

# Matthew G Knepley

## List of Publications by Year in descending order

Source: <https://exaly.com/author-pdf/3492807/publications.pdf>

Version: 2024-02-01

61  
papers

1,324  
citations

430754

18  
h-index

360920

35  
g-index

63  
all docs

63  
docs citations

63  
times ranked

1477  
citing authors

#	ARTICLE	IF	CITATIONS
1	A domain decomposition approach to implementing fault slip in finiteâ€element models of quasiâ€static and dynamic crustal deformation. <i>Journal of Geophysical Research: Solid Earth</i> , 2013, 118, 3059-3079.	1.4	216
2	Modular and flexible spectral-element waveform modelling in two and three dimensions. <i>Geophysical Journal International</i> , 2019, 216, 1675-1692.	1.0	100
3	Composing Scalable Nonlinear Algebraic Solvers. <i>SIAM Review</i> , 2015, 57, 535-565.	4.2	93
4	Biomolecular electrostatics using a fast multipole BEM on up to 512 gpus and a billion unknowns. <i>Computer Physics Communications</i> , 2011, 182, 1272-1283.	3.0	73
5	An efficient algorithm for classical density functional theory in three dimensions: ionic solutions. <i>Journal of Chemical Physics</i> , 2010, 132, 124101.	1.2	61
6	Numerical simulation of geodynamic processes with the Portable Extensible Toolkit for Scientific Computation. <i>Physics of the Earth and Planetary Interiors</i> , 2007, 163, 52-68.	0.7	57
7	PetRBF â€” A parallel O(N) algorithm for radial basis function interpolation with Gaussians. <i>Computer Methods in Applied Mechanics and Engineering</i> , 2010, 199, 1793-1804.	3.4	52
8	PyClaw: Accessible, Extensible, Scalable Tools for Wave Propagation Problems. <i>SIAM Journal of Scientific Computing</i> , 2012, 34, C210-C231.	1.3	45
9	Optimizing the Evaluation of Finite Element Matrices. <i>SIAM Journal of Scientific Computing</i> , 2005, 27, 741-758.	1.3	43
10	Search for disoriented chiral condensate at the Fermilab Tevatron. <i>Physical Review D</i> , 2000, 61, .	1.6	41
11	Mesh Algorithms for PDE with Sieve I: Mesh Distribution. <i>Scientific Programming</i> , 2009, 17, 215-230.	0.5	38
12	PetFMMâ€”A dynamically loadâ€balancing parallel fast multipole library. <i>International Journal for Numerical Methods in Engineering</i> , 2011, 85, 403-428.	1.5	33
13	Analysis of charged-particleâ€photon correlations in hadronic multiparticle production. <i>Physical Review D</i> , 1997, 55, 5667-5680.	1.6	32
14	Implementation of a multigrid solver on a GPU for Stokes equations with strongly variable viscosity based on Matlab and CUDA. <i>International Journal of High Performance Computing Applications</i> , 2014, 28, 50-60.	2.4	30
15	Composable Linear Solvers for Multiphysics. , 2012, , .		29
16	Efficient Mesh Management in Firedrake Using PETSc DMPlex. <i>SIAM Journal of Scientific Computing</i> , 2016, 38, S143-S155.	1.3	29
17	Finite Element Integration on GPUs. <i>ACM Transactions on Mathematical Software</i> , 2013, 39, 1-13.	1.6	27
18	Communication: Modeling charge-sign asymmetric solvation free energies with nonlinear boundary conditions. <i>Journal of Chemical Physics</i> , 2014, 141, 131103.	1.2	23

#	ARTICLE	IF	CITATIONS
19	Optimal, scalable forward models for computing gravity anomalies. <i>Geophysical Journal International</i> , 2011, 187, 161-177.	1.0	19
20	Manycore Parallel Computing for a Hybridizable Discontinuous Galerkin Nested Multigrid Method. <i>SIAM Journal of Scientific Computing</i> , 2019, 41, C73-C96.	1.3	19
21	Preliminary Implementation of PETSc Using GPUs. <i>Lecture Notes in Earth System Sciences</i> , 2013, , 131-140.	0.5	18
22	A hybridizable discontinuous Galerkin method for two-phase flow in heterogeneous porous media. <i>International Journal for Numerical Methods in Engineering</i> , 2018, 116, 161-177.	1.5	16
23	Bounding the electrostatic free energies associated with linear continuum models of molecular solvation. <i>Journal of Chemical Physics</i> , 2009, 130, 104108.	1.2	14
24	Predicting solvation free energies and thermodynamics in polar solvents and mixtures using a solvation-layer interface condition. <i>Journal of Chemical Physics</i> , 2017, 146, .	1.2	14
25	PCPATCH. <i>ACM Transactions on Mathematical Software</i> , 2021, 47, 1-22.	1.6	14
26	Unstructured Geometric Multigrid in Two and Three Dimensions on Complex and Graded Meshes. <i>SIAM Journal of Scientific Computing</i> , 2013, 35, A173-A191.	1.3	13
27	Toward performance-portable PETSc for GPU-based exascale systems. <i>Parallel Computing</i> , 2021, 108, 102831.	1.3	13
28	Run-Time Extensibility and Librarization of Simulation Software. <i>Computing in Science and Engineering</i> , 2015, 17, 38-45.	1.2	11
29	A performance spectrum for parallel computational frameworks that solve PDEs. <i>Concurrency Computation Practice and Experience</i> , 2018, 30, e4401.	1.4	11
30	The PetscSF Scalable Communication Layer. <i>IEEE Transactions on Parallel and Distributed Systems</i> , 2021, , 1-1.	4.0	11
31	Mathematical analysis of the boundary-integral based electrostatics estimation approximation for molecular solvation: Exact results for spherical inclusions. <i>Journal of Chemical Physics</i> , 2011, 135, 124107.	1.2	10
32	Comparative Study of Finite Element Methods Using the Time-Accuracy-Size(TAS) Spectrum Analysis. <i>SIAM Journal of Scientific Computing</i> , 2018, 40, C779-C802.	1.3	8
33	Computational science and re-discovery: open-source implementation of ellipsoidal harmonics for problems in potential theory. <i>Computational Science &amp; Discovery</i> , 2012, 5, 014006.	1.5	7
34	A stochastic performance model for pipelined Krylov methods. <i>Concurrency Computation Practice and Experience</i> , 2016, 28, 4532-4542.	1.4	7
35	Segmental Refinement: A Multigrid Technique for Data Locality. <i>SIAM Journal of Scientific Computing</i> , 2016, 38, C426-C440.	1.3	7
36	Extending the Solvation-Layer Interface Condition Continuum Electrostatic Model to a Linearized Poisson-Boltzmann Solvent. <i>Journal of Chemical Theory and Computation</i> , 2017, 13, 2897-2914.	2.3	7

