

# Curriculum Vitae

Lexing Ying

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## Education

- Ph.D., New York University, 06/2004.
- M.S., New York University, 06/2000.
- B.S., Shanghai Jiao Tong University, 06/1998.

## Professional Appointments

- Professor of Mathematics, Stanford University, since 12/2012.
- Professor of Mathematics, The University of Texas at Austin, 08/2012 - 12/2012.
- Associate Professor of Mathematics, The University of Texas at Austin, 08/2010 - 08/2012.
- Assistant Professor of Mathematics, The University of Texas at Austin, 08/2006 - 08/2010.
- Postdoctoral Scholar, California Institute of Technology, 08/2004 - 08/2006.

## Awards and Honors

- Morningside Silver Medal of Applied Mathematics, ICCM, 2016.
- James H. Wilkinson Prize in Numerical Analysis and Scientific Computing, SIAM, 2013.
- Feng Kang Prize of Scientific Computing, Chinese Academy of Sciences, 2011.
- CAREER Award, National Science Foundation, 2009.
- President's Associates Centennial Teaching Fellowship, UT Austin, 2009-2011.
- College of Natural Sciences Teaching Excellence Award, UT Austin, 2009.
- Alfred P. Sloan Research Fellowship, 2007.
- Janet Fabri Prize for the PhD dissertation, Courant Institute, NYU, 2005.
- Dean's Dissertation Fellowship of Graduate School of Arts and Sciences, NYU, 2003.
- Best Student Paper Award, the ACM/IEEE conference on Supercomputing, 2003.

## Publications

### Preprints

1. Y. Khoo, J. Lu, and L. Ying. Efficient construction of tensor ring representations from sampling. Submitted.
2. Y. Khoo, J. Lu, and L. Ying. Solving parametric PDE problems with artificial neural networks. Submitted.

3. F. Liu and L. Ying. Sparsify and sweep: an efficient preconditioner for the Lippmann-Schwinger equation. Submitted.
4. Z. Cai, Y. Fan, and L. Ying. Entropy monotonic spectral method for Boltzmann equation. Submitted.
5. A. Damle, V. Minden, and L. Ying. Robust and efficient multi-way spectral clustering. Submitted.

