Stanford



Lexing Ying

Professor of Mathematics and, by courtesy, of Computer Science

Curriculum Vitae available Online

Bio

ACADEMIC APPOINTMENTS

- Professor, Mathematics
- Professor (By courtesy), Computer Science
- Member, Institute for Computational and Mathematical Engineering (ICME)

HONORS AND AWARDS

- SIAM Fellow, SIAM (2024)
- Invited lecture, The International Congress of Mathematicians (2022)
- 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)
- Alfred P. Sloan Research Fellowship, Sloan Foundation (2007)

Teaching

COURSES

2026-27

- Applied Matrix Theory: MATH 104 (Win)
- Computational Methods of Applied Mathematics: CME 306, MATH 220B (Win)
- Introduction to Scientific Computing with Machine Learning Applications: CME 108 (Win)

2025-26

- Computational Methods of Applied Mathematics: CME 306, MATH 220B (Win)

2024-25

- Topics in Applied Math: Quantum Algorithms for Scientific Computation: MATH 275A (Aut)
- Computational Methods of Applied Mathematics: CME 306, MATH 220B (Win)
- Introduction to Scientific Computing: CME 108 (Aut)

2023-24

- Computational Methods of Applied Mathematics: CME 306, MATH 220B (Win)

- Introduction to Scientific Computing: CME 108 (Aut)
- Topics in Applied Math II: MATH 275B (Win)

STANFORD ADVISEES

Doctoral Dissertation Advisor (AC)

Haoxuan Chen, Hongrui Chen, HONGKANG NI, Nan Sheng

Doctoral Dissertation Co-Advisor (AC)

Shaghayegh Fazliani

Publications

PUBLICATIONS

- **Multimodal sampling via approximate symmetries** *RESEARCH IN THE MATHEMATICAL SCIENCES*
  Ying, L.
  2025; 12 (2)
- **An Analysis of Offline Model-Based Learning with Action Noise** *JOURNAL OF SCIENTIFIC COMPUTING*
  Li, H., Gangwani, T., Ying, L.
  2025; 103 (2)
- **Correcting convexity bias in function and functional estimate** *RESEARCH IN THE MATHEMATICAL SCIENCES*
  Ma, C., Ying, L.
  2025; 12 (1)
- **A perturbative analysis for noisy spectral estimation** *APPLIED AND COMPUTATIONAL HARMONIC ANALYSIS*
  Ying, L.
  2025; 74
- **Multidimensional unstructured sparse recovery via eigenmatrix** *APPLIED AND COMPUTATIONAL HARMONIC ANALYSIS*
  Ying, L.
  2025; 74
- **Computing free convolutions via contour integrals** *RANDOM MATRICES-THEORY AND APPLICATIONS*
  Cortinovis, A., Ying, L.
  2024
- **Quantum Multiple Eigenvalue Gaussian filtered Search: an efficient and versatile quantum phase estimation method** *QUANTUM*
  Ding, Z., Li, H., Lin, L., Ni, H., Ying, L., Zhang, R.
  2024; 8
- **Heisenberg-limited Hamiltonian learning for interacting bosons** *NPJ QUANTUM INFORMATION*
  Li, H., Tong, Y., Gefen, T., Ni, H., Ying, L.
  2024; 10 (1)
- **Solving high-dimensional Fokker-Planck equation with functional hierarchical tensor** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Tang, X., Ying, L.
  2024; 511
- **Quantum Hamiltonian Learning for the Fermi-Hubbard Model** *ACTA APPLICANDAE MATHEMATICAE*
  Ni, H., Li, H., Ying, L.
  2024; 191 (1)
- **Eigenmatrix for unstructured sparse recovery** *APPLIED AND COMPUTATIONAL HARMONIC ANALYSIS*
  Ying, L.
  2024; 71

