statistics of Binary Variables. *Journal of Theoretical Probability*. **11**, 853-856.
- 32 (1998) (with C.Lefevre) On order-preserving properties of probability metrics. *Journal of Theoretical Probability*. **11**, 907-920.
- 33 (1999) (with M.Denuit and C.Lefevre) Generalized stochastic convexity and stochastic orderings of mixtures. *Probability in the Engineering and Informational Sciences*. **13**, 275-291.
- 34 (1999) (with A. Barbour) Compound Poisson approximation in total variation. *Stochastic Processes and Their Applications*. **82**, 89-125.
- 35 (1999) (with C.Lefevre) Branching Approximation for the Collective Epidemic Model. *Methodology and Computing in Applied Probability*. **1**, 211-228.
- 36 (1999) (with M. Denuit and C.Lefevre) Stochastic orderings of convex/concave - type on an arbitrary grid. *Mathematics of Operations Research* **24**. 835-846.
- 37 (2001) (with N.G.Becker) Threshold Results for U -statistics of Dependent Binary Variables. *Journal of Theoretical probability* **14**, 97-114.
- 38 (2001) (with C.Lefevre) Comparison of individual risk models under different policies *Insurance: Mathematics and Economics* **28**, 21-30.
- 39 (2002) (with N.G.Becker) Protective vaccine efficacy when vaccine response is random. *Biom. J.* **44**, 29-42.
- 40 (2002) (with M. Denuit and C. Lefevre) Measuring the impact of dependence between claims occurrences. *Insurance: Mathematics and Economics* **30**, 1-19.
- 41 (2002) (with C.Lefevre and V.Papathanasiou) On a Polynomials Generator for Generalized Pearson distributions. *Annals of the Institute of Statistical Mathematics* **54**, 731-742.
- 42 (2002) (with N.G.Becker) Multivariate Discrete Distributions with a Product-Type Dependence. *Journal of Multivariate Analysis* **83**, 509-524.
- 43 (2003). (with M. Peligrad). Maximal inequalities and an invariance principle for a class of weakly dependent random variables. *Journal of Theoretical Probability* **16**, 101-115.
- 44 (2003) (with C. Lefevre). Exact norms of a Stein-type operator and applications to a CLT. *Probability Theory and Related Fields* **127**, 353-366.
- 45 (2004) (with A. Barbour). Approximating the Reed-Frost epidemic process. *Stochastic Processes and their applications* **113**, 173-197.

- 46 (2005) (with Magda Peligrad). A new maximal inequality and invariance principle for stationary sequences. *The Annals of Probability* **33** , 798–815.
- 47 (2006) (with M. Peligrad). Central Limit theorem for stationary linear processes. *The Annals of Probability* **34**, no. 4, 1608–1622.
- 48 (2006) (with M. Peligrad). Another approach to Brownian motion. *Stochastic Processes and their applications* **116** , no. 2, 279–292.
- 49 (2006) (with M. Peligrad and F. Merlevede). Recent advances in invariance principles for stationary sequences. *Probability Surveys* **3**, (online), 36pp.
- 50 (2007) (with M. Peligrad and W. B. Wu). A maximal L_p inequality for stationary sequences and its applications. *Proc. Amer. Math. Soc.* **135**, no. 2, 541–550
- 51 (2007) (with N. Becker and C. Lefevre). Estimating protective vaccine efficacy from large trials with recruitment. *Statistical Planning and Inference* **v.137**, 907-914.
- 52 (2009) (with J. Dedecker, F. Merlevede, M. Peligrad). Moderate deviations for stationary sequences of bounded random variables. *Ann. Inst. Henri Poincare Probab. Stat.* **45**, no. 2, 453–476.
- 53 (2009) (with G. Deligiannidis and H. Le). Optimal stopping for processes with independent increments, and applications. *Journal of Applied Probability* **46**, no 4, 1130-1145.
- 54 (2011) (with G. Deligiannidis). Asymptotic variance of the self-intersections of stable random walks using Darboux-Wiener theory. *Siberian Math. J.* **52**, 639-650.
- 55 (2012) (with Fraser Daly and Claude Lefevre). Stein’s method and stochastic orderings. *Advances in Applied Probability* **44**, 343-372.
- 56 (2013) (with Mudakkar, Syeda Rabab). On stochastic dominance of nilpotent operators. *Infin. Dimens. Anal. Quantum Probab. Relat. Top.* **16** , 10 pp.
- 57 (2013) (with Claude Lefevre). Convolution property and exponential bounds for symmetric monotone densities. *ESAIM Probab. Stat.* **17**, 605-613.
- 58 (2013) (with G. Deligiannidis). Variance of partial sums of stationary sequences. *The Annals of Probability* **41**, no. 5, 3606-3616.
- 59 (2014) (with Mudakkar, Syeda Rabab). Rademacher inequalities with applications. *J. Theoret. Probab.* **27**, 301–314.
- 60 (2015) (with G. Deligiannidis and M. Peligrad). Asymptotic variance of stationary reversible and normal Markov processes. *Electron. J. Probab.* **20**, (online), 26 pp.

