James V. Lambers

Department of Mathematics
University of Southern Mississippi
118 College Dr #5045
Hattiesburg, MS 39406-0001
USA

Phone: (601) 266-5784
Fax: (601) 266-5818
James.Lambers@usm.edu
http://www.math.usm.edu/lambers/

Education

Ph.D. in Scientific Computing and Computational Mathematics, September 2003
Stanford University, Stanford, CA, USA
Advisors: Joseph E. Oliger and Gene H. Golub

M.S. in Scientific Computing and Computational Mathematics, June 1994
Stanford University, Stanford, CA, USA

B.S. in Mathematics and Computer Science, *Summa Cum Laude*, May 1991
Purdue University, West Lafayette, IN, USA

Faculty Positions

University of Southern Mississippi — Hattiesburg, MS, USA
Department of Mathematics
Assistant Professor — Fall 2009–present
Quantitative Reasoning (MAT 100), Calculus I-II-III w/Analytic Geometry (MAT 167, 168, 169), Multivariable Calculus (MAT 280), Courses taught: Numerical Analysis I (MAT 460/560), Numerical Analysis II (MAT 461/561), Numerical Linear Algebra (MAT 610), Numerical Analysis for Computational Science (MAT 772), Topics in Computational Mathematics (MAT 685), Data Analysis Techniques (COS 702)

Stanford University — Stanford, CA, USA
Energy Resources Engineering
Acting Assistant Professor — Fall 2006–Summer 2009
Courses taught: C++ Programming for Earth Scientists and Engineers (ENERGY 211/CME 211), Introduction to Large Scale Computing (CME 212), Applied Mathematics of Reservoir Engineering (ENERGY 281), Introduction to Scientific Computing (CME 108), Numerical Linear Algebra (CME 302), Modeling and Simulation (ENERGY 125), Advanced Topics in Numerical Linear Algebra (CME 335). Research groups: SUPRI-B (Reservoir Simulation), SUPRI-C (Gas Injection). Co-advisor to students of Prof. Margot G. Gerritsen.

Research Positions

Stanford University — Stanford, CA, USA
Department of Petroleum Engineering
Research Associate — Fall 2004–Summer 2006
Supervisor: Professor Margot G. Gerritsen. Topic: Industrial Compositional Streamline Simulation for Efficient and Accurate Prediction of Gas Injection and WAG Processes

University of California, Irvine — Irvine, CA, USA
Department of Mathematics
Postgraduate Researcher — Summer 2003–Spring 2004
Supervisors: Professor Patrick Guidotti and Professor Knut Sølna. Topic: Wave Propagation in Inhomogeneous and Random Media

Purdue University — West Lafayette, IN, USA
Department of Computer Sciences
Research Assistant — Fall 1988–Spring 1991
Supervisors: Professor John R. Rice, Professor Greg N. Frederickson, and Professor Franz-Erich Wolter. Topics: Graph Algorithms, Numerical Quadrature for General 2-D Domains, and Differential Geometric Modeling of Surfaces

Teaching Positions

University of California, Irvine — Irvine, CA, USA
Department of Mathematics
Lecturer — Fall 2003–Fall 2004
Pre-Calculus (Math 1B), Calculus (Math 2A and 2B), Discrete Mathematics (Math 6A), Numerical Analysis (Math 105A). Supervisor: Paul Eklof.

Stanford University — Stanford, CA, USA
Department of Computer Science
Teaching Fellow/Teaching Assistant — Winter 2001–Summer 2003
Courses: Introduction to Scientific Computing (CS 137), Eigenvalue Computations (CS 339), Numerical Linear Algebra (CS 237A), Design and Analysis of Algorithms (CS 161), Ten Great Algorithms of Scientific Computing (CS 339), Compilers (CS 143), Scientific Computing with Matlab and Maple (CS 138). Supervisors: Gene Golub and Persi Diaconis.

