Lexing Ying

Department of Mathematics
450 Jane Stanford Way, Bldg 380
Stanford University
Stanford, CA 94305

Tel:(650) 723-2221
lexing@stanford.edu
http://web.stanford.edu/~lexing

Education

- Ph.D. in Computer Science, New York University, 06/2004.
- M.S. in Computer Science, New York University, 06/2000.
- B.S. in Computer Science and Applied Mathematics, 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, 08/12 - 12/12.
- 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

- SIAM Fellow, 2024
- Invited speaker, International Congress of Mathematicians, 2022
- ICME teaching awards, Stanford University, 2022, 2023
- 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.

Publications

Preprints

1. Haoxuan Chen, Yinuo Ren, Martin Renqiang Min, Lexing Ying, Zachary Izzo. Solving Inverse Problems via Diffusion-Based Priors: An Approximation-Free Ensemble Sampling Approach.
2. Xun Tang, Yuehaw Khoo, Lexing Ying. On a spherically lifted spin model at finite temperature.
3. Hongkang Ni, Rahul Sarkar, Lexing Ying, Lin Lin. Inverse nonlinear fast Fourier transform on SU(2) with applications to quantum signal processing.
4. Xun Tang, Yuehaw Khoo, Lexing Ying. Initialization and training of matrix product state probabilistic models.
5. Yinuo Ren, Grant M. Rotskoff, Lexing Ying. A Unified Approach to Analysis and Design of Denoising Markov Models.

6. Xun Tang, Lexing Ying. Solving the Fokker-Planck equation of discretized Dean-Kawasaki models with functional hierarchical tensor.
7. Xun Tang, Lexing Ying. Wavelet-based density sketching with functional hierarchical tensor.
8. Yinuo Ren, Haoxuan Chen, Yuchen Zhu, Wei Guo, Yongxin Chen, Grant M. Rotskoff, Molei Tao, Lexing Ying. Fast Solvers for Discrete Diffusion Models: Theory and Applications of High-Order Algorithms.
9. Nan Sheng, Xun Tang, Haoxuan Chen, Lexing Ying. Approximation of High-Dimensional Gibbs Distributions with Functional Hierarchical Tensors.
10. Lexing Ying. Blind free deconvolution over one-parameter sparse families via eigenmatrix.
11. Lexing Ying. Sparse free deconvolution under unknown noise level via eigenmatrix.
12. Dong An, Andrew M. Childs, Lin Lin, Lexing Ying. Laplace transform based quantum eigenvalue transformation via linear combination of Hamiltonian simulation.
13. Hongkang Ni, Lexing Ying. Fast Phase Factor Finding for Quantum Signal Processing.
14. Hongrui Chen, Bowen Li, Jianfeng Lu, Lexing Ying. A Randomized Method for Simulating Lindblad Equations and Thermal State Preparation.
15. Hongkang Ni, Lexing Ying. Quantum wave packet transforms with compact frequency support.
16. Xun Tang, Holakou Rahmanian, Michael Shavlovsky, Kiran Koshy Thekumparampil, Tesi Xiao, Lexing Ying. A Sinkhorn-type Algorithm for Constrained Optimal Transport.
17. Haoxuan Chen, Lexing Ying. Ensemble-Based Annealed Importance Sampling.
18. Yiping Lu, Wenlong Ji, Zach Izzo, Lexing Ying. Importance Tempering: Group Robustness for Over-parameterized Models.
19. Panagiotis Lolas, Lexing Ying. Shrinkage Estimation of Functions of Large Noisy Symmetric Matrices.
20. Cindy Orozco Bohorquez, Yuehaw Khoo, Lexing Ying. Maximizing robustness of point-set registration by leveraging non-convexity.

Published

1. Xun Tang, Nan Sheng, Lexing Ying. Solving high-dimensional Hamilton-Jacobi-Bellman equation with functional hierarchical tensor. To appear in SISC.
2. Yinuo Ren, Tesi Xiao, Michael Shavlovsky, Lexing Ying, Holakou Rahmanian. HyperDPO: Hypernetwork-based Multi-Objective Fine-Tuning Framework. To appear in UAI 2025.
3. Lexing Ying. Tangent differential privacy. To appear in Journal of Machine Learning.
4. Lexing Ying. Multimodal Sampling via Approximate Symmetries. To appear Research in the Mathematical Sciences 2025.
5. Haoya Li, Tanmay Gangwani, Lexing Ying. An Analysis of Offline Model-Based Learning with Action Noise. Journal of Scientific Computing 2025.
6. Chao Ma and Lexing Ying. Correcting Convexity Bias in Function and Functional Estimate. Research in the Mathematical Sciences 2025.
7. Hongrui Chen, Lexing Ying. Convergence Analysis of Discrete Diffusion Model: Exact Implementation through Uniformization. To appear in Journal of Machine Learning.
8. Alice Cortinovis, Lexing Ying. A sublinear-time randomized algorithm for column and row subset selection based on strong rank-revealing QR factorizations. SIAM Journal on Matrix Analysis and Applications. 2025
9. Yinuo Ren, Haoxuan Chen, Grant M. Rotskoff, Lexing Ying. How Discrete and Continuous Diffusion Meet: Comprehensive Analysis of Discrete Diffusion Models via a Stochastic Integral Framework. ICLR 2025.