- **ACCELERATING PRIMAL-DUAL METHODS FOR REGULARIZED MARKOV DECISION PROCESSES** *SIAM JOURNAL ON OPTIMIZATION*
  Li, H., Yu, H., Ying, L., Dhillon, I. S.
  2024; 34 (1): 764-789
- **Multi-Objective Optimization via Wasserstein-Fisher-Rao Gradient Flow**
  Ren, Y., Xiao, T., Gangwani, T., Rangi, A., Rahmanian, H., Ying, L., Sanyal, S.
  edited by Dasgupta, S., Mandt, S., Li, Y.
  JMLR-JOURNAL MACHINE LEARNING RESEARCH.2024
- **Understanding the Generalization Benefits of Late Learning Rate Decay**
  Ren, Y., Ma, C., Ying, L.
  edited by Dasgupta, S., Mandt, S., Li, Y.
  JMLR-JOURNAL MACHINE LEARNING RESEARCH.2024
- **Statistical Spatially Inhomogeneous Diffusion Inference**
  Ren, Y., Lu, Y., Ying, L., Rotskoff, G. M.
  edited by Wooldridge, M., Dy, J., Natarajan, S.
  ASSOC ADVANCEMENT ARTIFICIAL INTELLIGENCE.2024: 14820-14828
- **Adaptive low-depth quantum algorithms for robust multiple-phase estimation** *PHYSICAL REVIEW A*
  Li, H., Ni, H., Ying, L.
  2023; 108 (6)
- **Operator shifting for noisy elliptic systems** *RESEARCH IN THE MATHEMATICAL SCIENCES*
  Etter, P. A., Ying, L.
  2023; 10 (4)
- **On low-depth algorithms for quantum phase estimation** *QUANTUM*
  Ni, H., Li, H., Ying, L.
  2023; 7
- **A note on spike localization for line spectrum estimation** *APPLIED AND COMPUTATIONAL HARMONIC ANALYSIS*
  Li, H., Ni, H., Ying, L.
  2023; 67
- **High-dimensional density estimation with tensorizing flow** *RESEARCH IN THE MATHEMATICAL SCIENCES*
  Ren, Y., Zhao, H., Khoo, Y., Ying, L.
  2023; 10 (3)
- **On efficient quantum block encoding of pseudo- differential operators** *QUANTUM*
  Li, H., Ni, H., Ying, L.
  2023; 7
- **Generative modeling via tree tensor network states** *RESEARCH IN THE MATHEMATICAL SCIENCES*
  Tang, X., Hur, Y., Khoo, Y., Ying, L.
  2023; 10 (2)
- **Variational actor-critic algorithms*,**** *ESAIM-CONTROL OPTIMISATION AND CALCULUS OF VARIATIONS*
  Zhu, Y., Ying, L.
  2023; 29
- **Solving Traveltime Tomography with Deep Learning** *COMMUNICATIONS IN MATHEMATICS AND STATISTICS*
  Fan, Y., Ying, L.
  2023
- **DOUBLE FLIP MOVE FOR ISING MODELS WITH MIXED BOUNDARY CONDITIONS** *JOURNAL OF COMPUTATIONAL MATHEMATICS*
  Ying, L.
  2023

