Ann Almgren

List of Publications by Year
in descending order

103 papers	5,187 citations	109321 35 h-index	85541 71 g-index
103 all docs	103 docs citations	103 times ranked	3831 citing authors

#	Article	IF	Citations
1	An Adaptive Level Set Approach for Incompressible Two-Phase Flows. Journal of Computational Physics, 1999, 148, 81-124.	3.8	560
2	A Conservative Adaptive Projection Method for the Variable Density Incompressible Navierâ€“Stokes Equations. Journal of Computational Physics, 1998, 142, 1-46.	3.8	430
3	A High-Order Projection Method for Tracking Fluid Interfaces in Variable Density Incompressible Flows. Journal of Computational Physics, 1997, 130, 269-282.	3.8	418
4	High-resolution simulation and characterization of density-driven flow in CO2 storage in saline aquifers. Advances in Water Resources, 2010, 33, 443-455.	3.8	279
5	AMReX: a framework for block-structured adaptive mesh refinement. Journal of Open Source Software, 2019, 4, 1370.	4.6	217
6	CASTRO: A NEW COMPRESSIBLE ASTROPHYSICAL SOLVER. I. HYDRODYNAMICS AND SELF-GRAVITY. Astrophysical Journal, 2010, 715, 1221-1238.	4.5	211
7	Nyx: A MASSIVELY PARALLEL AMR CODE FOR COMPUTATIONAL COSMOLOGY. Astrophysical Journal, 2013, 765, 39.	4.5	192
8	DIMENSION AS A KEY TO THE NEUTRINO MECHANISM OF CORE-COLLAPSE SUPERNOVA EXPLOSIONS. Astrophysical Journal, 2010, 720, 694-703.	4.5	163
9	A Numerical Method for the Incompressible Navier-Stokes Equations Based on an Approximate Projection. SIAM Journal of Scientific Computing, 1996, 17, 358-369.	2.8	156
10	The Lyman Î± forest in optically thin hydrodynamical simulations. Monthly Notices of the Royal Astronomical Society, 2015, 446, 3697-3724.	4.4	133
11	Low Mach Number Modeling of Type Ia Supernovae. I. Hydrodynamics. Astrophysical Journal, 2006, 637, 922-936.	4.5	116
12	THE NUCLEOSYNTHETIC IMPRINT OF 15â€“40M_{â˜‰}PRIMORDIAL SUPERNOVAE ON METAL-POOR STARS. Astrophysical Journal, 2010, 709, 11-26.	4.5	113
13	A survey of high level frameworks in block-structured adaptive mesh refinement packages. Journal of Parallel and Distributed Computing, 2014, 74, 3217-3227.	4.1	112
14	A Cartesian Grid Projection Method for the Incompressible Euler Equations in Complex Geometries. SIAM Journal of Scientific Computing, 1997, 18, 1289-1309.	2.8	97
15	Approximate Projection Methods: Part I. Inviscid Analysis. SIAM Journal of Scientific Computing, 2000, 22, 1139-1159.	2.8	88
16	CASTRO: A NEW COMPRESSIBLE ASTROPHYSICAL SOLVER. II. GRAY RADIATION HYDRODYNAMICS. Astrophysical Journal, Supplement Series, 2011, 196, 20.	7.7	71
17	THREE-DIMENSIONAL SIMULATIONS OF RAYLEIGH-TAYLOR MIXING IN CORE-COLLAPSE SUPERNOVAE. Astrophysical Journal, 2010, 723, 353-363.	4.5	68
18	MAESTRO: AN ADAPTIVE LOW MACH NUMBER HYDRODYNAMICS ALGORITHM FOR STELLAR FLOWS. Astrophysical Journal, Supplement Series, 2010, 188, 358-383.	7.7	68