Refereed journal papers

1. A. Damle, L. Lin, and L. Ying. Computing localized representations of the kohn-sham subspace via randomization and refinement. To appear in *SIAM Journal on Scientific Computing*.
2. V. Minden, A. Damle, K. Ho, and L. Ying. Fast spatial Gaussian process maximum likelihood estimation via skeletonization factorizations. *SIAM Journal of Multiscale Modeling and Simulation* 15-4 (2017).
3. L. Ying. Tensor network skeletonization. *SIAM Journal of Multiscale Modeling and Simulation* 15-4 (2017).
4. Y. Li, H. Yang, and L. Ying. Multidimensional butterfly factorization. To appear in *Applied and Computational Harmonic Analysis*.
5. Y. Li and L. Ying. Distributed-memory hierarchical interpolative factorization. *Research in Mathematical Sciences* 4 (2017).
6. F. Liu and L. Ying. Localized sparsifying preconditioner for periodic indefinite systems. *Communications in Mathematical Sciences* 15-4 (2017).
7. V. Minden, K. L. Ho, A. Damle, and L. Ying. A recursive skeletonization factorization based on strong admissibility. *SIAM Multiscale Modeling and Simulation* 15-2 (2017).
8. L. Lin, Z. Xu, and L. Ying. Adaptively compressed polarizability operator for accelerating large scale ab initio phonon calculations. *SIAM Multiscale Modeling and Simulation* 15-1 (2017).
9. A. Damle, L. Lin, and L. Ying. SCDM-k: Localized orbitals for solids via selected columns of the density matrix. *Journal of Computational Physics* 334 (2017).
10. J. Lu and L. Ying. Fast algorithm for periodic density fitting for Bloch waves. *Annals of Mathematical Sciences and Applications* 1-2 (2016).
11. J. Lu and L. Ying. Sparsifying preconditioner for soliton calculations. *Journal of Computational Physics* 315 (2016).
12. F. Liu and L. Ying. Additive sweeping preconditioner for the Helmholtz equation. *SIAM Multiscale Modeling and Simulation* 14-2 (2016).
13. F. Liu and L. Ying. Recursive sweeping preconditioner for the 3D Helmholtz equation. *SIAM Journal on Scientific Computing* 38-2 (2016).
14. V. Minden, A. Damle, K. Ho, and L. Ying. A technique for updating hierarchical factorizations of integral operators. *SIAM Multiscale Modeling and Simulation* 14-1 (2016).
15. J. Sun, S. Fomel, and L. Ying. Lowrank one-step wave extrapolation for reverse-time migration. *Geophysics* 81-1 (2016).
16. K. Ho and L. Ying. Hierarchical interpolative factorization for elliptic operators: differential equations. *Communications in Pure and Applied Mathematics* 69-8 (2016).
17. K. Ho and L. Ying. Hierarchical interpolative factorization for elliptic operators: integral equations. *Communications in Pure and Applied Mathematics* 69-7 (2016).
18. H. Yang, J. Lu, and L. Ying. Crystal image analysis using 2D synchrosqueezed transforms. *SIAM Multiscale Modeling and Simulation* 13-4 (2015).
19. J. Lu and L. Ying. Compression of the electron repulsion integral tensor in tensor hypercontraction format with cubic scaling cost. *Journal of Computational Physics* 302-1 (2015).
20. L. Ying. Directional preconditioner for 2D high frequency obstacle scattering. *SIAM Multiscale Modeling and Simulation* 13-3 (2015).

