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Education

University of California, Berkeley. Ph.D., Mechanical Engineering.	May 1991
University of California, Berkeley. M.S., Mechanical Engineering.	May 1987
Harvard University B.A., Physics *Magna cum laude*	June 1984

Work Experience

Lawrence Berkeley National Laboratory.

Group Lead, Center for Computational Sciences & Engineering	2014 – present
Senior scientist	2016 – present
Staff scientist	1996 – 2016

Lawrence Livermore National Laboratory.

Staff Researcher, Applied Math Group	1995 – 1996
Postdoctoral Researcher, Applied Math Group	1992 – 1995

Institute for Advanced Study

Visiting member, School of Mathematics	1991 – 1992

University of California, Berkeley

Graduate research assistant.	1985 – 1991

Leadership & Service

Deputy Director, ECP Block-Structured AMR Co-Design Center
Co-PI, ExaStar, ExaSky, MFIX-Exa and WarpX ECP Application Projects
Fellow, Society of Industrial and Applied Mathematics (SIAM), 2015.
Organizing Committee, SIAM AN18 and PACS 2019.
Editorial Board of SIREV, CAMCoS, IJHPC
Co-Chair, ASCR Research Requirements Review, Sept 2016
Member, SIAM Membership Committee and SIAM Fellows Canvassing Committee
Co-PI on multiple DOE SciDAC and ASCR proposals.
Co-PI on multiple ERCAP and INCITE proposals.
Reviewer for Journal of Computational Physics, Monthly Weather Review, Physics of Fluids,
SIAM Journal of Numerical Analysis, International Journal for Numerical Methods in Fluids,
Journal of Atmospheric Sciences.
CRD Representative, LBNL Diversity and Inclusion Council, 2014 – 2017.
Mentor in CRD Mentoring Program, 2011 – present.
CS Area Mentoring Program Committee, 2017 – present

Refereed Publications

Knut Sverdrup, Nikolaos Nikiforakis, and Ann S. Almgren, "Highly parallelisable simulations of time-dependent viscoplastic fluid flow simulations with structured adaptive mesh refinement", Physics of Fluids, to appear, 2018. Named Editor's Pick.

J.-L. Vay, A. Almgren, J. Bell, L. Ge, D. P. Grote, M. Hogan, O. Kononenko, R. Lehe, A. Myers, C. Ng, J. Park, R. Ryne, O. Shapoval, M. Thevenet, W. Zhang, "Warp-X: A new exascale computing platform for beam-plasma simulations," Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, in press, 2018.

E. Motheau, M. Duarte, A. Almgren and J.B. Bell. " A Hybrid Adaptive Low-Mach-Number Compressible Method: Euler Equations", J. Comp. Physics, Vol 372, pp. 1027-1047, 2018.

Muhammad Nufail Farooqi, Didem Unat, Tan Nguyen, Weiqun Zhang, Ann Almgren and John Shalf, M. Zingale, A.S. Almgren, M.G. Barrios Sazo, V.E. Beckner, J.B. Bell, B. Friesen, A.M. Jacobs, M.P. Katz, C.M. Malone, A.J. Nonaka, D.E. Willcox, W. Zhang, "Meeting the Challenges of Modeling Astrophysical Thermonuclear Explosions: Castro, Maestro and the AMReX Astrophysics Suite," to appear, 2018.

B. Bastem, , D. Unat, W. Zhang, A. Almgren and J. Shalf, "Overlapping Data Transfers with Computation on GPU with Tiles," 2017 46th International Conference on Parallel Processing (ICPP), pp. 171-180, 2017.

Muhammad Nufail Farooqi, Didem Unat, Tan Nguyen, Weiqun Zhang, Ann Almgren and John Shalf, "Nonintrusive AMR Asynchrony for Communication Optimization," Euro-Par 2017.

Emmanuel Motheau, Ann Almgren, John Bell, "Navier-Stokes Characteristic Boundary Conditions Using Ghost Cells," AIAA J., **55:10**, pp. 3399-3408, 2017

Cy Chan, John Bachan, Joseph Kenny, Jeremiah ilke, Vincent Beckner, Ann Almgren and John Bell "Topology-Aware Performance Optimization and Modeling of Adaptive Mesh Refinement Codes for Exascale," COMHPC 2016 - SC16 Workshop on Communication Optimization in High Performance Computing, Salt Lake City, UT, November 18, 2016.

Weiqun Zhang, Ann Almgren, Marcus Day, Tan Nguyen, John Shalf, Didem Unat, "BoxLib with Tiling: An AMR Software Framework" SIAM J. Scientific Computing, **38(5)**, S156-S172 , 2016

Brian Friesen, Ann Almgren, Zarija Lukic, Gunther Weber, Dmitriy Morozov, Vincent Beckner, Marcus Day, "In situ and in-transit analysis of cosmological simulation," Computational Astrophysics and Cosmology, **3:4**, 2016.

