Stanford



Eric Darve

Director, Institute for Computational and Mathematical Engineering (ICME), Professor of Mechanical Engineering and, by courtesy, of Computer Science

CONTACT INFORMATION

- **Administrator**

  Bryan Gonzalez - Administrative Associate

  Email Beeyz95@stanford.edu

Bio

BIO

The research interests of Professor Darve span across several domains, including AI and ML for science and engineering, agentic systems for scientific discovery, large-language models, transformer models, surrogate and reduced order modeling, stochastic inversing, anomaly detection, numerical linear algebra, high-performance, parallel, and GPU computing.

Professor Darve received his Ph.D. in Applied Mathematics at the Jacques-Louis Lions Laboratory in the Pierre et Marie Curie University, Paris, France. His advisor was Prof. Olivier Pironneau, and his Ph.D. thesis was entitled "Fast Multipole Methods for Integral Equations in Acoustics and Electromagnetics." He was previously a student at the Ecole Normale Supérieure, rue d'Ulm, Paris, in Mathematics and Computer Science.

Prof. Darve became a postdoctoral scholar with Profs. Moin and Pohorille at Stanford and NASA Ames in 1999 and joined the faculty at Stanford University in 2001. He is a member of the Institute for Computational and Mathematical Engineering.

Prof. Darve has received many awards, including the H. Julian Allen Award, NASA (2010), the Habilitation à Diriger des Recherches, France (2007), the Leslie Fox Prize in Numerical Analysis, IMA (2001), and the James H. Clark Faculty Scholar, Stanford University (2001).

ACADEMIC APPOINTMENTS

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

ADMINISTRATIVE APPOINTMENTS

- Director, Institute for Computational and Mathematical Engineering (ICME), (2024-2029)

HONORS AND AWARDS

- Kenneth and Barbara Oshman Faculty Scholar Award, Stanford University (2011)

- H. Julian Allen Award, NASA (2010)
- Habilitation à Diriger des Recherches, France (2007)
- Leslie Fox Prize in Numerical Analysis, IMA (2001)
- James H. Clark Faculty Scholar, Stanford University (2001)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Associate Editor, SIAM Journal on Scientific Computing (SISC) (2014 - present)
- Associate Editor, Journal of Computational Physics (JCOMP) (2013 - 2024)

PROFESSIONAL EDUCATION

- PhD, Paris VI University, Paris , Applied Mathematics (1999)
- MS, Paris IX University, Paris , Applied Mathematics (1994)
- BS, Paris VI University, Paris , Mathematics and Physics (1993)

PATENTS

- Daniel Ratner, Eric Felix Darve, Ryan Humble. "United States Patent US20230409422A1 Systems and Methods for Anomaly Detection in Multi-Modal Data Streams", Leland Stanford Junior University, Jun 20, 2023
- Ziyi Yang, Eric Felix Darve, Iman Soltani Bozchalooi. "United States Patent US20200410285A1 Anomaly Augmented Generative Adversarial Network", Ford Global Technologies LLC Leland Stanford Junior University, Jun 25, 2020

LINKS

- DASH Lab: http://web.stanford.edu/people/darve
- https://me.stanford.edu/people/eric-darve: https://me.stanford.edu/people/eric-darve

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Keywords: AI agentic systems, ML for Science, autonomous systems, large-language models, physics-informed machine learning, anomaly detection, numerical linear algebra.

Teaching

COURSES

2026-27

- Numerical Linear Algebra: CME 302 (Aut)
- Programming for performance: CME 212 (Spr)

2025-26

- First Year Seminar Series: CME 300 (Aut)
- Introduction to parallel computing using MPI, openMP, and CUDA: CME 213, ME 339 (Spr)
- Numerical Linear Algebra: CME 302 (Aut)

2024-25

- First Year Seminar Series: CME 300 (Aut)
- Introduction to parallel computing using MPI, openMP, and CUDA: CME 213, ME 339 (Spr)
- Numerical Linear Algebra: CME 302 (Aut)