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19	Warp-X: A new exascale computing platform for beamâ€“plasma simulations. Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 2018, 909, 476-479.	1.6	68
20	TWO-DIMENSIONAL SIMULATIONS OF PULSATIONAL PAIR-INSTABILITY SUPERNOVAE. Astrophysical Journal, 2014, 792, 28.	4.5	67
21	LOW MACH NUMBER MODELING OF TYPE IA SUPERNOVAE. IV. WHITE DWARF CONVECTION. Astrophysical Journal, 2009, 704, 196-210.	4.5	63
22	The hydrodynamic origin of neutron star kicks. Monthly Notices of the Royal Astronomical Society, 2012, 423, 1805-1812.	4.4	61
23	THE GENERAL RELATIVISTIC INSTABILITY SUPERNOVA OF A SUPERMASSIVE POPULATION III STAR. Astrophysical Journal, 2014, 790, 162.	4.5	54
24	INDUCED ROTATION IN THREE-DIMENSIONAL SIMULATIONS OF CORE-COLLAPSE SUPERNOVAE: IMPLICATIONS FOR PULSAR SPINS. Astrophysical Journal, 2011, 732, 57.	4.5	53
25	Exascale applications: skin in the game. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2020, 378, 20190056.	3.4	53
26	PAIR INSTABILITY SUPERNOVAE OF VERY MASSIVE POPULATION III STARS. Astrophysical Journal, 2014, 792, 44.	4.5	52
27	CASTRO: A NEW COMPRESSIBLE ASTROPHYSICAL SOLVER. III. MULTIGROUP RADIATION HYDRODYNAMICS. Astrophysical Journal, Supplement Series, 2013, 204, 7.	7.7	48
28	A Fast Adaptive Vortex Method in Three Dimensions. Journal of Computational Physics, 1994, 113, 177-200.	3.8	47
29	Low Mach Number Modeling of Type Ia Supernovae. II. Energy Evolution. Astrophysical Journal, 2006, 649, 927-938.	4.5	47
30	A deferred correction coupling strategy for low Mach number flow with complex chemistry. Combustion Theory and Modelling, 2012, 16, 1053-1088.	1.9	44
31	THE CONVECTIVE PHASE PRECEDING TYPE Ia SUPERNOVAE. Astrophysical Journal, 2011, 740, 8.	4.5	43
32	AMReX: Block-structured adaptive mesh refinement for multiphysics applications. International Journal of High Performance Computing Applications, 2021, 35, 508-526.	3.7	43
33	Low Mach Number Modeling of Type Ia Supernovae. III. Reactions. Astrophysical Journal, 2008, 684, 449-470.	4.5	42
34	TECHNIQUES FOR INTEGRATING QUALITATIVE REASONING AND SYMBOLIC COMPUTATION IN ENGINEERING OPTIMIZATION. Engineering Optimization, 1987, 12, 117-135.	2.6	38
35	THE DEFLAGRATION STAGE OF CHANDRASEKHAR MASS MODELS FOR TYPE Ia SUPERNOVAE. I. EARLY EVOLUTION. Astrophysical Journal, 2014, 782, 11.	4.5	36
36	MULTIDIMENSIONAL MODELING OF TYPE I X-RAY BURSTS. I. TWO-DIMENSIONAL CONVECTION PRIOR TO THE OUTBURST OF A PURE⁴He ACCRETOR. Astrophysical Journal, 2011, 728, 118.	4.5	35