21. H. Yang, J. Lu, W. Brown, I. Daubechies, and L. Ying. Quantitative canvas weave analysis using 2D synchrosqueezed transforms. *IEEE Signal Processing Magazine* 55 (2015).
22. Y. Li, H. Yang, E. Martin, K. Ho, and L. Ying. Butterfly factorization. *SIAM Multiscale Modeling and Simulation* 13-2 (2015).
23. L. Ying. Sparsifying preconditioner for the Lippmann-Schwinger equation. *SIAM Multiscale Modeling and Simulation* 13-2 (2015).
24. Y. Li, H. Yang, and L. Ying. A multiscale butterfly algorithm for multidimensional Fourier integral operators. *SIAM Multiscale Modeling and Simulation* 13-2 (2015).
25. A. Damle, L. Lin, and L. Ying. Compressed representation of Kohn-Sham orbitals via selected columns of the density matrix. *J. Chem. Theory Comput.* 11 (2015)
26. L. Ying. Sparsifying preconditioner for pseudospectral approximations of indefinite systems on periodic structures. *SIAM Multiscale Modeling and Simulation* 13-2 (2015).
27. L. Ying. Fast directional computation of high frequency boundary integrals via local FFTs. *SIAM Multiscale Modeling and Simulation* 13-1 (2015).
28. J. Hu and L. Ying, A fast algorithm for the energy space boson Boltzmann collision operator. *Mathematics of Computation* 84 (2015).
29. J. Hu, S. Fomel, and L. Ying. A fast algorithm for 3D azimuthally anisotropic velocity scan. *Geophysical Prospecting* 63 (2015).
30. A. Damle, L. Lin, and L. Ying. Pole expansion for solving a type of parametrized linear systems in electronic structure calculations. *SIAM Journal on Scientific Computing* 36 (2014).
31. A. Benson, J. Poulson, K. Tran, B. Engquist, and L. Ying. A parallel directional fast multipole method. *SIAM Journal on Scientific Computing* 36 (2014).
32. H. Yang and L. Ying, Synchrosqueezed curvelet transform for two-dimensional mode decomposition. *SIAM Journal on Mathematical Analysis* 46 (2014).
33. J. Poulson, L. Demanet, N. Maxwell, and L. Ying. A parallel butterfly algorithm. *SIAM Journal on Scientific Computing* 36 (2014).
34. P. Tsuji, J. Poulson, B. Engquist, and L. Ying. Sweeping preconditioners for elastic wave propagation with spectral element methods. *ESAIM: Mathematical Modeling and Numerical Analysis* 48 (2014).
35. P. Schmitz and L. Ying. A fast nested dissection solver for Cartesian 3D elliptic problems using hierarchical matrices. *Journal of Computational Physics* 258 (2014).
36. H. Yang and L. Ying. Synchrosqueezed wave packet transform for 2D mode decomposition. *SIAM Journal on Imaging Sciences* 6 (2014).
37. J. Hu, S. Fomel, L. Demanet, and L. Ying. A fast butterfly algorithm for the hyperbolic Radon transform. *Geophysics* 78 (2013).
38. J. Poulson, B. Engquist, S. Li and L. Ying, A parallel sweeping preconditioner for high frequency heterogeneous 3D Helmholtz equations. *SIAM Journal on Scientific Computing* 35 (2013).
39. X. Song, S. Fomel, and L. Ying, Lowrank finite-differences and lowrank Fourier finite-differences for seismic wave extrapolation. *Geophysical Journal International* 193 (2013).
40. G. Bao, J. Qian, L. Ying, and H. Zhang, A convergent multiscale Gaussian-beam parametrix for wave equations. *Communications in Partial Differential Equations* 38 (2013).
41. B. Engquist and L. Ying, A fast algorithm for reiterated homogenization. *Communications in Mathematical Sciences* 11 (2013).
42. S. Fomel, L. Ying, and X. Song, Seismic wave extrapolation using lowrank symbol approximation. *Geophysical Prospecting* 61 (2013).
43. L. Lin and L. Ying, Element orbitals for Kohn-Sham density functional theory. *Physical Review B* 85 (2012).
44. I. Lashuk, A. Chandramowlishwaran, H. Langston, T. Nguyen, R. Sampath, A. Shringarpure, R. Vuduc, L. Ying, D. Zorin, and G. Biros, A massively parallel adaptive fast multipole method on heterogeneous architectures. *Communications of the ACM* 55 (2012).