2023-24

- Introduction to parallel computing using MPI, openMP, and CUDA: CME 213, ME 339 (Spr)
- Numerical Linear Algebra: CME 302 (Aut)
- Ordinary Differential Equations for Engineers: CME 102, ENGR 155A (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Jerry Liu

Postdoctoral Faculty Sponsor

Zhe Fu

Doctoral Dissertation Advisor (AC)

Nicholas Hausman, Junlin Luo, Nils Toft, John Winnicki

Doctoral Dissertation Co-Advisor (AC)

Junhyuk Hwang, Apoorv Srivastava, Ryan Wu, Elise Yang

Master's Program Advisor

Himansu Pathak

Doctoral (Program)

Shai Bernard, Amar Koric, Ziyu Liu, Larry Marshall

Publications

PUBLICATIONS

- **Physically interpretable representation learning with Gaussian Mixture Variational AutoEncoder (GM-VAE)** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Fan, T., Cutforth, M., D'Elia, M., Cortiella, A., Doostan, A., Darve, E.
  2026; 462

- **Discrete wavelet transform for serial X-ray crystallography image segmentation** *JOURNAL OF INSTRUMENTATION*
  Doering, D., Claret, N., Paulino, G., Scomparin, L., Poitevin, F., Darve, E., Hansson, C., Russell, J., Dave, A., Rota, L., Miceli, A., Herbst, R., Dragone, et al
  2026; 21 (8)

- **Bi-fidelity interpolative decomposition for multimodal data** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Cutforth, M., Fan, T., Zahtila, T., Doostan, A., Darve, E.
  2026; 451

- **Interpolative Bayesian Formulation to Improve Transfer Learning for Anomaly Detection in Rotating Machinery** *INTERNATIONAL JOURNAL OF PROGNOSTICS AND HEALTH MANAGEMENT*
  Liang, J., Gupta, R., Shui, H., Upadhyay, D., Darve, E.
  2026; 17 (1)

- **Data-driven bifurcation handling in physics-based reduced-order vascular hemodynamic models.** *Computer methods and programs in biomedicine*
  Rubio, N. L., Darve, E. F., Marsden, A. L.
  2025; 276: 109230

- **Coincident learning for beam-based rf station fault identification using phase information at the SLAC linac coherent light source** *PHYSICAL REVIEW ACCELERATORS AND BEAMS*
  Liang, J., Colocho, W., Decker, F., Humble, R., Morris, B., O'Shea, F. H., Steele, D. A., Zhang, Z., Darve, E., Ratner, D.
  2025; 28 (12)