- 61** (2015) (with R.S. Karadeniz). Modelling share prices via the random walk on the Lamplighter group. *Mathematical Methods in Economics and Finance* (m2ef), **9/10**, (online), 20pp.
- 62** (2016) (with G. Deligiannidis). Optimal bounds for the variance of self-intersection local times. *Int. J. Stoch. Anal.* 2016, Art. ID 5370627, (online), 10 pp.
- 63** (2016) (with M. Peligrad). On the invariance principle for reversible Markov chains. *J. of Appl. Probab.* **53**, no. 2, 593-599.
- 64** (2017) (with Lefevre, C. and Loisel, S.) On finite exchangeable sequences and their dependence. *Journal of Multivariate Analysis* **162**, 93-109.
- 65** (2018) (with Lefevre, C. and Loisel, S.) Markov property in discrete Schur-constant models. *Methodology and Computing in Applied Probability* **20**, no. 3, 1003-1012.
- 66** (2018) (with Tamturk, M). Ruin Probability via Quantum Mechanics Approach. *Insurance Mathematics and Economics* **79**, 69-74.
- 67** (2018) (with R.S. Karadeniz). Embedding problem for financial data. *IIB International Refereed Academic Social Sciences journal* **29**, 1-18. Available from Doi: 10.17364/IIB.2018.29.4.
- 68** (2018) (with Lefèvre C, Loisel S, Tamturk M). A quantum-type approach to non-life insurance risk modelling. *Risks* **6**, 1-17.
- 69** (2019) (with Tamturk, M). Optimal reinsurance via Dirac-Feynman approach. *Methodology and Computing in Applied Probability* **21**, 647-659.
- 70** (with W. Hao, C. Claude Lefèvre, M. Tamturk). Quantum Option Pricing and Data Analysis. *Quantitative Finance and Economics*, 3(3): 490-507.

Books

- 71** (2019)(with F. Merlevede and M. Peligrad). Functional Gaussian Approximation for dependent structures. Oxford University press.

Journal articles (Accepted, under revision, submitted)

- 72** (with C. Claude Lefèvre and P. Picard). On branching models with alarm triggerings. *Applied Probability journals*, (submitted).
- 73** (with Jun Fan). Lie bracket and Arithmetic derivative. (submitted).

Chapters of Books

- 74 (1982) (with Yu.Tambovcev) On the stochastic analysis of small frequencies in phonetic structures., In.: *Proceedings of Novosibirsk State University*, (in Russian), p. 51-62.
- 75 (1985) Inequalities for sums of weakly dependent random variables and estimates for the convergence rate in the invariance principle, In: *Limit theorems for sums of random variables*, (Ed. by Balakrishna and A.A.Borovkov), Optimization Software, p.73-114.
- 76 (1985) Extremal problems in moment inequalities. In: *Proceedings of the Institute of Mathematics* **5**, 56-75 (in Russian).
- 77 (1989) ϕ -mixing triangular arrays of random variables, In: *Proceedings of V1-th European conference of young statist.*, Prague.
- 78 (1990) Central limit theorem for dependent random variables. - In: *Prob. Theory and Math. Stat. Proceedings of the Vth Vilnius.*, VSP/Mokslas, **2**, 519-528.
- 79 (1994) (with R.Bradley) On the second-order properties of mixing random sequences and random fields, In: *Prob.Stats. Proceedings of the Vth Vilnius.*, VSP/Mokslas, ed. by Grigelionis. 99 -120.
- 80 (with H.Dehling.) (1996) The law of the iterated logarithm for degenerate U -statistics. In.: *Probability theory and mathematical statistics*, Gordon and Breach, Amsterdam, 19-28,
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Other publications and work in progress