#	ARTICLE	IF	CITATIONS
37	A high order hybridizable discontinuous Galerkin method for incompressible miscible displacement in heterogeneous media. Results in Applied Mathematics, 2020, 8, 100089.	0.5	7
38	Fully Parallel Mesh I/O Using PETSc DMplex with an Application to Waveform Modeling. SIAM Journal of Scientific Computing, 2021, 43, C127-C153.	1.3	7
39	Generalising the mean spherical approximation as a multiscale, nonlinear boundary condition at the solute-solvent interface. Molecular Physics, 2016, 114, 2558-2567.	0.8	6
40	Developing a Geodynamics Simulator with PETSc. , 2006, , 413-438.		6
41	GPU Implementation of Multigrid Solver for Stokes Equation with Strongly Variable Viscosity. Lecture Notes in Earth System Sciences, 2013, , 321-333.	0.5	6
42	Landau Collision Integral Solver with Adaptive Mesh Refinement on Emerging Architectures. SIAM Journal of Scientific Computing, 2017, 39, C452-C465.	1.3	5
43	An implicit discontinuous Galerkin method for modeling acute edema and resuscitation in the small intestine. Mathematical Medicine and Biology, 2019, 36, 513-548.	0.8	5
44	Solvation thermodynamics of neutral and charged solutes using the solvation-layer interface condition continuum dielectric model. International Journal of Quantum Chemistry, 2019, 119, e25771.	1.0	5
45	Composable block solvers for the four-field double porosity/permeability model. Journal of Computational Physics, 2019, 386, 428-466.	1.9	4
46	Families of interior penalty hybridizable discontinuous Galerkin methods for second order elliptic problems. Journal of Numerical Mathematics, 2020, 28, 161-174.	1.8	3
47	Implementation of higher-order velocity mapping between marker particles and grid in the particle-in-cell code XGC. Journal of Plasma Physics, 2021, 87, .	0.7	3
48	Droplet formation simulation using mixed finite elements. Physics of Fluids, 2022, 34, .	1.6	3
49	Analysis of fast boundary-integral approximations for modeling electrostatic contributions of molecular binding. Computational and Mathematical Biophysics, 2013, 1, 124-150.	0.6	2
50	Nonlocal Electrostatics in Spherical Geometries Using Eigenfunction Expansions of Boundary-Integral Operators. Computational and Mathematical Biophysics, 2015, 3, 1-22.	0.6	2
51	Understanding performance variability in standard and pipelined parallel Krylov solvers. International Journal of High Performance Computing Applications, 2021, 35, 47-59.	2.4	2
52	Design of Large-Scale Parallel Simulations. , 2000, , 273-279.		2
53	Closed strings with low harmonics and kinks. Physical Review D, 1993, 48, 2548-2562.	1.6	1
54	Automated FEM discretizations for the Stokes equation. BIT Numerical Mathematics, 2008, 48, 389-404.	1.0	1

#	ARTICLE	IF	CITATIONS
55	Fresh Outlook on Numerical Methods for Geodynamics. Part 1: Introduction and Modeling. , 2021, , 826-840.		1
56	Fast Multipole Method for particle interactions: an open source parallel library component. Lecture Notes in Computational Science and Engineering, 2010, , 285-292.	0.1	1
57	Why Do Scientists and Engineers Need GPUâ€™s Today?. Lecture Notes in Earth System Sciences, 2013, , 3-11.	0.5	1
58	Work/Precision Tradeoffs in Continuum Models of Biomolecular Electrostatics. , 2015, , .		1
59	Energetics of Calcium Selectivity: A Three-Dimensional Classical Density Functional Theory Approach. Biophysical Journal, 2009, 96, 661a.	0.2	0
60	Programming Languages for Scientific Computing. , 2015, , 1173-1181.		0
61	Multiscale models and approximation algorithms for protein electrostatics. , 2015, , .		0