Curriculum Vitae (abridged version)

Personal Data

Name:	Frank Oertel
Birthplace:	Kaiserslautern (Germany)
Citizenship:	German
Profession:	Senior Manager Deloitte LLP Audit & Assurance Hill House, 1 Little New Street, London, EC4A 3TR, UK
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Education

1980 - 1986	University of Kaiserslautern: study of mathematics and physics, research in functional analysis; Degree: Dipl. Math. (20.10.1986); Grade: *passed with distinction*
1986 - 1991	University of Kaiserslautern and University of Zurich, research area: operator ideals, geometry of Banach spaces and operator algebras; Degree: Dr. rer. nat. (03.06.1991) in Kaiserslautern; Grade: *magna cum laude*

Research Grants

28.06.2004 - 31.08.2005	Research Fellowship in Mathematical Finance (for a period of 24 months) funded by the Engineering and Physical Sciences Research Council (EPSRC) - in collaboration with Mark P. Owen, Heriot-Watt University, UK
15.10.1990 - 15.07.1991	National Fellowship funded by the Council of Europe, Swiss Federal Institute of Technology (ETH) and University of Zurich, CH
01.11.1986 - 31.03.1988	Doctorate Fellowship funded by the Landesgraduierten-förderungsgesetz (LGFG), University of Kaiserslautern, GER

Research Interests

- Advanced financial mathematics - fundamentals and applications (including semimartingale modelling in incomplete markets inluding Lévy processes, mathematics of Counterparty Credit Risk (CCR) including the calculation of minimum capital requirements for CCR in general, CVA, DVA, FVA, (XVAs, AVAs), multi-curve modelling and post-crisis financial mathematics, risk measures, mathematics of financial risk management and regulation, pricing and hedging of complex derivatives across all asset classes, model risk, modelling of default dependence, calibration methods)

- Measure theory, probability, stochastic processes and stochastic analysis (including stochastic integration, semimartingales, SDEs, Malliavin calculus, vector measures, modelling of dependence in general)
- Quantum probability, quantum information, algebraic quantum field theory with a view towards mathematical and philosophical foundations of physics
- General functional analysis, convex analysis, real and complex analysis
- Operator theory (operator ideals, tensor norms, localisation in the theory of operator ideals)
- Operator algebras (commutative Banach algebras, non-commutative C*-algebras including von Neumann algebras and their applications in quantum probability, quantum information and algebraic quantum field theory)

Administrative Duties and Refereeing Activities

01.10.2013 - 30.04.2014	Programme Director of PgDip/MSc in Actuarial Science, AU of Mathematical Sciences, University of Southampton
20.02.2006 - 09.06.2006	Member of the Local Organising Committee of the conference "Numerical Methods for Finance" in Dublin
03.01.2006 - 31.12.2007	Member of the FMAS Committee (Financial Mathematics and Actuarial Science) und Timetable Officer at the Department of Mathematics, National University of Ireland, Cork
01.10.1997 - 31.03.2000	Assistant Editor of the journal *Finance and Stochastics*
1997 - present	Reviewer for *Zentralblatt Math,* referee for journals including *Elemente der Mathematik, Finance and Stochastics*, *Mathematical Finance, Quantitative Finance* and *RISK*

Supervised BSc and MSc Projects (2001 – 2007 and 2013 – present)