- **Efficient long-range convolutions for point clouds** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Peng, Y., Lin, L., Ying, L., Zepeda-Nunez, L.
  2023; 473
- **Coarse-proxy reduced basis methods for integral equations** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Etter, P. A., Fan, Y., Ying, L.
  2023; 475
- **COMBINING RESAMPLING AND REWEIGHTING FOR FAITHFUL STOCHASTIC OPTIMIZATION** *COMMUNICATIONS IN MATHEMATICAL SCIENCES*
  An, J., Ying, L.
  2023; 21 (6): 1569-1588
- **When can Regression-Adjusted Control Variates Help? Rare Events, Sobolev Embedding and Minimax Optimality**
  Blanchet, J., Chen, H., Lu, Y., Ying, L.
  edited by Oh, A., Neumann, T., Globerson, A., Saenko, K., Hardt, M., Levine, S.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2023
- **ANNEALED IMPORTANCE SAMPLING FOR ISING MODELS WITH MIXED BOUNDARY CONDITIONS*** *JOURNAL OF COMPUTATIONAL MATHEMATICS*
  Ying, L.
  2023; 41 (3): 526-534
- **COMBINING RESAMPLING AND REWEIGHTING FOR FAITHFUL STOCHASTIC OPTIMIZATION** *COMMUNICATIONS IN MATHEMATICAL SCIENCES*
  An, J., Ying, L.
  2023; 21 (6): 1569-1588
- **Continuous-in-time Limit for Bayesian Bandits** *JOURNAL OF MACHINE LEARNING RESEARCH*
  Zhu, Y., Izzo, Z., Ying, L.
  2023; 24
- **OPERATOR SHIFTING FOR MODEL-BASED POLICY EVALUATION** *COMMUNICATIONS IN MATHEMATICAL SCIENCES*
  Tang, X., Ying, L., Zhu, Y.
  2023; 21 (8): 2169-2193
- **Analytic continuation from limited noisy Matsubara data** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Ying, L.
  2022; 469
- **Stable factorization for phase factors of quantum signal processing** *QUANTUM*
  Ying, L.
  2022; 6
- **Pole Recovery From Noisy Data on Imaginary Axis** *JOURNAL OF SCIENTIFIC COMPUTING*
  Ying, L.
  2022; 92 (3)
- **A Riemannian mean field formulation for two-layer neural networks with batch normalization** *RESEARCH IN THE MATHEMATICAL SCIENCES*
  Ma, C., Ying, L.
  2022; 9 (3)
- **On Lyapunov functions and particle methods for regularized minimax problems** *RESEARCH IN THE MATHEMATICAL SCIENCES*
  Ying, L.
  2022; 9 (2)
- **A semigroup method for high dimensional elliptic PDEs and eigenvalue problems based on neural networks** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Li, H., Ying, L.

2022; 453

- **A NOTE ON OPTIMIZATION FORMULATIONS OF MARKOV DECISION PROCESSES** *COMMUNICATIONS IN MATHEMATICAL SCIENCES*
  Ying, L., Zhu, Y.
  2022; 20 (3): 727-745
- **Operator Shifting for General Noisy Matrix Systems** *SIAM JOURNAL ON MATHEMATICS OF DATA SCIENCE*
  Etter, P. A., Ying, L.
  2022; 4 (4): 1320-1346
- **Solving optical tomography with deep learning** *ANNALS OF MATHEMATICAL SCIENCES AND APPLICATIONS*
  Fan, Y., Ying, L.
  2022; 7 (2): 195-220
- **How to Learn when Data Gradually Reacts to Your Model**
  Izzo, Z., Zou, J., Ying, L.
  edited by Camps-Valls, G., Ruiz, F. J., Valera
  JMLR-JOURNAL MACHINE LEARNING RESEARCH.2022
- **Enterprise-Scale Search: Accelerating Inference for Sparse Extreme Multi-Label Ranking Trees**
  Etter, P. A., Zhong, K., Yu, H., Ying, L., Dhillon, I., ACM
  ASSOC COMPUTING MACHINERY.2022: 452-461
- **Solving inverse wave scattering with deep learning** *ANNALS OF MATHEMATICAL SCIENCES AND APPLICATIONS*
  Fan, Y., Ying, L.
  2022; 7 (1): 23-48
- **Approximate inversion of discrete Fourier integral operators** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Feliu-Faba, J., Ying, L.
  2021; 446
- **Distributed-Memory H-Matrix Algebra I: Data Distribution and Matrix-Vector Multiplication** *CSIAM TRANSACTIONS ON APPLIED MATHEMATICS*
  Li, Y., Poulson, J., Ying, L.
  2021; 2 (3): 431-459
- **A simple multiscale method for mean field games** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Li, H., Fan, Y., Ying, L.
  2021; 439
- **Solving parametric PDE problems with artificial neural networks** *EUROPEAN JOURNAL OF APPLIED MATHEMATICS*
  Khoo, Y., Lu, J., Ying, L.
  2021; 32 (3): 421-435
- **A Heuristic Independent Particle Approximation to Determinantal Point Processes** *JOURNAL OF SCIENTIFIC COMPUTING*
  Ying, L.
  2021; 87 (2)
- **Natural Gradient for Combined Loss Using Wavelets** *JOURNAL OF SCIENTIFIC COMPUTING*
  Ying, L.
  2021; 86 (2)
- **MULTILEVEL FINE-TUNING: CLOSING GENERALIZATION GAPS IN APPROXIMATION OF SOLUTION MAPS UNDER A LIMITED BUDGET FOR TRAINING DATA** *MULTISCALE MODELING & SIMULATION*
  Li, Z., Fan, Y., Ying, L.
  2021; 19 (1): 344–73
- **HIERARCHICAL LOW-RANK STRUCTURE OF PARAMETERIZED DISTRIBUTIONS** *COMMUNICATIONS IN MATHEMATICAL SCIENCES*
  Qin, J., Ying, L.
  2021; 19 (3): 865-874