10. Xun Tang, Leah Collis, Lexing Ying. Solving high-dimensional Kolmogorov backward equations with functional hierarchical tensor operator. To appear in SIAM Journal on Scientific Computing.
11. Lexing Ying. Multidimensional unstructured sparse recovery via eigenmatrix. To appear in Applied and Computational Harmonic Analysis.
12. Lexing Ying. A perturbative analysis for noisy spectral estimation. Applied and Computational Harmonic Analysis Volume 74, January 2025.
13. Zhiyan Ding, Haoya Li, Lin Lin, Hongkang Ni, Lexing Ying, Ruizhe Zhang, Quantum Multiple Eigenvalue Gaussian filtered Search: an efficient and versatile quantum phase estimation method. Quantum 8, 1487 (2024).
14. Alice Cortinovis, Lexing Ying. Computing Free Convolutions via Contour Integrals. To appear in Random Matrices: Theory and Applications.
15. Lexing Ying. A note on continuous-time online learning. To appear in Journal of Machine Learning.
16. Haoxuan Chen, Yinuo Ren, Lexing Ying, Grant M. Rotskoff. Accelerating Diffusion Models with Parallel Sampling: Inference at Sub-Linear Time Complexity. NeurIPS 2024 (spotlight).
17. Haoya Li, Yu Tong, Hongkang Ni, Tuvia Gefen, Lexing Ying. Heisenberg-limited Hamiltonian learning for interacting bosons. npj Quantum Information volume 10, 83 (2024)
18. Xun Tang, Lexing Ying. Solving high-dimensional Fokker-Planck equation with functional hierarchical tensor. Journal of Computational Physics Volume 511 2024.
19. Kaizhao Liu, Jose Blanchet, Lexing Ying, Yiping Lu. Orthogonal Bootstrap: Efficient Simulation of Input Uncertainty. ICML 2024.
20. Yiping Lu, Jiajin Li, Lexing Ying, Jose Blanchet. Synthetic Principal Component Design: Fast Covariate Balancing with Synthetic Controls. 40th Conference on Uncertainty in Artificial Intelligence (UAI 2024) Oral presentation.
21. Hongkang Ni, Haoya Li, Lexing Ying. Quantum Hamiltonian Learning for the Fermi-Hubbard Model. Acta Applicandae Mathematicae (2024) 191:2.
22. Lexing Ying. Eigenmatrix for unstructured sparse recovery. Applied and Computational Harmonic Analysis, 2024.
23. Xun Tang, Michael Shavlovsky, Holakou Rahmanian, Elisa Tardini, Kiran Koshy Thekumparampil, Tesi Xiao, Lexing Ying. Accelerating Sinkhorn algorithm with sparse Newton iterations. ICLR 2024.
24. Yinuo Ren, Chao Ma, Lexing Ying. Understanding the Generalization Benefits of Late Learning Rate Decay. AISTAT 2024.
25. Yinuo Ren, Yiping Lu, Lexing Ying, Grant M. Rotskoff. Statistical Spatially Inhomogeneous Diffusion Inference. AAAI 2024.
26. Yinuo Ren, Tesi Xiao, Tanmay Gangwani, Anshuka Rangi, Holakou Rahmanian, Lexing Ying, Subhajit Sanyal. Multi-Objective Optimization via Wasserstein-Fisher-Rao Gradient Flow. AISTAT 2024
27. Haoya Li, Hsiangfu Yu, Lexing Ying, Inderjit Dhillon, Accelerating Primal-dual Methods for Regularized Markov Decision Processes. SIAM Journal on Optimization. 2024.
28. Haoya Li, Hongkang Ni, Lexing Ying. Adaptive low-depth quantum algorithms for robust multiple-phase estimation. Physical Review A. 2024
29. Hongkang Ni, Haoya Li, Lexing Ying. On low-depth algorithms for quantum phase estimation. Quantum 7, 1165 (2023).
30. Lin Lin, Jianfeng Lu, and Lexing Ying. Recent progressesx for evaluating the Kohn-Sham map, Density Functional Theory: Modeling, Mathematical Analysis, Computational Methods, and Applications. ed. Eric Cances and Gero Friesecke, Springer 2023.
31. Rajat Dwaraknath, Lexing Ying. On Optimization Formulations of Finite Horizon MDPs, OPT NeurIPS 2023 Workshop.

32. Jose Blanchet, Haoxuan Chen, Yiping Lu, Lexing Ying. When can Regression-Adjusted Control Variates Help? Rare Events, Sobolev Embedding and Minimax Optimality. NeurIPS 2023. [ARXIV]
33. Yuhua Zhu, Zach Izzo, Lexing Ying. Continuous-in-time Limit for Bayesian Bandits. Journal of Machine Learning Research. 2023
34. Philip A. Etter, Lexing Ying. Operator Shifting for Noisy Elliptic Systems. Research in the Mathematical Sciences. 2023.
35. Chao Ma, Lexing Ying. Why self-attention is Natural for Sequence-to-Sequence Problems? A Perspective from Symmetries. Journal of Machine Learning. 2023.
36. Haoya Li, Hongkang Ni, Lexing Ying. A note on spike localization for line spectrum estimation. Applied and Computational Harmonic Analysis, 2023.
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38. Haoya Li, Hongkang Ni, Lexing Ying. On efficient quantum block encoding of pseudo-differential operators. Quantum 7, 1031 (2023).
39. Haoya Li, Samarth Gupta, Hsiangfu Yu, Lexing Ying, Inderjit Dhillon. Approximate Newton policy gradient algorithms. SIAM Journal on Scientific Computing. 2023.
40. Xun Tang, YoonHaeng Hur, Yuehaw Khoo, Lexing Ying. Generative Modeling via Tree Tensor Network States. Research in the Mathematical Sciences. 2023.
41. Samarth Gupta, Daniel N. Hill, Lexing Ying, Inderjit Dhillon, Bayesian regularization of empirical MDPs. ICLR RRL workshop 2023.
42. Xun Tang, Lexing Ying, and Yuhua Zhu, Operator Shifting for Model-based Policy Evaluation. Communications in Mathematical Sciences. 2023.
43. Jikai Jin, Yiping Lu, Jose Blanchet, Lexing Ying. Minimax Optimal Kernel Operator Learning via Multilevel Training. ICLR 2023 (spotlight).
44. Yuhua Zhu and Lexing Ying. Variational Actor-Critic Algorithms. ESAIM: Control, Optimisation and Calculus of Variations. 2023.
45. Phillip Etter, Yuwei Fan, and Lexing Ying. Coarse-Proxy Reduced Basis Methods for Integral Equations. Journal of Computational Physics. 2023.
46. Jing An, Lexing Ying. Combining resampling and reweighting for faithful stochastic optimization. Communications in Mathematical Sciences. 2023.
47. Lexing Ying. Annealed importance sampling for Ising models with mixed boundary conditions. Journal of Computational Mathematics. 2023.
48. Lexing Ying. Double Flip Move for Ising Models with Mixed Boundary Conditions. Journal of Computational Mathematics. 2023.
49. Lexing Ying. Stable factorization for phase factors of quantum signal processing. Quantum 6, 842 (2022).
50. Yifan Peng, Lin Lin, Lexing Ying, Leonardo Zepeda-Nunez. Efficient Long-Range Convolutions for Point Clouds. Journal of Computational Physics. Volume 473, 15 January 2023
51. Yuwei Fan and Lexing Ying. Solving Traveltime Tomography with Deep Learning. Communications in Mathematics and Statistics. 2023.
52. Yiping Lu, Jose Blanchet, Lexing Ying. Sobolev Acceleration and Statistical Optimality for Learning Elliptic Equations via Gradient Descent. NeurIPS 2022.
53. Philip A. Etter, Lexing Ying. Operator Shifting for General Noisy Matrix Systems. SIAM Journal on Mathematics of Data Science. 2022
54. Lexing Ying. Analytic continuation from limited noisy Matsubara data. Journal of Computational Physics. 2022.