Iowa State University — Ames, IA, USA
Department of Mathematics
Instructor — Fall 1994–Summer 1996
Courses: Single-Variable Calculus (Math 165 and 166), Multivariable Calculus (Math 265), Differential Equations (Math 267), Trigonometry (Math 142). Supervisor: E. James Peake.

Stanford University — Stanford, CA, USA
Department of Computer Science
Teaching Assistant — Winter 1993–Spring 1994
Courses: Compilers (CS 143), Numerical Methods for Initial Value Problems (CS 237C), Numerical Methods for Boundary Value Problems (CS 237B). Supervisors: Joe Oliger, Andrew Stuart, and David Dill.

Other Employment

Starbase Corporation — Santa Ana, CA, USA
Senior Software Engineer — March 1999–August 2002
Projects: Starbase Replication Manager (lead engineer), Starbase Server 5.x for Solaris (lead engineer). Supervisor: Alan Kucheck.

Site Technologies — Scotts Valley, CA, USA

Senior Software Engineer November 1997–March 1999
Projects: SiteMaster 4.x (chief architect), SiteSweeper 2.0 Enterprise Edition. Supervisor: Ron Sauers.

Inlet Cedar Rapids, IA, USA
Software Engineer June 1996–November 1997
Projects: CurrentIssue 3.0, author of compiler for its markup language for building web applications. Supervisor: Todd Millard.

Journal Articles

1. J. V. Lambers, "Krylov Subspace Spectral Methods for Variable-Coefficient Initial-Boundary Value Problems", *Electronic Transactions on Numerical Analysis* **20** (2005), p. 212-234.
2. P. Guidotti, J. V. Lambers, and K. Sølna, "Analysis of Wave Propagation in 1D Inhomogeneous Media", *Numerical Functional Analysis and Optimization* **27** (2006), p. 25-55.
3. J. V. Lambers, "Practical Implementation of Krylov Subspace Spectral Methods", *Journal of Scientific Computing* **32** (2007), p. 449-476.
4. J. V. Lambers, "Derivation of High-Order Spectral Methods for Time-dependent PDE using Modified Moments", *Electronic Transactions on Numerical Analysis* **28**, Special Volume in Honor of Gene Golub's 75th Birthday (2008), p. 114-135.
5. J. V. Lambers, M. G. Gerritsen, and B. T. Mallison, "Accurate Local Upscaling with Variable Compact Multi-point Transmissibility Calculations", *Computational Geosciences* **12**, Special Issue on Multiscale Methods for Flow and Transport in Heterogeneous Porous Media (2008), p. 399-416.
6. M. G. Gerritsen and J. V. Lambers, "An Integration of Multilevel Local-Global Upscaling with Grid Adaptivity", *Computational Geosciences* **12** (2008), p. 193-208.
7. J. V. Lambers, "Implicitly Defined High-Order Operator Splittings for Parabolic and Hyperbolic Variable-Coefficient PDE Using Modified Moments", *International Journal of Computational Science* **2**, Special Issue on Multiplicative and Additive Operator Splitting (2008), p. 376-401.
8. P. Guidotti and J. V. Lambers, "Eigenvalue Characterization and Computation for the Laplacian on General 2-D Domains", *Numerical Functional Analysis and Optimization* **29** (2008), p. 507-531.
9. J. V. Lambers, "Enhancement of Krylov Subspace Spectral Methods Using Block Lanczos Iteration", *Electronic Transactions on Numerical Analysis* **31**, Special Volume on Computational Methods with Applications (2008), p. 86-109.
10. J. V. Lambers, "An Explicit, Stable, High-Order Spectral Method for the Wave Equation Based on Block Gaussian Quadrature", *IAENG Journal of Applied Mathematics* **38**(4), Special Issue on the World Congress of Engineering (2008), p. 233-248.
11. P. Guidotti and J. V. Lambers, "A New Nonlinear Nonlocal Diffusion For Noise Reduction", *Journal of Mathematical Imaging and Vision* **33** (2009), p. 27-35.
12. J. V. Lambers, "Krylov Subspace Spectral Methods for the Time-Dependent Schrödinger Equation with Non-Smooth Potentials", *Numerical Algorithms* **51** (2009), p. 239-280.