- **A SHARP CONVERGENCE RATE FOR A MODEL EQUATION OF THE ASYNCHRONOUS STOCHASTIC GRADIENT DESCENT** *COMMUNICATIONS IN MATHEMATICAL SCIENCES*
  Zhu, Y., Ying, L.
  2021; 19 (3): 851-863
- **AN EFFICIENT DYNAMICAL LOW-RANK ALGORITHM FOR THE BOLTZMANN-BGK EQUATION CLOSE TO THE COMPRESSIBLE VISCOUS FLOW REGIME** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Einkemmer, L., Hu, J., Ying, L.
  2021; 43 (5): B1057-B1080
- **Top-k eXtreme Contextual Bandits with Arm Hierarchy**
  Sen, R., Rakhlin, A., Ying, L., Kidambi, R., Foster, D., Hill, D., Dhillon, I. S.
  edited by Meila, M., Zhang, T.
  JMLR-JOURNAL MACHINE LEARNING RESEARCH.2021
- **ACHIEVING ADVERSARIAL ROBUSTNESS REQUIRES AN ACTIVE TEACHER** *JOURNAL OF COMPUTATIONAL MATHEMATICS*
  Ma, C., Ying, L.
  2021; 39 (6): 880-896
- **How to Learn when Data Reacts to Your Model: Performative Gradient Descent**
  Izzo, Z., Ying, L., Zou, J.
  edited by Meila, M., Zhang, T.
  JMLR-JOURNAL MACHINE LEARNING RESEARCH.2021
- **ON THE GRADIENT FLOW STRUCTURE OF THE ISOTROPIC LANDAU EQUATION** *COMMUNICATIONS IN MATHEMATICAL SCIENCES*
  An, J., Ying, L.
  2021; 19 (8): 2319-2333
- **EFFICIENT CONSTRUCTION OF TENSOR RING REPRESENTATIONS FROM SAMPLING** *MULTISCALE MODELING & SIMULATION*
  Khoo, Y., Lu, J., Ying, L.
  2021; 19 (3): 1261-1284
- **Stochastic modified equations for the asynchronous stochastic gradient descent** *INFORMATION AND INFERENCE-A JOURNAL OF THE IMA*
  An, J., Lu, J., Ying, L.
  2020; 9 (4): 851–73
- **Hierarchical Interpolative Factorization Preconditioner for Parabolic Equations** *JOURNAL OF SCIENTIFIC COMPUTING*
  Feliu-Faba, J., Ying, L.
  2020; 85 (2)
- **Mirror Descent Algorithms for Minimizing Interacting Free Energy** *JOURNAL OF SCIENTIFIC COMPUTING*
  Ying, L.
  2020; 84 (3)
- **Meta-learning pseudo-differential operators with deep neural networks** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Feliu-Faba, J., Fan, Y., Ying, L.
  2020; 408
- **Solving electrical impedance tomography with deep learning** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Fan, Y., Ying, L.
  2020; 404
- **RECURSIVELY PRECONDITIONED HIERARCHICAL INTERPOLATIVE FACTORIZATION FOR ELLIPTIC PARTIAL DIFFERENTIAL EQUATIONS** *COMMUNICATIONS IN MATHEMATICAL SCIENCES*
  Feliu-Faba, J., Ho, K. L., Ying, L.
  2020; 18 (1): 91–108
- **A SIMPLE SOLVER FOR THE FRACTIONAL LAPLACIAN IN MULTIPLE DIMENSIONS** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Minden, V., Ying, L.

