SIAG FME Newsletter

Dear Members —

Welcome to the latest edition of the Newsletter of the SIAM Activity Group on Financial Mathematics and Engineering. With this issue I pass the editorial baton to our SIAG Secretary Alexander Schied who has graciously agreed to take over those duties.

Later this year we are looking forward to the next SIAG/FME Conference. Mark your calendars for **Nov 17–19, 2016** when the **6th SIAM Financial Mathematics and Engineering Conference** (FM'16) will take place at the Sheraton Austin Hotel at the Capitol in Austin, Texas. This would be once again a full 3-day event with 40+ minisymposia and contributed sessions. On page 2 of the Newsletter you can find the full slate of Plenary Speakers. We are also very happy to have two exciting mini-tutorials that would be given by Mike Giles (Oxford) and Almut Veraart (Imperial) on the first morning of the Conference.

Since the conference relies on the community for its strong line-up of presentations, I hope you would consider organizing a Minisymposium on one of the many outlined themes – from Algorithmic Trading to Computational Finance to Systemic Risk. A reminder is that the deadline for submissions is **APRIL 18, 2016**. You can always find the latest information at `http://www.siam.org/meetings/fm16/`.

This is also reminder to encourage your excellent young colleagues to apply for the SIAG's **Conference Paper Prize** that honors the best graduate student/postdoc presentation at the SIAG/FME Conference. Applicants first submit an abstract of their invited minisymposium/contributed paper by the relevant FM'16 submission deadline. There is then an opportunity to submit the full paper towards the Paper Prize, used by the Prize Committee to select the finalists. Finalists then compete directly in a dedicated prize session at the meeting. Look for an imminent Call for Submissions in your mailbox or at `http://www.siam.org/prizes/sponsored/fme_conf_paper.php`

An important resource of the SIAG is our free moderated SIAM-FME Listserv (`http://lists.siam.org/pipermail/siam-fme/`). The maillist is a great venue to advertise conferences, career openings, and other items of interest to the FM&E community, reaching more than 600 members. On this note, let me point out the exceptionally strong academic job market in FM&E. This can be easily confirmed by perusing the SIAG-FME archives using the above link. Over the past 6 months, one counts a dozen tenure-track advertisements (plus almost as many for postdoctoral-type appointments) targeting financial mathematics, stochastic analysis and applied probability. With the respective universities covering North America, Europe and Asia, this is a testament to the global reach of our SIAG membership. Moreover, this upswing in academic hiring after the lull caused by the 2008-09 recession and financial crisis underlines the continued vitality and popularity of financial mathematics and engineering, supported by strong student demand at the undergraduate and graduate level, and numerous emerging research directions.

by M. Ludkovski

Member News

▷ Thomas Kruse (University of Duisburg-Essen) was the Winner of the 2014 Bruti Liberati Prize.

▷ Josef Teichmann (ETH Zurich) was the Winner of the 2014 Louis Bachelier Prize.

▷ René Carmona (Princeton) is the author of the inaugural volume in the SIAM Book Series on Financial Mathematics, published in Feb 2016. See a detailed description of the monograph on p. 3 of the Newsletter. Several more volumes of the series are in the works.

▷ Mete Soner (ETH Zurich) has been elected a SIAM Fellow; his citation read "for contributions to the theory of stochastic optimal control, viscosity solutions and mathematical finance."

▷ Shige Peng (Shandong U) was a plenary speaker at the ICIAM 2015 congress. In addition to his lecture, he also recorded an interview with ICIAM TV on "Financial Engineering", `http://www.websedge.com/videos/education/financial_engineering`

Conference Reports

The conference **Methods of Mathematical Finance**; a conference in honor of Steve Shreve's 65th birthday was held at Carnegie Mellon University in Pittsburgh on June 1-5th, 2015. This five day conference consisted of 20 invited talks, over 50 contributed posters, a 5 person panel discussion about US masters programs, and about 150 participants. The research topics included queuing theory, asset pricing, equilibrium theory, numerical methods, risk measures and much more. The meeting was sponsored by the National Science Foundation (NSF), Carnegie Mellon's Department of Mathematical Sciences, Carnegie Mellon's masters program Master of Science in Computational Finance (MSCF), Springer, and RSJ. *by K. LARSEN*

The **7th General AMaMeF and Swissquote Conference 2015** took place at the SwissTech Convention Center at EPFL from September 7 to 10. AMaMeF, which stands for *Advanced Mathematical Methods in Finance*, is a European research network that was created with the support of the European Science Foundation in 2005 for the development of mathematics for finance. The 7th General AMaMeF conference was held jointly with this year's traditional Swissquote conference at EPFL, which is an annual event that has been organized by the Swissquote Chair in Quantitative Finance at EPFL since 2010. It featured ten plenary talks and about seventy invited paper talks held in parallel sessions. In addition, about twenty young researchers were given the opportunity to present their results on posters during the conference. A key event in the program was the panel discussion on future directions and challenges for mathematics in finance, featuring Rene Carmona, Darrell Duffie, Alexander Lipton, and Chris Rogers. *by D. FILIPOVIC*