55. Lexing Ying. Pole recovery from noisy data on imaginary axis. Journal of Scientific Computing. 2022.
56. Chao Ma and Lexing Ying. A Riemannian Mean Field Formulation for Two-layer NeuralNetworks with Batch Normalization. Research in the Mathematical Sciences. 2022.
57. Chao Ma, Daniel Kunin, Lei Wu, Lexing Ying. Beyond the Quadratic Approximation: the Multiscale Structure of Neural Network Loss Landscapes. Journal of Machine Learning. 2022.
58. J. Yao, H. Li, M. Bukov, L. Lin, L. Ying, Monte Carlo tree search based hybrid optimization of variational quantum circuits. MSML 2022.
59. Yuwei Fan and Lexing Ying. Solving optical tomography with deep learning. Annals of Mathematical Sciences and Applications. 2022
60. Philip A. Etter, Kai Zhong, Hsiang-Fu Yu, Lexing Ying, Inderjit Dhillon. Enterprise-Scale Search: Accelerating Inference for Sparse Extreme Multi-Label Ranking Trees. WWW 2022.
61. Lexing Ying. On Lyapunov functions and particle methods for regularized minimax problems. Research in the Mathematical Sciences. 2022.
62. Yiping Lu, Haoxuan Chen, Jianfeng Lu, Lexing Ying, Jose Blanchet, Machine Learning For Elliptic PDEs: Fast Rate Generalization Bound, Neural Scaling Law and Minimax Optimality. ICLR 2022.
63. Chao Ma and Lexing Ying. Provably convergent quasistatic dynamics for mean-field two-player zero-sum games. ICLR 2022.
64. Zachary Izzo, Lexing Ying, and James Zou, How to Learn when Data Gradually Reacts to Your Model. AISTATS 2022.
65. Yingzhou Li, Jack Poulson, Lexing Ying. Distributed-memory H-matrix Algebra 1: Data distribution and matrix-vector multiplication. CSIAM Trans. Appl. Math., 2 (2021), pp. 431-459.
66. Haoya Li, Lexing Ying. A semigroup method for high dimensional elliptic PDEs and eigenvalue problems based on neural networks. Journal of Computational Physics. 2022
67. Yuwei Fan and Lexing Ying. Solving Inverse Wave Scattering with Deep Learning. Annals of Mathematical Sciences and Applications. 2022.
68. Lexing Ying. Solving Inverse Problems with Deep Learning. ICM 2022.
69. Chao Ma, Lexing Ying. On Linear Stability of SGD and Input-Smoothness of Neural Networks. NeurIPS 2021
70. Lexing Ying, Yuhua Zhu, A Note on Optimization Formulations of Markov Decision Processes. Communications in Mathematical Sciences. 2022
71. Jordi Feliu-Fab, Lexing Ying. Approximate inversion of discrete Fourier integral operators. Journal of Computational Physics. 2021.
72. Jordi Feliu-Faba, Lexing Ying. Hierarchical Interpolative Factorization Preconditioner for Parabolic Equations. Journal of Scientific Computing. 2020.
73. Jing An and Lexing Ying. On the gradient flow structure of the isotropic Landau equation. Communications in Mathematical Sciences. 2021.
74. Lukas Einkemmer, Jingwei Hu, Lexing Ying. An efficient dynamical low-rank algorithm for the Boltzmann-BGK equation close to the compressible viscous flow regime. SIAM Journal of Scientific Computing. 2021.
75. Chao Ma, Lexing Ying. Achieving Adversarial Robustness Requires An Active Teacher. Journal of Computational Mathematics. 2021.
76. Rajat Sen, Alexander Rakhlin, Lexing Ying, Rahul Kidambi, Dean Foster, Daniel Hill, Inderjit Dhillon. Top-k eXtreme Contextual Bandits with Arm Hierarchy. ICML(2021).
77. Zachary Izzo, Lexing Ying, James Zou. How to Learn when Data Reacts to Your Model: Performative Gradient Descent. ICML(2021).