2020; 42 (2): A878–A900

- **SEMIDEFINITE RELAXATION OF MULTIMARGINAL OPTIMAL TRANSPORT FOR STRICTLY CORRELATED ELECTRONS IN SECOND QUANTIZATION** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Khoo, Y., Lin, L., Lindsey, M., Ying, L.
  2020; 42 (6): B1462–B1489
- **ANALYTICAL LOW-RANK COMPRESSION VIA PROXY POINT SELECTION** *SIAM JOURNAL ON MATRIX ANALYSIS AND APPLICATIONS*
  Ye, X., Xia, J., Ying, L.
  2020; 41 (3): 1059–85
- **Hessian transport gradient flows** *RESEARCH IN THE MATHEMATICAL SCIENCES*
  Li, W., Ying, L.
  2019; 6 (4)
- **BCR-Net: A neural network based on the nonstandard wavelet form** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Fan, Y., Bohorquez, C., Ying, L.
  2019; 384: 1–15
- **A multiscale neural network based on hierarchical nested bases** *RESEARCH IN THE MATHEMATICAL SCIENCES*
  Fan, Y., Feliu-Faba, J., Lin, L., Ying, L., Zepeda-Nunez, L.
  2019; 6 (2)
- **Simple, direct and efficient multi-way spectral clustering** *INFORMATION AND INFERENCE-A JOURNAL OF THE IMA*
  Damle, A., Minden, V., Ying, L.
  2019; 8 (1): 181–203
- **Fast algorithms for integral formulations of steady-state radiative transfer equation** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Fan, Y., An, J., Ying, L.
  2019; 380: 191–211
- **Sparsifying preconditioner for the time-harmonic Maxwell's equations** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Liu, F., Ying, L.
  2019; 376: 913–23
- **A MULTISCALE NEURAL NETWORK BASED ON HIERARCHICAL MATRICES** *MULTISCALE MODELING & SIMULATION*
  Fan, Y., Lin, L., Ying, L., Zepeda-Nunez, L.
  2019; 17 (4): 1189–1213
- **CONVEX RELAXATION APPROACHES FOR STRICTLY CORRELATED DENSITY FUNCTIONAL THEORY** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Khoo, Y., Ying, L.
  2019; 41 (4): B773–B795
- **Numerical methods for Kohn-Sham density functional theory** *ACTA NUMERICA*
  Lin, L., Lu, J., Ying, L.
  2019; 28: 405–539
- **SWITCHNET: A NEURAL NETWORK MODEL FOR FORWARD AND INVERSE SCATTERING PROBLEMS** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Khoo, Y., Ying, L.
  2019; 41 (5): A3182–A3201
- **SPARSIFY AND SWEEP: AN EFFICIENT PRECONDITIONER FOR THE LIPPMANN- SCHWINGER EQUATION** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Liu, F., Ying, L.
  2018; 40 (2): B379–B404
- **AN ENTROPIC FOURIER METHOD FOR THE BOLTZMANN EQUATION** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Cai, Z., Fan, Y., Ying, L.
  2018; 40 (5): A2858–A2882

