The Activity Group on Financial Mathematics and Engineering focuses on research and practice in financial mathematics, computation, and engineering. Its goals are to foster collaborations among mathematical scientists, statisticians, computer scientists, computational scientists, and researchers and practitioners in finance and economics, and to foster collaborations in the use of mathematical and computational tools in quantitative finance in the public and private sector. The activity group promotes and facilitates the development of financial mathematics and engineering as an academic discipline.
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   Wednesday, November 12
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   Thursday, November 13
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   Friday, November 14
       8:00 AM – 3:30 PM

   Saturday, November 15
       8:00 AM – 4:30 PM

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### Meeting At-A-Glance

#### Wednesday, November 12
- **5:00 PM – 7:00 PM**
  - Registration
  - Registration Counter - 6th Floor

#### Thursday, November 13
- **8:00 AM - 7:30 PM**
  - Registration
  - Registration Counter - 6th Floor
- **10:00 AM - 12:00 PM**
  - Concurrent Sessions
    - **MS1** Portfolio Selection and Asset Pricing in the Non-EUT Framework
      - Water Tower Parlor - 6th Floor
    - **MS2** Variable Annuities
      - Adams - 6th Floor
    - **MS3** Radial Basis Function Based Methods in Finance
      - Grant Park Parlor - 6th Floor
    - **MS4** Topics from Derivatives Central Clearing
      - Hancock Parlor - 6th Floor
    - **CP1** Credit Risk
      - Millennium Parlor - 6th Floor
    - **CP2** Econometrics/Empirics
      - LaSalle 5 - 7th Floor
    - **CP3** Numerical Analysis - Part 1
      - LaSalle 1 - 7th Floor
    - **CP4** Options - Part 1
      - LaSalle 3 - 7th Floor
    - **CP5** Stochastic Control - Part 1
      - LaSalle 2 - 7th Floor
- **12:00 PM - 1:25 PM**
  - Lunch Break
  - Attendees on their own
- **1:25 PM - 1:30 PM**
  - Welcome Remarks
  - Adams - 6th Floor

#### Thursday, November 14
- **2:15 PM - 3:00 PM**
  - IP2 Multi-Period Mean Variance Asset Allocation: Is It Bad To Win the Lottery?
    - Peter Forsyth, University of Waterloo, Canada
    - Adams - 6th Floor
- **3:00 PM - 3:30 PM**
  - Coffee Break
  - Monroe - 6th Floor
- **3:30 PM - 5:30 PM**
  - Concurrent Sessions
    - **MS5** Advanced Numerical Techniques in Financial Mathematics - Part I of II
      - Adams - 6th Floor
    - **MS6** Optimal Stopping with Financial Applications
      - Grant Park Parlor - 6th Floor
    - **MS7** Optimal Investment with Transaction Costs
      - Hancock Parlor - 6th Floor
    - **MS8** Dynamic Risk and Performance Measures and Related Fields - Part I of II
      - Water Tower Parlor - 6th Floor
    - **MS9** Liquidity Risk in a System Context
      - Millennium Parlor - 6th Floor
    - **MS10** Mean-field Games Modeling in Economy and Finance
      - LaSalle 1 - 7th Floor
    - **CP6** Fixed Income
      - LaSalle 2 - 7th Floor
    - **CP7** Options - Part 2
      - LaSalle 3 - 7th Floor
    - **CP8** Systemic Risk
      - LaSalle 5 - 7th Floor
- **5:30 PM - 5:45 PM**
  - Intermission

#### Friday, November 14
- **8:00 AM - 3:30 PM**
  - Registration
  - Registration Counter - 6th Floor
- **8:30 AM - 10:30 AM**
  - Concurrent Sessions
    - **MS11** Dynamic Risk and Performance Measures and Related Fields - Part II of II
      - Water Tower Parlor - 6th Floor
    - **MS12** Mean Field Games - Part I of II
      - Adams - 6th Floor
    - **MS13** Recent Progress in Equilibrium Theory
      - LaSalle 1 - 7th Floor
    - **MS14** Counterparty Risk, Liquidity and Funding - Part I of II
      - Grant Park Parlor - 6th Floor
    - **MS15** Systemic and Liquidity Risk
      - Hancock Parlor - 6th Floor
    - **MS16** Asymptotic Methods in Continuous-Time Models with Jumps
      - LaSalle 2 - 7th Floor
    - **CP9** High-Frequency Markets
      - Millennium Parlor - 6th Floor
    - **CP10** Risk Measures
      - LaSalle 3 - 7th Floor
    - **CP11** Stochastic Volatility - Part 1
      - LaSalle 5 - 7th Floor
- **10:30 AM - 10:55 AM**
  - Coffee Break
  - Monroe - 6th Floor
- **10:55 AM - 11:00 AM**
  - Announcements
  - Adams - 6th Floor
- **11:00 AM - 11:45 AM**
  - IP4 Robust Meets Realistic: Interpolating Between Model-Specific and Model-Free Settings for Pricing and Hedging
    - Jan Obloj, Oxford University, United Kingdom
    - Adams - 6th Floor
- **11:45 AM - 12:30 PM**
  - IP5 Long-Term Valuation and Misspecified Recovery
    - Lars Peter Hansen, The University of Chicago, USA
    - Adams - 6th Floor
### Meeting At-A-Glance

#### Friday, November 14

**12:30 PM - 2:00 PM**
- Lunch Break
- Attendees on their own

**2:00 PM - 2:30 PM**
- SP1 SIAG/FME Junior Scientist Prize Lecture: Some Financial Markets with Discontinuities
  - Tomoyuki Ichiba, University of California, Santa Barbara, USA
  - Adams - 6th Floor

**2:30 PM - 3:00 PM**
- Coffee Break

**3:00 PM - 5:00 PM**
- Concurrent Sessions
  - MS17 Large Population Stochastic Control
    - LaSalle 1 - 7th Floor
  - MS18 Statistical Analysis of Risk and Stress Tests for Regulatory Policies - Part I of II
    - Hancock Parlor - 6th Floor
  - MS19 Spectral and Transform Methods in Finance - Part I of II
    - LaSalle 1 - 7th Floor
  - MS20 Robust Hedging and Pricing under Model Uncertainty - Part I of II
    - Adams - 6th Floor
  - MS21 Systemic Financial Risk
    - Millennium Parlor - 6th Floor
  - MS22 Operator Splittings Methods for Pricing Options
    - LaSalle 2 - 7th Floor
  - MS23 Algorithmic Trading - Part I of II
    - Water Tower Parlor - 6th Floor
  - CP12 Commodity Futures
    - LaSalle 3 - 7th Floor
  - CP13 Numerical Analysis - Part 2
    - LaSalle 5 - 7th Floor

**5:00 PM - 5:15 PM**
- Intermission

**5:15 PM - 6:00 PM**
- SIAG/FME Business Meeting
  - Adams - 6th Floor
  - Complimentary beer and wine will be served.

#### Saturday, November 15

**8:00 AM - 4:30 PM**
- Registration
  - Registration Counter - 6th Floor

**8:30 AM - 10:30 AM**
- Concurrent Sessions
  - MS24 Statistical Inference for Continuous-time Models of Asset Prices
    - Grant Park Parlor - 6th Floor
  - MS25 Algorithmic Trading - Part II of II
    - Water Tower Parlor - 6th Floor
  - MS26 Spectral and Transform Methods in Finance - Part II of II
    - Millennium Parlor - 6th Floor
  - MS27 Robust Hedging and Pricing under Model Uncertainty - Part II of II
    - LaSalle 1 - 7th Floor
  - MS28 Monte Carlo Methods in Finance
    - Hancock Parlor - 6th Floor
  - MS29 Forward Asset Allocation
    - Adams - 6th Floor
  - CP14 Insurance
    - LaSalle 5 - 7th Floor
  - CP15 Stochastic Control - Part 2
    - LaSalle 2 - 7th Floor
  - CP16 Stochastic Volatility - Part 2
    - LaSalle 3 - 7th Floor

**10:30 AM - 10:55 AM**
- Coffee Break

**11:00 AM - 11:45 AM**
- IP6 Moral Hazard in Dynamic Risk Management
  - Jakša Cvitanic, California Institute of Technology, USA

**11:45 AM - 12:30 PM**
- IP7 Adaptive Grids in Regression Monte Carlo
  - Mike Ludkovski, University of California, Santa Barbara, USA
  - Adams - 6th Floor

**12:30 PM - 2:00 PM**
- Lunch Break
  - Attendees on their own

**2:00 PM - 2:45 PM**
- IP8 The Value of Being Lucky: Option Backdating and Non-diversifiable Risk
  - Vicky Henderson, University of Warwick, United Kingdom
  - Adams - 6th Floor

**2:45 PM - 3:30 PM**
- IP9 The Value of Queue Position in a Limit Order Book
  - Ciamac C. Moallemi, Columbia University, USA
  - Adams - 6th Floor

**3:30 PM - 4:00 PM**
- Coffee Break

**4:00 PM - 6:00 PM**
- Concurrent Sessions
  - MS30 Advanced Numerical Techniques in Financial Mathematics - Part II of II
    - LaSalle 1 - 7th Floor
  - MS31 Asymptotics in Finance
    - Hancock Parlor - 6th Floor
  - MS32 Mean Field Games - Part II of II
    - Grant Park Parlor - 6th Floor
  - MS33 Statistical Analysis of Risk and Stress Tests for Regulatory Policies - Part II of II
    - Millennium Parlor - 6th Floor
  - MS34 Counterparty Risk, Liquidity and Funding - Part II of II
    - Adams - 6th Floor
  - MS35 Stochastic Financial Equilibria
    - Water Tower Parlor - 6th Floor
  - CP17 Stochastic Control - Part 3
    - LaSalle 2 - 7th Floor

#### Key to abbreviations and symbols

- **CP** = Contributed Presentation
- **IP** = Invited Speaker
- **MS** = Minisymposium
- **B** = Business Meeting
- **C** = Coffee Break
- **R** = Refreshments
- **SP** = Special Lecture
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Get-togethers
• Welcome Reception
  Thursday, November 13
  6:30 PM – 8:30 PM

• Business Meeting
  (open to SIAG/FME members)
  Friday, November 14
  5:15 PM – 6:00 PM

  Complimentary beer and wine will be served.

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Invited Plenary Speakers

**All Invited Plenary Presentations will take place in Adams – 6th Floor **

Thursday, November 13

1:30 PM – 2:15 PM

**IP1** No-arbitrage Under Model Ambiguity and Fundamental Theorems of Asset Pricing

Bruno Bouchard, Université Paris-Dauphine and ENSAE-ParisTech, Ceremade and Crest, France

2:15 PM – 3:00 PM

**IP2** Multi-Period Mean Variance Asset Allocation: Is It Bad To Win the Lottery?

Peter Forsyth, University of Waterloo, Canada

5:45 PM – 6:30 PM

**IP3**Bid-Ask Imbalance and Trade Arrival Modeling

Michael Sotiropoulos, Bank of America Merrill Lynch, USA

Friday, November 14

11:00 AM – 11:45 AM

**IP4** Robust Meets Realistic: Interpolating Between Model-Specific and Model-Free Settings for Pricing and Hedging

Jan Obloj, University of Manchester, United Kingdom

11:45 AM – 12:30 PM

**IP5** Long-Term Valuation and Misspecified Recovery

Lars Peter Hansen, The University of Chicago, USA
Invited Plenary Speakers

**All Invited Plenary Presentations will take place in Adams – 6th Floor**

Saturday, November 15

11:00 AM – 11:45 AM

**IP6** Moral Hazard in Dynamic Risk Management

Jakša Cvitanic, California Institute of Technology, USA

11:45 AM – 12:30 PM

**IP7** Adaptive Grids in Regression Monte Carlo

Mike Ludkovski, University of California, Santa Barbara, USA

2:00 PM – 2:45 PM

**IP8** The Value of Being Lucky: Option Backdating and Non-diversifiable Risk

Vicky Henderson, University of Warwick, United Kingdom

2:45 PM – 3:30 PM

**IP9** The Value of Queue Position in a Limit Order Book

Ciamac C. Moallemi, Columbia University, USA
Prizes

**All Prize Presentations will take place in Adams**

Friday, November 14
2:00 PM – 2:30 PM
SP1 SIAG/FME Junior Scientist Prize Lecture
Some Financial Markets with Discontinuities
Tomoyuki Ichiba, University of California, Santa Barbara, USA

Saturday, November 15
12:30 PM – 2:00 PM
SIAG/FME Conference Paper Prize Session
Information not available at time of publication.
From the American Mathematical Society

Probability Theory in Finance
Seán Dineen, University College Dublin, Ireland

In addition to the usual improvements in response to comments and suggestions, the new edition reflects the experience of teaching real analysis... Dineen is doing something valuable by trying to find ways to communicate mathematics in a serious way to an audience that often gets little more than recipes and rules. It's a project definitely worth supporting.
—Fernando Q. Gouvêa, MAA Reviews

Graduate Studies in Mathematics, Volume 70, 2013; 305 pages; Hardcover;

Introduction to the Mathematics of Finance
R. J. Williams, University of California, San Diego, La Jolla, CA

The text is clearly written and well-arranged and most of the results are proved in detail. Each chapter is completed with exercises, which makes the textbook very comprehensive.
—EMS Newsletter

Graduate Studies in Mathematics, Volume 72, 2006; 350 pages; Hardcover;
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Knowing the Odds
An Introduction to Probability
John B. Walsh, University of British Columbia, Vancouver, BC, Canada

A leisurely introduction to all of the standard material that one would want in a full-year probability course, with a slant toward applications in financial analysis.