45. L. Lin, J. Lu, L. Ying, and W. E, Optimized local basis set for Kohn-Sham density functional theory. *Journal of Computational Physics* 231 (2012).
46. H. Yang and L. Ying, A fast algorithm for multilinear operators. *Applied and Computational Harmonic Analysis* 33 (2012).
47. L. Ying, A pedestrian introduction to fast multipole methods. *Science China Mathematics* 55 (2012).
48. L. Demanet and L. Ying. Fast wave computation via Fourier integral operators. *Mathematics of Computation* 81 (2012).
49. P. Tsuji, B. Engquist, and L. Ying, A sweeping preconditioner for time-harmonic Maxwell's equations with finite elements. *Journal of Computational Physics* 231 (2012).
50. P. Tsuji and L. Ying. A sweeping preconditioner for Yees finite difference approximation of time-harmonic Maxwells equations. *Frontiers of Mathematics in China* 7 (2012).
51. L. Lin, J. Lu, L. Ying, and W. E, Adaptive local basis set for Kohn-Sham density functional theory in a discontinuous Galerkin framework I: Total energy calculation. *Journal of Computational Physics* 231 (2012).
52. L. Demanet, M. Ferrara, N. Maxwell, J. Poulson, and L. Ying. A butterfly algorithm for synthetic aperture radar imaging. *SIAM Journal on Imaging Sciences* 5 (2012).
53. J. Hu and L. Ying, A fast spectral algorithm for the quantum Boltzmann collision operator. *Communications in Mathematical Sciences* 10 (2012).
54. P. Schmitz and L. Ying, A fast direct solver for elliptic problems on general meshes in 2D. *Journal of Computational Physics* 231 (2012).
55. S. Jiang, B. Ren, P. Tsuji, and L. Ying. Second kind integral equations for the first kind Dirichlet problem of the biharmonic equation in three dimensions. *Journal of Computational Physics* 230 (2011).
56. B. Engquist and L. Ying. Sweeping preconditioner for the Helmholtz equation: Moving perfectly matched layers. *SIAM Multiscale Modeling and Simulation* 9 (2011).
57. L. Lin, C. Yang, J. Lu, L. Ying, and W. E. A fast parallel algorithm for selected inversion of structured sparse matrices with application to 2D electronic structure calculations. *SIAM Journal on Scientific Computing* 33 (2011).
58. L. Lin, J. Lu, and L. Ying. Fast construction of hierarchical matrix representation from matrix-vector multiplication. *Journal of Computational Physics* 230 (2011).
59. P. Tsuji and L. Ying. A fast directional algorithm for high-frequency electromagnetic scattering. *Journal of Computational Physics* 230 (2011).
60. B. Engquist and L. Ying. Sweeping preconditioner for the Helmholtz equation: Hierarchical matrix representation. *Communications in Pure and Applied Mathematics* 64 (2011).
61. L. Lin, C. Yang, J. Meza, J. Lu, L. Ying, and W. E. SelInv—an algorithm for selected inversion of a sparse symmetric matrix. *ACM Trans. Math. Software* 37 (2011).
62. P. Tsuji, D. Xiu, and L. Ying. A fast method for high-frequency acoustic scattering from random scatterers. *International Journal on Uncertainty Quantification* 1 (2011).
63. L. Demanet and L. Ying. Discrete symbol calculus. *SIAM Rev.* 53 (2011).
64. J. Qian and L. Ying. Fast multiscale Gaussian wavepacket transforms and multiscale Gaussian beams for the wave equation. *SIAM Multiscale Modeling and Simulation* 8 (2010).
65. J. Qian and L. Ying. Fast Gaussian wavepacket transforms and Gaussian beams for the Schrodinger equation. *J. Computational Physics* 229 (2010).
66. L. Demanet and L. Ying. Scattering in flatland: efficient representations via wave atoms. *Found. of Comput. Math.* 10 (2010).
67. B. Engquist and L. Ying. Fast directional algorithms for the Helmholtz kernel. *Journal of Computational and Applied Mathematics* 234 (2010).