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- 88 (1989, *textbook*). (With A.A.Borovkov, I.S.Borisov, etc.) "Problems and Exercises in Mathematical Statistics", Novosibirsk State University Publisher, 1989. (In Russian).
- 89, (1992, review). Extremal problems, Characterization, and Limit Theorems of Probability Theory. The author review of the DSI dissertation. Institute of Mathematics, Novosibirsk (In Russian), 23pp.
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- 94, (2005, with M. Lindsay). Suslin and non-Suslin subrings of \mathbb{R} - solution of the Erdos ring problem. Working paper, Lancaster University.
- 95, (2009, with Gracie Ma, X). Computational Aspects of Pricing Models.
- 96, (with Louis H.Y. Chen and J.H. Lou). Generalized Hardy-Poincare inequalities. Working paper. Singapore University.
- 97, (with G. Deligiannidis, F. Merlevede and M. Peligrad). Limit theorems for dependent structures. Working paper, University of Cincinnati.
- 98, (with Fraser Daly and Claude Lefevre). Convolution of Stein Operators. Working paper, Universite Libre de Bruxelles.
- 99, (with Jun Fan). Lie bracket and Arithmetic derivative. Working paper, University of Leicester.

Books in preparation

- 100, (with Lefevre, C. and Loisel, S). A graduate textbook for Actuarial Sciences.
- 101, (with Hao, W. and Tamturk, M.). Modern approaches to Actuarial Sciences. (A monograph).
- 102, (with Daly, F. and Lefevre, Cl.) Risk, Rare events and orderings.

TEACHING EXPERIENCE

Leicester University (since Jan 2013 to present)

Current teaching duties

I teach Financial Mathematics I and II and supervise MSc projects (so-called summer projects).

Financial Mathematics I. (MA3071/MA7071/MA7408). Level 3 (undergraduate year 3), level 4 (MMath, year 4) and level 7 (MSc students). Typical class 120 students. It is compulsory for MSc/BSc Financial mathematics, and BSc Actuarial mathematics (overall around 60-70 students).

Financial Mathematics II. (MA4072/MA7072 and used to teach a part of MA7418). Level 4 and level 7 (MSc students, with various background and majority of overseas students), overall class is about 30 students.

The syllabus in both modules have been changed to reflect the recent development in Financial Mathematics, such as a low/zero/negative interest rates.

Each module is based on examples and in addition has 5-10 problem classes. This really makes the difference.

MSc/MMath project supervision

I supervise in average:

1-2 MMath projects (level 4) an academic year (each project is 40 credits = 1/3 of the year load).

4-6 Msc Summer projects, level 7, (each project is 60 credits = 1/3 of the year load).

Overall teaching at Leicester University

Financial Mathematics I, lectures and problem classes, 20 credits, level 3/7, 2014/15-2017/18.

Financial Mathematics II, lectures and problem classes, 20 credits, level 4/7, 2012/13-2017/18.

Financial Risk 2013/14-2014/15 (part 1, 10 credits out of 20), level 7.

Introduction to Mathematical English, level 1, 2013/14

Advanced Financial Modelling, level 4, 2015/16.

Project supervision. I have supervised:

2 Projects for Distance learning MSc Actuarial students,

7 MMath projects, level 4.

around 40 Msc Summer projects, level 7.

Leicester University Typical teaching load

module	no of students	credits	contact hrs	+ marking hrs	+ exam marking hrs
MA3071/7	110	20	40	+ 25	+ 40
MA7408	10	20	40	+ 30	+ 5
MA4072/7	30	40	40	+ 5	+ 10
Project	5	60	30	+20	

Nottingham University (Jan 2001 -Dec 2012)

Typical teaching responsibilities (Academic Year 2010-2011 and 2011-2012):

Stochastic models, G13STM, level 3, 20 credits, non-compulsory course, I have significantly modified the module. With typically 60-90 students taking it, the module includes 45 lecture hours plus around 25-35 hours exam marking, and 3 hours of unassessed homework marking weekly (overall 10). This also include a compulsory course for MSc in Statistics and Applied probability. Needless to say, the material is constantly updated on the web.