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37	An adaptive mesh refinement algorithm for compressible two-phase flow in porous media. Computational Geosciences, 2012, 16, 577-592.	2.4	35
38	LOW MACH NUMBER MODELING OF CORE CONVECTION IN MASSIVE STARS. Astrophysical Journal, 2013, 773, 137.	4.5	35
39	BoxLib with Tiling: An Adaptive Mesh Refinement Software Framework. SIAM Journal of Scientific Computing, 2016, 38, S156-S172.	2.8	35
40	Cosmological fluid mechanics with adaptively refined large eddy simulations. Monthly Notices of the Royal Astronomical Society, 2014, 440, 3051-3077.	4.4	34
41	Optimization of geometric multigrid for emerging multi- and manycore processors. , 2012, , .		33
42	CARBON DEFLAGRATION IN TYPE Ia SUPERNOVA. I. CENTRALLY IGNITED MODELS. Astrophysical Journal, 2013, 771, 58.	4.5	30
43	WHITE DWARF MERGERS ON ADAPTIVE MESHES. I. METHODOLOGY AND CODE VERIFICATION. Astrophysical Journal, 2016, 819, 94.	4.5	26
44	Porting WarpX to GPU-accelerated platforms. Parallel Computing, 2021, 108, 102833.	2.1	25
45	In situ and in-transit analysis of cosmological simulations. Computational Astrophysics and Cosmology, 2016, 3, 4.	22.7	24
46	MULTIDIMENSIONAL MODELING OF TYPE I X-RAY BURSTS. II. TWO-DIMENSIONAL CONVECTION IN A MIXED H/He ACCRETOR. Astrophysical Journal, 2014, 788, 115.	4.5	23
47	COMPARISONS OF TWO- AND THREE-DIMENSIONAL CONVECTION IN TYPE I X-RAY BURSTS. Astrophysical Journal, 2015, 807, 60.	4.5	23
48	Modeling of a chain of three plasma accelerator stages with the WarpX electromagnetic PIC code on GPUs. Physics of Plasmas, 2021, 28, .	1.9	23
49	A parallel second-order adaptive mesh algorithm for incompressible flow in porous media. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2009, 367, 4633-4654.	3.4	21
50	Massively parallel finite difference elasticity using block-structured adaptive mesh refinement with a geometric multigrid solver. Journal of Computational Physics, 2021, 427, 110065.	3.8	21
51	Navierâ€“Stokes Characteristic Boundary Conditions Using Ghost Cells. AIAA Journal, 2017, 55, 3399-3408.	2.6	20
52	On the Use of Higher-Order Projection Methods for Incompressible Turbulent Flow. SIAM Journal of Scientific Computing, 2013, 35, B25-B42.	2.8	18
53	LOW MACH NUMBER MODELING OF CONVECTION IN HELIUM SHELLS ON SUB-CHANDRASEKHAR WHITE DWARFS. I. METHODOLOGY. Astrophysical Journal, 2013, 764, 97.	4.5	18
54	Small-Scale Processes and Entrainment in a Stratocumulus Marine Boundary Layer. Journals of the Atmospheric Sciences, 2000, 57, 567-581.	1.7	17

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55	Multidimensional simulations of pair-instability supernovae. Computer Physics Communications, 2011, 182, 254-256.	7.5	17
56	Hot and turbulent gas in clusters. Monthly Notices of the Royal Astronomical Society, 2016, 459, 701-719.	4.4	17
57	Highly parallelisable simulations of time-dependent viscoplastic fluid flow with structured adaptive mesh refinement. Physics of Fluids, 2018, 30, .	4.0	17
58	MFIX-Exa: A path toward exascale CFD-DEM simulations. International Journal of High Performance Computing Applications, 2022, 36, 40-58.	3.7	17
59	Numerical approaches for multidimensional simulations of stellar explosions. Astronomy and Computing, 2013, 3-4, 70-78.	1.7	16
60	Large-eddy simulations of isolated disc galaxies with thermal and turbulent feedback. Monthly Notices of the Royal Astronomical Society, 2014, 442, 3407-3426.	4.4	16
61	An adaptive projection method for the incompressible Euler equations. , 1993, , .		15
62	LOW MACH NUMBER MODELING OF CONVECTION IN HELIUM SHELLS ON SUB-CHANDRASEKHAR WHITE DWARFS. II. BULK PROPERTIES OF SIMPLE MODELS. Astrophysical Journal, 2016, 827, 84.	4.5	15
63	CASTRO: A Massively Parallel Compressible Astrophysics Simulation Code. Journal of Open Source Software, 2020, 5, 2513.	4.6	15
64	Shear instability of internal solitary waves in Euler fluids with thin pycnoclines. Journal of Fluid Mechanics, 2012, 710, 324-361.	3.4	13
65	s-Step Krylov Subspace Methods as Bottom Solvers for Geometric Multigrid. , 2014, , .		13
66	MAESTROeX: A Massively Parallel Low Mach Number Astrophysical Solver. Astrophysical Journal, 2019, 887, 212.	4.5	13
67	A New Look at the Pseudo-Incompressible Solution to Lambâ€™s Problem of Hydrostatic Adjustment. Journals of the Atmospheric Sciences, 2000, 57, 995-998.	1.7	11
68	Simulation of lean premixed turbulent combustion. Journal of Physics: Conference Series, 2006, 46, 1-15.	0.4	11
69	A Numerical Study of Methods for Moist Atmospheric Flows: Compressible Equations. Monthly Weather Review, 2014, 142, 4269-4283.	1.4	11
70	TiDA: High-Level Programming Abstractions for Data Locality Management. Lecture Notes in Computer Science, 2016, , 116-135.	1.3	11
71	A Low Mach Number Model for Moist Atmospheric Flows. Journals of the Atmospheric Sciences, 2015, 72, 1605-1620.	1.7	8
72	Influence of adaptive mesh refinement and the hydro solver on shear-induced mass stripping in a minor-merger scenario. Astronomy and Computing, 2015, 9, 49-63.	1.7	8