The **Seventh Western Conference in Mathematical Finance (WCMF'7)** took place on the UT Austin campus on October 30th and 31st, 2015. Continuing an already established tradition, it gathered eminent researchers in mathematical finance and related fields from the western part of the United States. As is usually the case with the Western Conferences, special attention was paid to the inclusion of the junior members of the field: the attendance of 21 PhD students, in addition to 16 plenary speakers, was fully supported by the National Science Foundation and the University of Texas. The topics of the plenary presentations ranged from optimal stochastic control and its applications to mathematical finance, over stochastic portfolio theory and mean-field games, to systemic risk, machine learning and computational and statistical methods. Over 60 participants attended the conference, and many of them gathered for a Texas-style barbecue dinner. The next WCMF is expected to take place in Seattle, in the Spring of 2017. *by G. ZITKOVIĆ*

Please direct enquiries or suggestions for new items to Newsletter Editor/SIAG Secretary Alex Schied at `schied@uni-mannheim.de`

SIAM FM'16 Conference

Plenary Speakers:

▷ Beatrice Acciaio, London School of Economics, United Kingdom
▷ René Aïd, EDF, France
▷ Francesca Biagini, Ludwig Maximilian University of München, Germany
▷ Sebastian Jaimungal, University of Toronto, Canada
▷ Steven Kou, National University of Singapore, Singapore
▷ José A. Scheinkman, Columbia University, USA
▷ Jianfeng Zhang, University of Southern California, USA
▷ Gordan Žitković, University of Texas at Austin, USA

Mini-Tutorial Speakers:

▷ Mike Giles, Oxford University, United Kingdom
▷ Almut Veraart, Imperial College, United Kingdom

Organizing Committee:

▷ Tim Leung, Columbia University, USA (co-chair)
▷ Mike Ludkovski, University of California, Santa Barbara, USA (co-chair)
▷ Carlo Acerbi, MSCI Inc., Switzerland
▷ Fred Espen Benth, University of Oslo, Norway
▷ Bruno Bouchard, Université Paris-Dauphine, Ceremade, France
▷ Jaksa Cvitanic, California Institute of Technology, USA
▷ Peter Forsyth, University of Waterloo, Canada
▷ Vicky Henderson, University of Warwick, United Kingdom
▷ Jan Obloj, University of Oxford, United Kingdom
▷ Thaleia Zariphopoulou, University of Texas at Austin

Upcoming Conferences

SIAM FM'16 Conference Austin, TX	November 17–19, 2016
Energy and Commodity Finance Conference 2016 Paris, France	June 23–24, 2016
2016 SIAM Annual Meeting Boston, USA	July 11–15, 2016
Bachelier Finance Society 9th World Congress 2016 New York, USA	July 15–19, 2016
PIMS Summer School in Mathematical Finance Followed by Sixth International IMS-FIPS Workshop Edmonton, Canada	Summer School: June 25–July 6, 2016 Workshop: July 7–9, 2016
Vienna Congress on Mathematical Finance Vienna, Austria	Sep 12–14, 2016

FME Bookshelf: Lectures on BSDEs, Stochastic Control, and Stochastic Differential Games with Financial Applications by René Carmona

This is the first title in **SIAM's Financial Mathematics book series** and is based on the author's lecture notes. The goal of this textbook is to introduce students to the stochastic analysis tools which play an increasing role in the probabilistic approach to optimization problems, including stochastic control and stochastic differential games. While optimal control is taught in many graduate programs in applied mathematics and operations research, the author was intrigued by the lack of coverage of the theory of stochastic differential games.

RENÉ CARMONA

Lectures on BSDEs, Stochastic Control, and Stochastic Differential Games with Financial Applications

Audience: This book is written for young researchers and newcomers to stochastic control and stochastic differential games. It will be helpful to students who are interested in

▷ stochastic differential equations (forward, backward, forward-backward);
▷ the probabilistic approach to stochastic control: dynamic programming and the stochastic maximum principle;
▷ and mean field games and control of McKean–Vlasov dynamics. The theory is illustrated by applications to models of systemic risk, macroeconomic growth, flocking/schooling, crowd behavior, and predatory trading, among others.

About the Author: René Carmona is the Paul M. Wythes '55 Professor of Engineering and Finance at Princeton University, where he chairs the Department of Operations Research and Financial Engineering. René is a Fellow of IMS and SIAM, the founding chair of the SIAM Activity Group on Financial Mathematics and Engineering, and the founding co-editor of Electronic Journal of Probability, Electronic Communications in Probability, and SIAM Journal on Financial Mathematics.