68. L. Lin, J. Lu, L. Ying, and W. E. Pole-based approximation of the Fermi-Dirac function. *Chinese Annals of Mathematics - Series B* 30 (2009).
69. L. Ying and S. Fomel. Fast computation of partial Fourier transforms. *SIAM Multiscale Modeling and Simulation* 8 (2009).
70. L. Lin, J. Lu, L. Ying, R. Car, and W. E. Fast algorithm for extracting the diagonal of the inverse matrix with application to the electronic structure analysis of metallic systems. *Communications in Mathematical Sciences* 7 (2009).
71. E. Candès, L. Demanet and L. Ying. A fast butterfly algorithm for the computation of Fourier integral operators. *SIAM Multiscale Modeling and Simulation* 7 (2009).
72. B. Engquist and L. Ying. A fast directional algorithm for high frequency acoustic scattering in two dimensions. *Communications in Mathematical Sciences* 7 (2009).
73. L. Demanet and L. Ying. Wave atoms and time upscaling of wave equations. *Numerische Mathematik* 113 (2009).
74. L. Ying. Sparse Fourier transform via butterfly algorithm. *SIAM Journal on Scientific Computing* 31 (2009).
75. L. Demanet, L. Ying. Wave atoms and sparsity of oscillatory patterns. *Applied and Computational Harmonic Analysis* 23 (2007). Implementation (Matlab).
76. E. Candès, L. Demanet and L. Ying. Fast computation of Fourier integral operators. *SIAM Journal on Scientific Computing* 29 (2007).
77. B. Engquist and L. Ying. Fast directional multilevel algorithms for oscillatory kernels. *SIAM Journal on Scientific Computing* 29 (2007).
78. L. Ying, E. Candès. The phase flow method. *Journal of Computational Physics* 220 (2006).
79. L. Ying, E. Candès. Fast geodesics computation with the phase flow method. *Journal of Computational Physics* 220 (2006).
80. L. Ying, G. Biros, D. Zorin. A high-order 3D boundary integral equation solver for elliptic PDEs in smooth domains. *Journal of Computational Physics* 219 (2006).
81. E. Candès, L. Demanet, D. Donoho, L. Ying. Fast discrete curvelet transforms. *SIAM Journal on Multiscale Modeling and Simulation* 5 (2006). Implementation (Matlab and C++).
82. L. Ying. A kernel independent fast multipole algorithm for radial basis functions. *Journal of Computational Physics* 213 (2006).
83. L. Ying, D. Zorin. A simple manifold-based construction of surfaces of arbitrary smoothness. *ACM Transactions on Graphics* 23 (2004) (SIGGRAPH 2004). Implementation (C++).
84. L. Ying, G. Biros, D. Zorin. A kernel-independent adaptive fast multipole method in two and three dimensions. *Journal of Computational Physics* 196 (2004). Implementation (C++).
85. G. Biros, L. Ying, D. Zorin. A fast solver for the Stokes equations with distributed forces in complex geometries. *Journal of Computational Physics* 194 (2004).
86. L. Velho, K. Perlin, L. Ying, H. Biermann. Algorithmic shape modeling with subdivision surfaces. *Computers and Graphics* 26 (2002).

#### Book chapters

1. B. Engquist and L. Ying, Fast algorithms for high frequency wave propagation. To appear in *Numerical Analysis of Multiscale Problems*, I. Graham, T. Hou, O. Lakkis and R. Scheichl (editors), *Lecture Notes in Computational Science and Engineering*, Vol. 83, 2012, Springer.
2. L. Ying. Fast algorithms for boundary integral equations. In *Multiscale Modeling and Simulation in Science*, B. Engquist, O. Runborg, P. Lötstedt (editors), *Lecture Notes in Computational Science and Engineering*, Vol. 66, 2009, Springer.

#### Refereed proceeding papers

1. J. Hu, S. Fomel, and L. Ying, A fast algorithm for 3D azimuthally anisotropic velocity scan. Proceedings of the 2013 SEG Annual Meeting.
2. J. Hu, S. Fomel, L. Demanet, and L. Ying, A fast butterfly algorithm for the hyperbolic Radon transform. Proceedings of the 2012 SEG Annual Meeting.
3. J. Poulson, B. Engquist, S. Li, and L. Ying, A parallel sweeping preconditioner for frequency-domain seismic wave propagation. Proceedings of the 2012 SEG Annual Meeting.
4. X. Song, S. Fomel, L. Ying, and T. Ding, Lowrank finite-difference for wave extrapolation. Proceedings of the 2011 SEG Annual Meeting.
5. B. Engquist, J. Poulson, and L. Ying, Sweeping preconditioner for the 3D Helmholtz equation. Proceedings of the 2011 SEG Annual Meeting.
6. S. Fomel, L. Ying, and X. Song, Seismic wave extrapolation using lowrank symbol approximation. Proceedings of the 2010 SEG Annual Meeting.
7. I. Lashuk, A. Chandramowlishwaran, H. Langston, T. Nguyen, R. Sampath, A. Shringarpure, R. Vuduc, L. Ying, D. Zorin, and G. Biros. A massively parallel adaptive fast multipole method on heterogeneous architectures. Proceedings of Proc. ACM/IEEE Conf. Supercomputing (SC), Portland, OR, USA, 2009. This paper is nominated for the Best Technical Paper Award.
8. B. Engquist, K. Tran, and L. Ying. Fast hybrid algorithms for high frequency scattering. The 3rd Conference on Mathematical Modeling of Wave Phenomena and the 20th Nordic Conference on Radio Science and Communications. AIP Conference Proceedings, Volume 1106, pp. 3-17 (2009).
9. L. Demanet and L. Ying. Curvelets and wave atoms for mirror-extended images. Proc. SPIE Wavelets XII conf, San Diego, August 2007 (Invited Paper). Implementation (Matlab).
10. L. Ying, L. Demanet, E. Candès. 3D discrete curvelet transform. Proc. Wavelets XI conf., San Diego, July 2005 (Invited Paper).
11. L. Ying, G. Biros, D. Zorin, H. Langston. A new parallel kernel-independent fast multipole method. Proceedings of the 2003 ACM/IEEE conference on Supercomputing, 14-29, 2003. This paper was awarded the Best Student Paper Award and nominated for the Gordon Bell Award and the Best Technical Paper Award.
12. G. Biros, L. Ying, D. Zorin. The embedded boundary integral equation solver for the incompressible Navier-Stokes equations. International Association for Boundary Element Methods Symposium, 2002.
13. L. Ying, D. Zorin. Nonmanifold subdivision. The 12th IEEE Visualization Conference, 2001.
14. L. Ying, A. Hertzmann, H. Biermann, D. Zorin. Texture and shape synthesis on surfaces. The 12th Eurographics Workshop on Rendering, 2001.