- **SCDM-k: Localized orbitals for solids via selected columns of the density matrix** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Damle, A., Lin, L., Ying, L.
  2017; 334: 1-15
- **ADAPTIVELY COMPRESSED POLARIZABILITY OPERATOR FOR ACCELERATING LARGE SCALE AB INITIO PHONON CALCULATIONS** *MULTISCALE MODELING & SIMULATION*
  Lin, L., Xu, Z., Ying, L.
  2017; 15 (1): 29-55
- **COMPUTING LOCALIZED REPRESENTATIONS OF THE KOHN-SHAM SUBSPACE VIA RANDOMIZATION AND REFINEMENT** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Damle, A., Lin, L., Ying, L.
  2017; 39 (6): B1178–B1198
- **TENSOR NETWORK SKELETONIZATION** *MULTISCALE MODELING & SIMULATION*
  Ying, L.
  2017; 15 (4): 1423–47
- **Hierarchical Interpolative Factorization for Elliptic Operators: Differential Equations** *COMMUNICATIONS ON PURE AND APPLIED MATHEMATICS*
  Ho, K. L., Ying, L.
  2016; 69 (8): 1415-1451
- **Hierarchical Interpolative Factorization for Elliptic Operators: Integral Equations** *COMMUNICATIONS ON PURE AND APPLIED MATHEMATICS*
  Ho, K. L., Ying, L.
  2016; 69 (7): 1314-1353
- **Sparsifying preconditioner for soliton calculations** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Lu, J., Ying, L.
  2016; 315: 458-466
- **RECURSIVE SWEEPING PRECONDITIONER FOR THE THREE-DIMENSIONAL HELMHOLTZ EQUATION** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Liu, F., Ying, L.
  2016; 38 (2): A814-A832
- **A TECHNIQUE FOR UPDATING HIERARCHICAL SKELETONIZATION-BASED FACTORIZATIONS OF INTEGRAL OPERATORS** *MULTISCALE MODELING & SIMULATION*
  Minden, V., Damle, A., Ho, K. L., Ying, L.
  2016; 14 (1): 42-64
- **ADDITIVE SWEEPING PRECONDITIONER FOR THE HELMHOLTZ EQUATION** *MULTISCALE MODELING & SIMULATION*
  Liu, F., Ying, L.
  2016; 14 (2): 799-822
- **Low-rank one-step wave extrapolation for reverse time migration** *GEOPHYSICS*
  Sun, J., Fomel, S., Ying, L.
  2016; 81 (1): S39-S54
- **Compression of the electron repulsion integral tensor in tensor hypercontraction format with cubic scaling cost** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Lu, J., Ying, L.
  2015; 302: 329-335
- **Quantitative Canvas Weave Analysis Using 2-D Synchrosqueezed Transforms Application of time-frequency analysis to art investigation** *IEEE SIGNAL PROCESSING MAGAZINE*
  Yang, H., Lu, J., Brown, W. P., Daubechies, I., Ying, L.
  2015; 32 (4): 55-63
- **Compressed Representation of Kohn-Sham Orbitals via Selected Columns of the Density Matrix.** *Journal of chemical theory and computation*

Damle, A., Lin, L., Ying, L.
2015; 11 (4): 1463-9

- **Compressed Representation of Kohn-Sham Orbitals via Selected Columns of the Density Matrix** *JOURNAL OF CHEMICAL THEORY AND COMPUTATION*
  Damle, A., Lin, L., Ying, L.
  2015; 11 (4): 1463-1469
- **A fast algorithm for 3D azimuthally anisotropic velocity scan** *GEOPHYSICAL PROSPECTING*
  Hu, J., Fomel, S., Ying, L.
  2015; 63 (2): 368-377
- **A FAST ALGORITHM FOR THE ENERGY SPACE BOSON BOLTZMANN COLLISION OPERATOR** *MATHEMATICS OF COMPUTATION*
  Hu, J., Ying, L.
  2015; 84 (291): 271-288
- **SPARSIFYING PRECONDITIONER FOR PSEUDOSPECTRAL APPROXIMATIONS OF INDEFINITE SYSTEMS ON PERIODIC STRUCTURES** *MULTISCALE MODELING & SIMULATION*
  Ying, L.
  2015; 13 (2): 459-471
- **A MULTISCALE BUTTERFLY ALGORITHM FOR MULTIDIMENSIONAL FOURIER INTEGRAL OPERATORS** *MULTISCALE MODELING & SIMULATION*
  Li, Y., Yang, H., Ying, L.
  2015; 13 (2): 614-631
- **SPARSIFYING PRECONDITIONER FOR THE LIPPMANN-SCHWINGER EQUATION** *MULTISCALE MODELING & SIMULATION*
  Ying, L.
  2015; 13 (2): 644-660
- **BUTTERFLY FACTORIZATION** *MULTISCALE MODELING & SIMULATION*
  Li, Y., Yang, H., Martin, E. R., Ho, K. L., Ying, L.
  2015; 13 (2): 714-732
- **FAST DIRECTIONAL COMPUTATION OF HIGH FREQUENCY BOUNDARY INTEGRALS VIA LOCAL FFTs** *MULTISCALE MODELING & SIMULATION*
  Ying, L.
  2015; 13 (1): 423-439
- **SPARSIFYING PRECONDITIONER FOR PSEUDOSPECTRAL APPROXIMATIONS OF INDEFINITE SYSTEMS ON PERIODIC STRUCTURES** *MULTISCALE MODELING & SIMULATION*
  Ying, L.
  2015; 13 (2): 459-471
- **A MULTISCALE BUTTERFLY ALGORITHM FOR MULTIDIMENSIONAL FOURIER INTEGRAL OPERATORS** *MULTISCALE MODELING & SIMULATION*
  Li, Y., Yang, H., Ying, L.
  2015; 13 (2): 614-631
- **SWEEPING PRECONDITIONERS FOR ELASTIC WAVE PROPAGATION WITH SPECTRAL ELEMENT METHODS** *ESAIM-MATHEMATICAL MODELLING AND NUMERICAL ANALYSIS-MODELISATION MATHEMATIQUE ET ANALYSE NUMERIQUE*
  Tsuji, P., Poulson, J., Engquist, B., Ying, L.
  2014; 48 (2): 433-447
- **A fast nested dissection solver for Cartesian 3D elliptic problems using hierarchical matrices** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Schmitz, P. G., Ying, L.
  2014; 258: 227-245
- **A PARALLEL BUTTERFLY ALGORITHM** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Poulson, J., Demanet, L., Maxwell, N., Ying, L.
  2014; 36 (1): C49-C65