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Uncertainty Quantification: Theory, Implementation, and Applications
Ralph C. Smith
Computational Science and Engineering 12

The field of uncertainty quantification is evolving rapidly because of increasing emphasis on models that require quantified uncertainties for large-scale applications, novel algorithm development, and new computational architectures that facilitate implementation of these algorithms. Uncertainty Quantification provides readers with the basic concepts, theory, and algorithms necessary to quantify input and response uncertainties for simulation models arising in a broad range of disciplines. The book begins with a detailed discussion of applications where uncertainty quantification is critical for both scientific understanding and policy. It then covers concepts from probability and statistics, parameter selection techniques, frequentist and Bayesian model calibration, propagation of uncertainties, quantification of model discrepancy, surrogate model construction, and local and global sensitivity analysis. The author maintains a complementary web page where readers can find data used in the exercises and other supplementary material.

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List Price $74.00 • Attendee Price $59.20
SIAM Member Price $51.80 • Order Code CS12

Elementary Calculus of Financial Mathematics
A. J. Roberts
Mathematical Modeling and Computation 15

This book introduces the fascinating area of financial mathematics and its calculus in an accessible manner geared toward undergraduate students. Using little high-level mathematics, the author presents the basic methods for evaluating financial options and building financial simulations. By emphasizing relevant applications and illustrating concepts with color graphics, Elementary Calculus of Financial Mathematics presents the crucial concepts needed to understand financial options among these fluctuations. Among the topics covered are the binomial lattice model for evaluating financial options, the Black–Scholes and Fokker–Planck equations, and the interpretation of Ito’s formula in financial applications. Each chapter includes exercises for student practice and the appendices offer MATLAB® and SCILAB code as well as alternate proofs of the Fokker–Planck equation and Kolmogorov backward equation.

2008 • xi + 128 pages • Softcover • 978-0-898716-67-2
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Hans Kaper
and Hans Engler
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2013 • xx + 295 pages • Hardcover • 978-1-611972-60-3
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Wednesday, November 12

Registration
5:00 PM-7:00 PM
Room: Registration Counter - 6th Floor

Thursday, November 13

Registration
8:00 AM-7:30 PM
Room: Registration Counter - 6th Floor

Thursday, November 13
MS1
Portfolio Selection and Asset Pricing in the Non-EUT Framework
10:00 AM-12:00 PM
Room: Water Tower Parlor - 6th Floor

A variety of alternative theories to the expected utility theory (EUT) have been proposed in the literature to better describe individuals’ preference under risk. This minisymposium is devoted to the recent advances in portfolio selection and asset pricing based on these alternative theories. Two of the four speakers address portfolio selection problems under the rank-dependent expected utility theory and under a general law-invariant preference measure while the other two study equilibrium asset pricing problems in which the agent has non-EUT preference relations such as those with time-changing risk aversion and those represented by the cumulative prospect theory.

Organizer: Xuedong He
Columbia University, USA

10:00-10:25 Rank Dependent Utility and Risk Taking in Complete Markets
Xuedong He, Columbia University, USA; Roy Kouwenberg, Mahidol University, Thailand; Xunyu Zhou, University of Oxford, United Kingdom, and The Chinese University of Hong Kong, China

10:30-10:55 Rationalizing Investors’ Choices
Carole Bernard, University of Waterloo, Canada; Jit Seng Chen, GGY, Canada; Steven Vanduffel, Vrije Universiteit Brussels, Belgium

11:00-11:25 The Effect of Time Changing Risk Aversion on Equilibrium Pricing
Traian A. Pirvu, McMaster University, Canada

11:30-11:55 Equilibrium Asset Pricing with Rational and Irrational Investors
Jing Guo, Columbia University, USA
Thursday, November 13  
**MS2**  
**Variable Annuities**  
**10:00 AM-12:00 PM**  
*Room: Adams - 6th Floor*

Variable Annuities with embedded guarantees are increasingly popular in many markets across the world. These products combine financial option-like investment features with traditional life insurance. As such, the pricing and risk management of these products present challenging problems that have attracted interest from quantitative researchers from different fields. This minisymposium first offers an overview of various types of investment guarantees, and then covers a number of topical research problems in this area. In particular, the presentations discuss analytical and computational techniques for the valuation, the modeling and hedging of dynamic policyholder behavior, the optimization of guaranteed benefits, and computational methods for risk measures of guaranteed benefits.

**Organizer: Runhuan Feng**  
*University of Illinois at Urbana-Champaign, USA*

**Organizer: Daniel Bauer**  
*Georgia State University, USA*

10:00-10:25 Revisiting the Risk-Neutral Approach to Optimal Policyholder Behavior: A Study of Withdrawal Guarantees in Variable Annuities  
Thorsten Moenig, University of St. Thomas, USA; Daniel Bauer, Georgia State University, USA

10:30-10:55 Hedging Costs for Variable Annuities under Regime-Switching  
Peter Forsyth, University of Waterloo, Canada

11:00-11:25 Computation of Risk Measures for Variable Annuity Guaranteed Benefits  
Runhuan Feng, University of Illinois at Urbana-Champaign, USA; Hans W. Volkmer, University of Wisconsin, Milwaukee, USA

11:30-11:55 Optimal Initiation of a GLWB in a Variable Annuity: No Arbitrage Approach  
Huaxiong Huang, Moshe Milevsky, and Tom Salisbury, York University, Canada

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Thursday, November 13  
**MS3**  
**Radial Basis Function Based Methods in Finance**  
**10:00 AM-11:30 PM**  
*Room: Grant Park Parlor - 6th Floor*

Numerical methods based on radial basis function (RBF) approximation have often been suggested as interesting for computational problems arising in finance because they allow for easy implementation of high-dimensional problems. However, there are also other interesting properties that can be explored. Because the methods are meshfree, they easily allow for local adaptivity. They can be used for evaluating fractional derivatives that arise in jump diffusion problems and Gaussian RBFs can be interpreted as representing statistical uncertainty. In this minisymposium, we will explore a range of financial problems where RBFs have been proven successful in different ways.

**Organizer: Elisabeth Larsson**  
*Uppsala University, Sweden*

**Organizer: Lina von Sydow**  
*Uppsala University, Sweden*

10:00-10:25 Filtering and Parameter Estimation of Partially Observed Diffusion Processes Using Gaussian RBFs  
Josef Höök and Elisabeth Larsson, Uppsala University, Sweden; Erik Lindström, Lund University, Sweden; Lina von Sydow, Uppsala University, Sweden

10:30-10:55 Option Pricing under Fractional Diffusion Using Radial Basis Functions  
Cécile M. Piret, Université catholique de Louvain, Belgium

11:00-11:25 Efficient Pricing of Vanilla and Exotic Options with Multiple Discrete Dividends using Finite-Difference Method for Algorithmic Trading System  
Alexander Toropov, TBricks AB, Sweden and ITMO University, Russia; Dmitry Ivanov, TBricks AB, Sweden; Yuri Shpolyanskiy, TBricks AB, Sweden and ITMO University, St. Petersburg, Russia

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Thursday, November 13  
**MS4**  
**Topics from Derivatives Central Clearing**  
**10:00 AM-12:00 PM**  
*Room: Hancock Parlor - 6th Floor*

Efficiently marging derivatives and securities lending portfolios is principally a classic application of short-term market risk management. It involves econometrics, pricing, simulation, portfolio risk quantification and managing the model risk of these models. Most relevant phenomena can be observed in historical data. But regulatory guidance and best practice around margins are moving beyond an objective approach and acknowledging heretofore mutualized risks such as the market impact of a liquidation that may emerge only under the circumstances of a fail where little to no historical data is available.

**Organizer: John A. Dodson**  
*Options Clearing Corporation, USA*

10:00-10:25 A Class of Fat-Tailed Residuals for Log-Returns Consistent with Finite Asset Price Expectations  
Ziyi Guo, Options Clearing Corporation, USA

10:30-10:55 Principal Components Analysis in Yield-Curve Modeling  
Carlos Tolmasky, University of Minnesota, USA

11:00-11:25 Pricing and Hedging of Futures Contracts under Multiple Stochastic Factors  
Jinchun Ye, Options Clearing Corporation, USA

11:30-11:55 Quantifying the Mutual Information Between Innovations in the Prices of Security Options and Their Underlyings  
Lu Zhou, University of Minnesota, USA
Thursday, November 13

CP1
Credit Risk
10:00 AM-12:00 PM
Room: Millenium Parlor - 6th Floor
Chair: Hugo E. Ramirez, The University of Manchester, United Kingdom
10:00-10:25 The Application of KMV Model in Chinese Market
Haoyun Chen, Central University of Finance and Economics, China
10:30-10:55 Bank Liquidity Risk Management
Mmboniseni Mulaudzi, University of South Africa, South Africa; Mark Petersen and Janine Mukuddem-Petersen, North-West University, South Africa
11:00-11:25 Capital Investment and Liquidity Management with Collateralized Debt
Erwan Pierre, EDF Lab, France; Stephane Villeneuve, Toulouse University, France; Xavier Warin, EDF Lab, France
11:30-11:55 Hedge Fund Management with Liquidity Constraint
Hugo E. Ramirez, Peter Duck, Sydney Howell, and Paul Johnson, The University of Manchester, United Kingdom

Thursday, November 13

CP2
Econometrics/Empirics
10:00 AM-12:00 PM
Room: LaSalle 5 - 7th Floor
Chair: Lingjiong Zhu, University of Minnesota, USA
10:00-10:25 High-Speed Fourier Method Estimation of Covariances from Asynchronous Data for Real-Time Cluster Analysis
Dieter Hendricks, Tim Gebbie and Diane Wilcox, University of Witwatersrand, South Africa
10:30-10:55 Statistically Significant Fits of Hawkes Processes to Financial Data
Mehdi Lallouache and Damien Challet, Ecole Centrale Paris, France
11:00-11:25 Regime Change in Dynamic Correlation Matrices of Financial Data
Joongyeub Yeo and George C. Papanicolaou, Stanford University, USA
11:30-11:55 Hawkes Processes and Applications in Finance
Lingjiong Zhu, University of Minnesota, USA

Thursday, November 13

CP3
Numerical Analysis - Part 1
10:00 AM-12:00 PM
Room: LaSalle 1 - 7th Floor
Chair: Hailing Wu, Nanyang Technological University, Singapore
10:00-10:25 Pricing “Partial-Average” Asian Options with Binomial Method
Erwina Chendra, Institute Technology Bandung and Parahyangan Catholic University, Indonesia; Kuntjoro Adjii Sidarto and Dila Puspita, Institute Technology Bandung, Indonesia
10:30-10:55 Flexible Finite Element Method for Option Pricing in Lévy Models
Kathrin Glau, Technical University München, Germany
11:00-11:25 A Radial Basis Function Partition of Unity Penalty Method for Pricing American Basket Call Options
Victor Shcherbakov and Elisabeth Larsson, Uppsala University, Sweden
11:30-11:55 Fredholm Expansions and Pde Methods Applied to Quadratic Functionals of the OU Process
Hailing Wu and Nicolas Privault, Nanyang Technological University, Singapore
Thursday, November 13

CP4

Options - Part 1
10:00 AM-12:00 PM
Room: LaSalle 3 - 7th Floor
Chair: To Be Determined

10:00-10:25 Return-Volatility Correlation Implied by the Asymmetry in Options Trading Activity
Jungwoo Lee, Yonsei University, South Korea

10:30-10:55 A Model Selection Method for Option Pricing
Berk Orbay, Refik Gullu, and Wolfgang Hormann, Bogazici University, Turkey

11:00-11:25 Efficient Computation of Hedge-Sensitivities Via Automatic Differentiation
Juergen T. Topper, University of Hannover, Germany; Thomas Kaminski, FastOpt, Germany; Michael B. Giles, University of Oxford, United Kingdom

11:30-11:55 Holding Period Information in Options Hedging
Antoine E. Zambelli, University of California, Los Angeles, USA

Thursday, November 13

CP5

Stochastic Control - Part 1
10:00 AM-12:00 PM
Room: LaSalle 2 - 7th Floor
Chair: Chao Zhu, University of Wisconsin, Milwaukee, USA

10:00-10:25 The Optionality of a Financially Constrained Firm
Mingliang Cheng, Geoffrey Evatt, and Paul V. Johnson, University of Manchester, United Kingdom

10:30-10:55 Leveraged Investments and Agency Conflicts When Prices are Mean Reverting
Kristoffer J. Glover and Gerhard Hambusch, University of Technology, Sydney, Australia

11:00-11:25 An Explicit Formula for the Optimal Government Debt Ceiling
Ricardo Huaman-Aguilar and Abel Cadenillas, University of Alberta, Canada

11:30-11:55 On Linear Programing Approach to Inventory Control Problems
Chao Zhu, University of Wisconsin, Milwaukee, USA

Lunch Break
12:00 PM-1:25 PM
Attendees on their own

Welcome Remarks
1:25 PM-1:30 PM
Room: Adams - 6th Floor

Thursday, November 13

IP1

No-arbitrage Under Model Ambiguity and Fundamental Theorems of Asset Pricing
1:30 PM-2:15 PM
Room: Adams - 6th Floor
Chair: Christoph Reisinger, Oxford University, United Kingdom

We will present several recent versions of the Fundamental Theorem of Asset Pricing for discrete and continuous time models under model ambiguity, with and without proportional transaction costs. This talks is based on recent collaborations with S. Biagini, K. Kardaras and M. Nutz.

Bruno Bouchard
Université Paris-Dauphine and ENSAE-ParisTech, Ceremade and Crest, France
IP2

Multi-Period Mean Variance Asset Allocation: Is It Bad To Win the Lottery?
2:15 PM-3:00 PM
Room: Adams - 6th Floor
Chair: Christoph Reisinger, Oxford University, United Kingdom

We present semi-self-financing mean-variance (MV) dynamic asset allocation strategies which are superior to self-financing MV portfolio strategies. Our strategies are built upon a Hamilton-Jacobi-Bellman (HJB) equation approach for the solution of the portfolio allocation problem. Under an HJB framework, our strategies have a simple and intuitive derivation, and can be readily employed in a very general setting, namely continuous or discrete re-balancing, jump-diffusions, and realistic portfolio constraints. MV strategies are often criticized for penalizing the upside as well as the downside. However, under our strategies, the MV portfolio optimization problem can be shown to be equivalent to maximizing the expectation of a well-behaved utility function of the portfolio wealth. We show that, for long term investors, the the use of dynamic MV strategies can achieve the same expected value with a much smaller standard deviation compared to a constant proportions strategy.

Peter Forsyth
University of Waterloo, Canada

Coffee Break
3:00 PM-3:30 PM
Room: Monroe - 6th Floor

MS5
Advanced Numerical Techniques in Financial Mathematics - Part I of II
3:30 PM-5:30 PM
Room: Adams - 6th Floor
For Part 2 see MS30

These two sessions aim to discuss advanced numerical techniques for modern applications in financial mathematics. We will encounter efficient versions of Monte Carlo methods, for stochastic local volatility models, and for Credit Valuation Adjustment (CVA). Regarding PDE techniques we will discuss dimension reduction, spectral methods, discontinuous Galerkin, and also a CVA PDE technique under the Heston model. We have Fourier integration for BSDEs and for the so-called VIX Heston model calibration. Latest results for recent topics in computational finance are thus reported.

Organizer: Cornelis W. Oosterlee
Centrum voor Wiskunde en Informatica (CWI), Netherlands

Organizer: Karel In’t Hout
University of Antwerp, Belgium

3:30-3:55 The Time-Dependent FX-SABR Model: Efficient Calibration based on Effective Parameters
Anthonie W. Van der Stoep, Rabobank International and CWI, The Netherlands

4:00-4:25 The VIX-Heston Model for Asset Liability Management
Stefan Singor, Ortec-Finance, United Kingdom

4:30-4:55 Second Order Weak Taylor Scheme and a Numerical Fourier Method for Backward Sdes
Marjon Ruijter and Kees Oosterlee, CWI, Amsterdam, Netherlands

5:00-5:25 Credit Valuation Adjustment and the Stochastic Grid Bundling Method
Qian Feng, and Cornelis W. Oosterlee, Centrum voor Wiskunde en Informatica (CWI), Netherlands

MS6
Optimal Stopping with Financial Applications
3:30 PM-5:30 PM
Room: Grant Park Parlor - 6th Floor

This minisymposium presents four talks on optimal single/multiple stopping problems in finance. The problem formulations and solution techniques will be relevant to a number of financial applications such as mean-reversion/pairs trading, optimal capital structure, stock loans, and real options.

Organizer: Tim Leung
Columbia University, USA

3:30-3:55 Optimal Multiple Stopping with Random Refraction Times under Levy Models
Hongzhong Zhang, Columbia University, USA

4:00-4:25 Sequential Replacement under Uncertainty in the Population Distribution
Dharma Kwon, University of Illinois at Urbana-Champaign, USA; Steven Lippman, University of California, Los Angeles, USA

4:30-4:55 Optimal Capital Structure with Scale Effects under Spectrally Negative Levy Models
Kazutoshi Yamazaki, Kansai University, Japan; Budhi Surya, Bandung Institute of Technology, Indonesia

5:00-5:25 Optimal Mean Reversion Trading with Transaction Cost & Stop-Loss Exit
Tim Leung, Columbia University, USA
Thursday, November 13

**MS7**

**Optimal Investment with Transaction Costs**
3:30 PM-5:30 PM

*Room:* Hancock Parlor - 6th Floor

The problem of Optimal Investment is fundamental in Mathematical Finance, and frictions make the underlying market model more realistic. One of the most fundamental frictions in the market are transaction costs. In this session, we will present recent developments in optimal investment with transaction costs, as well as with more general price impact models. Particular emphasis is placed on the one hand on elegant conditions for robust no arbitrage in the market and on the other hand on asymptotic techniques that allow us to obtain tractable results as transaction costs become small.

**Organizer:** Maxim Bichuch  
Worcester Polytechnic Institute, USA

**3:30-3:55** Trading with Small Price Impact  
*Johannes Muhle-Karbe, ETH Zürich, Switzerland*

**4:00-4:25** Fundamental Theorem of Asset Pricing under Transaction Costs and Model Uncertainty  
*Erhan Bayraktar, University of Michigan, USA; Yuchong Zhang, University of Michigan, Ann Arbor, USA*

**4:30-4:55** Balancing Small Fixed and Proportional Transaction Cost in Trading Strategies  
*Arash Fahim, Florida State University, USA; Jose Alcala, Universidad Jesuita de Guadalajara, Mexico*

**5:00-5:25** Portfolio Choice with Liquid and Illiquid Assets  
*Maxim Bichuch, Worcester Polytechnic Institute, USA; Paolo Guasoni, Boston University, USA*

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Thursday, November 13

**MS8**

**Dynamic Risk and Performance Measures and Related Fields - Part I of II**
3:30 PM-5:30 PM

*Room:* Water Tower Parlor - 6th Floor

**For Part 2 see MS11**

The focus of this minisymposium will be on the recent theoretical and practical developments in the areas of risk and performance measures. Specifically, the emphasis will be put on the theory and applications of dynamic risk measures and dynamic performance measures, whose importance and use in financial and insurance industries is unquestionable. The talks will be presented by the following renowned experts in these areas.

**Organizer:** Tomasz Bielecki  
Illinois Institute of Technology, USA

**Organizer:** Igor Cialenco  
Illinois Institute of Technology, USA

**Organizer:** Marco Maggis  
Milano University, Italy

**Organizer:** Antonis Papapantoleon  
TU Berlin, Germany

**3:30-3:55** Market Making Via Acceptability Indices  
*Igor Cialenco, Illinois Institute of Technology, USA*

**4:00-4:25** Price and Risk in Discrete Time Market Models Subject to Model Misspecification  
*Marco Maggis, Milano University, Italy*

**4:30-4:55** A Robust Fundamental Theorem of Asset Pricing in Continuous Time  
*Patrick Cheridito, Princeton University, USA; Michael Kupper and Ludovic Tangpi, Universität Konstanz, Germany*

**5:00-5:25** Distribution Based Risk Measures and Their Implementation  
*Stefan Weber, Leibniz Universität Hannover, Germany*

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Thursday, November 13

**MS9**

**Liquidity Risk in a System Context**
3:30 PM-5:30 PM

*Room:* Millennium Parlor - 6th Floor

In today’s complex financial systems, liquidity risk and systemic risk cannot be disentangled. We explore how systemic risk emerges from the collective behavior of the market participants that face liquidations constraints. Three viewpoints area taken: a network approach with applications to over-the-counter markets, a price formation model approach in which assets are endogenously correlated in periods of mass liquidations and a mean field games approach.

**Organizer:** Andreea Minca  
Cornell University, USA

**3:30-3:55** Systemic Risk with Central Counterparty Clearing  
*Hamed Amini, Swiss Finance Institute, École Polytechnique Fédérale de Lausanne, Switzerland*

**4:00-4:25** Institutional Investors and the Dependence Structure of Asset Returns  
*Lakshithe Wagalath, IESEG School of Management, France*

**4:30-4:55** Welfare Analysis of Dark Pools  
*Krishnamurthy Iyer, Cornell University, USA; Ramesh Johari, Stanford University, USA; Ciamac C. Moallemi, Columbia University, USA*

**5:00-5:25** Networks of Overlapping Portfolios: Aggregation and Measures of Vulnerability  
*Anton Braverman and Andreea Minca, Cornell University, USA*
MS10
Mean-field Games Modeling in Economy and Finance
3:30 PM-5:00 PM
Room: LaSalle 1 - 7th Floor
This minisymposium will be a continuation of the one submitted on large population stochastic control. It will more specifically focus on mean-field games. Mean-field games theory was introduced in 2006 by Lasry and Lions and by Huang, Caines and Malhamé as a way to describe consensus among population of individuals submitted to cost constraints. Various applications appear in economy, finance and engineering. Speakers of the session will discuss some of these applications by considering several advanced examples of modeling in economy and finance.
Organizer: François Delarue
Université de Nice, Sophia Antipolis, France
3:30-3:55 On the Connection Between Mean Field Games and Symmetric N-Player Games
Markus Fischer, University of Padua, Italy
4:00-4:25 Wealth Distribution and the Business Cycle: The Role of Private Firms
Yves Achdou, University of Paris VII, France; Jean-Michel Lasry, University of Paris, Dauphine, France; Pierre-Louis Lions, Collège de France, France; Benjamin Moll, Princeton University, USA
4:30-4:55 Mean Field Games with Major and Minor Players
Geoffrey Zhu, Princeton University, USA

Thursday, November 13
CP7
Options - Part 2
3:30 PM-5:30 PM
Room: LaSalle 3 - 7th Floor
Chair: Hongzhong Zhang, Columbia University, USA
3:30-3:55 Pricing and Hedging Exotic Options with Transaction Cost under Jump-Diffusion Process
Waseem A. Khan, Sukkur Institute of Business Administration, Pakistan; Mohammad Rasras and Abdul Khaliq, Middle Tennessee State University, USA; Mohammad Yousuf, King Fahd University of Petroleum and Minerals, Saudi Arabia
4:00-4:25 Convergence of Monte-Carlo Computation on Various Exotic Options
Qingshuo Song, City University of Hong Kong, Hong Kong
4:30-4:55 Gaussian Markov Processes and Option Pricing Theory
Mackenzie Wildman, Vladimir Dobric, and Daniel Conus, Lehigh University, USA
5:00-5:25 Optimal Multiple Stopping with Negative Discount Rate and Random Refraction Times under Lévy Models
Tim Leung, Columbia University, USA; Kazutoshi Yamazaki, Kansai University, Japan; Hongzhong Zhang, Columbia University, USA
Thursday, November 13

**CP8**

**Systemic Risk**

3:30 PM-5:30 PM

Room: LaSalle 5 - 7th Floor

Chair: Yuanying Guan, Indiana University, USA

3:30-3:55 Systemic Risk with Jump-Diffusion Processes

Yi-Tai Chiu and Jean-Pierre Fouque, University of California, Santa Barbara, USA

4:00-4:25 Dynamics of Trust in Networks and Systemic Risk

Joao Da Gama Batista, Ecole Centrale Paris, France; Jean-Philippe Bouchaud, Capital Fund Management, France; Damien Challet, Ecole Centrale Paris, France

4:30-4:55 Optimal Capital Reserve Strategies for a Bank and Its Regulator

Geoff Evatt, University of Manchester, United Kingdom

5:00-5:25 Financial Contagion with Heterogeneous Link-Weight Distributions

Yuanying Guan and Micah Pollak, Indiana University, USA

**Intermission**

5:30 PM-5:45 PM

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Thursday, November 13

**IP3**

**Bid-Ask Imbalance and Trade Arrival Modeling**

5:45 PM-6:30 PM

Room: Adams - 6th Floor

Chair: Sebastian Jaimungal, University of Toronto, Canada

We consider the dynamics of trade arrivals and best bid and ask order sizes in an electronic limit order book. The joint evolution of these events is described by a three-dimensional diffusion model. We show how to construct semi-analytical solutions for the probability of price movement prior to the arrival of an aggressive market order. Finally, we calibrate the model to empirical limit order book data and discuss how it can be used to optimize order execution at the tactical level.

Michael Sotiropoulos

Bank of America Merrill Lynch, USA

**Welcome Reception**

6:30 PM-8:30 PM

Room: Monroe - 6th Floor

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Friday, November 14

**Registration**

8:00 AM-3:30 PM

Room: Registration Counter - 6th Floor
MS11
Dynamic Risk and Performance Measures and Related Fields - Part II of II
8:30 AM-10:30 AM
Room: Water Tower Parlor - 6th Floor
For Part 1 see MS8
The focus of this minisymposium will be on the recent theoretical and practical developments in the areas of risk and performance measures. Specifically, the emphasis will be put on the theory and applications of dynamic risk measures and dynamic performance measures, whose importance and use in financial and insurance industries is unquestionable. The talks will be presented by the following renowned experts in these areas.
Organizer: Tomasz Bielecki
Illinois Institute of Technology, USA
Organizer: Igor Cialenco
Illinois Institute of Technology, USA
Organizer: Marco Maggis
Milano University, Italy
Organizer: Antonis Papapantoleon
TU Berlin, Germany
8:30-8:55 A Fourier Approach to the Computation of Risk Measures
Antonis Papapantoleon, TU Berlin, Germany
9:00-9:25 On the Model-free Hedging Duality
Michael Kupper, Universität Konstanz, Germany
9:30-9:55 Correspondence Between Dynamic Quasi Concave Performance Measures and Parametric Families of Dynamic Risk Measures
Jocelyne Bion-Nadal, CMAP, Ecole Polytechnique, France
10:00-10:25 A Recursive Algorithm for Dynamic Multivariate Risk Measures and a Set-Valued Bellman’s Principle
Birgit Rudolff, Princeton University, USA; Zachary Feinstein, Washington University in St. Louis, USA

MS12
Mean Field Games - Part I of II
8:30 AM-10:30 AM
Room: Adams - 6th Floor
For Part 2 see MS32
Recent developments in the theory and applications of Mean Field Games (MFG)
Organizer: Rene Carmona
Princeton University, USA
8:30-8:55 The Master Equation of Mean Field Games and Controlled McKean-Vlasov Dynamics
Rene Carmona, Princeton University, USA
9:00-9:25 Coalescence of Hysteresis in a Large Population: Mean Field Stackelberg Games
S.C.P Yam, The Chinese University of Hong Kong, Hong Kong
9:30-9:55 Mean Field Games with Congestion
Diogo Gomes, King Abdullah University of Science & Technology (KAUST), Saudi Arabia
10:00-10:25 Linear-Quadratic Optimal Control Problems for Mean-Field Stochastic Differential Equations --- Time-Consistent Solutions
Jiongmin Yong, University of Central Florida, USA

MS13
Recent Progress in Equilibrium Theory
8:30 AM-10:30 AM
Room: LaSalle 1 - 7th Floor
This minisymposium focuses on recent developments in equilibrium models with multiple interacting agents. Special emphasis is placed on models with market incompleteness, price impact, and relative preference. These problems are important in economics and have also gain significant interest in math finance community. Some of these problems are mathematically tremendously complex and have remained almost untouched for two decades. Several progresses have been made in recent years by speakers in this minisymposium, using similar mathematical tools: analysis of systems of PDE/BSDE with nonlinearity in first order terms. These results also help to study several long standing open problems in BSDEs.
Organizer: Hao Xing
London School of Economics and Political Science, United Kingdom
8:30-8:55 Various Aspects of Incomplete Equilibrium Theory
Kasper Larsen, Carnegie Mellon University, USA
9:00-9:25 Existence of Close to Pareto Optimal Incomplete Radner Equilibrium
Hao Xing and Kostas Kardaras, London School of Economics and Political Science, United Kingdom; Gordan Zitkovic, University of Texas at Austin, USA
9:30-9:55 Finding Local Equilibria by Splitting Multidimensional BSDEs
Christoph Frei, University of Alberta, Canada
10:00-10:25 Quadratic BSDEs Arising from a Price Impact Model with Exponential Utility
Sergio Pulido, EPFL, Switzerland; Dmitriy Kramkov, Carnegie Mellon University, USA
MS14
Counterparty Risk, Liquidity and Funding - Part I of II
8:30 AM-10:30 AM
Room:Grant Park Parlor - 6th Floor
For Part 2 see MS34
The importance and complexity of the counterparty credit risk (CCR) and funding biases has been brought to the forefront of financial risk management by the developments surrounding the credit crisis 2008-2010. This led to explosion of research work that was devoted to theoretical and practical aspects of the CCR and multiple funding curves, and their relation to the systemic risk. This minisymposium will focus on presentation of the recent developments in this area, presented by the leading researchers from academia and from financial industry.
Organizer: Tomasz Bielecki
Illinois Institute of Technology, USA
Organizer: Igor Cialenco
Illinois Institute of Technology, USA
Organizer: Stephane C. Crepey
Evry University, France
8:30-8:55 Valuation and Hedging of Contracts with Funding Costs and Collateralization
Marek Rutkowski, University of Sydney, Australia; Tomasz Bielecki, Illinois Institute of Technology, USA
9:00-9:25 Underexposed Risk Snapshots - The Dangers of Risk-Neutral Exposures
Harvey Stein, Bloomberg LP, USA
8:30-8:55 Dynamic Replication Strategies under Funding and Collateral Costs
Stephan Sturm, Worcester Polytechnic Institute, USA; Agostino Capponi, Johns Hopkins University, USA
10:00-10:25 Efficient Options Pricing under Levy Processes with CVA and FVA
Justin Shek, Bank of China International, Hong Kong; Sergei Levendorskii, University of Leicester, United Kingdom

MS15
Systemic and Liquidity Risk
8:30 AM-10:30 AM
Room:Hancock Parlor - 6th Floor
Systemic and liquidity risk have been at the heart of policy debates aiming at stabilizing the financial system. The intricate nature of linkages connecting economic sectors can cause wide propagation of shocks throughout the system, and generate large number of default related losses. This session aims at presenting recent developments by leading experts. The talks will illustrate the effect of preventive policies, such as those enforcing capital-to-asset ratio constraints, on asset prices. They will discuss how contagion effects may arise through balance sheet linkages, and illustrate how systematic effects may generate large losses in heterogeneous portfolios. Signal processing techniques will be introduced to analyze the impulse response of economic variables to fundamental shocks.
Organizer: Agostino Capponi
Johns Hopkins University, USA
8:30-8:55 Price Contagion Through Balance Sheet Linkages
Agostino Capponi, Johns Hopkins University, USA; Martin Larsson, Cornell University, USA
9:00-9:25 A Structural Model for Asset Price Contagion and Systemic Risk
Ciamac C. Moallemi, Columbia University, USA; Chen Chen, University of California, Berkeley, USA; Garud Iyengar, Columbia University, USA
Stefano Giglio and Bryan Kelly, The University of Chicago, USA; Seth Pruitt, Arizona State University, USA
10:00-10:25 Large Portfolio Asymptotics and Fluctuation Analysis for Losses from Default
Konstantinos Spiliopoulos, Brown University, USA

MS16
Asymptotic Methods in Continuous-Time Models with Jumps
8:30 AM-10:30 AM
Room:LaSalle 2 - 7th Floor
Asymptotic methods have become some of the most useful tools in mathematical finance. The applications are many, ranging from high-frequency nonparametric methods to short-time characterizations of option prices, and more. These methods are particularly crucial to deal with models with jumps due to the lack of tractable formulas and efficient computational/statistical methods for option prices, distributions, and volatility/covariance estimators. The minisymposium brings together leading researchers to present recent advances in selected problems of financial mathematics in which asymptotic methods are critical for their solutions.
Organizer: Jose E. Figueroa-Lopez
Purdue University, USA
8:30-8:55 Optimally Thresholded Realized Power Variations for Levy Jump Diffusion Models
Jose E. Figueroa-Lopez and Jeff Nisen, Purdue University, USA
9:00-9:25 Convergence Rate of the Truncated Realized Covariance When Prices Have Infinite Variation Jumps
Cecilia Mancini, University of Florence, Italy
9:30-9:55 Short-Time Expansions for Close-to-the-Money Options under a Levy Jump Model with Stochastic Volatility
Sveinn O. Olafsson, Purdue University, USA
10:00-10:25 Asymptotic Methods for Portfolio Risk Management
Peter Tankov, Université Paris-Diderot, France
Friday, November 14

**CP9**

**High-Frequency Markets**  
8:30 AM-10:30 AM  
Room: Millennium Plenum - 6th Floor  
Chair: Amirhossein Sadoghi, Frankfurt School of Finance and Management, Germany and Linköping University, Sweden  
8:30-8:55 Optimal Liquidation in Limit Order Books under General Uncertainties  
James Blair, Paul V. Johnson, and Peter Duck, University of Manchester, United Kingdom  
9:00-9:25 Long-Run Price Dynamics under a Level-1 Lob with Memory and Variable Spread  
Jonathan A. Chávez Casillas and José Figueroa-López, Purdue University, USA  
9:30-9:55 A Stochastic Free Boundary Problem and Limit Order Book Model  
Marvin Mueller, TU Dresden and TU Berlin, Germany; Martin Keller-Ressel, TU Dresden, Germany  
10:00-10:25 Optimum Strategy in Market Order Execution Associated with the Poisson Cluster Process  
Amirhossein Sadoghi, Frankfurt School of Finance and Management, Germany and Linköping University, Sweden; Jan Vecer, Columbia University, USA

**CP10**

**Risk Measures**  
8:30 AM-10:30 AM  
Room: LaSalle 3 - 7th Floor  
Chair: Dan Ren, University of Dayton, USA  
8:30-8:55 Set-valued Shortfall Risk Measures for Multi-asset Markets  
Cagin Ararat and Birgit Rudloff, Princeton University, USA; Andreas Hamel, Free University of Bolzen-Bolzano, Italy  
9:00-9:25 Dynamic Optimal Portfolio Choices for Robust Preferences  
Jingshu Liu and Marcel Rindisbacher, Boston University, USA  
9:30-9:55 Classical Differentiability of BSvies and Dynamic Capital Allocations  
Ludger Overbeck, University of Giessen, Germany  
10:00-10:25 Shortfall Aversion  
Paolo Guasoni, Boston University, USA; Gur Huberman, Columbia Business School, USA; Dan Ren, University of Dayton, USA

**CP11**

**Stochastic Volatility - Part 1**  
8:30 AM-10:00 AM  
Room: LaSalle 5 - 7th Floor  
Chair: Yeliz Yolcu Okur, Middle East Technical University, Turkey  
8:30-8:55 A Fast Calibrating Volatility Model for Option Pricing  
Paresh Date, Brunel University, United Kingdom  
9:00-9:25 The Small Maturity Implied Volatility Slope for Levy Models  
Stefan Gerhold, Technische Universität Wien, Germany; Ismail Gülüm, TU Wien, Austria  
9:30-9:55 Computation of the Delta of European Options under Stochastic Volatility Models  
Yeliz Yolcu Okur, Bilgi Yilmaz, and Alper Inkaya, Middle East Technical University, Turkey; Tilman Sayer, Fraunhofer Institute for Industrial Mathematics, Germany  
10:00-10:25 Tax-Aware Dynamic Asset Allocation  
Martin B. Haugh, Garud N. Iyengar, and Chun Wang, Columbia University, USA

**Coffee Break**  
10:30 AM-10:55 AM  
Room: Monroe - 6th Floor
Friday, November 14
Announcements
10:55 AM-11:00 AM
Room: Adams - 6th Floor

IP4
Robust Meets Realistic: Interpolating Between Model-Specific and Model-Free Settings for Pricing and Hedging
11:00 AM-11:45 AM
Room: Adams - 6th Floor
Chair: Ronnie Sircar, Princeton University, USA

Classical models in mathematical finance, even if highly complex, typically share important methodological weaknesses: failure to account for model uncertainty and failure to incorporate market information in a consistent manner. In the wake of financial crisis these have been much debated. In response, an increasingly active field of research focuses on model-free super/sub-hedging using the underlying and Vanilla options. Explicit results often rely on pathwise inequalities and embedding techniques while pricing-hedging duality is obtained using martingale optimal transport methods. However, the resulting prices and hedges are often too expensive to be practically relevant. In this talk I show how to interpolate between the two worlds. I argue that quoted option prices should be incorporated through distributional constraints while beliefs, or past data, are most naturally included through pathwise restrictions. The resulting framework is robust and flexible. It allows for realistic outputs while quantifying the impact of making assumptions. I will present abstract results about pricing-hedging duality and then discuss examples of restrictions on future realised volatility and future option prices. Based on joint works with Sergey Nadtochiy (University of Michigan) and Zhaoxu Hou and Peter Spoida (University of Oxford).

Jan Obloj
Oxford University, United Kingdom

Friday, November 14
IP5
Long-Term Valuation and Misspecified Recovery
11:45 AM-12:30 PM
Room: Adams - 6th Floor
Chair: Ronnie Sircar, Princeton University, USA

Asset prices contain information about the probability distribution of future states and the stochastic discounting of those states. The stochastic discounting encodes market prices for the exposure of cash flows to uncertainty at alternative investment horizons. We represent asset valuation as a semigroup of valuation operators indexed by the investment horizon. This approach allows us to apply a generalization of Perron-Frobenius theory to characterize asset valuation. We use this theory to extract a martingale component to a stochastic discount factor process that reveals the durable contributions to risk pricing. The martingale induces a change of measure that is useful in understanding the determinants to valuation. It reflects long-term uncertainty in the underlying macroeconomy and investor concerns about future growth prospects. We describe methods for quantifying the importance of this martingale component. Other researchers have assumed this component to be degenerate, but we show that this assumption may result in the misspecified recovery of investor beliefs.

Lars Peter Hansen
The University of Chicago, USA

Friday, November 14
Coffee Break
2:30 PM-3:00 PM
Room: Monroe - 6th Floor

Friday, November 14
Lunch Break
12:30 PM-2:00 PM
Attendees on their own
Large population stochastic control addresses the question of equilibriums within population of interacting agents or particles subject to cost or energy constraints. This research field has been growing fast for the last decade, motivated by various applications in engineering, economy, finance or social sciences. According to the nature of the equilibriums dictated by the modeling, it may refer to the mean-field game theory or to the control theory of McKean-Vlasov diffusion processes. Speakers will discuss some of the nowadays challenges, such as: theoretical results about existence and uniqueness of the equilibriums, numerical results about the approximation of the equilibriums and practical use in modeling.

Organizer: François Delarue
Université de Nice, Sophia Antipolis, France

3:00-3:25 Uniqueness of Random Equilibriums in Large Population Stochastic Control
François Delarue, Université de Nice, Sophia Antipolis, France

3:30-3:55 Mean Field Games Systems with Local Coupling
Jameson Graber, ENSTA ParisTech, France; Pierre Cardaliaguet, University of Paris, Dauphine, France

4:00-4:25 Bertrand & Cournot Mean Field Games
Patrick Chan, Princeton, NJ, USA

3:00-3:25 Risk Measures for Financial Networks
Zachary Feinstein, Washington University in St. Louis, USA

Samim Ghamami, Federal Reserve Bank, USA

4:00-4:25 The Systemic Effects of Benchmarking
Gustavo Schwenkler, Diogo Duarte, and Keith Lee, Boston University, USA

4:25-4:55 Likelihood Inference for Large Financial Systems
Justin Sirignano, Stanford University, USA; Gustavo Schwenkler, Boston University, USA; Kay Giesecke, Stanford University, USA

Friday, November 14
MS18
Statistical Analysis of Risk and Stress Tests for Regulatory Policies - Part I of II
3:00 PM-5:00 PM
Room:Grant Park Parlor - 6th Floor

For Part 2 see MS33
The Basel accords have suggested that VaR be the standard for measuring risk to financial institutions. Specifically, banks are required to keep regulatory capital sufficient to cover losses up to a prescribed quantile in their loss distributions. However, VaR continues to be the measurement of risk even though it has been shown to not encourage diversification in portfolio management. These talks will address various aspects of the regulatory system, such as measurement of risk, systemic risk factors, and statistical analysis of the financial data.

Organizer: Andrew Papanicolaou
University of Sydney, Australia
Organizer: Igor Cialenco
Illinois Institute of Technology, USA

3:00-3:25 Risk Measures for Financial Networks
Zachary Feinstein, Washington University in St. Louis, USA

3:00-3:25 On Additive Subordination with an Application in Cross Commodity Modeling
Lingfei Li, The Chinese University of Hong Kong, Hong Kong; Rafael Mendoza-Arriaga, University of Texas at Austin, USA

3:30-3:55 Modeling Electricity Prices: A Time Change Approach
Rafael Mendoza-Arriaga, University of Texas at Austin, USA; Lingfei Li, The Chinese University of Hong Kong, Hong Kong

4:00-4:25 Ghost Calibration and Pricing Barrier Options and CDSs in Spectrally One-Sided Lévy Models: the Parabolic Laplace Inversion Method
Sergei Levendorskii, University of Leicester, United Kingdom
Friday, November 14

**MS20**

**Robust Hedging and Pricing under Model Uncertainty - Part I of II**

3:00 PM-5:00 PM

Room:Adams - 6th Floor

For Part 2 see MS27

Pricing and hedging under a given model are always subject to the risk of model misspecification. How to price and hedge in a robust manner is therefore of great interest. Based on Skorokhod's embedding, classical methods in this direction rely directly on market data (such as quotes of liquidly traded options), instead of any calibrated model. With the aid of new techniques, including quasi-sure analysis, theory of optimal transport, and stochastic control, we will present new directions toward model-independent pricing, risk measuring, as well as their implications to the lifetime ruin problem.

Organizer: Arash Fahim
Florida State University, USA

Organizer: Yu-Jui Huang
Dublin City University, Ireland

3:00-3:25 Model Uncertainty and Its Impact on the Pricing of Derivative Instruments
Rama Cont, Imperial College of London, United Kingdom

3:30-3:55 Model Uncertainty and Optimal Transport
Marcel Nutz, Columbia University, USA

4:00-4:25 Martingale Optimal Transport in the Skorokhod Space
Yan Dolinsky, Hebrew University of Jerusalem, Israel; Mete Soner, ETH Zürich, Switzerland

4:30-4:55 On Arbitrage and Duality under Model Uncertainty and Portfolio Constraints
Zhou Zhou, University of Michigan, Ann Arbor, USA; Erhan Bayraktar, University of Michigan, USA

Friday, November 14

**MS21**

**Systemic Financial Risk**

3:00 PM-5:00 PM

Room:Millenium Parlor - 6th Floor

The Great Financial Crisis of 2007-09 highlights the need to better understand the behavior of risk in the financial system. This minisymposium will feature talks by advanced graduate students, Postdocs, junior and mid-career faculty from the US and Asia. It is hoped that the talks stimulate further discussion in this important area, and that the talks generate interest in students to take up work in this area.

Organizer: Kay Giesecke
Stanford University, USA

Organizer: Nan Chen
The Chinese University of Hong Kong, Hong Kong

3:00-3:25 Interconnected Balance Sheets, Market Liquidity, and the Amplification Effects in a Financial System
Nan Chen, The Chinese University of Hong Kong, Hong Kong

3:30-3:55 Rehypothecation and Systemic Risk
Alex Shkolnik, Stanford University, USA

4:00-4:25 Information Contagion in Financial Networks
Jennifer La'O, Columbia University, USA; Alireza Tahbaz-Salehi, Columbia Business School, USA

4:30-4:55 Efficient Risk Analysis for Mortgage Pools and Mortgage-backed Securities
Justin Sirignano and Kay Giesecke, Stanford University, USA

Friday, November 14

**MS22**

**Operator Splitting Methods for Pricing Options**

3:00 PM-5:00 PM

Room:LaSalle 2 - 7th Floor

Pricing and hedging European and American options under a jump-diffusion framework requires solving either a parabolic PDE/PIDE or a linear complementarity problem, both with the same jump-diffusion operator. Usually this is computationally expensive. An operator splitting method addresses this by reducing the multi-dimensional solution to a sequence of the lower dimensional ones. For instance, for jump-diffusion models splitting is used to decompose the entire operator into the local and global parts. Either of them could be further directionally decomposed as well. This mini symposium aims to discuss modern results in this area.

Organizer: Andrey Itkin
New York University, USA

Organizer: Jari Toivanen
Stanford University, USA

3:00-3:25 High-Order Splitting Methods for Forward PDEs and PIDEs
Andrey Itkin, New York University, USA; Mohammad Yousuf, King Fahd University of Petroleum and Minerals, Saudi Arabia; Ruihua Liu, University of Dayton, USA

3:30-3:55 Convergence of ADI Schemes for Two-dimensional Convection-diffusion Equations with Mixed Derivative Term
Karel In’t Hout and Maarten Wyns, University of Antwerp, Belgium

4:00-4:25 Efficient Implicit Predictor-Corrector Methods for Pricing American Options under Regime Switching
Abdal M. Khaliq, Middle Tennessee State University, USA; Mohammad Yousuf, King Fahd University of Petroleum and Minerals, Saudi Arabia; Ruihua Liu, University of Dayton, USA

4:30-4:55 Pricing Options under Stochastic Volatility Models with Jumps
Jari Toivanen, Stanford University, USA; Santtu Salmi, University of Jyvaskyla, Finland; Lina von Sydow, Uppsala University, Sweden
Friday, November 14

**MS23**

**Algorithmic Trading - Part I of II**

3:00 PM-5:00 PM

*Room:* Water Tower Parlor - 6th Floor

*For Part 2 see MS25*

In modern electronic markets nearly all trading is executed using an algorithm and a great deal of these algorithms rely on sophisticated mathematical models. This minisymposium brings together some of the cutting edge research papers which explore different topics including: optimal execution, adverse selection, market making, trading with information, LOB dynamics and other aspects of order flow information.

**Organizer:** Alvaro Cartea

University College London, United Kingdom

3:00-3:25 Simulating and Analyzing Order Book Data: The Queue-Reactive Model

Mathieu Rosenbaum, CMAP, Ecole Polytechnique, France

3:30-3:55 When Option Pricing Meets Optimal Execution

Olivier Guéant, Université Paris-Diderot, France

4:00-4:25 Algorithmic Trading with Learning

Damir Kinzebulatov, The Fields Institute, Toronto, Canada

4:30-4:55 Title Not Available at Time of Publication

Sasha F. Stoikov, Cornell University, USA

Friday, November 14

**CP12**

**Commodities**

3:00 PM-5:00 PM

*Room:* LaSalle 3 - 7th Floor

*Chair:* Nina Lange, Copenhagen Business School, Denmark

3:00-3:25 Hedging of Quantity Risk in Energy Markets

Nina Lange, Copenhagen Business School, Denmark; Fred Espen Benth, University of Oslo, Norway

3:30-3:55 Optimal Writing of American Call Options on Electricity with Physical Delivery: A Free Boundary Analysis of Optimal Entry

Jan Palczewski, University of Leeds, United Kingdom; John Moriarty, University of Manchester, United Kingdom

4:00-4:25 Enhancement of Practice-Based Methods for the Real Option Management of Commodity Storage Assets

Nicola Secomandi, Carnegie Mellon University, USA

4:30-4:55 Modeling Risks in Climate Change by Real Option Analysis

Shuhua Zhang, Tianjin University of Finance and Economics, China

Friday, November 14

**CP13**

**Numerical Analysis - Part 2**

3:00 PM-5:00 PM

*Room:* LaSalle 5 - 7th Floor

*Chair:* Abass Sagna, Evry University, France

3:00-3:25 A Grid Based Optimization Algorithm to Select Intertwined Markets That Maximize Trading Returns

Athula D. Gunawardena and William Dougan, University of Wisconsin, Whitewater, USA; Patrick Monaghan, Blackthorne Capital Management, LLC., USA

3:30-3:55 A Second Order Discretization Scheme for the Extended Cox-Ingersoll-Ross Process

Chulmin Kang, National Institute for Mathematical Sciences, Korea

4:00-4:25 Radial Basis Functions Generated Finite Differences (RBF-FD) for Solving High-Dimensional PDEs in Finance

Slobodan Milovanovic and Lina von Sydow, Uppsala University, Sweden

4:30-4:55 Marginal Quantization of An Euler Diffusion Process and Its Application to Finance

Abass Sagna, Evry University, France; Gilles Pagès, Université Paris 6, France

**Intermission**

5:00 PM-5:15 PM

**SIAG/FME Business Meeting**

5:15 PM-6:00 PM

*Room:* Adams - 6th Floor

Complimentary beer and wine will be served.
Saturday, November 15

MS24

Statistical Inference for Continuous-time Models of Asset Prices
8:30 AM-10:30 AM
Room: Grant Park Parlor - 6th Floor
Continuous-time stochastic processes are widely used in finance and economics. They describe the time-series behavior of asset prices, interest and foreign exchange rates, commodity and energy prices, default rates, and other economic factors. In spite of their popularity, statistical inference is often challenging. This minisymposium will present new developments in the field of statistical inference for continuous-time models in finance. Our goal is to give researchers from different fields an opportunity to discuss new approaches and techniques.

Organizer: Gustavo Schwenkler
Boston University, USA

Organizer: Kay Giesecke
Stanford University, USA

8:30-8:55 Simulated Likelihood Estimators for Discretely Observed Jump-Diffusions
Kay Giesecke, Stanford University, USA; Gustavo Schwenkler, Boston University, USA

9:00-9:25 Assessment of Uncertainty in High Frequency Data: The Observed Asymptotic Variance
Per Mykland, The University of Chicago, USA; Lan Zhang, University of Illinois at Chicago, USA

9:30-9:55 Parametric Inference and Dynamic State Recovery from Option Panels
Torben G. Andersen, Northwestern University, USA

10:00-10:25 Nonparametric Tests for Constant Betas in Jump-Diffusions
Viktor Todorov, Northwestern University, USA

Saturday, November 15

MS25

Algorithmic Trading - Part II of II
8:30 AM-10:30 AM
Room: Water Tower Parlor - 6th Floor
For Part 1 see MS23
In modern electronic markets nearly all trading is executed using an algorithm and a great deal of these algorithms rely on sophisticated mathematical models. This minisymposium brings together some of the cutting edge research papers which explore different topics including: optimal execution, adverse selection, market making, trading with information, LOB dynamics and other aspects of order flow information.

