Spectral and Cubature Methods in Finance and Econometrics
An interdisciplinary international research workshop
University of Leicester, UK, June 18-20, 2009

Supported by
AMAMEF, EPSRC, LMS, Oxford-Man Institute and University of Leicester

Organizers
Sergei Levendorskii, Dept. of Mathematics, University of Leicester
Terry Lyons, Oxford-Man Institute, University of Oxford
Martijn Pistorius, Dept. of Mathematics, Imperial College, London

Scientific Committee
Claudio Albanese, King’s College
Peter Carr, Bloomberg and Courant Institute, NYU
Darrell Duffie, Stanford University
Alex Eydeland, Morgan Stanley
Steve Kou, Columbia University
Andreas Kyprianou, University of Bath
Sergei Levendorskii, University of Leicester
Vadim Linetsky, Northwestern University
Alex Lipton, Merrill Lynch
Terry Lyons, Oxford-Man Institute
Dilip Madan, University of Maryland
Martijn Pistorius, Imperial College, London

GENERAL INFORMATION

On site registration and distribution of badges, etc:
Cromwell room, Ramada-Jarvis hotel, 08:30-11:30, June 18-19

All talks: Cromwell room, Ramada-Jarvis hotel, Leicester

Each talk is 40 min plus 5 min for discussions, with the exception of the talks by
John Crosby and Sergei Levendorskii (35+5) and last talk by Alexey Kuznetsov
(25 min) who kindly suggested to sacrifice 20 min of his talk to facilitate the trip
to the Warwick Castle

Coffee and buffet lunches are available for registered participants
Poster sessions: during the coffee and lunch breaks

Reception for registered participants: Ramada-Jarvis hotel, 19:45, June 18

Dinner: restaurant at Belmont hotel, 19:40, June 19 (10 min walk from
Ramada; provisional arrangement to be confirmed)
Thursday, June 18, 2009

08:40-08:45 Welcome remarks

08:45-08:55 Introductory speech by Dilip Madan

Session 1. Chair: Alex Lipton

08:55- 09:40
Dilip Madan (University of Maryland)
*Saddlepoint Pricing, Loan Spreads and Counterparty Credit Risk Evaluation*

09:40-10:25
Peter Carr* (Bloomberg and Courant Institute) Roger Lee (University of Chicago)
*Pricing and Hedging Volatility Derivatives on Time Changed Diffusions*

10: 25-10:40 Coffee break

Session 2. Chair: Peter Carr

10:40-11:25
Alex Lipton* (Bank of America Merrill Lynch & Imperial College London)
Artur Sepp (Bank of America Merrill Lynch)
*Quantitative methods for Counterparty Risk: I. Analytical Formulation and Results*

11:25-12:10
Alex Lipton (Bank of America Merrill Lynch & Imperial College London)
Artur Sepp* (Bank of America Merrill Lynch)
*Quantitative methods for Counterparty Risk: II. Implementation Issues and Examples*

12:10-12:55
Alexander Eydeland* (Morgan Stanley)
Daniel Mahoney (RBS-SEMPRA)
*Fast Convolution Algorithm*

12:55-13:50 Lunch
Session 3. Chair: Andreas Kyprianou

13:50-14:35
Christian Litterer (Mathematical Institute, Oxford)
Terry Lyons* (Mathematical Institute and Oxford-Man Institute, Oxford University, Wales Institute of Mathematical and Computational Sciences, Swansea University)
Cubature and super-accurate Monte Carlo PDE solvers

14:35-15:20
Konstantinos Manolarakis (BNP Paribas)
Solving a Backward SDE with the Cubature method

15:20-15:35 Coffee break

Session 4. Chair: Damir Filipovic

15:35-16:20
Michael Dempster (Centre for Mathematical Sciences University of Cambridge & Cambridge Systems Associates Limited)
Wavelet Optimized PDE Valuation of Derivatives

16:20-17:35
Mitya Boyarchenko* (University of Chicago)
Svetlana Boyarchenko (University of Texas at Austin)
Double Barrier Options in Regime-Switching Hyper-Exponential Jump-Diffusion Models