M. Zingale, C. M. Malone, A. Nonaka, A. S. Almgren, and J. B. Bell, "Comparisons of Two- and Three-Dimensional Convection in Type I X-ray Bursts," Astrophysical Journal, **807**, 60, 2015.

Max P. Katz, Michael Zingale, Alan C. Calder, F. Douglas Swesty, Ann S. Almgren, Weiqun Zhang, White Dwarf Mergers on Adaptive Meshes. I. Methodology and Code Verification, *Astrophysical Journal*, **819**, 94, 2016.

A.M. Jacobs, M. Zingale, A. Nonaka, A.S. Almgren, J.B. Bell, "Low Mach Number Modeling of Convection in Helium Shells on Sub-Chandrasekhar White Dwarfs II: Bulk Properties of Simple Models," Astrophysical Journal, **827**, 84, 2016.

J.C. Dolence, A. Burrows, and W. Zhang, "Two-Dimensional Core-Collapse Supernova Models with Multi-Dimensional Transport," Astrophysical Journal, **800**, 10, 2015

Ke-Jung Chen, Alexander Heger, Stan Woosley, Ann Almgren and Daniel J. Whalen, "Pair-Instability Supernovae of Non-Zero Metallicity Stars," Numerical Modeling of Space Plasma Flows, ASTRONUM-2014, **498**, 2015.

Ann Almgren, John Bell, Andy Nonaka and Michael Zingale, "Low Mach Number Modeling of Stratified Flows," Finite Volumes for Complex Applications VII – Methods and Theoretical Aspects, Springer Proceedings in Mathematics and Statistics, eds. J. Fuhrmann, M. Ohlberger, C. Rohde, Berlin, June 2014.

A. Dubey, A. Almgren, J. Bell, M. Berzins, S. Brandt, G. Bryan, P. Colella, D. Graves, M. Lijewski, F. Loffler, B. O'Shea, E. Schnetter, B. Van Straalen, K. Weide "A Survey of High Level Frameworks in Block-Structured Adaptive Mesh Refinement Packages", *Journal of Parallel and Distributed Computing*, **74**, pp. 3217-3227, 2014

W. Zhang, L. Howell, A. Almgren, A. Burrows, and J. Bell "CASTRO: A New Compressible Astrophysical Solver. II. Gray Radiation Hydrodynamics," *Astrophysical Journal Supplement Series*, **196**, 20, 2011.

Weiqun Zhang, L. Howell, A. Almgren, A. Burrows, J. Dolence, J. Bell, "CASTRO: A New Compressible Astrophysical Solver. III. Multigroup Radiation Hydrodynamics," *Astrophysical Journal Supplement Series*, **204**, 7, 2013.

R. Tiron, A.S. Almgren, R. Camassa, "Shear instability of internal solitary waves in Euler fluids with thin pycnoclines, Journal of Fluid Mechanics, **712**, 324-361, 2012.

A. Nonaka, J. B. Bell, M. S. Day, C. Gilet, A. S. Almgren, and M. L. Minion, "A Deferred Correction Coupling Strategy for Low Mach Number Flow with Complex Chemistry", Combustion Theory and Modelling, **16:6**, pp. 1053-1088, 2012.

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A. Nonaka, S. May, A. S. Almgren, and J. B. Bell, "A Three-Dimensional, Unsplit Godunov Method for Scalar Conservation Laws," *SIAM J. Sci. Comput.*, **33:4**, 2011.

A. Nonaka, A. J. Aspden, M. Zingale, A. S. Almgren, J. B. Bell, and S. E. Woosley, "High-Resolution Simulations of Convection Preceding Ignition in Type Ia Supernovae Using Adaptive Mesh Refinement," *Astrophysical Journal*, **745**, 73, 2011.

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Ke-Jung Chen, Alexander Heger, and Ann Almgren, "Two Dimensional Simulations of Pair-Instability Supernovae," Conference on The First Stars and Galaxies: Challenges for the Next Decade, Austin, Texas, March 8-11, 2010, Conference Proceedings, published by the American Institute of Physics.

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G. S. H. Pau, J. B. Bell, K. Pruess, A. S. Almgren, M. J. Lijewski, K. Zhang, "Numerical studies of density-driven flow in CO2 storage in saline aquifers," *Proceedings of TOUGH Symposium*, September 14 -16 2009, Berkeley, California, USA.

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Ann Almgren, Thomas Buttke, and Phillip Colella, "A Fast Vortex Method in Three Dimensions," *Proceedings of the AIAA 10th Computational Fluid Dynamics Conference*, June 24-27, 1991, Honolulu, HI.

A.S. Almgren and A.M. Agogino, "A Generalization and Correction of the Welded Beam Optimal Design Problem Using Symbolic Computation," *ASME Journal of Mechanisms, Transmissions and Automation in Design*, 1989.

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