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73	An embedded boundary approach for efficient simulations of viscoplastic fluids in three dimensions. Physics of Fluids, 2019, 31, .	4.0	8
74	Type Ia supernovae. Journal of Physics: Conference Series, 2007, 78, 012081.	0.4	7
75	A coupled discontinuous Galerkin-Finite Volume framework for solving gas dynamics over embedded geometries. Journal of Computational Physics, 2022, 450, 110861.	3.8	7
76	A Three-Dimensional, Unsplit Godunov Method for Scalar Conservation Laws. SIAM Journal of Scientific Computing, 2011, 33, 2039-2062.	2.8	6
77	Perilla: Metadata-Based Optimizations of an Asynchronous Runtime for Adaptive Mesh Refinement. , 2016, , .		6
78	Overlapping Data Transfers with Computation on GPU with Tiles. , 2017, , .		6
79	Nyx: A Massively Parallel AMR Code for Computational Cosmology. Journal of Open Source Software, 2021, 6, 3068.	4.6	6
80	MAESTROeX: A Massively Parallel Low Mach Number Astrophysical Solver. Journal of Open Source Software, 2019, 4, 1757.	4.6	6
81	Topology-Aware Performance Optimization and Modeling of Adaptive Mesh Refinement Codes for Exascale. , 2016, , .		5
82	Phase Asynchronous AMR Execution for Productive and Performant Astrophysical Flows. , 2018, , .		5
83	Preparing Nuclear Astrophysics for Exascale. , 2020, , .		5
84	A New Low Mach Number Approach in Astrophysics. Computing in Science and Engineering, 2009, 11, 24-33.	1.2	4
85	An unsplit, higher-order Godunov method using quadratic reconstruction for advection in two dimensions. Communications in Applied Mathematics and Computational Science, 2011, 6, 27-61.	1.8	4
86	Toward the modeling of chains of plasma accelerator stages with WarpX. Journal of Physics: Conference Series, 2020, 1596, 012059.	0.4	4
87	Feature Analysis, Tracking, and Data Reduction: An Application to Multiphase Reactor Simulation MFiX-Exa for In-Situ Use Case. Computing in Science and Engineering, 2021, 23, 75-82.	1.2	4
88	Low Mach Number Modeling of Stratified Flows. Springer Proceedings in Mathematics and Statistics, 2014, , 3-15.	0.2	3
89	The potential role of spatial dimension in the neutrino-driving mechanism of core-collapse supernova explosions. Computer Physics Communications, 2011, 182, 1764-1766.	7.5	2
90	Conservative Initial Mapping For Multidimensional Simulations of Stellar Explosions. Journal of Physics: Conference Series, 2012, 402, 012024.	0.4	2

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91	A hybrid adaptive low-Mach number/compressible method: Euler equations. Journal of Computational Physics, 2018, 372, 1027-1047.	3.8	2
92	Toward Plasma Wakefield Simulations at Exascale. , 2018, , .		2
93	Nonintrusive AMR Asynchrony for Communication Optimization. Lecture Notes in Computer Science, 2017, , 682-694.	1.3	1
94	Hurricaneâ€Like Vortices in Conditionally Unstable Moist Convection. Journal of Advances in Modeling Earth Systems, 2022, 14, .	3.8	1
95	Two-Dimensional Simulations of Pair-Instability Supernovae. , 2010, , .		0
96	Fates of the most massive primordial stars. , 2012, , .		0
97	Low Mach number models in computational astrophysics. , 2012, , .		0
98	Navier-Stokes Characteristic Boundary Conditions Using Ghost Cells. , 2017, , .		0
99	A Hybrid Adaptive Low-Mach-Number/Compressible Method for the Euler Equations. , 2017, , .		0
100	The divergence of nearby trajectories in soft-sphere DEM. Particuology, 2022, 63, 1-8.	3.6	0
101	Asynchronous AMR on Multi-GPUs. Lecture Notes in Computer Science, 2019, , 113-123.	1.3	0
102	Modeling pyrotechnic explosions. AIP Conference Proceedings, 2020, , .	0.4	0
103	In situ feature analysis for large-scale multiphase flow simulations. Journal of Computational Science, 2022, , 101773.	2.9	0