#### Technical reports

1. A. Gupta and L. Ying. A Fast Maximum-Weight-Bipartite-Matching Algorithm for Reducing Pivoting in Sparse Gaussian Elimination, Tech. Report RC 21576 (97320), IBM T. J. Watson Research Center, Yorktown Heights, NY, 1999.

## Teaching

### At Stanford

- Ordinary Differential Equations with Linear Algebra (Spring 2016)
- Applied Matrix Analysis (Spring 2013, Spring 2014, Spring 2015, Winter 2017)
- Introduction to Scientific Computing (Winter 2015, Winter 2017)
- Partial Differential Equations (Winter 2015)
- Numerical Solution of Partial Differential Equations (Spring 2013, Spring 2014, Spring 2015, Spring 2016, Spring 2017)
- Mathematics of Computation (Fall 2013)

- Top Ten Algorithms (Fall 2013)

At UT Austin

- Calculus, (Fall 2006, Spring 2008).
- Probability, (Spring 2007).
- Scientific Computing in Numerical Analysis, (Fall 2008, Fall 2009, Fall 2010, Fall 2011).
- Iterative Methods and Fast Algorithms, (Fall 2007, Spring 2009, Spring 2010, Spring 2012).

At Caltech:

- Introductory Methods of Computational Mathematics, (Spring 2006).

## Students and Postdocs Advised

Ph.D. students:

- Cindy Catherine Orozco Bohorquez (2016-)
- Fei Liu, ICME, Stanford (2014-)
- Yingzhou Yi, ICME, Stanford (2013-2017)
- Victor Minden, ICME, Stanford (2013-2017)
- Anil Damle, ICME, Stanford (2013-2016)
- Haizhao Yang, Mathematics, UT Austin (2010-2012), Stanford (2013-2015)
- Paul Tsuji, CAM, UT Austin (2009-2012)
- Jack Poulson, CAM, UT Austin (2010-2012)
- Phillip Schmitz, Mathematics, UT Austin (2008-2010)

Postdoctoral scholars:

- Yuwei Fan, Stanford (2015-)
- Yuehaw Khoo, Stanford (2015-)
- Kenneth Ho, Stanford (2013-2015)
- Jingwei Hu, UT Austin (2011-2014)
- Jack Poulson, Stanford (2013)