78. Haoya Li, Yuwei Fan, Lexing Ying. A Simple Multiscale Method for Mean Field Games. Journal of Computational Physics. 2021.
79. Lexing Ying. A heuristic independent particle approximation to determinantal point processes. Journal of Scientific Computing. 2021.
80. Haoya Li, Yuehaw Khoo, Yinuo Ren, Lexing Ying. A semigroup method for high dimensional committor functions based on neural network, MSML(2021).
81. Yuhua Zhu, Zach Izzo, and Lexing Ying. Borrowing From the Future: Addressing Double Sampling in Model-free Control. MSML(2021).
82. Jing An, Lexing Ying, Yuhua Zhu. Why resampling outperforms reweighting for correcting sampling bias. ICLR 2021.
83. Yuehaw Khoo, Jianfeng Lu, and Lexing Ying. Efficient construction of tensor ring representations from sampling. SIAM Journal of Multiscale Modeling and Simulation. 2021.
84. Jun Qin and Lexing Ying. Hierarchical Low-rank Structure of Parameterized Distributions. Communications in Mathematical Sciences. 2021.
85. Yuhua Zhu and Lexing Ying. A Sharp Convergence Rate for a Model Equation of the Asynchronous Stochastic Gradient Descent. Communications in Mathematical Sciences. 2021.
86. Zhihan Li, Yuwei Fan, and Lexing Ying. Multilevel Fine-Tuning: Closing Generalization Gaps in Approximation of Solution Maps under a Limited Budget for Training Data. SIAM MMS. 2021.
87. Lexing Ying. Natural Gradient for Combined Loss Using Wavelets. Journal of Scientific Computing. 2021.
88. Xin Ye, Jianlin Xia, Lexing Ying. Analytical low-rank compression via proxy point selection. SIAM Journal on Matrix Analysis and Applications. 2020.
89. Yuehaw Khoo, Lin Lin, Michael Lindsey, Lexing Ying. Semidefinite relaxation of multi-marginal optimal transport for strictly correlated electrons in second quantization. SISC. 2020.
90. Lexing Ying. Mirror Descent Algorithms for Minimizing Interacting Free Energy. Journal of Scientific Computing 51 (2020). .
91. Yiping Lu, Chao Ma, Yulong Lu, Jianfeng Lu, Lexing Ying. A Mean-field Analysis of Deep ResNet and Beyond: Towards Provable Optimization via Overparameterization from Depth. ICML (2020).
92. Yuhua Zhu and Lexing Ying. Borrowing From the Future: An Attempt to Address Double Sampling. Mathematical and Scientific Machine Learning Conference (2020).
93. Jordi Feliu-Faba, Yuwei Fan, and Lexing Ying. Meta-learning pseudo-differential operators with deep neural networks. Journal of Computational Physics 408 (2020).
94. Yuwei Fan and Lexing Ying. Solving electrical impedance tomography with deep learning. Journal of Computational Physics 404 (2020).
95. Victor Minden and Lexing Ying. A simple solver for the fractional Laplacian in multiple dimensions. SIAM Journal on Scientific Computing 42-2 (2020).
96. Yuehaw Khoo, Jianfeng Lu, and Lexing Ying. Solving PDE problems with uncertainty using neural-networks. European Journal of Applied Mathematics (2020).
97. Jordi Feliu-Faba, Kenneth Ho, and Lexing Ying. Recursively preconditioned hierarchical interpolative factorization for elliptic partial differential equations. Communications in Mathematical Sciences 18-1 (2020).
98. Wuchen Li, Lexing Ying. Hessian transport gradient flows. Research in the Mathematical Sciences 6 (2019).
99. Yuehaw Khoo and Lexing Ying. SwitchNet: a neural network model for forward and inverse scattering problems. SIAM Journal on Scientific Computing 41-5 (2019).

100. Yuehaw Khoo and Lexing Ying. Convex relaxation approaches for strictly correlated density functional theory. SIAM Journal on Scientific Computing 41-4, (2019).

101. Yuwei Fan, Lin Lin, Lexing Ying, and Leonardo Zepeda-Nunez, A multiscale neural network based on hierarchical matrices. SIAM Journal of Multiscale Modeling and Simulation 17-4, (2019)

102. Jing An, Jianfeng Lu, and Lexing Ying. Stochastic modified equations for the asynchronous stochastic gradient descent. Information and Inference (2019).

103. Lin Lin, Jianfeng Lu, and Lexing Ying. Numerical methods for Kohn-Sham density functional theory, Acta Numer. 2019.

104. Yuwei Fan, Jordi Feliu-Faba, Lin Lin, Lexing Ying, and Leonardo Zepeda-Nunez. A multiscale neural network based on hierarchical nested bases. Research in the Mathematical Sciences, 2019, Vol. 6

105. Yuwei Fan, Cindy Orozco Bohorquez, and Lexing Ying. BCR-Net: a neural network based on the nonstandard wavelet form. Journal of Computational Physics, 2019, Vol. 384.

106. Yuwei Fan, Jing An, and Lexing Ying. Fast algorithms for integral formulations of steady-state radiative transfer equation. Journal of Computational Physics, 2019, Vol. 380

107. Fei Liu and Lexing Ying. Sparsifying preconditioner for the time-harmonic Maxwell's equations. Journal of Computational Physics 376, (2019).

108. Anil Damle, Victor Minden, and Lexing Ying. Simple, direct and efficient multi-way spectral clustering. Information and Inference 8 (2019).

109. Yuehaw Khoo, Jianfeng Lu, and Lexing Ying. Solving for high dimensional committor functions using artificial neural networks. Research in the Mathematical Sciences 6 (1), 2018

110. Zhenning Cai, Yuwei Fan, and Lexing Ying. An entropic Fourier method for the Boltzmann equation. SIAM J. Sci. Comput. 40(5) (2018).

111. Fei Liu and Lexing Ying. Sparsify and sweep: an efficient preconditioner for the Lippmann-Schwinger equation. SIAM Journal on Scientific Computing 40-2 (2018).

112. Yingzhou Li, Haizhao Yang, and Lexing Ying. Multidimensional butterfly factorization. Applied and Computational Harmonic Analysis 44-3 (2018).