17:35-18:15
Mitya Boyarchenko (University of Chicago)
Sergei Levendorskiĭ* (University of Leicester)
Prices and sensitivities of barrier, first touch digital and double barrier options in Lévy-driven models

18:15-19:00
Roger Lee (University of Chicago)
Joint Transforms of Prices and Clocks, with Applications to Path-Dependent Options

19:00-19:40
John Crosby* (Glasgow University),
Aleksandar Mijatovic (Imperial College London)
Nolwenn Le Saux (Imperial College London)
Approximating Lévy processes by hyperexponential jump-diffusion processes with a view to option pricing

19:45-21:15 Reception
Friday, June 19, 2009

Session 5. Chair: Claudio Albanese

08:55-09:40
Lars Peter Hansen* (University of Chicago)
José A. Scheinkman (Princeton University)
Pricing Growth-Rate Risk

09:40-10:25
Xiaohong Chen (Yale University)
Estimation of option pricing and default pricing from the point of view of nonlinear ill-posed inverse problem

10:25-10:40 Coffee break

Session 6. Chair: Roger Lee

10:40-11:25
Bruno Feunou (Duke University), Nour Meddahi* (University of Toulouse)
Generalized Affine Models

11:25-12:10
Damir Filipovic (Vienna Institute of Finance)
Affine Transform Analysis and Asset Pricing

12:10-13:05 Lunch

Session 7. Chair: Steven Kou

13:05-13:50
Andreas Kyprianou (University of Bath)
Scale functions for spectrally negative Lévy processes and their appearance in economic models

13:50-14:35
Alexandar Mijatovic and Martijn Pistorius* (Imperial College London)
Barrier options for general jump-diffusions

14:35-15:20
Alexandar Mijatovic* and Martijn Pistorius (Imperial College London)
Double-no-touch options and the volatility smile

15:20-15:35 Coffee break
Session 8. Chair: Martino Grasselli

15:35-16:20
Peter Laurence (Universita di Roma 1)
Some asymptotic results for local volatility models

16:20-17:35
Liming Feng* and Xiong Lin (University of Illinois at Urbana-Champaign)
Hilbert transform approach for pricing Bermudan options in Lévy models

17:35-18:20
Vadim Linetsky and Lingfei Li* (NorthWestern University)
Commodity Derivatives Models with Mean-Reverting Jumps and Stochastic Volatility: A Spectral Expansion Approach

18:20-19:05
Lech Grzelak* and C. W. Oosterlee (Delft University of Technology, Institute of Applied Mathematics)
The Heston model with stochastic interest rates under Fourier based pricing algorithms

19:40 Dinner
Saturday, June 20

**Session 9. Chair: Peter Laurence**

08:55- 09:40  
**Claudio Albanese** (King’s College London)  
*Operator methods for analytically solvable and non-parametric models*

09:40-10:25  
**Ning Cai** (Hong Kong Univ. of Science and Technology) and  
**Steven Kou** (Columbia University)  
*Laplace Transforms and Integro-Differential Equations for Asian and Other Path-Dependent Options*

10:25-10:35 Coffee break

**Session 10. Chair: Liming Feng**

10:35-11:20  
**José da Fonseca** (Auckland University of Technology, ESILV Ecole Supérieure d’Ingénieurs Léonard de Vinci and Zeliade Systems)  
**Martino Grasselli** (Università di Padova and ESILV)  
**Florian Ielpo** (Pictet & Cie, Genéve)  
*Riding on the Smiles I*

11:20-12:05  
**P. Gruber, F. Trojani** (University of Lugano)  
**C. Tebaldi** (Bocconi University Milano)  
*Estimation of Volatility Factor Models with Wishart Spectral Dynamics*

12:05-12:30  
**Alexey Kuznetsov** (York University)  
*Wiener-Hopf factorization and distribution of extrema for a family of Lévy processes*

12:30-13:30 Lunch

13:30-19:30 Trip to the Warwick Castle  
departure from the hotel: 13:30  
estimated time of arrival the Warwick Castle: 14:30  
visit to the castle: 14:45-18:00  
estimated time of departure from Warwick: 18:30  
estimated time of arrival Leicester 19:30