- An introduction to counterparty credit risk and a derivation of UCVA and BCVA (MSc, 2013)
- Modelling Stochastic Dependence: The Copula Approach (MSc, 2013)
- Modelling of Dependence: A survey on the copula approach to modelling dependencies with practical applications (MSc, 2013)
- The Fundamental Theorem of Asset Pricing (BSc, 2006 - at UCC, Ireland)
- An Introduction to Lévy Processes and their Applications in Incomplete Financial Markets (BSc, 2005 - at UCC, Ireland)
- Applied Credibility Models in Business Insurance (BSc, 2003 - at ZHW and Zurich Financial Services, Switzerland)
- A quantitative Comparison of different Approaches to the Calculation of Credit Portfolio Loss Distributions (BSc, 2003 - at ZHW and Zurich Kantonal Bank ZKB, Switzerland) [received the Swiss ETW Award 2003]
- Are Financial Markets Able to Offer a Hedge Against Natural Catastrophes and Man-Made Disasters? (BSc, 2002 - at ZHW and Converium Ltd, Switzerland) [received the Swiss Jefferies Award 2003]
- Methods of Risk Measurement in Zurich Financial Services (BSc, 2002 - at ZHW and Zurich Financial Services, Switzerland)
- Investigation of Correlation between Asset Prices quoted on the Stock Exchange (BSc, 2002 - at ZHW and United Bank of Switzerland UBS, Switzerland)
- Stochastic Term Structure Models - A Case Study (BSc, 2002 - at ZHW, Switzerland)
- Modelling of Dependency of Stock Prices in Mixed Models (BSc, 2001 - at ZHW and United Bank of Switzerland UBS, Switzerland) [received the Swiss ETW Award 2001]
- Real Options: Evaluation under Uncertainty (BSc, 2001 - at ZHW, Switzerland)

Professional Experience (during the years of study until the doctorate; research grants excluded)

01.04.1988 - 14.10.1990	Research Assistant, University of Kaiserslautern, Department of Mathematics, Kaiserslautern (Germany)
01.05.1983 - 31.10.1986	Tutor, University of Kaiserslautern, Department of Mathematics, Kaiserslautern (Germany)

Professional Experience (after the years of study; research grants excluded)

Career Summary

I have been working at the interface of teaching and research in mathematical finance and stochastic analysis at different universities worldwide, in technical consulting, software development, financial risk measurement and financial market regulation (the latter at the BaFin in Germany) - focusing on the mathematical (i.e., "quant") part including enhancing and examining dynamic stochastic models.

This has been leading to related refereed publications in top tier scientific journals and to invited talks and own workshops at related conferences and workshops (including WBS and RISK in London).

Industry Summary

Banks and Financial Services: software development (mainly in C and C++), writing confidential internal technical documents on option pricing and hedging, on dependence modelling and risk measures, training of traders in the FO, quant modelling in FO and MO (primarily at risk management departments) and most recently model control and methodology review as part of statutory audits designed for clients of Deloitte LLP.

Moreover, analysis and documentation of the Sensitivity Based Approach SBA (regulatory standard model for market risk) for calculating the market risk capital charge in the framework of the Fundamental Review of the Trading Book (FRTB) of the Basel Committee of Banking Supervision (BCBS) - also known as “Basel 3.5”, respectively “Basel IV”.

Central Government: member of the Federal Financial Supervisory Agency in Bonn (BaFin), focusing on the mathematical (“quant”) part of the calculation of the Basel III/CCR standardised and advanced CVA volatility risk capital charge and exposure modelling (CEM and IMM). Member of European subgroups of Counterparty Credit Risk, German deputy of the BCBS Risk Management Group (RMG) and member of the Research Task Force of BCBS (RTF).

Education: teaching and research (including several publications in refereed top tier scientific journals) at University of Bonn (Germany), Heriot Watt University (Scotland), University College Cork UCC (Irish Republic) and University of Southampton (UK) and in-house trainings in financial mathematics and derivatives pricing in the financial industry and at Deloitte LLP in London.

Reinsurance: development of reinsurance derivatives and tariffing of non-proportional non-life reinsurance contracts (XL, SL), actuarial calculations (ruin probability, insurance risk, etc.) and training of underwriters.

Software: Windows programming in C++ (most recently via QuantLib), writing codes in C (exotic equity option pricing), co-development of an investment database.