Mathematical Finance, G13MAF, level 3, 20 credits, non-compulsory course, I have made significant changes to the module. With typically 90-110 students taking it, the module require 45 lecture hours plus around 30-40 hours exam marking, and 3 hours of unassessed homework marking weekly (overall 9). Again, the material is constantly updated on the web.

Stochastic Financial Modelling, G14SFM, 20 credits, non-compulsory course for MSc students only, based on the same lecture course as G13MAF but with different assessment, with typically 10-20 students taking it, which includes 5-7 hours for marking the 10 pages of assessed essays. The essay part was redesigned.

First year group tutorials, weekly one hour tutorials on core mathematics plus occasional extra tutorials and marking.

Projects and Dissertations: I also supervised 4 project students (level 3), G13PJA/S, 20 credits, 1 hour weekly meeting and assessment, plus 1 MMath dissertation student, 40 credits, 1/2 hour weekly meeting and assessment.

Average contacts hours (meetings plus marking, not including preparation) were around 15 hours a week.

Overall teaching experience at Nottingham University

Topics in Probability, lectures, 5 credits, level 4, 2000-2001.

Statistical methods, tutorials, level 1, 2000-2001.

Stochastic Processes, lectures and tutorials, level 2, 2002-2003, (2000-2001 only tutorials).

Probability, lectures and tutorials, 5 credits, level 1 service module, 2001-2002.

Application of probability, lectures, 15 credits, level 3, 2002-2004.

Applied probability, lectures, 15 credits, level 3, 2002-2004.

Markov chains, lectures and tutorials, 10 credits, level 2, 2003-2009.

Stochastic models, lectures, 20/15/10 credits, level 3, 2003-2011.

Mathematical Finance, lectures, 15 credits, level 3, 2010-2011.

Projects and Dissertations: In addition I have supervised more than 40 3rd year Projects and 15 MSc and MMath Dissertations, most notably on "Mathematical methods in Actuarial sciences". Selected titles:

An Investigation into stochastic dominance as a method of comparing risk random variables.

Application of Time series to the insurance business.

Fractional calculus and non-standard utility functions.

Non-standard convexity and utility functions.

Optimization in priority queuing systems.

"On mathematical methods found in Actuarial Examinations.

Application of the Gambler's Ruin problem and stochastic processes in risk analysis.

Actuarial Valuations and Life Assurance Liabilities.

Methods in Actuarial Sciences : Survival analysis.

Applications of convex functions and ordering in Actuarial Sciences.

How important is Brownian Motion when Considering Actuarial Sciences?

What do you need to know to be an Actuary?

Game theory approach to Actuarial Sciences.

A stochastic volatility model in Finance.

Ruin probability and application of Optimal Stopping Theorem.

Actuarial methods used in Life Insurance.

Most of them are available on request.

Nottingham University Typical teaching load was

module	no of students	credits	contact hrs	+ marking hrs	+ exam marking hrs
G13STM	75	20	45	+ 25	+ 35
G13MAF	100	20	45	+ 30	+ 40
G14SFM	15	20	0	+ 5	+ 5
Core	6		22	+ 5	+ 0
G14PJA/S	4	20	22	+ 8	+ 0
G14DIS	1	40	22	+ 3	+ 0

La Trobe University

Statistical Methods, tutorials, level 1, 1997-1998.

Statistics for life sciences, tutorials, level 1, 1997-1998.

Novosibirsk University (in Russian)

Stochastic processes, lectures, level 4, 1988-1993.

Additional chapters in probability theory, lectures, level 4, 1986-1987.

Convergence of probability measures, lectures, level 4, 1986-1987.

Probability Theory and Mathematical Statistics, lectures, level 2, 1984-1985.

Extras on Teaching and Learning

Publications related to Teaching and/or Scholarship e.g. textbooks:

One textbook in Russian (item 85 of publications).