13. J. V. Lambers, "A Spectral Time-Domain Method for Computational Electrodynamics", *Advances in Applied Mathematics and Mechanics* **1**(6) (2009), p. 781-798.
14. J. V. Lambers, "A Multigrid Block Krylov Subspace Spectral Method for Variable-Coefficientcient Elliptic PDE", *IAENG Journal of Applied Mathematics* **39**(4), Special Issue on the World Congress of Engineering (2009), p. 236-246.
15. T. Chen, M. Gerritsen, J. V. Lambers and L. J. Durlofsky, "Global Variable Compact Multipoint Methods for Accurate Upscaling with Full-tensor Effects", *Computational Geosciences* **14**(1) (2010), p. 65-81.
16. J. V. Lambers, "Solution of Time-Dependent PDE Through Component-wise Approximation of Matrix Functions", *IAENG Journal of Applied Mathematics* **41**(1) (2011), p. 1-10.
17. J. V. Lambers, "Explicit High-Order Time-Stepping Based on Componentwise Application of Asymptotic Block Lanczos Iteration", *Numerical Linear Algebra with Applications*, in review.

Refereed Conference Papers

1. J. V. Lambers, "Krylov Subspace Spectral Methods for Systems of Variable-Coefficient PDE", *American Institute of Physics Conference Proceedings* **936**, Proceedings of the Fifth International Conference on Numerical Analysis and Applied Mathematics, Corfu, Greece (2007), p. 332-335.
2. J. V. Lambers, "Implicitly Defined High-Order Operator Splittings for Parabolic and Hyperbolic Variable-Coefficient PDE Using Modified Moments", *Proceedings of the 2008 World Congress on Engineering*, London (Winner, Best Paper Award, 2008 International Conference on Applied and Engineering Mathematics).
3. J. V. Lambers, "Enhancement of Krylov Subspace Spectral Methods Using Block Lanczos Iteration", *American Institute of Physics Conference Proceedings*, Proceedings of the Sixth International Conference on Numerical Analysis and Applied Mathematics, Kos, Greece (2008), p. 347-350.
4. J. V. Lambers, "A Spectral Time-Domain Method for Computational Electrodynamics", *Proceedings of the 2009 International Multiconference of Engineers and Computer Scientists*, Hong Kong.
5. J. V. Lambers, "Block Krylov Subspace Spectral Methods for Variable-Coefficient Elliptic PDE", *Proceedings of the 2009 World Congress on Engineering*, London.
6. K. T. Chu, J. V. Lambers, "Using Optimal Time Step Selection to Boost the Accuracy of FD Schemes for Variable Coefficient PDEs", *Proceedings of the 2009 World Congress on Engineering*, London.
7. J. V. Lambers, "A Spectral Time-Domain Method for Computational Electrodynamics", *Proceedings of the 8th European Conference on Numerical Mathematics and Advanced Applications*, Uppsala, 2009.
8. J. V. Lambers, "Spectral Methods for Time-dependent Variable-coefficient PDE Based on Block Gaussian Quadrature", *Spectral and High Order Methods for Partial Differential Equations: Selected papers from the ICOSAHOM '09 conference, June 22-26, Trondheim, Norway*, Jan S. Hesthaven and Einar M. Rønquist, eds., Lecture Notes in Computational Science and Engineering (2010), p. 429-440.