- **Reinforced ridges in Thwaites Glacier yield insights into resolution requirements for coupled ice sheet and solid Earth models** *CRYOSPHERE*
  Houriez, L., Larour, E., Caron, L., Schlegel, N., Adhikari, S., Ivins, E., Pelle, T., Seroussi, H., Darve, E., Fischer, M.
  2025; 19 (10): 4355-4372
- **Transfer Learning for Anomaly Detection in Rotating Machinery Using Data-Driven Key Order Estimation** *IEEE TRANSACTIONS ON AUTOMATION SCIENCE AND ENGINEERING*
  Liang, J., Shui, H., Gupta, R., Upadhyay, D., Darve, E.
  2025; 22: 13310-13326
- **Unsupervised Learning Techniques for Identification of Anomalous LZ Waveform Data**
  Winnicki, J., Arthurs, M., Anderson, T., O'Shea, F. H., Monzani, M., Darve, E., LZ Collaboration
  edited by Szumlak, T., Rachwal, B., Dziurda, A., Schulz, M., VomBruch, D., Ellis, K., Hageboeck, S.
  E D P SCIENCES.2025
- **Physically Interpretable Representation and Controlled Generation for Turbulence Data**
  Fan, T., Cutforth, M., D'Elia, M., Cortiella, A., Doostan, A., Darve, E., IEEE COMPUTER SOC
  IEEE COMPUTER SOC.2025: 1084-1085
- **Hybrid physics-based and data-driven modeling of vascular bifurcation pressure differences.** *Computers in biology and medicine*
  Rubio, N. L., Pegolotti, L., Pfaller, M. R., Darve, E. F., Marsden, A. L.
  2024; 184: 109420
- **Coincident learning for unsupervised anomaly detection of scientific instruments** *MACHINE LEARNING-SCIENCE AND TECHNOLOGY*
  Humble, R., Zhang, Z., OShea, F., Darve, E., Ratner, D.
  2024; 5 (3)
- **A NUMERICALLY STABLE COMMUNICATION-AVOIDING s- STEP GMRES ALGORITHM** *SIAM JOURNAL ON MATRIX ANALYSIS AND APPLICATIONS*
  Xu, Z., Alonso, J., Darve, E.
  2024; 45 (4): 2039-2074
- **Matrix Sketching for Online Analysis of LCLS Imaging Datasets**
  Winnicki, J., Poitevin, F., Li, H., Darve, E., ASSOC COMPUTING MACHINERY
  IEEE.2024: 2144-2153
- **Resilient VAE: Unsupervised Anomaly Detection at the SLAC Linac Coherent Light Source**
  Humble, R., Colocho, W., O'Shea, F., Ratner, D., Darve, E.
  edited by Espinal, DeVita, R., Laycock, P., Shadura, O.
  E D P SCIENCES.2024
- **Learning reduced-order models for cardiovascular simulations with graph neural networks.** *Computers in biology and medicine*
  Pegolotti, L., Pfaller, M. R., Rubio, N. L., Ding, K., Brugarolas Brufau, R., Darve, E., Marsden, A. L.
  2023; 168: 107676
- **Temperature field optimization for laser powder bed fusion as a traveling salesperson problem with history** *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING*
  Wang, G., Darve, E., Lew, A. J.
  2023
- **Probabilistic partition of unity networks for high-dimensional regression problems** *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING*
  Fan, T., Trask, N., D'Elia, M., Darve, E.
  2023
- **Beam-based rf station fault identification at the SLAC Linac Coherent Light Source** *PHYSICAL REVIEW ACCELERATORS AND BEAMS*
  Humble, R., O'Shea, F. H., Colocho, W., Gibbs, M., Chaffee, H., Darve, E., Ratner, D.
  2022; 25 (12)
- **Variational encoder geostatistical analysis (VEGAS) with an application to large scale riverine bathymetry** *ADVANCES IN WATER RESOURCES*

Forghani, M., Qian, Y., Lee, J., Farthing, M., Hesser, T., Kitanidis, P. K., Darve, E. F.
2022; 170

- **HyKKT: a hybrid direct-iterative method for solving KKT linear systems** *OPTIMIZATION METHODS & SOFTWARE*
Regev, S., Chiang, N., Darve, E., Petra, C. G., Saunders, M. A., Swirydowicz, K., Peles, S.
2022

- **Second-order accurate hierarchical approximate factorizations for solving sparse linear systems** *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING*
Klockiewicz, B., Cambier, L., Humble, R., Tchelepi, H., Darve, E.
2022

- **Linear solvers for power grid optimization problems: A review of GPU-accelerated linear solvers** *PARALLEL COMPUTING*
Swirydowicz, K., Darve, E., Jones, W., Maack, J., Regev, S., Saunders, M. A., Thomas, S. J., Peles, S.
2022; 111

- **Learning generative neural networks with physics knowledge** *RESEARCH IN THE MATHEMATICAL SCIENCES*
Xu, K., Zhu, W., Darve, E.
2022; 9 (2)

- **Hierarchical Orthogonal Factorization: Sparse Least Squares Problems** *JOURNAL OF SCIENTIFIC COMPUTING*
Gnanasekaran, A., Darve, E.
2022; 91 (2)

- **Physics constrained learning for data-driven inverse modeling from sparse observations** *JOURNAL OF COMPUTATIONAL PHYSICS*
Xu, K., Darve, E.
2022; 453