A Few Keywords

Basel II, Basel 2.5, IRB, RWA;
Basel III, CRD, CRR, CCR, CCP, CVA, DVA, FVA, XVA, CSA, ISDA, collateral
Basel 3.5, FRTB, VaR, ES
PDEs, Fokker-Planck, SDEs, FT, FFT; HJM, Vasicek, Hull-White, OIS-LIBOR spread, CCS;
CCDS, CDO; stochastic volatility, Dupire, Heston, Trolle-Schwartz, SABR
Murex, SunGard FastVal, QuantLib
IFRS 13, IFRS 9
Prudent Valuation (AVA)

Professional Societies (Memberships)

01.03.2013 - present	Elected Member of the LMS (London Mathematical Society)
10.09.2007 - present	Member of the DHV (Association of German Universities)
12.07.2002 - 30.04.2014	Member of the SMG (Swiss Mathematical Society)
02.06.1996 - present	Member of the BFS (Bachelier Finance Society)
01.03.1996 - present	Member of the Stochastics Group of the DMV (Association of German Mathematicians)
01.02.1994 - 01.05.98	Member of the ECMI (European Consortium for Mathematics in Industry)
03.10.1993 - present	Member of the AMS (American Mathematical Society)
23.03.1989 - present	Member of the DMV (Association of German Mathematicians)

Conferences and Workshops (invited) [ordered as ‘Bottom-Up’]

13.01.1990 - 20.01.1990	18th Winter School in abstract analysis, Srni (Czech Republic)
16.09.1990 - 22.09.1990	Anniversary conference of the DMV, Bremen (Germany)
24.11.1991 - 30.11.1991	Symposium on functional analysis, Essen (Germany)
02.02.1992 - 08.02.1992	20th Winter School in abstract analysis, Strobl (Austria)
31.05.1992 - 05.06.1992	Summer School “Impacts of Mathematics upon our Culture“, Lambrecht/Pfalz (Germany)
01.10.1993 - 03.10.1993	DMV/AMS - conference, Heidelberg (Germany)
03.02.1994 - 04.02.1994	ECMI - workshop “Financial Innovations“, Lambrecht/ Pfalz (Germany)
13.02.1994 - 19.02.1994	Seminar in analysis, Strobl (Austria)
03.08.1994 - 11.08.1994	ICM, Zurich (Switzerland)
05.09.1994 - 10.09.1994	Workshop “Stochastics and Finance, Humboldt University, Berlin (Germany)
22.01.1995 - 28.01.1995	23rd Winter School in abstract analysis, Lhota (Czechoslovakia)
03.02.1995	Symposium on the theory of financial markets, University St. Gallen (Switzerland)
20.01.1996 - 27.01.1996	24th Winter School in abstract analysis, Lhota