9. J. V. Lambers, "Krylov Subspace Spectral Methods for the Time-Dependent Schrodinger Equation with Non-Smooth Potentials", *Proceedings of the 2010 International Multi-Conference of Engineers and Computer Scientists*, Hong Kong (Winner, Best Paper Award, 2010 Inernational Conference of Scientific Computing).
10. J. V. Lambers, "Spectral Methods for Time-dependent Variable-cofficient PDE Based on Block Gaussian Quadrature", *Proceedings of the 2010 World Congress on Engineering*, London.
11. J. V. Lambers, "High-order Time-stepping for Galerkin and Collocation Methods Based on Component-wise Approximation of Matrix Functions", *Proceedings of the 2011 World Congress on Engineering*, London.

Non-refereed Conference Papers

1. J. V. Lambers, M. G. Gerritsen, "An Integration of Multilevel Local-Global Upscaling with Grid Adaptivity", *Proceedings of the SPE Annual Technical Conference and Exhibition*, Dallas, 2005, SPE 97250.
2. M. G. Gerritsen, K. Jessen, B. T. Mallison, and J. V. Lambers, "A Fully Adaptive Streamline Framework for the Challenging Simulation of Gas-Injection Processes", *Proceedings of the SPE Annual Technical Conference and Exhibition*, Dallas, 2005, SPE 97270.
3. M. G. Gerritsen, J. V. Lambers, and B. T. Mallison, "A Variable and Compact MPFA for Transmissibility Upscaling with Guaranteed Monotonicity", *Proceedings of the 10th European Conference on the Mathematics of Oil Recovery*, Amsterdam, 2006.
4. J. V. Lambers, "Recent Advances in Krylov Subspace Spectral Methods", *Proceedings in Applied Mathematics and Mechanics* **7**, No. 1, Proceedings of the Sixth International Congress on Industrial and Applied Mathematics, Zurich (2007), p. 2020143-2020144.
5. J. V. Lambers, "Recent Advances in Krylov Subspace Spectral Methods", *International Journal on Pure and Applied Mathematics* **42**, No. 4, Proceedings of the Fourth International Conference on Applied Mathematics and Computing, Plovdiv, Bulgaria (2007), p. 495-500.
6. J. V. Lambers, M. G. Gerritsen, "Spatially-Varying Compact Multi-Point Flux Approximations for 3-D Adapted Grids with Guaranteed Monotonicity", *Proceedings of the 2008 ASME International Mechanical Engineering Congress and Exposition*, Boston, in press.
7. J. V. Lambers, M. G. Gerritsen, "Spatially-varying Compact Multi-point Flux Approximations for 3-D Adapted Grids with Guaranteed Monotonicity", *Proceedings of the 11th European Conference on the Mathematics of Oil Recovery*, Bergen, 2008.
8. J. V. Lambers, M. G. Gerritsen, and D. Fragola, "Multiphase, 3-D Flow Simulation with Integrated Upscaling, MPFA Discretization, and Adaptivity", *Proceedings of the SPE Reservoir Simulation Symposium*, The Woodlands, Texas, 2009, SPE 118983.
9. T. Chen, M. G. Gerritsen, L. J. Durlofsky, and J. V. Lambers, "Adaptive local-global VCMP methods for coarse-scale reservoir modeling", *Proceedings of the SPE Reservoir Simulation Symposium*, The Woodlands, Texas, 2009, SPE 118994.

10. J. V. Lambers, "Implicitly Defined High-Order Operator Splittings for Parabolic and Hyperbolic Variable-Coefficient PDE Using Modified Moments", *International Journal on Pure and Applied Mathematics* **50**, No. 2, Proceedings of the Fifth International Conference on Applied Mathematics and Computing, Plovdiv, Bulgaria (2009), p. 239-244.
11. J. V. Lambers, "A Spectral Time-Domain Method for Computational Electrodynamics", *Proceedings of the 7th International Conference on Numerical Analysis and Applied Mathematics*, Crete, Greece (2009), p. 1192-1195.