- **On the fractional Laplacian of variable order** *FRACTIONAL CALCULUS AND APPLIED ANALYSIS*
Darve, E., D'Elia, M., Garrappa, R., Giusti, A., Rubio, N. L.
2022; 25 (1): 15-28

- **Integrating deep neural networks with full-waveform inversion: Reparameterization, regularization, and uncertainty quantification** *GEOPHYSICS*
Zhu, W., Xu, K., Darve, E., Biondi, B., Beroza, G. C.
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- **Soft Masking for Cost-Constrained Channel Pruning**
Humble, R., Shen, M., Latorre, J., Darve, E., Alvarez, J.
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SPRINGER INTERNATIONAL PUBLISHING AG.2022: 641-657

- **HIERARCHICAL ORTHOGONAL FACTORIZATION: SPARSE SQUARE MATRICES** *SIAM JOURNAL ON MATRIX ANALYSIS AND APPLICATIONS*
Gnanasekaran, A., Darve, E.
2022; 43 (1): 94-123

- **Memory-Augmented Generative Adversarial Networks for Anomaly Detection** *IEEE TRANSACTIONS ON NEURAL NETWORKS AND LEARNING SYSTEMS*
Yang, Z., Zhang, T., Bozchalooi, I., Darve, E.
2021

- **Learning viscoelasticity models from indirect data using deep neural networks** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
Xu, K., Tartakovsky, A. M., Burghardt, J., Darve, E.
2021; 387

- **Solving inverse problems in stochastic models using deep neural networks and adversarial training** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
Xu, K., Darve, E.
2021; 384

- **PBBFMM3D: A parallel black-box algorithm for kernel matrix-vector multiplication** *JOURNAL OF PARALLEL AND DISTRIBUTED COMPUTING*
  Wang, R., Chen, C., Lee, J., Darve, E.
  2021; 154: 64-73
- **A general approach to seismic inversion with automatic differentiation** *COMPUTERS & GEOSCIENCES*
  Zhu, W., Xu, K., Darve, E., Beroza, G. C.
  2021; 151
- **Learning constitutive relations using symmetric positive definite neural networks** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Xu, K., Huang, D. Z., Darve, E.
  2021; 428
- **Application of deep learning to large scale riverine flow velocity estimation** *STOCHASTIC ENVIRONMENTAL RESEARCH AND RISK ASSESSMENT*
  Forghani, M., Qian, Y., Lee, J., Farthing, M. W., Hesser, T., Kitanidis, P. K., Darve, E. F.
  2021
- **Deep learning technique for fast inference of large-scale riverine bathymetry** *ADVANCES IN WATER RESOURCES*
  Ghorbanidehno, H., Lee, J., Farthing, M., Hesser, T., Darve, E. F., Kitanidis, P. K.
  2021; 147
- **Universal Sentence Representation Learning with Conditional Masked Language Model**
  Yang, Z., Yang, Y., Cer, D., Law, J., Darve, E., Assoc Computat Linguist
  ASSOC COMPUTATIONAL LINGUISTICS-ACL.2021: 6216-6228
- **A Task-Based Distributed Parallel Sparsified Nested Dissection Algorithm**
  Cambier, L., Darve, E., ACM
  ASSOC COMPUTING MACHINERY.2021
- **A Simple and Effective Method To Eliminate the Self Language Bias in Multilingual Representations**
  Yang, Z., Yang, Y., Cer, D., Darve, E., Assoc Computat Linguist
  ASSOC COMPUTATIONAL LINGUISTICS-ACL.2021: 5825-5832
- **Recent developments in fast and scalable inverse modeling and data assimilation methods in hydrology** *JOURNAL OF HYDROLOGY*
  Ghorbanidehno, H., Kokkinaki, A., Lee, J., Darve, E.
  2020; 591
- **Learning constitutive relations from indirect observations using deep neural networks** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Huang, D. Z., Xu, K., Farhat, C., Darve, E.
  2020; 416
- **Coupled Time-Lapse Full-Waveform Inversion for Subsurface Flow Problems Using Intrusive Automatic Differentiation** *WATER RESOURCES RESEARCH*
  Li, D., Xu, K., Harris, J. M., Darve, E.
  2020; 56 (8)
- **Isogeometric collocation method for the fractional Laplacian in the 2D bounded domain** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Xu, K., Darve, E.
  2020; 364
- **Parallelization of the inverse fast multipole method with an application to boundary element method** *COMPUTER PHYSICS COMMUNICATIONS*
  Takahashi, T., Chen, C., Darve, E.
  2020; 247
- **AN ALGEBRAIC SPARSIFIED NESTED DISSECTION ALGORITHM USING LOW-RANK APPROXIMATIONS** *SIAM JOURNAL ON MATRIX ANALYSIS AND APPLICATIONS*
  Cambier, L., Chen, C., Boman, E. G., Rajamanickam, S., Tuminaro, R. S., Darve, E.