	(Czechoslovakia)
11.04.1996 - 13.04.1996	Banach workshop 96, UCL, London (UK)
02.06.1996 - 08.06.1996	Conference on Mathematical Finance, University of Aarhus, Aarhus (Denmark)
24.09.1996 - 25.09.1996	Latsis symposium “Finance, Insurance and Society“, Swiss Federal Institute of Technology (ETH), Zurich (Switzerland)
02.10.1996 - 04.10.1996	Workshop “Mathematical Finance and Applications“, Humboldt University, Berlin (Germany)
01.02.1997 - 02.02.1997	Workshop “Mathematics Tomorrow - Academia Meets Industry“, Trippstadt/Pfalz (Germany)
29.04.1997	36th ASTIN - Conference, Würzburg (Germany)
25.05.1998 - 29.05.1998	Advanced Workshop on Malliavin Calculus with Applications to Economics, University of Aarhus, Aarhus (Denmark)
08.06.1998 - 13.06.1998	Conference on “The Interplay between Finance, Insurance and Statistics“, Cortona (Italy)
29.05.1999 - 03.06.1999	Visitor at the Department of Actuarial Mathematics and Statistics, Heriot - Watt University, Edinborough (UK) [being a candidate of the short list]
13.09.1999 - 18.09.1999	Workshop on Mathematical Finance, Strobl and Wien (Austria)
03.07.2000 - 08.07.2000	International Functional Analysis Meeting on the Occasion of the 70^{th} birthday of Professor Manuel Valdivia, Valencia (Spain)
24.05.2001 - 25.05.2001	2nd Workshop on Financial Mathematics: “Beyond Markowitz - Modern Methods of Portfolio Optimisation with Practical Applications“, University of Kaiserslautern (Germany)
07.06.2001 - 08.06.2001	3rd Workshop on Financial Mathematics: “Portfolio Credit Risk“, University of Kaiserslautern (Germany)
12.11.2001 - 13.11.2001	Workshop on “Extremal Events and Dependence Modelling with Applications to Financial Risk Management“, Swiss Re, Rüschlikon - Centre for Global Dialogue (Switzerland)
18.02.2002 - 19.02.2002	INTAS Workshop on Incomplete Markets and Weather Derivatives, Humboldt University, Berlin (Germany)
22.05.2002 - 23.02.2002	4th Workshop on Financial Mathematics: “Interest Rate Theory: Introduction and some Recent Aspects“, University of Kaiserslautern (Germany)
18.09.2002	Interview at the Department of Mathematics of ETH Zurich (Switzerland), [*being the second candidate of the short list* concerning an application as the ”Director of the MaS Finance Program”]
31.01.2003	“B. L. van der Waerden Centenary Colloquium“, University of Zurich (Switzerland)
02.06.2003 - 05.06.2003	Visitor at the Department of Mathematics and Statistics, University of Limerick, Limerick (Ireland) [being a *candidate of the short list* concerning a lectureship in financial mathematics]
06.07.2003 - 13.07.2003	“Stochastic Methods in Finance”, Joint course with the European Mathematical Society, Cusanus Akademie, Bressanone/Brixen (Italy)
12.03.2004 - 13.03.2004	“2004 Spring Southeastern Section Meeting”, Florida State University, Tallahassee (USA)
02.12.2004 - 03.12.2004	Visitor at the Department of Mathematics and Statistics, Birkbeck, University of London, London (UK)

10.01.2005 - 14.01.2005	"Fourth Symposium on Lévy Processes: Theory and Applications", Manchester Institute for Mathematical Sciences (MIMS) of Manchester University (UK)
24.01.2005 - 22.07.2005	"Developments in Quantitative Finance", Long Term Visitor at the Isaac Newton Institute for Mathematical Sciences, Cambridge (UK) [February 2005, May 2005, and June 2005]
06.04.2005 - 08.04.2005	"Workshop on the Interface between Quantitative Finance and Insurance", ICMS, Edinburgh (UK)
20.04.2005 - 22.04.2005	"Workshop Stochastic Analysis and Applications in Finance", Max Planck Institute for Mathematics in the Sciences, Leipzig (Germany)
26.04.2005 - 28.04.2005	Interview and presentation at the School of Mathematics, University of Leeds (UK) [*being the second candidate of the short list* concerning a lectureship in financial mathematics]
12.05.2005	Visitor at the School of Mathematics and Statistics, Department of Probability and Statistics, University of Sheffield (UK)
15.06.2005	Interview and presentation at the Department of Mathematics, National University of Ireland, Cork (Irland), June 2005 [*being the first candidate of the short list* concerning a lectureship in financial mathematics; *acceptance of UCC's offer*, directly after my own rejection of Loughborough (cf. below)]
04.07.2005 - 08.07.2005	Conference "Quantitative Finance: Developments, Applications and Problems", Isaac Newton Institute for Mathematical Sciences, Cambridge (UK)
06.07.2005	Interview and presentation at the Department of Mathematical Sciences, Loughborough University (UK), July 2005 [Own decision for UCC and *own immediate rejection of Loughborough soon after interview*]
10.11.2005 - 12.11.2005	"AMaMeF Workshop on Stochastic Analysis and Computational Finance", Imperial College, London (UK)
24.03.2006	Mathematics Colloquium, National University of Ireland, Cork (Ireland)
26.04.2006 - 30.04.2006	"First Conference of Advanced Mathematical Methods for Finance", Side, Antalya (Turkey)
06.09.2006 - 08.09.2006	"Workshop on Financial Modeling with Jump Processes", Ecole Polytechnique (Palaiseau, France)
11.05.2007	"Festkolloquium on the Occasion of the Receipt of the Emeritus Status in 2007 of Prof. Dr. Eberhard Schock", University of Kaiserslautern (Germany)
25.06.2007 - 29.06.2007	"Workshop & Topical Week on Stochastic Analysis and Related Topics", Philipps University Marburg (Germany)
21.07.2007 - 27.07.2007	"Positivity V", Queen's University Belfast (UK)
13.02.2009	Winter School "Modelling risk in electricity and other energy markets", Ludwig-Maximilians-University, Munich (Germany)
29.04.2010	Workshop "An academic view on capital requirements for the trading book", Deutsche Bundesbank, Frankfurt/Main (Germany)
24.06.2010 - 25.06.2010	"Workshop on Counterparty Credit Risk" by Jon Gregory, Deloitte Office, Frankfurt/Main (Germany)
26.01.2011 - 28.01.2011	"Marcus Evans - Workshop & Conference on CVA and Counterparty Risk (Theme: Implementing and managing CVA and DVA in financial institutions)", Hilton London Tower Bridge Hotel, London (UK)
21.09.2011	Conference "Risk Capital 2011" (invited as guest of speaker Claudio Albanese, Visiting Professor of King's College

