

# JAMES A. SETHIAN

## Current Employment

Professor of Mathematics  
James H. Simons Chair in Mathematics  
University of California, Berkeley  
Berkeley, California, 94720

Head/Senior Scientist  
Mathematics Department  
Berkeley National Laboratory  
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## Date/Place of Birth

1954, Washington, D.C.

## Education

Ph.D. Applied Mathematics, Univ. of Cal., Berkeley, 1982  
M.A. Mathematics, Univ. of Cal., Berkeley, 1978  
B.A. Princeton University, 1976

## Employment

Professor, Dept. of Mathematics, UC Berkeley: Current  
Department Head, Mathematics, LBNL: 1996-Current  
Director, Center for Applied Mathematics for Energy Research Applications, LBNL: 2013-Current  
Associate Professor, Dept. of Mathematics, UC , Berkeley: 1988-1991  
Assistant Professor, Department of Mathematics, UC , Berkeley: 1985-1988  
NSF Postdoctoral Fellow, Courant Institute of Mathematics, NYU, 1984-1985  
NSF Postdoctoral Fellow, LBNL, 1982-1984

## Visiting Positions

Frei University, Technical University, Humboldt University, Berlin, 2011-2012  
Acting Director, Thinking Machines Corporation, 1993  
National Institute of Standards and Technology, 1990  
University of Maryland, 1990  
Courant Institute of Mathematics, NYU, 1984-1985  
National Center for Atmospheric Research, 1978-1980

## Awards and Honors:

NSF Distinguished Lecture: May 2014.  
Honorable Mention: 2013 International Science & Engineering Visualization Challenge  
(2nd place tie): Robert I. Saye and James A. Sethian  
US National Academy of Sciences, 2013  
Fellow, American Mathematical Society (Initial Class of Fellows, 2012)  
Cozzarelli Prize, National Academy of Sciences, 2012  
Pollak Prize Lecture, Technion, Israel, Oct. 2011  
ICIAM Pioneer Prize, 2011, Vancouver Canada  
Einstein Fellowship Prize, Berlin Einstein Stiftung, July 2011, Berlin  
Richard von Mises Lecture, 200th Anniversary Celebration of Humboldt University, Berlin, 2010  
Invited Address, Joint Meeting, AMS-MAA, Washington, 2009  
Fellow, Society for Industrial and Applied Mathematics (SIAM), initial class of Fellows, 2009  
US National Academy of Engineering, 2008  
Norbert Wiener Prize, Joint AMS-SIAM, 2004  
Lighthill Lecturer, British Applied Mathematics Conference, March 2003  
Invited Lecture, International Congress of Mathematicians, Beijing, 2002

Plenary Lecture, Australian Mathematical Society, Sept. 2001  
 I.E. Block Community Lecture Prize, SIAM Annual Meeting, Puerto Rico, July 2000  
 Plenary Lecture, Int. Congress of Industrial and Applied Mathematics, Edinburgh, 1999.  
 Plenary Speaker, ACM Conference on Computational Geometry, June, 1998.  
 Plenary Lecture, ENUMATH '97, Heidelberg, Sept., 1997  
 Robert Noyce Distinguished Teaching Prize, 1995  
 Plenary Invited Lecture, Supercomputer '93, Portland, November 1993  
 Presidential Young Investigator Award, National Science Foundation, 1987.  
 Alfred P. Sloan Foundation Fellow, 1986-1988  
 National Science Foundation Mathematical Sciences, Post-Doctoral Fellow, 1983-1985  
 Bernard Friedman Prize, Most Outstanding Doctoral Dissertation Applied Mathematics,  
 Sciences, and Engineering, University of California, Berkeley, 1982  
 National Research Council High Priority Engineering Postdoctoral Fellowship, 1982 (declined)

### Publications

1. *Normal Modes of the Giss Atmospheric Circulation Model* with Williamson, D.L., Durran, D., and Dee, D. NCAR Technical Report, National Center for Atmospheric Research May, 1982 [TR]
2. *An Analysis of Flame Propagation* (PhD Thesis), University of California, Berkeley. Lawrence Berkeley Laboratory Report 14125, June, 1982 [TR]
3. *Turbulent Combustion in Open and Closed Vessels*, Journal of Computational Physics, 54, 3, June 1984, pp.425-456. [A]
4. *The Wrinkling of a Flame Due to Viscosity*, Fire Dynamics and Heat Transfer, Editors: J.G. Quintiere, R.A. Alpert and R.A. Altenkirch, HTD, ASME, New York, New York, 25, 1983, pp.29-32. [AP]
5. *Numerical Simulation of Flame Propagation in a Closed Vessel*, Notes on Numerical Fluid Mechanics, Editors: Pandolfi, M. and Piva, R., Proceedings of the Fifth GAMM-Conference on Numerical Methods in Fluid Mechanics, Rome, October 5-7, 1983, Friedr. Vieweg & Sohn, Braunschweig/Wiesbaden, 1984, pp. 324-331. [AP]
6. *Some Numerical Methods for Discontinuous Flows in Porous Media*, with P. Colella and P. Concus, The Mathematics of Reservoir Simulation, R. Ewing, Editor, SIAM Volume on Frontiers in Applied Mathematics, SIAM Publications, Philadelphia, PA., 1984, pp. 161-186.[AC]
7. *Numerical Solution of the Buckley Leverett Equations*, with Chorin, A.J., and Concus, P., Proceedings, Seventh Society of Petroleum Engineers Reservoir Simulation Symposium, San Francisco, California, November 1983, pp.197-200.[AP]
8. *Capillary Pressure and the Modified Random Choice Method for Porous Flow*, with P. Concus and E. Kostlan, Proceedings of the Sixth International Conference on Computing Methods in Applied Sciences and Engineering, Versailles, France, Dec. 12-16, 1983. [AP]
9. *Search, Encounter Rates and the Evolution of Anisogamy*, with Cox, P.A., submitted by E.O. Wilson, