

# Contents

## Part I Invited Articles

<b>Computing Functionals of Square Root and Wishart Processes Under the Benchmark Approach via Exact Simulation .....</b>	<b>3</b>
Jan Baldeaux and Eckhard Platen	
<b>The Supremum Norm of the Discrepancy Function: Recent Results and Connections .....</b>	<b>23</b>
Dmitriy Bilyk and Michael Lacey	
<b>An Introduction to Stochastic Particle Integration Methods: With Applications to Risk and Insurance .....</b>	<b>39</b>
Pierre Del Moral, Gareth W. Peters, and Christelle Vergé	
<b>Multilevel Monte Carlo Methods .....</b>	<b>83</b>
Michael B. Giles	
<b>Guaranteed Conservative Fixed Width Confidence Intervals via Monte Carlo Sampling .....</b>	<b>105</b>
Fred J. Hickernell, Lan Jiang, Yuewei Liu, and Art B. Owen	
<b>Discrepancy, Integration and Tractability .....</b>	<b>129</b>
Aicke Hinrichs	
<b>Noisy Information: Optimality, Complexity, Tractability .....</b>	<b>173</b>
Leszek Plaskota	

## Part II Tutorial

<b>Quasi-Monte Carlo Image Synthesis in a Nutshell .....</b>	<b>213</b>
Alexander Keller	

### Part III Contributed Articles

<b>Conditional Sampling for Barrier Option Pricing Under the Heston Model</b> .....	253
Nico Achtsis, Ronald Cools, and Dirk Nuyens	
<b>Probabilistic Star Discrepancy Bounds for Double Infinite Random Matrices</b> .....	271
Christoph Aistleitner and Markus Weimar	
<b>The <math>L^2</math> Discrepancy of Irrational Lattices</b> .....	289
Dmitriy Bilyk	
<b>Complexity of Banach Space Valued and Parametric Integration</b> .....	297
Thomas Daun and Stefan Heinrich	
<b>Extended Latin Hypercube Sampling for Integration and Simulation</b> ....	317
Rami El Haddad, Rana Fakhereddine, Christian Lécot, and Gopalakrishnan Venkiteswaran	
<b>A Kernel-Based Collocation Method for Elliptic Partial Differential Equations With Random Coefficients</b> .....	331
Gregory E. Fasshauer and Qi Ye	
<b>Polynomial Accelerated MCMC and Other Sampling Algorithms Inspired by Computational Optimization</b> .....	349
Colin Fox	
<b>Antithetic Multilevel Monte Carlo Estimation for Multidimensional SDEs</b> .....	367
Michael B. Giles and Lukasz Szpruch	
<b>On the Convergence of Quantum and Sequential Monte Carlo Methods</b> .....	385
François Giraud and Pierre Del Moral	
<b>Lower Error Bounds for Randomized Multilevel and Changing Dimension Algorithms</b> .....	399
Michael Gnewuch	
<b>A Non-empirical Test on the Second to the Sixth Least Significant Bits of Pseudorandom Number Generators</b> .....	417
Hiroshi Haramoto, Makoto Matsumoto, Takuji Nishimura, and Yuki Otsuka	
<b>A Finite-Row Scrambling of Niederreiter Sequences</b> .....	427
Roswitha Hofer and Gottlieb Pirsic	

**Reconstructing Multivariate Trigonometric Polynomials  
by Sampling Along Generated Sets** ..... 439  
Lutz Kammerer

**Bayesian Approaches to the Design of Markov Chain Monte  
Carlo Samplers** ..... 455  
Jonathan M. Keith and Christian M. Davey

**Deterministic Consistent Density Estimation for Light  
Transport Simulation** ..... 467  
Alexander Keller and Nikolaus Binder

**On Wavelet-Galerkin Methods for Semilinear Parabolic  
Equations with Additive Noise** ..... 481  
Mihaly Kovacs, Stig Larsson, and Karsten Urban

**Component-by-Component Construction of Hybrid Point Sets  
Based on Hammersley and Lattice Point Sets** ..... 501  
Peter Kritzer, Gunther Leobacher, and Friedrich Pillichshammer

**A QMC-Spectral Method for Elliptic PDEs with Random  
Coefficients on the Unit Sphere** ..... 517  
Quoc Thong Le Gia

**Sampling and Low-Rank Tensor Approximation  
of the Response Surface** ..... 535  
Alexander Litvinenko, Hermann G. Matthies,  
and Tarek A. El-Moselhy

**The Stochastic EM Algorithm for Censored Mixed Models** ..... 553  
Ian C. Marschner

**Existence of Higher Order Convergent Quasi-Monte Carlo  
Rules via Walsh Figure of Merit** ..... 569  
Makoto Matsumoto and Takehito Yoshiki

**ANOVA Decomposition of Convex Piecewise Linear Functions** ..... 581  
Werner Romisch

**Hit-and-Run for Numerical Integration** ..... 597  
Daniel Rudolf

**QMC Galerkin Discretization of Parametric Operator Equations** ..... 613  
Christoph Schwab

**On the Choice of Weights in a Function Space for Quasi-Monte  
Carlo Methods for a Class of Generalised Response Models  
in Statistics** ..... 631  
Vasile Sinescu, Frances Y. Kuo, and Ian H. Sloan

**Multi-level Monte Carlo Finite Difference and Finite Volume  
Methods for Stochastic Linear Hyperbolic Systems** ..... 649  
Jonas Šukys, Siddhartha Mishra, and Christoph Schwab

**Conference Participants** ..... 667

**Index** ..... 685



<http://www.springer.com/978-3-642-41094-9>

Monte Carlo and Quasi-Monte Carlo Methods 2012  
Dick, J.; Kuo, F.Y.; Peters, G.W.; Sloan, I. (Eds.)  
2013, XII, 686 p. 64 illus., 6 illus. in color., Hardcover  
ISBN: 978-3-642-41094-9