113. Anil Damle, Lin Lin, and Lexing Ying. Computing localized representations of the kohn-sham subspace via randomization and refinement. SIAM Journal on Scientific Computing 39-6 (2017).

114. Victor Minden, Anil Damle, Kenneth Ho, and Lexing Ying. Fast spatial Gaussian process maximum likelihood estimation via skeletonization factorizations. SIAM Journal of Multiscale Modeling and Simulation 15-4 (2017).

115. Lexing Ying. Tensor network skeletonization. SIAM Journal of Multiscale Modeling and Simulation 15-4 (2017).

116. Yingzhou Li and Lexing Ying. Distributed-memory hierarchical interpolative factorization. Research in the Mathematical Sciences 4 (2017).

117. Fei Liu and Lexing Ying. Localized sparsifying preconditioner for periodic indefinite systems. Communications in Mathematical Sciences 15-4 (2017).

118. Victor Minden, Kenneth Ho, Anil Damle, and Lexing Ying. A recursive skeletonization factorization based on strong admissibility. SIAM Multiscale Modeling and Simulation 15-2 (2017).

119. Lin Lin, Ze Xu, and Lexing Ying. Adaptively compressed polarizability operator for accelerating large scale ab initio phonon calculations. SIAM Multiscale Modeling and Simulation 15-1 (2017).

120. Anil Damle, Lin Lin, and Lexing Ying. SCDM-k: Localized orbitals for solids via selected columns of the density matrix. Journal of Computational Physics 334 (2017).

121. Jianfeng Lu and Lexing Ying. Fast algorithm for periodic density fitting for Bloch waves. Annals of Mathematical Sciences and Applications 1-2 (2016).

122. Jianfeng Lu and Lexing Ying. Sparsifying preconditioner for soliton calculations. Journal of Computational Physics 315 (2016).
123. Fei Liu and Lexing Ying. Additive sweeping preconditioner for the Helmholtz equation. SIAM Multiscale Modeling and Simulation 14-2 (2016).
124. Fei Liu and Lexing Ying. Recursive sweeping preconditioner for the 3D Helmholtz equation. SIAM Journal on Scientific Computing 38-2 (2016).
125. Victor Minden, Anil Damle, Kenneth Ho, and Lexing Ying. A technique for updating hierarchical factorizations of integral operators. SIAM Multiscale Modeling and Simulation 14-1 (2016).
126. Junzhe Sun, Sergey Fomel, and Lexing Ying. Lowrank one-step wave extrapolation for reverse-time migration. Geophysics 81-1 (2016).
127. Kenneth Ho and Lexing Ying. Hierarchical interpolative factorization for elliptic operators: differential equations. Communications in Pure and Applied Mathematics 69-8 (2016).
128. Kenneth Ho and Lexing Ying. Hierarchical interpolative factorization for elliptic operators: integral equations. Communications in Pure and Applied Mathematics 69-7 (2016).
129. Haizhao Yang, Jianfeng Lu, and Lexing Ying. Crystal image analysis using 2D synchrosqueezed transforms. SIAM Multiscale Modeling and Simulation 13-4 (2015).
130. Jianfeng Lu and Lexing Ying. Compression of the electron repulsion integral tensor in tensor hypercontraction format with cubic scaling cost. Journal of Computational Physics 302-1 (2015).
131. Lexing Ying. Directional preconditioner for 2D high frequency obstacle scattering. SIAM Multiscale Modeling and Simulation 13-3 (2015).
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133. Yingzhou Li, Haizhao Yang, Eileen Martin, Kenneth Ho, and Lexing Ying. Butterfly factorization. SIAM Multiscale Modeling and Simulation 13-2 (2015).
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135. Yingzhou Li, Haizhao Yang, and Lexing Ying. A multiscale butterfly algorithm for multidimensional Fourier integral operators. SIAM Multiscale Modeling and Simulation 13-2 (2015).
136. Anil Damle, Lin Lin, and Lexing Ying. Compressed representation of Kohn-Sham orbitals via selected columns of the density matrix. J. Chem. Theory Comput. 11 (2015)
137. Lexing Ying. Sparsifying preconditioner for pseudospectral approximations of indefinite systems on periodic structures. SIAM Multiscale Modeling and Simulation 13-2 (2015).
138. Lexing Ying. Fast directional computation of high frequency boundary integrals via local FFTs. SIAM Multiscale Modeling and Simulation 13-1 (2015).
139. Jingwei Hu and Lexing Ying. A fast algorithm for the energy space boson Boltzmann collision operator. Mathematics of Computation 84 (2015).
140. Jingwei Hu, Sergey Fomel, and Lexing Ying. A fast algorithm for 3D azimuthally anisotropic velocity scan. Geophysical Prospecting 63 (2015).
141. Anil Damle, Lin Lin, and Lexing Ying. Pole expansion for solving a type of parametrized linear systems in electronic structure calculations. SIAM Journal on Scientific Computing 36 (2014).
142. Austin Benson, Jack Poulson, Khoa Tran, Bjorn Engquist, and Lexing Ying. A parallel directional fast multipole method. SIAM Journal on Scientific Computing 36 (2014).
143. Haizhao Yang and Lexing Ying. Synchrosqueezed curvelet transform for two-dimensional mode decomposition. SIAM Journal on Mathematical Analysis 46 (2014).
144. Jack Poulson, Laurent Demanet, Nicholas Maxwell, and Lexing Ying. A parallel butterfly algorithm. SIAM Journal on Scientific Computing 36 (2014).