In addition, a graduate textbook for Actuarial Sciences is in preparation (item 96 of publications).

Significant personal achievements in teaching and learning:

From individual comments on SET evaluation and SEM, it seems that I am regarded by students as a teacher who can explain complicated material in a simple way which helped to improve the student opinion about the School related to the Teaching Quality Assessment, and the National Student Survey.

I believe I have significantly changed myself from being a %100 research oriented person to someone who respects and likes teaching. Although, probably, I spend too much time on teaching, I am getting some reward as I was several times nominated by students for the Lord Dearing Award at the University of Nottingham and University Staff Oscars/Superstar lecturer at the University of Leicester.

And it has been reflected in SET (student evaluation of teaching) comments (from "module was badly organized, 2001, to "fantastic lecturer", 2010).

I am trying to listen to student opinion (but not be too overwhelmed by it).

Teaching and Learning innovation:

As far as the undergraduate teaching concerned, I was told by students (in SET and in person) that my style is untraditional and was encouraged to promote it. More exactly, I believe in the following simple formula

$$10Ex + 1Th \gg 10Th + 1Ex,$$

that is:

I believe that presenting a series of results without proper proofs and examples does not help in understanding the matter.

I believe that the better policy is to present one important theorem, supported by 10 appropriately collected exercises (examples, problems) showing (i) meaning of the theorem, (ii) where we apply it, (iii) how we can generalise it, (iv) why we need this and that condition, (v) how one can prove it (for interested).

Summary of SET scores for (insert module code and name of module). The scale ranges from 1 (strongly agree) to 5 (strongly disagree), school average being about 2.5:

G13STM, 2010-2011, 45 responses

1. Mean responses to standard questions set by University	
1.1 The teacher was an able communicator	2.0
1.2 The teacher retained my interest	1.5
1.3 The teacher was approachable	1.5
1.4 Sessions were paced appropriately	1.7
1.5 Overall this teacher assisted my learning	1.5
2. Mean responses to questions set by the School of Mathematical Sciences	
2.1 Important points were clearly emphasized	1.8
2.2 The teacher gave adequate feedback on my work	1.5
2.3 The teacher makes good use of examples and illustrations	1.4
2.4 The exercises helped me to understand the lecture material	1.5

G13STM, 2011-2012, 53 responses

1. Mean responses to standard questions set by University	
1.1 The teacher was an able communicator	1.6
1.2 The teacher retained my interest	1.4
1.3 The teacher was approachable	1.4
1.4 Sessions were paced appropriately	1.6
1.5 Overall this teacher assisted my learning	1.3
2. Mean responses to questions set by the School of Mathematical Sciences	
2.1 Important points were clearly emphasized	1.5
2.2 The teacher gave adequate feedback on my work	1.5
2.3 The teacher makes good use of examples and illustrations	1.2
2.4 The exercises helped me to understand the lecture material	1.4

I also got good comments from peer teaching observations.

ADMINISTRATION

Leicester School responsibilities

Course Director duties. So far the main duties are related to financial mathematics. I was a MSc course director in 2013/2014, 2014/2015, 2015/16 and helping/or replacing the current MSc course director.

Program Specification. I am involved in the modification of the Actuarial program.

Tutor's duties. I have around 15 MSc tutees per academic year, most of them overseas. The most important part is helping them to go through the tough new experience such as the time management between learning and job hunting.

Nottingham School responsibilities (were)

I was a course director of GL11, Mathematics and Economics and GN12, Mathematics and Management studies, which includes admission duties and timetabling via checking the module entry forms and liaison with colleagues in the School of Economics (2004/5 - 2012/13) and Business School (2012/13).

Activities in support of internationalisation, including the overseas campuses:

I was involved in the creation of the new course of Financial mathematics, which originally was mainly oriented for the Ningbo campus.

Outreach activities:

As a course director I am engaged in Open day events and advertise GL11/GN12 to applicants and parents (in person, via email and phone conversations).

I wish...

To create a Department of Mathematics with the Modern curriculum on Maths based on Quantum Probability, Machine Learning, Ito and Malliavin calculus with applications to Epidemiology, Finance and Insurance.