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- **Regularized Cycle Consistent Generative Adversarial Network for Anomaly Detection**
  Yang, Z., Bozchalooi, I., Darve, E.
  edited by DeGiacomo, G., Catala, A., Dilkina, B., Milano, M., Barro, S., Bugarin, A., Lang, J.
  IOS PRESS.2020: 1618-1625
- **TaskTorrent: a Lightweight Distributed Task-Based Runtime System in C plus**
  Cambier, L., Qian, Y., Darve, E., IEEE Comp Soc
  IEEE COMPUTER SOC.2020: 16-26
- **SPARSE HIERARCHICAL PRECONDITIONERS USING PIECEWISE SMOOTH APPROXIMATIONS OF EIGENVECTORS** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Klockiewicz, B., Darve, E.
  2020; 42 (6): A3907–A3931
- **A robust hierarchical solver for ill-conditioned systems with applications to ice sheet modeling** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Chen, C., Cambier, L., Boman, E. G., Rajamanickam, S., Tuminaro, R. S., Darve, E.
  2019; 396: 819–36
- **Sparse hierarchical solvers with guaranteed convergence** *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING*
  Yang, K., Pouransari, H., Darve, E.
  2019
- **Erratum: "Investigating the role of non-covalent interactions in conformation and assembly of triazine-based sequence-defined polymers" [J. Chem. Phys. 149, 072330 (2018)].** *The Journal of chemical physics*
  Ahn, S., Grate, J. W., Darve, E. F.
  2019; 150 (17): 179901
- **Investigating the role of non-covalent interactions in conformation and assembly of triazine-based sequence-defined polymers (vol 149, 072330, 2018)** *JOURNAL OF CHEMICAL PHYSICS*
  Ahn, S., Grate, J. W., Darve, E. F.
  2019; 150 (17)
- **The multi-dimensional generalized Langevin equation for conformational motion of proteins** *JOURNAL OF CHEMICAL PHYSICS*
  Lee, H., Ahn, S., Darve, E. F.
  2019; 150 (17)
- **Novel Data Assimilation Algorithm for Nearshore Bathymetry** *JOURNAL OF ATMOSPHERIC AND OCEANIC TECHNOLOGY*
  Ghorbanidehno, H., Lee, J., Farthing, M., Hesser, T., Kitanidis, P. K., Darve, E. F.
  2019; 36 (4): 699–715
- **The multi-dimensional generalized Langevin equation for conformational motion of proteins.** *The Journal of chemical physics*
  Lee, H. S., Ahn, S. H., Darve, E. F.
  2019; 150 (17): 174113
- **Embedding Imputation with Grounded Language Information**
  Yang, Z., Zhu, C., Sachidananda, V., Darve, E., ACL
  edited by Korhonen, A., Traum, D., Marquez, L.
  ASSOC COMPUTATIONAL LINGUISTICS-ACL.2019: 3356–61
- **BLOCK BASIS FACTORIZATION FOR SCALABLE KERNEL EVALUATION** *SIAM JOURNAL ON MATRIX ANALYSIS AND APPLICATIONS*
  Wang, R., Li, Y., Mahoney, M. W., Darve, E.
  2019; 40 (4): 1497–1526
- **FAST LOW-RANK KERNEL MATRIX FACTORIZATION USING SKELETONIZED INTERPOLATION** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Cambier, L., Darve, E.
  2019; 41 (3): A1652–A1680

- **Investigating the role of non-covalent interactions in conformation and assembly of triazine-based sequence-defined polymers.** *The Journal of chemical physics*
  Ahn, S., Grate, J. W., Darve, E. F.
  2018; 149 (7): 072330
- **Sparse supernodal solver using block low-rank compression: Design, performance and analysis** *JOURNAL OF COMPUTATIONAL SCIENCE*
  Pichon, G., Darve, E., Faverge, M., Ramet, P., Roman, J.
  2018; 27: 255–70
- **A distributed-memory hierarchical solver for general sparse linear systems**
  Chen, C., Pouransari, H., Rajamanickam, S., Boman, E. G., Darve, E.
  ELSEVIER SCIENCE BV.2018: 49–64
- **Riverine Bathymetry Imaging With Indirect Observations** *WATER RESOURCES RESEARCH*
  Lee, J., Ghorbanidehno, H., Farthing, M. W., Hesser, T. J., Darve, E. F., Kitanidis, P. K.
  2018; 54 (5): 3704–27
- **An efficient preconditioner for the fast simulation of a 2D stokes flow in porous media** *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING*
  Quaife, B., Coulier, P., Darve, E.
  2018; 113 (4): 561–80
- **ON THE NUMERICAL RANK OF RADIAL BASIS FUNCTION KERNELS IN HIGH DIMENSIONS** *SIAM JOURNAL ON MATRIX ANALYSIS AND APPLICATIONS*
  Wang, R., Li, Y., Darve, E.
  2018; 39 (4): 1810–35
- **LOW-RANK FACTORIZATIONS IN DATA SPARSE HIERARCHICAL ALGORITHMS FOR PRECONDITIONING SYMMETRIC POSITIVE DEFINITE MATRICES** *SIAM JOURNAL ON MATRIX ANALYSIS AND APPLICATIONS*
  Agullo, E., Darve, E., Giraud, L., Harness, Y.
  2018; 39 (4): 1701–25
- **Optimal estimation and scheduling in aquifer management using the rapid feedback control method** *ADVANCES IN WATER RESOURCES*
  Ghorbanidehno, H., Kokkinaki, A., Kitanidis, P. K., Darve, E.
  2017; 110: 310–18
- **Efficiently sampling conformations and pathways using the concurrent adaptive sampling (CAS) algorithm.** *The Journal of chemical physics*
  Ahn, S. H., Grate, J. W., Darve, E. F.
  2017; 147 (7): 074115
- **Smoothing-based compressed state Kalman filter for joint state-parameter estimation: Applications in reservoir characterization and CO2 storage monitoring** *WATER RESOURCES RESEARCH*
  Li, Y. J., Kokkinaki, A., Darve, E. F., Kitanidis, P. K.
  2017; 53 (8): 7190–7207
- **A numerical study of super-resolution through fast 3D wideband algorithm for scattering in highly-heterogeneous media** *WAVE MOTION*
  Letourneau, P., Wu, Y., Papanicolaou, G., Garnier, J., Darve, E.
  2017; 70: 113-134
- **Computing the non-Markovian coarse-grained interactions derived from the Mori-Zwanzig formalism in molecular systems: Application to polymer melts** *JOURNAL OF CHEMICAL PHYSICS*
  Li, Z., Lee, H. S., Darve, E., Karniadakis, G. E.
  2017; 146 (1)
- **Sparse Supernodal Solver Using Block Low-Rank Compression**
  Pichon, G., Darve, E., Faverge, M., Ramet, P., Roman, J., IEEE
  IEEE.2017: 1138–47
- **Efficient mesh deformation based on radial basis function interpolation by means of the inverse fast multipole method** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*
  Coulier, P., Darve, E.