Book Chapters

1. J. V. Lambers, "Coarse-scale Modeling of Flow in Gas-injection Processes for Enhanced Oil Recovery", *Multiscale Modeling and Simulation in Science*, Lecture Notes in Computational Science and Engineering **66** (2009), p. 303-306.
2. J. V. Lambers, "Application of Block Krylov Subspace Spectral Methods to Maxwell's Equations", *IAENG Transactions on Engineering Technologies* **3** (2010)
3. J. V. Lambers, "Block Krylov Subspace Spectral Methods for Variable-Coefficient Elliptic PDE", *Current Themes in Engineering Science* (2010)

Technical Reports

1. J. V. Lambers and J. R. Rice, *Numerical Quadrature for General Two-Dimensional Domains*, Purdue University Technical Report CSD-TR-91-067, 1991.
2. J. V. Lambers, *QUAD2D: A Two-Dimensional Quadrature Routine*, Purdue University Technical Report CSD-TR-91-069, 1991.
3. G. R. Kreiss, W. Sawyer, J. V. Lambers, et al. *Computation of Eigenvalues of Burgers Equation*, Swiss Scientific Computing Center Technical Report, 1992.

Sponsored Research

P. Guidotti (PI) and J. V. Lambers (Senior Personnel), "Nonlinear Diffusions and Image Processing", NSF Award 0712875, 07/15/2007-7/14/2010, $270,428.

Presentations

Multiresolution Methods for Variable-Coefficient Initial Value Problems, Midwest Numerical Analysis Day, University of Iowa, 1995

Multiresolution Methods for Variable-Coefficient Initial Value Problems, Applied Math Seminar, Iowa State University, 1996

Numerical Quadrature for General 2D Domains, Applied Math Seminar, Iowa State University, 1996

Krylov Subspace Methods for Variable-Coefficient Initial-Boundary Value Problems, Mathematics Colloquium, University of New Orleans, April 2003

Krylov Subspace Methods for Variable-Coefficient Initial-Boundary Value Problems, SCCM Seminar, Stanford University, April 2003

Krylov Subspace Spectral Methods for Variable-Coefficient Initial-Boundary Value Problems, Computational and Applied Mathematics Seminar, University of California at Irvine, December 2003

Krylov Subspace Spectral Methods for Variable-Coefficient Initial-Boundary Value Problems, Southern California Applied Mathematics Symposium, Harvey Mudd College, Claremont, CA, April 2004

Krylov Subspace Spectral Methods for Variable-Coefficient Initial-Boundary Value Problems, SIAM Annual Meeting, Portland, OR, July 2004

An Integration of Multilevel Local-Global Upscaling with Grid Adaptivity, Stanford University School of Earth Sciences Research Review, April 2005

An Integration of Multilevel Local-Global Upscaling with Grid Adaptivity, Stanford University Petroleum Research Institute Industrial Affiliates Meeting, May 2005

Eigenvalue Characterization and Computation for the Laplacian on General Domains, SIAM Annual Meeting, New Orleans, July 2005

An Integration of Multilevel Local-Global Upscaling with Grid Adaptivity, Society of Petroleum Engineers Annual Technical Conference and Exhibition, Dallas, October 2005

Eigenvalue Characterization and Computation for the Laplacian on General Domains, and its Application to Inverse Spectral Problems, AMS/MAA Joint Annual Meeting, San Antonio, January 2006

Fun (and Challenging!) Problems Concerning Variable-Coefficient Differential Operators, Linear Algebra Seminar, Stanford University, January 2006

Eigenvalue Characterization and Computation for the Laplacian on General Domains, and its Application to Inverse Spectral Problems, Linear Algebra Seminar, Stanford University, April 2006

A Multi-Pronged Research Strategy for Numerical Solution of Variable-Coefficient PDE: Recent Successes and Upcoming Challenges, CCT Computing the Future Seminar Series, Louisiana State University, April 2006