Organizer: Alvaro Cartea
University College London, United Kingdom

8:30-8:55 Volume Imbalance and Algorithmic Trading
Ryan Donnelly, University of Toronto, Canada

9:00-9:25 Optimal Execution and Order Flow Imbalance
Michael Ludkovski, University of California, Santa Barbara, USA; Kyle Bechler, University of California, Santa Barbara, USA

9:30-9:55 The Self-Financing Condition for High Frequency Trading
Rene Carmona, Princeton University, USA; Kevin Webster, Independent Researcher

10:00-10:25 Robust Market Making
Alvaro Cartea, University College London, United Kingdom

Saturday, November 15

MS26

Spectral and Transform Methods in Finance - Part II of II
8:30 AM-10:30 AM
Room: Millennium Parlor - 6th Floor
For Part 1 see MS19
Spectral and Transform methods play a very important role in Mathematical Finance. This session focuses on recent theoretical advances in these methods as well as their applications to modeling and derivative pricing in a variety of markets, including interest rates, credit, electricity and commodities.

Organizer: Rafael Mendoza-Arriaga
University of Texas at Austin, USA

Organizer: Lingfei Li
The Chinese University of Hong Kong, Hong Kong

8:30-8:55 A Martingale Approach to Long Term Risk and Ross Recovery: Theory
Vadim Linetsky, Northwestern University, USA

9:00-9:25 A Martingale Approach to Long Term Risk and Ross Recovery: Examples
Likuan Qin and Vadim Linetsky, Northwestern University, USA

9:30-9:55 Sticky Reflecting Ornstein-Uhlenbeck Processes and Interest Rate Modeling with Zero Lower Bound
Yutian Nie, Northwestern State University, USA; Vadim Linetsky, Northwestern University, USA

10:00-10:25 A Class of Distributions with Analytic Characteristic Functions
Liming Feng, University of Illinois at Urbana-Champaign, USA
### Saturday, November 15

#### MS27
**Robust Hedging and Pricing under Model Uncertainty - Part II of II**

**8:30 AM-10:30 AM**

**Room:** LaSalle 1 - 7th Floor

**For Part 1 see MS20**

Pricing and hedging under a given model are always subject to the risk of model misspecification. How to price and hedge in a robust manner is therefore of great interest. Based on Skorokhod’s embedding, classical methods in this direction rely directly on market data (such as quotes of liquidly traded options), instead of any calibrated model. With the aid of new techniques, including quasi-sure analysis, theory of optimal transport, and stochastic control, we will present new directions toward model-independent pricing, risk measuring, as well as their implications to the lifetime ruin problem.

**Organizer:** Arash Fahim  
*Florida State University, USA*

**Organizer:** Yu-Jui Huang  
*Dublin City University, Ireland*

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<th>Time</th>
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<tr>
<td>8:30-8:55</td>
<td>Optimal Transport and Skorokhod Embedding</td>
<td>Mathias Beiglböck, University of Vienna, Austria</td>
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<tr>
<td>9:00-9:25</td>
<td>Model-Independent Hedging under Portfolio Constraints</td>
<td>Arash Fahim, Florida State University, USA; Yu-Jui Huang and Yu-Jui Huang, Dublin City University, Ireland</td>
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<tr>
<td>9:30-9:55</td>
<td>Quantile Hedging in a Semi-Static Market with Model Uncertainty</td>
<td>Gu Wang and Erhan Bayraktar, University of Michigan, USA</td>
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<td>10:00-10:25</td>
<td>Minimizing the Probability of Lifetime Ruin Under Ambiguity Aversion</td>
<td>Yuchong Zhang, University of Michigan, Ann Arbor, USA; Erhan Bayraktar, University of Michigan, USA</td>
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#### MS28
**Monte Carlo Methods in Finance**

**8:30 AM-10:30 AM**

**Room:** Hancock Parlor - 6th Floor

The minisymposium will explore new directions and developments in Monte Carlo techniques in financial mathematics, especially in the context of stochastic control and sensitivity analysis.

**Organizer:** Michael Ludkovski  
*University of California, Santa Barbara, USA*

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<td>8:30-8:55</td>
<td>Improved Greeks for American Options Using Simulation</td>
<td>Lars Stentoft, Western University, Canada</td>
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<tr>
<td>9:00-9:25</td>
<td>Rare Event Simulations using shaking transformations on stochastic processes</td>
<td>Emmanuel Gobet, and Gang Liu, Ecole Polytechnique, France</td>
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<tr>
<td>9:30-9:55</td>
<td>An Iterative Simulation Approach for Solving Stochastic Control Problems in Finance</td>
<td>Chunyu Yang, BI Norwegian Business School, Norway; Stathis Tompaidis, University of Texas at Austin, USA</td>
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<tr>
<td>10:00-10:25</td>
<td>Global Ranking Problems, Sequential Design and Applications to Real Options</td>
<td>Ruimeng Hu, and Michael Ludkovski, University of California, Santa Barbara, USA</td>
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#### MS29
**Forward Asset Allocation**

**8:30 AM-10:30 AM**

**Room:** Adams - 6th Floor

The talks in this minisymposium will include results on optimal investments, turnpike problems and portfolio construction under market uncertainty under the new class of the so called forward performance criteria. These criteria complement the classical ones while offering flexibility with respect to investment horizons, market views and benchmarking.

**Organizer:** Thaleia Zariphopoulou  
*University of Texas at Austin, USA*

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<tr>
<td>8:30-8:55</td>
<td>Predictable Investment Preferences: The Binomial Model</td>
<td>Xunyu Zhou, University of Oxford, United Kingdom</td>
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<td>9:00-9:25</td>
<td>Time-reversed HJB Equations</td>
<td>Emmanuel Gobet, and Gang Liu, Ecole Polytechnique, France</td>
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<tr>
<td>9:30-9:55</td>
<td>The Robust Forward Criteria: Forward Performance Processes Under Model Uncertainty</td>
<td>Chenyang Lu, and Michael Ludkovski, University of California, Santa Barbara, USA</td>
</tr>
<tr>
<td>10:00-10:25</td>
<td>Predictable Investment Preferences (Part II)</td>
<td>Thaleia Zariphopoulou, University of Texas at Austin, USA</td>
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Saturday, November 15

CP14
Insurance
8:30 AM-10:00 AM
Room: LaSalle 5 - 7th Floor
Chair: Jungmin Choi, East Carolina University, USA
8:30-8:55 Indifference Pricing of Variable Annuities
Jungmin Choi, East Carolina University, USA
9:00-9:25 Regression-based Monte Carlo Methods for Stochastic Control Models: Variable Annuities with Lifelong Guarantees
Yao Tung Huang and Yue Kuen Kwok, Hong Kong University of Science and Technology, Hong Kong
9:30-9:55 Constant Proportion Portfolio Insurance in Defined Contribution Pension Plan Management
Busra Z. Temocin, Middle East Technical University, Turkey; Ralf Korn, University of Kaiserslautern, Germany; Sevtap Kestel, Middle East Technical University, Turkey

CP15
Stochastic Control - Part 2
8:30 AM-10:00 AM
Room: LaSalle 2 - 7th Floor
Chair: Li-Hsien Sun, University of California, Santa Barbara, USA
8:30-8:55 Equilibrium in Risk Sharing Games
Michail Anthropelos, University of Piraeus, Greece; Constantinos Kardaras, London School of Economics, United Kingdom
9:00-9:25 Asymptotics for Merton Problem with Capital Gain Taxes and Small Interest Rate
Min Dai, National University of Singapore, Republic of Singapore
9:30-9:55 Mean Field Games and Systemic Risk: Heterogeneous Grouping Models
Li-Hsien Sun and Jean-Pierre Fouque, University of California, Santa Barbara, USA

CP16
Stochastic Volatility - Part 2
8:30 AM-10:30 AM
Room: LaSalle 3 - 7th Floor
Chair: Hongtao Yang, University of Nevada, Las Vegas, USA
8:30-8:55 Volatility, Risk-Premiums and Feedback Effect
Alper Inkaya, Middle East Technical University, Turkey
9:00-9:25 Asian Option Pricing Using Mellin Transform for BN-S Models with Stochastic Volatility
Indranil Sengupta, North Dakota State University, USA
9:30-9:55 Resolution of Policy Uncertainty and Sudden Declines in Volatility
Dacheng Xiu, University of Chicago, USA; Dante Amengual, Center for Monetary and Financial Studies, Spain
10:00-10:25 Market Option Prices and the Informational Consistency
Hongtao Yang and Seungmook Choi, University of Nevada, Las Vegas, USA

Coffee Break
10:30 AM-11:00 AM
Room: Monroe - 6th Floor
IP6
Moral Hazard in Dynamic Risk Management
11:00 AM-11:45 AM
Room: Adams - 6th Floor
Chair: Erhan Bayraktar, University of Michigan, USA

We consider a contracting problem in which a principal hires an agent to manage a risky project. When the agent chooses volatility components of the output process and the principal observes the output continuously, the principal can compute the quadratic variation of the output, but not the individual components. This leads to moral hazard with respect to the risk choices of the agent. Using a recent theory of singular changes of measures for Ito processes, we formulate a principal-agent problem in this context, and solve it in the case of CARA preferences. In that case, the optimal contract is linear in these factors: the contractible sources of risk, including the output, the quadratic variation of the output and the cross-variations between the output and the contractible risk sources. Thus, path-dependent contracts naturally arise when there is moral hazard with respect to risk management. We also provide comparative statics via numerical examples, showing that the optimal contract is sensitive to the values of risk premia and the initial values of the risk exposures.

Jakša Cvitanic
California Institute of Technology, USA

IP7
Adaptive Grids in Regression Monte Carlo
11:45 AM-12:30 PM
Room: Adams - 6th Floor
Chair: Erhan Bayraktar, University of Michigan, USA

Regression Monte Carlo has been enormously successful in numerical solution of optimal stopping problems. It relies on the statistical tool of regression and the probabilistic idea of a stochastic mesh to construct an approximate stopping strategy. While the former has been extensively investigated, grid placement is typically prescribed by a basic simulation of underlying state process. We discuss the associated layers of inefficiency and introduce adaptive generation of these grids using sequential design schemes. This accomplishes active learning of the classifiers partitioning the state space into the continuation and stopping regions. As we show, adaptive refinement of the grids around the stopping boundaries can achieve an order of magnitude savings in gridding budgets. Moreover, sequential design opens the door for other statistical approaches, including Bayesian methods, kriging, and multi-armed bandits for this class of control problems. We examine dynamic regression algorithms that can implement such recursive estimation of the stopping strategy, and present several numerical examples in the context of multi-dimensional Bermudan option pricing.

Mike Ludkovski
University of California, Santa Barbara, USA

IP8
The Value of Being Lucky: Option Backdating and Non-diversifiable Risk
2:00 PM-2:45 PM
Room: Adams - 6th Floor
Chair: Peter Tankov, Université Paris-Diderot, France

The practice of executives influencing their option compensation by setting a grant date retrospectively is known as backdating. Since these options are usually granted at-the-money, selecting an advantageous grant date will be valuable to the executive. There is substantial evidence that backdating took place in the US, particularly prior to the tightening of SEC reporting requirements. In this talk, we develop and solve a utility-indifference model to quantify the value of the opportunity to backdate options. We show that the magnitude of ex ante gains from backdating is significant. Our model can be used to explain why backdating was more prevalent at firms with highly volatile stock prices. Joint work with Jia Sun (China Credit Ratings) and Elizabeth Whalley (Warwick Business School)

Vicky Henderson
University of Warwick, United Kingdom

Lunch Break
12:30 PM-2:00 PM
Attendees on their own

SIAG/FME Conference Paper Prize Session
12:30 PM - 2:00 PM
Adams-6th Floor
Saturday, November 15

IP9

The Value of Queue Position in a Limit Order Book
2:45 PM-3:30 PM
Room: Adams - 6th Floor
Chair: Peter Tankov, Université Paris-Diderot, France

Many financial markets are organized as electronic limit order books operating under a price-time priority rule. In practice, this creates a technological arms among high-frequency traders to establish advantageous early positions in the resulting FIFO queue. We develop a model for valuing orders based on their queue position that identifies two components of positional value: a static component that relates to the instantaneous trade-off between earning a spread and incurring adverse selection costs; and a dynamic component that captures future value that accrues by locking in given queue position. We empirically calibrated and test the model. Joint work with Kai Yuan (Columbia)

Ciamac C. Moallemi
Columbia University, USA

Coffee Break
3:30 PM-4:00 PM
Room: Monroe - 6th Floor

Saturday, November 15

MS30

Advanced Numerical Techniques in Financial Mathematics - Part II of II
4:00 PM-6:00 PM
Room: LaSalle 1 - 7th Floor
For Part 1 see MS5

These two minisymposia aim to discuss advanced numerical techniques for modern applications in financial mathematics. We will encounter efficient versions of Monte Carlo methods, for stochastic local volatility models, and for Credit Valuation Adjustment (CVA). Regarding PDE techniques we will discuss dimension reduction, spectral methods, discontinuous Galerkin, and also a CVA PDE technique under the Heston model. We have Fourier integration for BSDEs and for the so-called VIX Heston model calibration. Latest results for recent topics in computational finance are thus reported.