- **POLE EXPANSION FOR SOLVING A TYPE OF PARAMETRIZED LINEAR SYSTEMS IN ELECTRONIC STRUCTURE CALCULATIONS** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Damle, A., Lin, L., Ying, L.
  2014; 36 (6): A2929-A2951
- **A PARALLEL DIRECTIONAL FAST MULTIPOLE METHOD** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Benson, A. R., Poulson, J., Tran, K., Engquist, B., Ying, L.
  2014; 36 (4): C335-C352
- **SYNCHROSQUEEZED CURVELET TRANSFORM FOR TWO-DIMENSIONAL MODE DECOMPOSITION** *SIAM JOURNAL ON MATHEMATICAL ANALYSIS*
  Yang, H., Ying, L.
  2014; 46 (3): 2052-2083
- **A fast butterfly algorithm for generalized Radon transforms** *GEOPHYSICS*
  Hu, J., Fomel, S., Demanet, L., Ying, L.
  2013; 78 (4): T141-T151
- **Synchrosqueezed Wave Packet Transform for 2D Mode Decomposition** *SIAM JOURNAL ON IMAGING SCIENCES*
  Yang, H., Ying, L.
  2013; 6 (4): 1979-2009
- **Wave atoms and time upscaling of wave equations** *NUMERISCHE MATHEMATIK*
  Demanet, L., Ying, L.
  2009; 113 (1): 1-71
- **A FAST BUTTERFLY ALGORITHM FOR THE COMPUTATION OF FOURIER INTEGRAL OPERATORS** *MULTISCALE MODELING & SIMULATION*
  Candes, E., Demanet, L., Ying, L.
  2009; 7 (4): 1727-1750
- **Wave atoms and sparsity of oscillatory patterns** *APPLIED AND COMPUTATIONAL HARMONIC ANALYSIS*
  Demanet, L., Ying, L.
  2007; 23 (3): 368-387
- **Curvelets and wave atoms for mirror-extended images** *Conference on Wavelets XII*
  Demanet, L., Ying, L.
  SPIE-INT SOC OPTICAL ENGINEERING.2007
- **Fast computation of Fourier integral operators** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Candes, E., Demanet, L., Ying, L.
  2007; 29 (6): 2464-2493
- **Fast discrete curvelet transforms** *MULTISCALE MODELING & SIMULATION*
  Candes, E., Demanet, L., Donoho, D., Ying, L.
  2006; 5 (3): 861-899