145. Paul Tsuji, Jack Poulson, Bjorn Engquist, and Lexing Ying. Sweeping preconditioners for elastic wave propagation with spectral element methods. ESAIM: Mathematical Modeling and Numerical Analysis 48 (2014).
146. Phillip Schmitz and Lexing Ying. A fast nested dissection solver for Cartesian 3D elliptic problems using hierarchical matrices. Journal of Computational Physics 258 (2014).
147. Haizhao Yang and Lexing Ying. Synchrosqueezed wave packet transform for 2D mode decomposition. SIAM Journal on Imaging Sciences 6 (2014).
148. Jingwei Hu, Sergey Fomel, Laurent Demanet, and Lexing Ying. A fast butterfly algorithm for the hyperbolic Radon transform. Geophysics 78 (2013).
149. Jack Poulson, Bjorn Engquist, S. Li and Lexing Ying. A parallel sweeping preconditioner for heterogeneous 3D Helmholtz equations. SIAM Journal on Scientific Computing 35 (2013).
150. X. Song, Sergey Fomel, and Lexing Ying. Lowrank finite-differences and lowrank Fourier finite-differences for seismic wave extrapolation. Geophysical Journal International 193 (2013).
151. G. Bao, J. Qian, Lexing Ying, and H. Zhang. A convergent multiscale Gaussian-beam parametrix for wave equations. Communications in Partial Differential Equations 38 (2013).
152. Bjorn Engquist and Lexing Ying. A fast algorithm for reiterated homogenization. Communications in Mathematical Sciences 11 (2013).
153. Sergey Fomel, Lexing Ying, and X. Song. Seismic wave extrapolation using lowrank symbol approximation. Geophysical Prospecting 61 (2013).
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164. Paul Tsuji and Lexing Ying. A sweeping preconditioner for Yee's finite difference approximation of time-harmonic Maxwell's equations. Frontiers of Mathematics in China 7 (2012).
165. Lin Lin, Jianfeng Lu, Lexing Ying, and Weinan 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).
166. Laurent Demanet, M. Ferrara, N. Maxwell, Jack Poulson, and Lexing Ying. A butterfly algorithm for synthetic aperture radar imaging. SIAM Journal on Imaging Sciences 5 (2012).

167. Jingwei Hu and Lexing Ying. A fast spectral algorithm for the quantum Boltzmann collision operator. Commun. Math. Sci 10 (2012).
168. Phillip Schmitz and Lexing Ying. A fast direct solver for elliptic problems on general meshes in 2D. Journal of Computational Physics 231 (2012).
169. X. Song, Sergey Fomel, Lexing Ying, and T. Ding, Lowrank finite-difference for wave extrapolation. Proceedings of the 2011 SEG Annual Meeting.
170. Bjorn Engquist, Jack Poulson, and Lexing Ying. Sweeping preconditioner for the 3D Helmholtz equation. Proceedings of the 2011 SEG Annual Meeting.
171. Shidong Jiang, Bo Ren, Paul Tsuji, and Lexing Ying. Second kind integral equations for the first kind Dirichlet problem of the biharmonic equation in three dimensions. Journal of Computational Physics 230 (2011).
172. Bjorn Engquist and Lexing Ying. Sweeping preconditioner for the Helmholtz equation: Moving perfectly matched layers. SIAM Multiscale Modeling and Simulation 9 (2011).
173. Lin Lin, Chao Yang, Jianfeng Lu, Lexing Ying, and Weinan 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).
174. Lin Lin, Jianfeng Lu, and Lexing Ying. Fast construction of hierarchical matrix representation from matrix-vector multiplication. Journal of Computational Physics 230 (2011).
175. Paul Tsuji and Lexing Ying. A fast directional algorithm for high-frequency electromagnetic scattering. Journal of Computational Physics 230 (2011).
176. Bjorn Engquist and Lexing Ying. Sweeping preconditioner for the Helmholtz equation: Hierarchical matrix representation. Communications in Pure and Applied Mathematics 64 (2011).
177. Lin Lin, C. Yang, Juan Meza, Jianfeng Lu, Lexing Ying, and Weinan E. SelInv–an algorithm for selected inversion of a sparse symmetric matrix. ACM Trans. Math. Software 37 (2011).
178. Paul Tsuji, Dongbin Xiu, and Lexing Ying. A fast method for high-frequency acoustic scattering from random scatterers. International Journal on Uncertainty Quantification 1 (2011).
179. Laurent Demanet and Lexing Ying. Discrete symbol calculus. SIAM Rev. 53 (2011).
180. Bjorn Engquist and Lexing Ying. Fast algorithms for high frequency wave propagation. Numerical Analysis of Multiscale Problems, I. Graham, T. Hou, O. Lakkis and R. Scheichl (editors), Lecture Notes in Computational Science and Engineering, Springer.
181. Sergey Fomel, Lexing Ying, and X. Song, Seismic wave extrapolation using lowrank symbol approximation. Proceedings of the 2010 SEG Annual Meeting.
182. Jianliang Qian and Lexing Ying. Fast multiscale Gaussian wavepacket transforms and multiscale Gaussian beams for the wave equation. SIAM Multiscale Modeling and Simulation 8 (2010).
183. Jianliang Qian and Lexing Ying. Fast Gaussian wavepacket transforms and Gaussian beams for the Schrodinger equation. J. Computational Physics 229 (2010).
184. Laurent Demanet and Lexing Ying. Scattering in flatland: efficient representations via wave atoms. Found. of Comput. Math. 10 (2010).
185. Bjorn Engquist and Lexing Ying. Fast directional algorithms for the Helmholtz kernel. Journal of Computational and Applied Mathematics 234 (2010).
186. I. Lashuk, A. Chandramowlishwaran, H. Langston, T. Nguyen, R. Sampath, A. Shringarpure, R. Vuduc, Lexing 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.
187. Bjorn Engquist, Khoa Tran, and Lexing Ying. Fast hybrid algorithms for high frequency scattering Engquist. 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).

188. Lin Lin, Jianfeng Lu, Lexing Ying. and Weinan E. Pole-based approximation of the Fermi-Dirac function. Chinese Annals of Mathematics - Series B 30 (2009).