	London and CEO of Global Valuation Ltd), Frankfurt/Main (Germany)
23.11.2011 - 25.11.2011	“Workshop on Interest Rates and Credit Risk”, TU Chemnitz, Chemnitz (Germany)
21.03.2012 - 23.03.2012	WBS-CVA Conference: Implementation, Trading, Liquidity, Modeling & Funding (invited speaker - thanks to the invitation of Claudio Albanese, Visiting Professor of King's College London and CEO of Global Valuation Ltd), London (UK)
04.05.2012	CVA Counterparty Risk Frontiers: Collateral Damages (invited speaker - thanks to the invitation of Professor Stéphane Crépey), FBF - Fédération Bancaire Française, 18 rue La Fayette, 75009 Paris (France)
25.09.2012 - 26.09.2012	Perspectives in Analysis and Probability. Conference in Honor of Freddy Delbaen, Swiss Federal Institute of Technology (ETH), Zurich (Switzerland)
08.10.2012 - 10.10.2012	Quant Congress Europe and pre-conference workshops (invited speaker and organiser of the pre-conference workshop on Basel III and counterparty credit risk), London (UK)
29.11.2012 - 30.11.2012	WBS-Training on Basel III & Capital Requirements: CVA, Counterparty Credit Risk, VaR & Central Counterparty Risk (invited speaker), London (UK)
10.06.2013 - 15.06.2013	"Advances in Mathematics of Finance - 6th AMaMeF and Banach Center Conference", Warsaw (PL)
23.09.2013 - 24.09.2013	"QOP Meeting in Leeds, 2013", Leeds (UK) [QOP = quantum groups, operators and non-commutative probability research network]; invited speaker - thanks to Dr Matthew Daws
31.03.2014 - 03.04.2014	Conference “Stochastic Processes and Differential Equations in Infinite Dimensional Spaces“, King’s College London (UK)
23.09.2014 - 26.09.2014	Risk Week Cambridge, Christ’s College Cambridge (UK)
17.10.2014 - 18.10.2014	Workshop on Risk and Regulation, University of Freiburg, Freiburg (Germany)
30.03.2015 - 01.04.2015	Conference “Challenges in Derivatives Markets: Fixed income modeling, valuation adjustments, risk management, and regulation“, Technical University Munich, TUM Quantum Lounge, Garching-Hochbrück (Germany)
21.04.2015 - 16.06.2015	TUM John von Neumann Lecture “Financial models based on Lévy processes“, Technical University Munich, Munich (Germany)
03.06.2015 - 05.06.2015	Conference “Journées à la mémoire de Marc Yor”, Université Pierre et Marie Curie, Campus Jussieu, Paris (France)
25.09.2015 - 26.09.2015	London-Paris Bachelier Workshop on Mathematical Finance 2015, King’s College London (UK)
12.11.2015 - 13.11.2015	Conference “Dependence and Risk Measures“, University of Milano-Bicocca, Milan (Italy)
04.05.2016	Lakatos Award Workshop on Geometry and Physics, LSE Lakatos Building, London (UK)
14.05.2016	The Cambridge Masterclass in Philosophy of Physics: Measurement, Emergence, and the Classical-Quantum Interface, Trinity College Cambridge (UK)
06.07.2016 - 08.07.2016	The Stone-Cech Compactification: Theory and Applications, Centre for Mathematical Sciences, University of Cambridge (UK)