Diagonalizing Similarity Transformations for Variable-Coefficient Differential Operators, AMS Western Section Meeting, San Francisco, April 2006

Adaptive Pressure Solves: on Specialized Upscaling and Faults, Stanford University Petroleum Research Institute Industrial Affiliates Meeting, May 2006

Diagonalizing Similarity Transformations for Variable-Coefficient Differential Operators, SIAM Conference on Analysis of PDE, Boston, July 2006

Krylov Subspace Spectral Methods for Conservation Laws, SIAM Annual Meeting, Boston,

July 2006

Derivation of High-Order Methods for Time-Dependent PDE using Modified Moments, GAMM-SIAM Applied Linear Algebra Meeting, Dusseldorf, Germany, July 2006 (minisymposium co-organizer, "Applications of Moments")

The Evolution of Krylov Subspace Spectral Methods (Or: How the Work of Gene Golub and Joe Oliger Collided), Applied Mathematics Seminar, Stanford, December 2006

Transmissibility upscaling with compact, spatially varying multi-point flux stencils, SIAM Conference on Mathematical and Computational Issues in the Geosciences, Santa Fe, March 2007

The Evolution of Krylov Subspace Spectral Methods (Or: How the Ideas of Gene Golub and Joe Oliger Collided), Stanford 50 Conference, March 2007 (as winner of poster competition)

Stability of Krylov Subspace Spectral Methods, AMS Western Section Meeting, Tucson, April 2007

Transmissibility upscaling on Adapted Grids for Gas Injection Processes, Summer School on Multiscale Modeling and Simulation in Science, Stockholm, Sweden, June 2007

Recent Advances in Krylov Subspace Spectral Methods, ICOSAHOM 2007, Beijing, June 2007

Recent Advances in Krylov Subspace Spectral Methods, ICIAM 2007, Zurich, Switzerland, July 2007

Recent Advances in Krylov Subspace Spectral Methods, 4th International Conference of Applied Mathematics and Computing, Plovdiv, Bulgaria, August 2007

Stability of Krylov Subspace Spectral Methods, Harrachov 07 (Computational Methods with Applications), Harrachov, Czech Republic, August 2007

Krylov Subspace Spectral Methods for Systems of Variable-Coefficient PDE, ICNAAM 2007, Corfu, Greece, September 2007

Krylov Subspace Spectral Methods for Hyperbolic Systems, SIAM Conference on Analysis of PDE, Phoenix, December 2007

Implicitly Defined High-Order Operator Splittings for Time-Dependent Variable-Coefficient PDE Using Modified Moments, Bay Area Scientific Computing Day 2008, Berkeley, March 2008

Implicitly Defined High-Order Operator Splittings for Time-Dependent Variable-Coefficient PDE Using Modified Moments, Linear Algebra Seminar, Stanford University, April 2008

Transmissibility Upscaling on Adapted Cartesian Grids with Compact, Spatially Varying

Multi-point Flux Stencils, ERE Seminar, Stanford University, April 2008

Robust Computation of Off-Diagonal Elements of Functions of Matrices, Householder '08, Berlin, Germany, June 2008

Matrices, Moments, and Quadrature...and now, PDE!, FoCM '08, Hong Kong, June 2008

Implicitly Defined High-Order Operator Splittings for Time-Dependent Variable-Coefficient PDE Using Modified Moments, World Congress on Engineering, London, July 2008

Enhancement of Krylov Subspace Spectral Methods by Block Lanczos Iteration, SIAM Annual Meeting, San Diego, July 2008

Two Novel Nonlocal Nonlinear Diffusions for Image Denoising II, SIAM Conference on Imaging Science, San Diego, July 2008

Implicitly Defined High-Order Operator Splittings for Time-Dependent Variable-Coefficient PDE Using Modified Moments, 5th International Conference of Applied Mathematics and Computing, Plovdiv, Bulgaria, August 2008