189. Lexing Ying and Sergey Fomel. Fast computation of partial Fourier transforms. SIAM Multiscale Modeling and Simulation 8 (2009).

190. Lin Lin, Jianfeng Lu, Lexing Ying, Roberto Car, and Weinan E. Fast algorithm for extracting the diagonal of the inverse matrix with application to the electronic structure analysis of metallic systems. Commun. Math. Sci. 7 (2009).

191. Emmanuel Candes, Laurent Demanet and Lexing Ying. A fast butterfly algorithm for the computation of Fourier integral operators. SIAM Multiscale Modeling and Simulation 7 (2009).

192. Bjorn Engquist and Lexing Ying. A fast directional algorithm for high frequency acoustic scattering in two dimension. Communications in Mathematical Sciences 7 (2009).

193. Laurent Demanet and Lexing Ying. Wave atoms and time upscaling of wave equations. Numerische Mathematik 113 (2009).

194. Lexing Ying. Sparse Fourier transform via butterfly algorithm. SIAM Journal on Scientific Computing 31 (2009).

195. Lexing Ying. Fast algorithms boundary integral equations. In Bjorn Engquist, O. Runborg, P. Lotstedt, editors, Multiscale Methods in Science and Engineering, pages 139-194, volume 66 of Lecture Notes in Computational Science and Engineering, Heidelberg, 2009. Springer Verlag.

196. Laurent Demanet and Lexing Ying. Curvelets and wave atoms for mirror-extended images. Proc. SPIE Wavelets XII conf, San Diego, August 2007 (Invited Paper).

197. Laurent Demanet and Lexing Ying. Wave atoms and sparsity of oscillatory patterns. Applied and Computational Harmonic Analysis 23 (2007).

198. Emmanuel Candes, Laurent Demanet and Lexing Ying. Fast computation of Fourier integral operators. SIAM Journal on Scientific Computing 29 (2007).

199. Bjorn Engquist and Lexing Ying. Fast directional multilevel algorithms for oscillatory kernels. SIAM Journal on Scientific Computing 29 (2007).

200. Lexing Ying and Emmanuel Candes. The phase flow method. Journal of Computational Physics 220 (2006).

201. Lexing Ying and Emmanuel Candes. Fast geodesics computation with the phase flow method. Journal of Computational Physics 220 (2006).

202. Lexing Ying, George Biros, and Denis Zorin. A high-order 3D boundary integral equation solver for elliptic PDEs in smooth domains. Journal of Computational Physics 219 (2006).

203. Emmanuel Candes, Laurent Demanet, Donoho Donoho, and Lexing Ying. Fast discrete curvelet transforms. SIAM Multiscale Modeling and Simulation 5 (2006).

204. Lexing Ying. A kernel independent fast multipole algorithm for radial basis functions. Journal of Computational Physics 213 (2006).

205. Lexing Ying, Laurent Demanet, and Emmanuel Candes. 3D discrete curvelet transform. Proc. Wavelets XI conf., San Diego, July 2005 (Invited Paper).

206. Lexing Ying and Denis Zorin. A simple manifold-based construction of surfaces of arbitrary smoothness. ACM Transactions on Graphics 23 (2004) (SIGGRAPH 2004).

207. Lexing Ying, George Biros, and Denis Zorin. A kernel-independent adaptive fast multipole method in two and three dimensions. Journal of Computational Physics 196 (2004).

208. George Biros, Lexing Ying, and Denis Zorin. A fast solver for the Stokes equations with distributed forces in complex geometries. Journal of Computational Physics 194 (2004).

209. Lexing Ying, George Biros, Denis Zorin, and 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.

210. L. Velho, K. Perlin, Lexing Ying, and H. Biermann. Algorithmic shape modeling with subdivision surfaces. Computers and Graphics 26 (2002).
211. George Biros, Lexing Ying, Denis Zorin. The embedded boundary integral equation solver for the incompressible Navier-Stokes equations. International Association for Boundary Element Methods Symposium, 2002.
212. Lexing Ying, Denis Zorin. Nonmanifold subdivision. The 12th IEEE Visualization Conference, 2001.
213. Lexing Ying, A. Hertzmann, H. Biermann, Denis Zorin. Texture and shape synthesis on surfaces. The 12th Eurographics Workshop on Rendering, 2001.
214. Anshul Gupta and Lexing Ying. A Fast Maximum-Weight-Bipartite-Matching Algorithm for Reducing Pivoting in Sparse Gaussian Elimination. Technical report RC 21576 (97320), IBM T. J. Watson Research Center, Yorktown Heights, NY, 1999.

Teaching

At Stanford

- Topic course on quantum algorithms of scientific computing: Fall 2024
- Topic course on physical models of applied mathematics: Winter 2024
- Topic course on algorithms for quantum mechanics and machine learning: Fall 2021
- Computational methods for applied mathematics: Winter 2024, Winter 2025.
- Topic course on algorithms for quantum mechanics and machine learning: Fall 2021
- Linear Algebra and Differential Calculus of Several Variables: Winter 2020, Fall 2022
- Basic Probability and Stochastic Processes with Engineering Applications: Spring 2018, Spring 2021, Spring 2022
- Ordinary Differential Equations with Linear Algebra: Spring 2016
- Applied Matrix Analysis: Spring 2013, Spring 2014, Spring 2015, Winter 2017, Winter 2018, Spring 2019, Fall 2020
- Introduction to Scientific Computing: Winter 2015, Winter 2017, Fall 2023, Fall 2024
- Partial Differential Equations: Winter 2015
- Numerical Solution of Partial Differential Equations: Spring 2013, Spring 2014, Spring 2015, Spring 2016, Spring 2017, Spring 2018, Spring 2020, Spring 2021, Spring 2022, Spring 2023
- 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:

- Nan Sheng (2024-)
- Hongrui Chen (2024-)
- Haoxuan Chen (2023-)
- Ya-Chi Chu (co-advised with Madeleine Udell, 2023-)
- Rajat Dwaraknath (co-advised with Mert Pilanci, 2023-)
- Hongkang Ni (2023-)
- Yinuo Ren (co-advised with Grant Rotskoff, 2022-)
- Leah Reeder (2021-)
- Xun Tang (2021-2025)
- Milo Marsden (co-advised with Persi Diaconis, 2021-2025)
- Haoya Li (2020-2024)
- Yiping Lu (2020-2023)
- Zach Izzo (2020-2023)
- Panagiotis Lolas (2019-2022)
- Philip Etter (2018-2022)
- Jing An (2017-2021)
- Jordi Feliu-Faba (2017-2021)
- Cindy Catherine Orozco Bohorquez (2016-2021)
- Fei Liu, ICME, Stanford (2014-2019)
- 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:

- Xun Tang (2025-)
- Alice Cortinovis (2022-2024, postdoc co-advised with Emmanuel Candes)
- Yuhua Zhu, Stanford (2019-2022)
- Yuwei Fan, Stanford (2016-2019)
- Yuehaw Khoo, Stanford (2016-2019)
- Kenneth Ho, Stanford (2013-2015)
- Jingwei Hu, UT Austin (2011-2014)
- Jack Poulson, Stanford (2013)

Services

University and departmental services

- Member, Math Hiring Committee, Stanford, 2024-.
- Member, Math PhD admission committee, Stanford, 2021-2024.
- Member, ICME Admission Committee, Stanford, 2013-2017, 2019-2023.
- Director, ICME Imaging Science Master Program, Stanford, 2015-present.
- Chair, Math+X Search Committee, Stanford, 2016-2018, 2019-2020
- Member, Mathematics Hiring Committee, Stanford, 2016-2017, 2019-2020
- Chair, ICME Qualify Exam Committee, Stanford, 2015-2019.
- 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 committee member of AMS Graduate Studies in Mathematics
- Board member of Mathematical Sciences Publishers
- Journal service: Associate editor of Communications in Mathematical Sciences (2010-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). Associate editor of SIAM Journal on Scientific Computing (2013-2016).
- Programs: MSRI Fall 2015 Kinetic theory.

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

- Issac Newton Institute, Workshop on Deep learning and partial differential equations, Nov 2021
- Simons Workshop, PDEs, Sampling, and Optimization, Oct 2021
- Invited lecture, IUTAM-Symposium, July 2021
- IMA Workshop on Deep Learning, Purdue, June 2021.
- IPAM Workshop, Tensor Network States and Applications, UCLA, April 2021
- Plenary lecture Mathematical and Scientific Machine Learning, July 2020.
- SIAM Data Science, virtual, May 2020.
- Plenary lecture at Waves Conference, Vienna, Austria, Aug 2019.
- Plenary lecture at Preconditioning Conference, Minneapolis, USA, July 2019.
- Machine Learning for Multiscale Model Reduction, Harvard University, March 2019.
- Banff workshop, Optimal Transport Methods in Density Functional Theory, Jan 2019.

- International Conference on Machine Learning and Physics, Tsinghua University, China, July 2018
- Mathematical and Numerical Aspects of Quantum Dynamics, CSCAMM, Univ of Maryland, June 2018.
- International Workshop on Computational Mathematics, China, June 2018
- The Fourth International Workshop on the Development and Application of High-Order Numerical Methods, China, June 2018
- SIAM Applied Linear Algebra, May 2018.
- Recent Advances in Seismic Modeling and Inversion at ICERM, Nov 2017.
- 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

- Class '27 Lectures, RPI, April 2025
- Colloquium, MIT, Feb 2024
- Colloquium, Univ of Chicago, Feb 2024
- Colloquium, Univ of Chicago, April 2023
- Colloquium and Aziz lecture, UMD, April 2023
- Colloquium, Princeton, April 2023
- Colloquium, UBC, Jan 2023
- Colloquium, Michigan State, Oct 2022
- Colloquium, UWash, Oct 2022
- Colloquium, NJIT, Feb 2022
- Seminar, UAM-ICMAT, Feb 2022
- Colloquium, UCSC, Feb 2022
- DDPS Seminar, Lawrence Livermore Lab, Feb 2022

- Math colloquium, University of Colorado, Feb 2022
- Colloquium, CUHK Mathematics Department and Institute of Mathematical Sciences, Feb 2022
- Computational Math Seminar, Ohio State, Jan 2022
- Seminar, FAU Erlangen, Dec 2011
- Issac Newton Institute, three invited lectures, Nov 2021
- Cornell CAM Colloquium, Cornell, Sept 2021
- Machine Learning and Scientific Applications, SJTU, Aug 2021
- Scientific Computing Seminar, Emory, Mar 2021
- Inverse Problem Seminar, UC Irvine, Jan 2021
- Keller Colloquium, Caltech, Jan 2021.
- Applied math Colloquium, UPenn, Nov 2020
- Colloquium, Southern University of Science and Technology, May 2020.
- Colloquium, Shanghai Jiao Tong University, April 2020.
- Applied math seminar, UC Berkeley, April 2020.
- Applied math seminar, Georgia Tech, Feb 2019.
- Mathematics colloquium, Georgia Tech, Feb 2019.
- Ordway Visitor (3 lectures), University of Minnesota, Nov 2018.
- Mathematics colloquium, New York University, Oct 2018.
- Facebook AI Research, July 2018.
- Mathematics colloquium, East China Normal University, June 2018.
- Applied mathematics colloquium, Columbia University, Feb 2018.
- Taiwan semiconductor manufacturing company, Jan 2018.
- Google Brain, Nov 2017.
- Scientific computing seminar, Southern Methodist University, Nov 2017.
- Operations research and financial engineering seminar, Princeton University, Nov 2017.
- 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, UC Berkeley, 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.
- 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 Univeristy, 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.
- 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.