Organizer: Cornelis W. Oosterlee
Centrum voor Wiskunde en Informatica (CWI), Netherlands

Organizer: Karel In ’t Hout
University of Antwerp, Belgium

4:00-4:25 Dimension Reduction Techniques in Space and Discontinuous Galerkin in Time to Price High-Dimensional Options
Lina von Sydow, Uppsala University, Sweden; Erik Lehto, Royal Institute of Technology, Stockholm, Sweden; Paria Ghafari and Mats Wångersjö, Uppsala University, Sweden

4:30-4:55 A New Hybrid Monte Carlo-Finite Difference Method to Obtain Counterparty Exposure Profiles and Sensitivities
Kees de Graaf, University of Amsterdam, The Netherlands; Drona Kandhai, University of Amsterdam and ING Bank, The Netherlands; Peter Sloot, University of Amsterdam, The Netherlands

5:00-5:25 A Robust Spectral Method for Pricing Options under Local Volatility
Pindza Edson, Kailash C. Patidar, and Edgard Ngounda, University of the Western Cape, South Africa

5:30-5:55 On the Sensitivity of Calibrated American Put Values to Short Rate Volatility
Aleksey Polishchuk, Bloomberg LP, USA

continued in next column
Saturday, November 15
MS31
Asymptotics in Finance
4:00 PM-5:30 PM
Room: Hancock Parlor - 6th Floor
Asymptotic analyses have contributed to our understanding of the limiting behaviors of prices in financial markets. This session features applications to derivative contracts.
Organizer: Roger Lee
University of Chicago, USA
4:00-4:25 Explicit Implied Vols for Multifactor Local-Stochastic Vol Models
Matthew Lorig, University of Washington, USA; Stefano Pagliarani, Ecole Polytechnique, France; Andrea Pascucci, Università di Bologna, Italy
4:30-4:55 Convergence of the Discrete Variance Swap in Time-Homogeneous Diffusion Models
Carole Bernard, University of Waterloo, Canada; Zhenyu Cui, Brooklyn College of the City University of New York, USA; Don McLeish, University of Waterloo, Canada
5:00-5:25 Asymptotic Approximations for Some Path-Dependent Contracts
Roger Lee, University of Chicago, USA

Saturday, November 15
MS32
Mean Field Games - Part II of II
4:00 PM-6:00 PM
Room: Grant Park Parlor - 6th Floor
For Part 1 see MS12
Recent developments in the theory and applications of Mean Field Games (MFG)
Organizer: Rene Carmona
Princeton University, USA
4:00-4:25 Mean Field Games and Systemic Risk
Jean Pierre Fouque, University of California, Santa Barbara, USA
4:30-4:55 Mean Field Games with a Common Noise
Daniel Lacker and Rene Carmona, Princeton University, USA; François Delarue, Université de Nice, Sophia Antipolis, France
5:00-5:25 Robust Nash Strategies in Mean Field LQG Games
Jianhui Huang, The Hong Kong Polytechnic University, Hong Kong; Minyi Huang, Carleton University, Canada
5:30-5:55 Mean Field Models for Dynamic Matching Markets
Nick Arnosti and Ramesh Johari, Stanford University, USA

Saturday, November 15
MS33
Statistical Analysis of Risk and Stress Tests for Regulatory Policies - Part II of II
4:00 PM-6:00 PM
Room: Millenium Parlor - 6th Floor
For Part 1 see MS18
The Basel accords have suggested that VaR be the standard for measuring risk to financial institutions. Specifically, banks are required to keep regulatory capital sufficient to cover losses up to a prescribed quantile in their loss distributions. However, VaR continues to be the measurement of risk even though it has been shown to not encourage diversification in portfolio management. These talks will address various aspects of the regulatory system, such as measurement of risk, systemic risk factors, and statistical analysis of the financial data.
Organizer: Andrew Papanicolaou
University of Sydney, Australia
Organizer: Igor Cialenco
Illinois Institute of Technology, USA
4:00-4:25 Asymptotic Single Risk Factor Model of Credit Risk: Empirical Evidence from Australia
Silvio Tarca and Marek Rutkowski, University of Sydney, Australia
4:30-4:55 Perturbation Analysis on Decision-Making for Investment Portfolios Under Partial Information
Andrew Papanicolaou, University of Sydney, Australia
5:00-5:25 Short Rate Models with Stochastic Volatility
Andrew Lesniewski, Baruch College, USA; Heng Sun, Bank of New York Mellon, USA; Qi Wu, Chinese University of Hong Kong, Hong Kong
5:30-5:55 Optimal Consumption With Habit Formation In Markets with Transaction Costs And Unbounded Random Endowment
Xiang Yu, University of Michigan, USA
Saturday, November 15

**MS34**

**Counterparty Risk, Liquidity and Funding - Part II of II**

*4:00 PM-5:30 PM*  
*Room: Adams - 6th Floor*

**For Part 1 see MS14**

The importance and complexity of the counterparty credit risk (CCR) and funding biases has been brought to the forefront of financial risk management by the developments surrounding the credit crisis 2008-2010. This led to an explosion of research work that was devoted to theoretical and practical aspects of the CCR and multiple funding curves, and their relation to systemic risk. This minisymposium will focus on presentation of the recent developments in this area, presented by the leading researchers from academia and from the financial industry.

**Organizer:** Tomasz Bielecki  
*Illinois Institute of Technology, USA*

**Organizer:** Igor Cialenco  
*Illinois Institute of Technology, USA*

**Organizer:** Stephane C. Crepey  
*Evy University, France*

4:00-4:25 Wrong Way and Gap Risks Modeling: A Marked Default Time Approach  
Stephane C. Crepey, Evy University, France

4:30-4:55 Joint Measure Calibration and Mean Reversion Skew for Interest Rates  
Alexander Sokol, CompatibL, USA

5:00-5:25 Derivative Pricing under Collateralization and Differential Rates  
Fabio Mercurio, Bloomberg LP, USA

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**Saturday, November 15**

**MS35**

**Stochastic Financial Equilibria**

*4:00 PM-6:00 PM*  
*Room: Water Tower Parlor - 6th Floor*

A fundamental problem in financial economics is the one of existence, uniqueness and characterization of equilibrium prices in financial markets. It provides a theoretical underpinning of the entire field and gives rise to very interesting mathematical problems.

Current research in the field include endogenous completeness and incomplete market models as well as a spectrum of mathematical difficulties that arise from their analysis. These range from various continuity and stability questions in the context of optimal-investment problems in incomplete markets to existence and uniqueness issues related to nonlinear BSDEs and their systems.

**Organizer:** Gordan Zitkovic  
*University of Texas at Austin, USA*

**Organizer:** Kasper Larsen  
*Carnegie Mellon University, USA*

4:00-4:25 Feedback, Equilibrium and Financialization of Commodities Markets  
Ronnie Sircar, Princeton University, USA

4:30-4:55 Integral Representation Theorems for Martingales Motivated by the Problems of Endogenous Completeness and Market Completeness with Derivative Securities  
Daniel Schwarz and Dmitry Kramkov, Carnegie Mellon University, USA

5:00-5:25 The Folk Theorem with Imperfect Public Information in Continuous Time  
Benjamin Bernard, University of Alberta, Canada

5:30-5:55 Taylor Approximation in Incomplete Radner Equilibrium Models  
Jin Hyuk Choi, Carnegie Mellon University, USA

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**Saturday, November 15**

**CP17**

**Stochastic Control - Part 3**

*4:00 PM-6:00 PM*  
*Room: LaSalle 2 - 7th Floor*

**Chair:** Bin Zou, University of Alberta, Canada

4:00-4:25 Stochastic Target Problems with Controlled Probability of Success - A Probabilistic Approach  
Geraldine Bouveret and Jean-Francois Chassagneux, Imperial College London, United Kingdom; Bruno Bouchard, Université Paris-Dauphine and ENSAE-Crest, France

4:30-4:55 Turnpike Property and Convergence Rate for an Investment Model with General Utility Functions  
Harry Zhang, Imperial College, United Kingdom

5:00-5:25 Time Consistent Portfolio Selection under Short-Selling Prohibition  
Kwok Chuen Wong, The University of Hong Kong, Hong Kong and Imperial College London, United Kingdom; Alain Bensoussan, The University of Texas at Dallas and City University of Hong Kong, Hong Kong; Phillip S. Yam, The Chinese University of Hong Kong, Hong Kong; Siu Pang Yung, University of Hong Kong, Hong Kong, PRC

5:30-5:55 Optimal Investment and Risk Control Policies for An Insurer: Expected Utility Maximization  
Bin Zou and Abel Cadenillas, University of Alberta, Canada
Abstracts are printed as submitted by the author.
| Amini, Hamed, MS9, 3:30 Thu |
| Andersen, Torben G., MS24, 9:30 Sat |
| Anthropelos, Michail, CP15, 8:30 Sat |
| Ararat, Cagin, CP10, 8:30 Fri |

| Bauer, Daniel, MS2, 10:00 Thu |
| Bauer, Daniel, MS2, 10:00 Thu |
| Bayraktar, Erhan, MS7, 4:00 Thu |
| Bechler, Kyle, MS25, 9:00 Sat |
| Beiglböck, Mathias, MS27, 8:30 Sat |
| Bernard, Benjamin, MS35, 5:00 Sat |
| Bernard, Carole, MS1, 10:30 Thu |
| Bichuch, Maxim, MS7, 3:30 Thu |
| Bichuch, Maxim, MS7, 5:00 Thu |
| Bielecki, Tomasz, MS11, 8:30 Fri |
| Bielecki, Tomasz, MS14, 8:30 Fri |
| Bielecki, Tomasz, MS34, 4:00 Sat |
| Bion-Nadal, Jocelyne, MS11, 9:30 Fri |
| Blair, James, CP9, 8:30 Fri |
| Bouchard, Bruno, IP1, 1:30 Thu |
| Bouveret, Geraldine, CP17, 4:00 Sat |
| Boyarchenko, Svetlana, MS19, 4:30 Fri |
| Braverman, Anton, MS9, 5:00 Thu |

| Capponi, Agostino, MS15, 8:30 Fri |
| Capponi, Agostino, MS15, 8:30 Fri |
| Carmona, Rene, MS12, 8:30 Fri |
| Carmona, Rene, MS12, 8:30 Fri |
| Carmona, Rene, MS12, 4:00 Sat |
| Cartea, Alvaro, MS23, 3:00 Fri |
| Cartea, Alvaro, MS25, 8:30 Sat |
| Cartea, Alvaro, MS25, 10:00 Sat |
| Chan, Patrick, MS17, 4:00 Fri |
| Chávez Casillas, Jonathan A., CP9, 9:00 Fri |
| Chen, Haoyun, CP1, 10:00 Thu |

| Chen, Nan, MS21, 3:00 Fri |
| Chen, Nan, MS21, 3:00 Fri |
| Chendra, Erwinna, CP3, 10:00 Thu |
| Cheng, Mingliang, CP5, 10:00 Thu |
| Cheridito, Patrick, MS8, 4:30 Thu |
| Chiu, Yi-Tai, CP8, 3:30 Thu |
| Choi, Jin Hyuk, MS35, 5:30 Sat |
| Choi, Jungmin, CP14, 8:30 Sat |
| Cialenco, Igor, MS8, 3:30 Thu |
| Cialenco, Igor, MS8, 3:30 Thu |
| Cialenco, Igor, MS11, 8:30 Fri |
| Cialenco, Igor, MS14, 8:30 Fri |
| Cialenco, Igor, MS18, 3:00 Fri |
| Cialenco, Igor, MS33, 4:00 Sat |
| Cialenco, Igor, MS34, 4:00 Sat |
| Cont, Rama, MS20, 3:00 Fri |
| Crepey, Stephane C., MS14, 8:30 Fri |
| Crepey, Stephane C., MS34, 4:00 Sat |
| Crepey, Stephane C., MS34, 4:00 Sat |
| Cvitanic, Jakša, IP6, 11:00 Sat |

| Da Gama Batista, Joao, CP8, 4:00 Thu |
| Dai, Min, CP15, 9:00 Sat |
| Date, Paresh, CP11, 8:30 Fri |
| de Graaf, Kees, MS30, 4:30 Sat |
| Delarue, François, MS10, 3:30 Thu |
| Delarue, François, MS17, 3:00 Fri |
| Delarue, François, MS17, 3:00 Fri |
| Dodson, John A., MS4, 10:00 Thu |
| Dolinsky, Yan, MS20, 4:00 Fri |
| Donnelly, Ryan, MS25, 8:30 Sat |
| Duarte, Diogo, MS18, 4:00 Fri |