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- **A fast, memory efficient and robust sparse preconditioner based on a multifrontal approach with applications to finite-element matrices** *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING*
  Aminfar, A., Darve, E.
  2016; 107 (6): 520-540
- **Task-based FMM for heterogeneous architectures** *CONCURRENCY AND COMPUTATION-PRACTICE & EXPERIENCE*
  Agullo, E., Bramas, B., Coulaud, O., Darve, E., Messner, M., Takahashi, T.
  2016; 28 (9): 2608-2629
- **A fast block low-rank dense solver with applications to finite-element matrices** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Aminfar, A., Ambikasaran, S., Darve, E.
  2016; 304: 170-188
- **Real-time data assimilation for large-scale systems: The spectral Kalman filter** *ADVANCES IN WATER RESOURCES*
  Ghorbanidehno, H., Kokkinaki, A., Li, J. Y., Darve, E., Kitanidis, P. K.
  2015; 86: 260-272
- **The compressed state Kalman filter for nonlinear state estimation: Application to large-scale reservoir monitoring** *WATER RESOURCES RESEARCH*
  Li, J. Y., Kokkinaki, A., Ghorbanidehno, H., Darve, E. F., Kitanidis, P. K.
  2015; 51 (12): 9942-9963
- **A new sparse matrix vector multiplication graphics processing unit algorithm designed for finite element problems** *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING*
  Wong, J., Kuhl, E., Darve, E.
  2015; 102 (12): 1784-1814
- **A comparison of weighted ensemble and Markov state model methodologies** *JOURNAL OF CHEMICAL PHYSICS*
  Feng, H., Costaouec, R., Darve, E., Izaguirre, J. A.
  2015; 142 (21)
- **OPTIMIZING THE ADAPTIVE FAST MULTIPOLE METHOD FOR FRACTAL SETS** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Pouransari, H., Darve, E.
  2015; 37 (2): A1040-A1066
- **AWE-WQ: Fast-Forwarding Molecular Dynamics Using the Accelerated Weighted Ensemble** *JOURNAL OF CHEMICAL INFORMATION AND MODELING*
  Abdul-Wahid, B., Feng, H., Rajan, D., Costaouec, R., Darve, E., Thain, D., Izaguirre, J. A.
  2014; 54 (10): 3033-3043
- **A Kalman filter powered by H-2-matrices for quasi-continuous data assimilation problems** *WATER RESOURCES RESEARCH*
  Li, J. Y., Ambikasaran, S., Darve, E. F., Kitanidis, P. K.
  2014; 50 (5): 3734-3749
- **Method and advantages of genetic algorithms in parameterization of interatomic potentials: Metal oxides** *COMPUTATIONAL MATERIALS SCIENCE*
  Solomon, J., Chung, P., Srivastava, D., Darve, E.
  2014; 81: 453-465
- **CAUCHY FAST MULTIPOLE METHOD FOR GENERAL ANALYTIC KERNELS** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Letourneau, P., Cecka, C., Darve, E.
  2014; 36 (2): A396-A426
- **TASK-BASED FMM FOR MULTICORE ARCHITECTURES** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
  Agullo, E., Bramas, B., Coulaud, O., Darve, E., Messner, M., Takahashi, T.
  2014; 36 (1): C66-C93
- **An Fast Direct Solver for Partial Hierarchically Semi-Separable Matrices** *JOURNAL OF SCIENTIFIC COMPUTING*
  Ambikasaran, S., Darve, E.

2013; 57 (3): 477-501

- **Large-scale stochastic linear inversion using hierarchical matrices** *COMPUTATIONAL GEOSCIENCES*
  Ambikasaran, S., Li, J. Y., Kitanidis, P. K., Darve, E.
  2013; 17 (6): 913-927
- **ANALYSIS OF THE ACCELERATED WEIGHTED ENSEMBLE METHODOLOGY** *DISCRETE AND CONTINUOUS DYNAMICAL SYSTEMS*
  Costaouec, R., Feng, H., Izaguirre, J., Darve, E.
  2013: 171-181
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