## Services

University and departmental services

- Chair, Math+X Search Committee, Stanford, 2017.
- Member, Mathematics Hiring Committee, Stanford, 2017.
- Chair, ICME Qualify Exam Committee, Stanford, 2015-present.
- Director, ICME Imaging Science Master Program, Stanford, 2015-present.
- Member, ICME Admission Committee, Stanford, 2013, 2014, 2015-present.
- Member, Strategic Planning Committee, Mathematics Department, UT Austin, 2011-2012.
- Member, Chairs Committee, Mathematics Department, UT Austin, 2011-2012.
- Member, Hiring Committee, Mathematics Department, UT Austin, 2010-2011.
- Member, Faculty Welfare Committee, UT Austin, 2010-2011.
- Member, University Faculty Council, UT Austin, 2009-2011.
- Chair, CAM Program Admission Committee, UT Austin, 2008-2009.

## Professional services

- Editorial service: Associate editor of Communications in Mathematical Sciences (2010-present); Associate editor of SIAM Journal on Scientific Computing (2013-present), Editor in chief of Annals of Mathematical Sciences and Applications (2016-present), Associate editor of Journal of Computational Mathematics (2017-present), Associate editor of Research in the Mathematical Sciences (2017-present).
- Journal Referee for SIAM Review, SIAM Journal on Numerical Analysis, SIAM Journal on Scientific Computing, SIAM Journal on Imaging Sciences, Nonlinearity, Journal of Computational Physics, Communications in Mathematical Sciences, IEEE Transactions on Image Processing, IEEE Transactions on Signal Processing, Signal Image and Video Processing, Journal of the Optical Society of America A, ACM Transaction on Graphics, and etc.
- Conference referee for the IEEE Conference on Visualizations (2007), the SIGGRAPH Conferences (2005, 2006, 2008), and the ACM/IEEE Conferences on Supercomputing (2005, 2007).
- School organized: RTG summer school on multiscale analysis and modeling (Mathematics Department, UT Austin, 2008), Electronic structure analysis and computation (Shanghai Jiao Tong University, 2011).
- Workshops and minisymposiums organized: Four minisymposiums at ICIAM 2007.

## Talks

### Lecture series and minicourses

- RTG Summer School on Multiscale Modeling and Analysis, UT Austin, Aug 2008.
- Summer School on Multiscale Modeling and Simulation in Science, Sweden, Jun 2007.

### Invited talks at conferences and workshops

- The 3rd PRIMA Conference, August 2017.
- Big Data Meets Computation at IPAM, Feb 2017.
- International Congress of Chinese Mathematicians, August 2016.
- Frontiers of Applied and Computational Mathematics, Peking University, August 2015.
- James H. Wilkinson Prize Lecture, SIAM Annual meeting, July 2013.
- Minisymposium at ICIAM 2011, Jul 2011.
- Summer School on Electronic Structure Analysis and Computation at SJTU, June 2011.
- Minisymposium at Applied Inverse Problems Conference, May 2011.
- International Congress of Chinese Mathematicians, Dec 2010.
- IMA Workshop on Integral Equation Methods, Fast Algorithms and Applications, Aug 2010.
- Minisymposium at SIAM Conference on Mathematical Aspects of Materials Science, May 2010.
- Banff Workshop on Numerical Analysis of Multiscale Computations, Dec 2009.
- Minisymposium at SIAM Conference on Applied Linear Algebra, Oct 2009.
- Minisymposium at SIAM Conference on Imaging Science, Jul 2008.
- Minisymposium at ICIAM 2007, Jul 2007.
- Minisymposium at SIAM Conference on Imaging Science, May 2006.
- IPAM Workshop on Multiscale Geometry in Scientific Computing, Oct 2004.
- Session at SIGGRAPH 2004, Los Angeles, Aug 2004.

### Colloquia and seminars

- Applied Mathematics Seminar, Ohio State, Mar 2017.