Spatially-varying Compact Multi-point Flux Approximations for 3-D Adapted Grids with Guaranteed Monotonicity, ECMOR XI, Bergen, Norway, September 2008

Enhancement of Krylov Subspace Spectral Methods by Block Lanczos Iteration, ICNAAM '08, Kos, Greece, September 2008

Spatially-varying Compact Multi-point Flux Approximations for 3-D Adapted Grids with Guaranteed Monotonicity, ASME Congress, Boston, November 2008

A Spectral Time-Domain Method for Computational Electrodynamics, 3rd International Conference on Scientific Computing and Differential Equations, Hong Kong, December 2008

Multiphase, 3-D Flow Simulation with Integrated Upscaling, MPFA Discretization, and Adaptivity, SPE Reservoir Simulation Symposium, The Woodlands, Texas, February 2009

A Spectral Time-Domain Method for Computational Electrodynamics, International Multiconference of Engineers and Computer Scientists, Hong Kong, March 2009

Upscaling for Multiphase Flow on 3-D Adapted Grids, SIAM Conference on Mathematical and Computational Issues in the Geosciences, Leipzig, Germany, June 2009

A Spectral Time-Domain Method for Computational Electrodynamics, ENUMATH, Uppsala, Sweden, June 2009

Block Krylov Subspace Spectral Methods for Variable-Coefficient Elliptic PDE, World Congress on Engineering, London, July 2009

A Spectral Time-Domain Method for Computational Electrodynamics, SIAM Annual Meeting, Denver, July 2009

Multiphase Flow Simulation with Integrated Upscaling, MPFA Discretization, and Adaptivity, IMACS, Athens, Georgia, August 2009

A Spectral Time-Domain Method for Computational Electrodynamics, ICNAAM '09, Crete, Greece, September 2009

Multiphase, 3-D Flow Simulation with Integrated Upscaling, MPFA Discretization, and Adaptivity, SUPRI-C Seminar, Stanford, Jan 2010

A Crash Course on Matrices, Moments and Quadrature, Linear Algebra/Optimization Seminar, Stanford, January 2010

A Spectral Time-Domain Method for Computational Electrodynamics, AMS/MAA Joint Mathematics Meetings, San Francisco, January 2010

A Crash Course on Matrices, Moments and Quadrature, School of Computing Seminar, USM, January 2010

A Crash Course on Matrices, Moments and Quadrature, Oberseminar Computational Mathematics, Universitat Kassel (Germany), March 2010

Krylov Subspace Spectral Methods for the Time-Dependent Schrodinger Equation with Non-smooth Potentials, International MultiConference for Engineers and Computer Scientists, Hong Kong, March 2010

A Crash Course on Matrices, Moments and Quadrature, Applied Mathematics Seminar, University of California Irvine, May 2010

A Crash Course on Matrices, Moments and Quadrature, Analysis Seminar, Drexel University, May 2010

Component-wise Approximation of Matrix Functions via Block Gaussian Quadrature, 2nd IMA Conference on Numerical Linear Algebra and Optimisation, Birmingham, England, September 2010

Spectral Methods for Time-Dependent PDE Based on Block Gaussian Quadrature, 3rd International Conference on Numerical Algebra and Scientific Computing, Beijing, October 2010

Solution of time-dependent PDEs through component-wise approximation of matrix functions, Linear Algebra/Optimization Seminar, Stanford, March 2011

Spectral Methods for Time-Dependent PDE Based on Block Gaussian Quadrature, 2011 Bay Area Scientific Computing Day, Stanford, May 2011

Solution of time-dependent PDEs through component-wise approximation of matrix functions, ICIAM '11, Vancouver, July 2011

Solution of time-dependent PDEs through component-wise approximation of matrix functions, Fall 2011 AMS Southeastern Section Meeting, Winston-Salem, September 2011