| Evatt, Geoff, CP8, 4:30 Thu |

| Fahim, Arash, MS7, 4:30 Thu |
| Fahim, Arash, MS20, 3:00 Fri |

| Feinstein, Zachary, MS18, 3:00 Fri |
| Feng, Liming, MS26, 10:00 Sat |
| Feng, Qian, MS5, 5:00 Thu |
| Feng, Runhuan, MS2, 10:00 Thu |
| Feng, Runhuan, MS2, 11:00 Thu |
| Figueroa-Lopez, Jose E., MS16, 8:30 Fri |
| Figueroa-Lopez, Jose E., MS16, 8:30 Fri |
| Fischer, Markus, MS10, 3:30 Thu |
| Fontana, Claudio, CP6, 3:30 Thu |
| Forsyth, Peter, IP2, 2:15 Thu |
| Forsyth, Peter, MS2, 10:30 Thu |
| Fouque, Jean Pierre, MS32, 4:00 Sat |
| Frei, Christoph, MS13, 9:30 Fri |

| Gerhold, Stefan, CP11, 9:00 Fri |
| Ghamami, Samim, MS18, 3:30 Fri |
| Giesecke, Kay, MS18, 4:30 Fri |
| Giesecke, Kay, MS21, 3:00 Fri |
| Giesecke, Kay, MS24, 8:30 Sat |
| Giglio, Stefano, MS15, 9:30 Fri |
| Glau, Kathrin, CP3, 10:30 Thu |
| Glover, Kristoffer J., CP5, 10:30 Thu |
| Gobet, Emmanuel, MS28, 9:00 Sat |
| Gomes, Diogo, MS12, 9:30 Fri |
| Graber, Jameson, MS17, 3:30 Fri |
| Grbac, Zorana, CP6, 4:00 Thu |
| Guan, Yuanying, CP8, 5:00 Thu |
| Gueant, Olivier, MS23, 3:30 Fri |
| Gunawardena, Athula D., CP13, 3:00 Fri |
| Guo, Jing, MS1, 11:30 Thu |
| Guo, Ziyi, MS4, 10:00 Thu |

| Hansen, Lars Peter, IP5, 11:45 Fri |
| Haugh, Martin B., CP11, 10:00 Fri |
| He, Xuedong, MS1, 10:00 Thu |

Italicized names indicate session organizers.
He, Xuedong, MS1, 10:00 Thu
Henderson, Vicky, IP8, 2:00 Sat
Hendricks, Dieter, CP2, 10:00 Thu
Hu, Ruimeng, MS28, 10:00 Sat
Huanman-Aguilar, Ricardo, CP5, 11:00 Thu
Huang, Huaxiong, MS2, 11:30 Thu
Huang, Minyi, MS32, 5:00 Sat
Huang, Yao Tung, MS27, 9:00 Sat
Huang, Yu-Jui, MS20, 3:00 Fri
Huang, Yu-Jui, MS27, 8:30 Sat
Ichiba, Tomoyuki, SP1, 2:00 Fri
In ’t Hout, Karel, MS5, 3:30 Thu
In ’t Hout, Karel, MS22, 3:30 Fri
In ’t Hout, Karel, MS30, 4:00 Sat
Inkaya, Alper, CP16, 8:30 Sat
Itkin, Andrey, MS22, 3:00 Fri
Iyer, Krishnamurthy, MS9, 4:30 Thu
Johari, Ramesh, MS32, 5:30 Sat
Kallblad, Sigrid, MS29, 9:30 Sat
Kang, Chulmin, CP13, 3:30 Fri
Khaliq, Abdul M., MS22, 4:00 Fri
Khan, Waseem A., CP7, 3:30 Thu
Kinzebulatov, Damir, MS23, 4:00 Fri
Kupper, Michael, MS11, 9:00 Fri
Kwon, Dharma, MS6, 4:00 Thu
Lacker, Daniel, MS32, 4:30 Sat
Lallouache, Mehdi, CP2, 10:30 Thu
Lange, Nina, CP12, 3:00 Fri
Larsen, Kasper, MS13, 8:30 Fri
Larsen, Kasper, MS35, 4:00 Sat
Larsson, Elisabeth, MS3, 10:00 Thu
Lee, Jungwoo, CP4, 10:00 Thu
Lee, Roger, MS31, 4:00 Sat
Lee, Roger, MS31, 5:00 Sat
Leung, Tim, MS6, 3:30 Thu
Leung, Tim, MS6, 5:00 Thu
Levendovskii, Sergey, MS19, 4:00 Fri
Li, Lingfei, MS19, 3:00 Fri
Li, Lingfei, MS26, 8:30 Sat
Linetsky, Vadim, MS26, 8:30 Sat
Liu, Jingshu, CP10, 9:00 Fri
Lorig, Matthew, MS31, 4:00 Sat
Ludkovski, Michael, MS28, 8:30 Sat
Ludkovski, Mike, IP7, 11:45 Sat
Maggis, Marco, MS8, 3:30 Thu
Maggis, Marco, MS8, 4:00 Thu
Maggis, Marco, MS11, 8:30 Thu
Mancini, Cecilia, MS16, 9:00 Fri
McLeish, Don, MS31, 4:30 Sat
Mendoza-Arriaga, Rafael, MS19, 3:00 Fri
Mendoza-Arriaga, Rafael, MS19, 3:30 Fri
Mendoza-Arriaga, Rafael, MS26, 8:30 Sat
Mercurio, Fabio, MS34, 5:00 Sat
Miloovanovic, Slobodan, CP13, 4:00 Fri
Minca, Andreea, MS9, 3:30 Thu
Moallemi, Ciaram C., IP9, 2:45 Sat
Moallemi, Ciaram C., MS15, 9:00 Fri
Moll, Benjamin, MS10, 4:00 Thu
Mueller, Marvin, CP9, 9:30 Fri
Muhle-Karbe, Johannes, MS7, 3:30 Thu
Mulaudzi, Mmboniseni, CP1, 10:30 Thu
Muravey, Dmitry, CP6, 4:30 Thu
Nadtochiy, Sergey, MS29, 9:00 Sat
Nie, Yutian, MS26, 9:30 Sat
Nutz, Marcel, MS20, 3:30 Fri
Obloj, Jan, IP4, 11:00 Fri
Olafsson, Sveinn O., MS16, 9:30 Fri
Oosterlee, Cornelis W., MS5, 3:30 Thu
Oosterlee, Cornelis W., MS30, 4:00 Sat
Orbay, Berk, CP4, 10:30 Thu
Overbeck, Ludger, CP10, 9:30 Fri
Palczewski, Jan, CP12, 3:30 Fri
Papanicolaou, Andrew, MS18, 3:00 Fri
Papanicolaou, Andrew, MS33, 4:00 Sat
Papanicolaou, Andrew, MS33, 4:30 Sat
Papapantoleon, Antonis, MS8, 3:30 Thu
Papapantoleon, Antonis, MS11, 8:30 Fri
Papapantoleon, Antonis, MS11, 8:30 Fri
Patidar, Kailash C., MS30, 5:00 Sat
Pierre, Erwan, CP1, 11:00 Thu
Piret, Cecile M., MS3, 10:30 Thu
Pirvu, Traian A., MS1, 11:00 Thu
Polishchuk, Aleksey, MS30, 5:30 Sat
Pulido, Sergio, MS13, 10:00 Fri
Qin, Likuan, MS26, 9:00 Sat
Ramirez, Hugo E., CP1, 11:30 Thu
Ren, Dan, CP10, 10:00 Fri
Rosenbaum, Mathieu, MS23, 3:00 Fri
Rudolff, Birgit, MS11, 10:00 Fri
Ruijter, Marjon, MS5, 4:30 Thu
Rutkowski, Marek, MS14, 8:30 Fri
Sadoghi, Amirhossein, CP9, 10:00 Fri
Sagna, Abass, CP13, 4:30 Fri
Schwarz, Daniel, MS35, 4:30 Sat
Schwenkler, Gustavo, MS24, 8:30 Sat
Schwenkler, Gustavo, MS24, 8:30 Sat
Secomandi, Nicola, CP12, 4:00 Fri

Italicized names indicate session organizers.
Sengupta, Indranil, CP16, 9:00 Sat
Shcherbakov, Victor, CP3, 11:00 Thu
Shek, Justin, MS14, 10:00 Fri
Shkolnik, Alex, MS21, 3:30 Fri
Singor, Stefan, MS5, 4:00 Thu
Sircar, Ronnie, MS35, 4:00 Sat
Sirignano, Justin, MS21, 4:30 Fri
Sokol, Alexander, MS34, 4:30 Sat
Song, Qingshuo, CP7, 4:00 Thu
Sotiropoulos, Michael, IP3, 5:45 Thu
Sambilopoulos, Konstantinos, MS15, 10:00 Fri
Stein, Harvey, MS14, 9:00 Fri
Stentoft, Lars, MS28, 8:30 Sat
Stoikov, Sasha F., MS23, 4:30 Fri
Sturm, Stephan, MS14, 9:30 Fri
Sun, Li-Hsien, CP15, 9:30 Sat

T

Tahbaz-Salehi, Alireza, MS21, 4:00 Fri
Tanaka, Keiichi, CP6, 5:00 Thu
Tankov, Peter, MS16, 10:00 Fri
Tarca, Silvio, MS33, 4:00 Sat
Temocin, Busra Z., CP14, 9:30 Sat
Todorov, Viktor, MS24, 10:00 Sat
Toivanen, Jari, MS22, 3:00 Fri
Toivanen, Jari, MS22, 4:30 Fri
Tolmasky, Carlos, MS4, 10:30 Thu
Tompaidis, Stathis, MS28, 9:30 Sat
Topper, Juergen T., CP4, 11:00 Thu
Toropov, Alexander, MS3, 11:00 Thu

V

Van der Stoep, Anthonie W., MS5, 3:30 Thu
von Sydow, Lina, MS3, 10:00 Thu
von Sydow, Lina, MS30, 4:00 Sat

W

Wagalath, Lakshitha, MS9, 4:00 Thu
Wang, Gu, MS27, 9:30 Sat
Weber, Stefan, MS8, 5:00 Thu
Webster, Kevin, MS25, 9:30 Sat
Wildman, Mackenzie, CP7, 4:30 Thu
Wolfram, Marie-Therese, MS17, 4:30 Fri
Wong, Kwok Chuen, CP17, 5:00 Sat
Wu, Hailing, CP3, 11:30 Thu
Wu, Qi, MS33, 5:00 Sat

X

Xing, Hao, MS13, 8:30 Fri
Xing, Hao, MS13, 9:00 Fri
Xiu, Dacheng, CP16, 9:30 Sat

Y

Yam, S.C.P, MS12, 9:00 Fri
Yamazaki, Kazutoshi, MS6, 4:30 Thu
Yang, Hongtao, CP16, 10:00 Sat
Ye, Jinchun, MS4, 11:00 Thu
Yeo, Joongyeub, CP2, 11:00 Thu
Yolcu Okur, Yeliz, CP11, 9:30 Fri
Yong, Jiongmin, MS12, 10:00 Fri
Yu, Xiang, MS33, 5:30 Sat

Z

Zambelli, Antoine E., CP4, 11:30 Thu
Zariphopoulou, Thaleia, MS29, 8:30 Sat
Zariphopoulou, Thaleia, MS29, 10:00 Sat
Zhang, Harry, CP17, 4:30 Sat
Zhang, Hongzhong, MS6, 3:30 Thu
Zhang, Hongzhong, CP7, 5:00 Thu
Zhang, Lan, MS24, 9:00 Sat
Zhang, Shuhua, CP12, 4:30 Fri
Zhang, Yuchong, MS27, 10:00 Sat
Zhou, Lu, MS4, 11:30 Thu
Zhou, Xunyu, MS29, 8:30 Sat

Zhou, Zhou, MS20, 4:30 Fri
Zhu, Chaoye, CP5, 11:30 Thu
Zhu, Geoffrey, MS10, 4:30 Thu
Zhu, Lingjiong, CP2, 11:30 Thu
Zitkovic, Gordan, MS35, 4:00 Sat
Zou, Bin, CP17, 5:30 Sat

Italicized names indicate session organizers.
# FM14 Budget

**Conference Budget**  
SIAM Conference on Financial Mathematics and Engineering  
**November 13-15, 2014**  
**Chicago, IL**

Expected Paid Attendance 220

### Revenue

<table>
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<th>Item</th>
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<td>Registration Income</td>
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### Expenses

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<td>Organizing Committee</td>
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<td>Invited Speakers</td>
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<td>Food and Beverage</td>
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<td>AV Equipment and Telecommunication</td>
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<td>Advertising</td>
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<td>Administrative</td>
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<td>Marketing</td>
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<tr>
<td>Office Space (Building)</td>
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<td>Other SIAM Services</td>
<td>$2,976</td>
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<td>Total</td>
<td>$130,750</td>
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Net Conference Expense ($63,420)

Support Provided by SIAM $63,420  
$0

Estimated Support for Travel Awards not included above:

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Early Career and Students</td>
<td>18</td>
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<td>$12,800</td>
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