- Mathematics Colloquium, UCSD, Mar 2016.
- Mathematics Colloquium, UT Austin, Oct 2015.
- Applied Mathematics Seminar, Stanford University, Sept 2015.
- CSCAMM Seminar, University of Maryland at College Park, August 2015.
- Applied Mathematics Seminar, Duke University, August 2015.
- Colloquium, Shanghai Jiaotong University, August 2015.
- Two colloquium talks, Beijing Computational Science Research Center, August 2015.
- Applied Mathematics Seminar, UC Davis, May 2015.
- Scientific and Statistical Computing Seminar, Univ of Chicago, Apr 2015.
- Computational Science and Engineering Distinguished Seminar, MIT, Oct 2014.
- Computational and Applied Mathematics Colloquium, Penn State, Mar 2014.
- Scientific Computing and Matrix Computations Seminar, Jan 2014.
- Applied and Computational Mathematics Seminar, UC Irvine, Jan 2014.
- Math Department Colloquium, Iowa State University, Apr 2012.
- Computational and Applied Mathematics Seminar, Iowa State University, Apr 2012.
- Math Department Colloquium, Stanford University, Jan 2012.
- Seminar at Department of Mathematics, Fudan University, Jun 2011.
- ICME Colloquium, Stanford University, Feb 2011.
- Applied and Computational Mathematics Colloquium, Caltech, Feb 2011.
- ICES Seminar, UT Austin, Feb 2011.
- ICMSEC and LSEC, Chinese Academy of Science, Dec 2010.
- School of Mathematics, Peking University, Dec 2010.
- Numerical Analysis and Scientific Computing Seminar, New York University, Oct 2010.
- Applied and Computational Mathematics Colloquium, Caltech, Oct 2010.
- Computational and Applied Mathematics Seminar, Purdue University, Sep 2010.
- Scientific Computing and Numerics Seminar, Cornell University, Sep 2010.
- ICES Seminar, UT Austin, Sep 2010.
- Applied Mathematics Seminar, Stanford University, May 2010.
- Math Department Colloquium, UT Austin, Mar 2009.
- Applied Mathematics Colloquium, Southern Methodist University, Jan 2010.
- Applied Mathematics Seminar, University of Wisconsin-Madison, Oct 2009.
- CAAM Colloquium, Rice University, Sep 2009.
- Applied Mathematics Seminar, Michigan State University, Apr 2009.
- RTG Seminar, UT Austin, Mar 2009.
- Applied Mathematics Colloquium, Illinois Institute of Technology, Mar 2009.
- Applied Mathematics Seminar, Princeton University, Feb 2009.
- Numerical Analysis Seminar, UT Austin, Dec 2008.
- Scientific Computing Seminar, UC Berkeley, Nov 2008.
- ICME Colloquium, Stanford University, Nov 2008.
- Applied Mathematics Seminar, Stanford University, Mar 2008.
- Applied Mathematics Seminar, University of North Carolina at Charlotte, Nov 2007.
- Applied and Computational Mathematics Colloquium, Caltech, Nov 2007.

- Mathematical Physics Seminar, UT Austin, Sep 2006.
- Applied Mathematics Seminar, University of Waterloo, Feb 2006.
- Applied Mathematics Seminar, University of Minnesota, Feb 2006.
- Computational and Applied Mathematics Seminar, UC Irvine, Feb 2006.
- Applied Mathematics Seminar, University of Texas at Austin, Feb 2006.
- Applied and Computational Mathematics Colloquium, Caltech, Jan 2006.
- Applied Mathematics Seminar, University of Tennessee, Jan 2006.
- Computer Science and Mathematics Division Seminar, Oak Ridge National Lab, Jan 2006.
- Computational and Applied Mathematics Seminar, Purdue University, Jan 2006.
- CAMP/Nonlinear PDE's Seminar, University of Chicago, Jan 2006.
- Applied Mathematics Seminar, UCLA, Sep 2005.
- Computational Biology Seminar, IBM T.J.Watson Research Lab, Feb 2004.