12.07.2016	QuantLib User Meeting, London (UK)
16.07.2016 - 18.07.2016	Foundations 2016 - The 18th UK and European Conference on Foundations of Physics, LSE, London (UK)
01.09.2016 - 02.09.2016	Invariant Subspaces and Banach Algebras - A meeting in memory of Charles Read (1958-2015), MALL, School of Mathematics, University of Leeds (UK)
05.09.2016 - 09.09.2016	LMS Research School "Combinatorics and Operators in Quantum Information Theory", Queen's University Belfast (UK)
12.10.2016 - 14.10.2016	The 12th Fixed Income Conference, Hotel Adlon Kempinski, Berlin (Germany)
10.11.2016 - 11.11.2016	Deloitte LLP - EMEA Quant Meeting 2016, Novotel Amsterdam City, Amsterdam (the Netherlands)
12.11.2016	The Cambridge Masterclass in Philosophy of Physics: Structure and Equivalence in Physical Theories, Trinity College Cambridge (UK)
18.04.2017 - 22.04.2017	London Mathematical Society Invited Lectures 2017 "Function Theory by Hilbert Space Methods", Newcastle University, Newcastle (UK)
03.07.2017 - 05.07.2017	Conference "Copulas and Their Applications - To commemorate the 75th birthday of Professor Roger B. Nelsen", The University of Almería, Almería (Spain)

Further Skills

Foreign Languages:	English (business fluent), French (average)
IT:	Solid software skills (including *LaTeX, Mathematica, Matlab, MS Excel*, *MS Word and HTML*), good knowledge of the programming languages C, C++, good knowledge of UNIX and Windows (programming and handling), QuantLib
Teaching and Consulting:	Large experiences and joy on *advanced* teaching, based on the establishment and lead of student workshops, lectures, own talks on conferences and education in banking- and insurance companies (mathematical training of option traders, underwriters and consultants; establishment and lead of the Actuarial & Retro Workshop at Swiss Re, establishment and lead of the Risk-Table Workshop at Zurich Re), establishment of a solid link between ZHW and the Financial Mathematics Group of the Swiss Federal Institute of Technology (ETH), intensive support in particular of those graduate students who wanted to continue their advanced studies at ETH, specialist consulting of Tier 1 financial institutes (G-SIFIs)
Project Management:	Lead of several projects in relation to quantitative finance (also in collaboration with Swiss banks and reinsurance companies like UBS, ZKB or Converium Ltd.) including the provision of internships for graduate students
Audit Advisory:	Verification of risk models including a tracking of related findings of Deutsche Bundesbank at statutory audits designed for clients of Deloitte Munich including advanced IRB and Prudent Valuation (AVA);

Model control and detailed methodology review of complex multi-layered stochastic pricing models of derivatives at statutory audits (Level 3) designed for large audit clients of Deloitte LLP London (structure, calibration and implementation).