SIAM Journal on Financial Mathematics

Recently published articles (Vol 6, 2015):

▷ Density Approach in Modeling Successive Defaults by Nicole El Karoui, Monique Jeanblanc, and Ying Jiao
▷ Multilevel Monte Carlo Quadrature of Discontinuous Payoffs in the Generalized Heston Model Using Malliavin Integration by Parts by Martin Altmayer and Andreas Neuenkirch
▷ Properties of American Volatility Options in the Mean-Reverting 3/2 Volatility Model by Hsuan-Ku Liu

▷ Market Models with Optimal Arbitrage by Huy N. Chau and Peter Tankov

▷ Default Clustering in Large Pools: Large Deviations by Konstantinos Spiliopoulos and Richard B. Sowers

▷ No Access The Existence of Optimal Bang-Bang Controls for GMxB Contracts by P. Azimzadeh and P. A. Forsyth

▷ Valuation and Parities for Exchange Options by Constantinos Kardaras

▷ Asymptotic Analysis of Stock Price Densities and Implied Volatilities in Mixed Stochastic Models by Archil Gulisashvili and Josep Vives

▷ Liquidity Suppliers and High Frequency Trading by Robert Jarrow and Philip Protter

▷ Optimal Diversification in the Presence of Parameter Uncertainty for a Risk Averse Investor by Mathieu S. Dubois and Luitgard A. M. Veraart

▷ Asymptotic Glosten–Milgrom Equilibrium by Cheng Li and Hao Xing

▷ Optimal Execution with Multiplicative Price Impact by Xin Guo and Mihail Zervos

▷ Asymptotics of Forward Implied Volatility by Antoine Jacquier and Patrick Roome

▷ On Suboptimality of Delta Hedging for Asian Options by Adam W. Kolkiewicz

▷ Systemic Risk in Interbanking Networks by Lijun Bo and Agostino Capponi

▷ On Hedging American Options under Model Uncertainty by Erhan Bayraktar, Yu-Jui Huang, and Zhou Zhou

▷ Pricing Bermudan Options via Multilevel Approximation Methods by Denis Belomestny, Fabian Dickmann, and Tigran Nagapetyan

▷ Portfolio Selection with Multiple Spectral Risk Constraints by Carlos Abad and Garud Iyengar

▷ ESO Valuation with Job Termination Risk and Jumps in Stock Price by Tim Leung and Haohua Wan

▷ Optimal Investment with Nonconcave Utilities in Discrete-Time Markets by Miklós Rásonyi

▷ The Formation of Financial Bubbles in Defaultable Markets by Francesca Biagini and Sorin Nedelcu

▷ Consistent Pricing of Options on Leveraged ETFs by Andrew Ahn, Martin Haugh, and Ashish Jain

▷ Valuation and Hedging of Contracts with Funding Costs and Collateralization by Tomasz R. Bielecki and Marek Rutkowski

▷ High Frequency Trading and Asymptotics for Small Risk Aversion in a Markov Renewal Model by Pietro Fodra and Huyên Pham

▷ Reduced Basis Methods for Pricing Options with the Black–Scholes and Heston Models by O. Burkovska, B. Haasdonk, J. Salomon, and B. Wohlmuth

▷ Efficient Option Pricing by Frame Duality with the Fast Fourier Transform by J. Lars Kirkby

▷ Sequential Design for Optimal Stopping Problems by Robert B. Gramacy and Michael Ludkovski

▷ How Superadditive Can a Risk Measure Be? by Ruodu Wang, Valeria Bignozzi, and Andreas Tsanakas

▷ No Access Informational Efficiency under Short Sale Constraints by Robert A. Jarrow and Martin Larsson

▷ Derivatives Pricing in Energy Markets: An Infinite-Dimensional Approach by Fred Espen Benth and Paul Krühner

▷ A Feedback Model for the Financialization of Commodity Markets by Patrick Chan, Ronnie Sircar, and Michael V. Stein

▷ On the Level-Slope-Curvature Effect in Yield Curves and Eventual Total Positivity by Liliana Forzani and Carlos F. Tolmasky

▷ Analytical Approximations of BSDEs with Nonsmooth Driver by Emmanuel Gobet and Stefano Pagliarani

▷ Dynamic Contracting: Accidents Lead to Nonlinear Contracts by Agostino Capponi and Christoph Frei

▷ Affine LIBOR Models with Multiple Curves: Theory, Examples and Calibration by Zorana Grbac, Antonis Papapantoleon, John Schoenmakers, and David Skovmand

▷ Long-Time Behavior of a Hawkes Process–Based Limit Order Book Frédéric Abergel and Aymen Jedidi

▷ Optimal Trade Execution for Time-Inconsistent Mean-Variance Criteria and Risk Functions by Torsten Schöneborn

▷ Dynamic Conic Finance via Backward Stochastic Difference Equations by Tomasz R. Bielecki, Igor Cialenco, and Tao Chen

▷ Optimal Execution with Dynamic Order Flow Imbalance by Kyle Bechler and Michael Ludkovski

▷ Duality in a Problem of Static Partial Hedging under Convex Constraints by Erick Trevino-Aguilar

▷ Linking Vanillas and VIX Options: A Constrained Martingale Optimal Transport Problem by Stefano De Marco and Pierre Henry-Labordère

▷ Control of Interbank Contagion Under Partial Information by Hamed Amini, Andreea Minca, and Agnès Sulem

▷ Weighted Elastic Net Penalized Mean-Variance Portfolio Design and Computation by Michael Ho, Zheng Sun, and Jack Xin