Supervised Students

- Alexandru Cibotarica, PhD 2014. Project: High-Order Time-Stepping for Nonlinear PDE Through Componentwise Approximation of Matrix Functions
- Eva Comino, USM, MS 2012. Project: Numerical Integration over General Two-dimensional Domains Through Curvature-based Domain Decomposition
- Daniel Lanterman, USM, MS 2012. Project: Approximation of Bilinear Forms Involving Matrix Functions Through Rational-based Quadrature Rules
- Lisa Palchak, USM, MS 2012. Project: Approximation of Elements of Functions of Matrices Through Modified Moments
- Lauren Sears, USM, BS 2012. Project: Numerical Integration over General Three-dimensional Domains
- Alexa Rogers, USM, BS 2013. Project: Approximation of Eigenfunctions of Differential Operators via the Uncertainty Principle

Honors and Awards

- Winner, Best Paper Award, 2010 International Conference on Scientific Computing, International MultiConference of Engineers and Computer Scientists
- Winner, Best Paper Award, 2008 International Conference on Applied and Engineering Mathematics, World Congress of Engineering
- Winner, Junior Scientist Category, Stanford 50 Conference Poster Competition, 2007
- Professor of the Month, UCI Campus Village, December 2004
- Professor Recognition, Delta Delta Delta, UC Irvine chapter, May 2004
- Teacher of the Month, Kappa Alpha Delta, UC Irvine chapter, February 2004
- Professor Recognition, Pi Beta Phi, UC Irvine chapter, Fall quarter 2003

Professional Memberships

- American Mathematical Society
- Society for Industrial and Applied Mathematics
- Mathematical Association of America

University Service (USM)

- Director of Graduate Studies, Department of Mathematics, USM, 2010-
- Comprehensive Examination Committee, Raymond Hanser, Department of Mathematics, USM, 2009
- Prospectus Defense Committee, Deanna Leggett, Department of Mathematics, USM, 2010
- Prospectus Defense Committee, Jeanette Monroe, Department of Mathematics, USM, 2010

University Service (Stanford)

- Doctoral Dissertation Reading Committee, Tianhong Chen, Department of Energry Resources Engineering, Stanford University, 2008
- Doctoral Dissertation Oral Examination Committee, David Amsallem, Department of Aeronautics and Astronautics, Stanford University, 2009
- Doctoral Dissertation Oral Examination Committee, Paul Constantine, Institute for Computational and Mathematical Engineering, Stanford University, 2009
- Organizing Committee, "Symposium on Gene Golub's Legacy", Stanford, March 1, 2008
- Organizing Committee, "Remembrances in Celebration of Gene Golub", Stanford, February 29, 2008

Professional Service

- Program Committee Member, World Congress of Engineering, London, 2010-
- Program Committee Member, International Multiconference on Engineering and Computer Science, Hong Kong, 2010-
- Proposal Reviewer, Engineering and Physical Sciences Research Council (UK), 2010
- Proposal Reviewer, Austrian Academy of Sciences, 2010
- Proposal Reviewer, Georgia (former Soviet Republic) Science Foundation, 2009
- Reviewer, Signal Image and Video Processing, 2010-
- Reviewer, Journal of Sampling Theory in Signal and Image Processing, 2010-
- Reviewer, Computational and Applied Mathematics, 2009-
- Reviewer, SPE Reservoir Evaluation and Engineering, 2008-
- Reviewer, Transactions on Image Processing, 2008-
- Reviewer, SIAM Review, 2008-
- Reviewer, Transactions on Signal Processing, 2008-
- Reviewer, International Journal on Computational Science, 2008-
- Reviewer, Water Resources Research, 2006-
- Reviewer, Mathematical Reviews, 2006-
- Reviewer, Journal of Computational Physics, 2005-
- Reviewer, World Scientific Publishing, 2004

- Reviewer, Houghton-Mifflin Co., 2004
- SIAM Web Committee, 2002-2008
- Author of "Finding an Academic Job" for SIAM web site, Student section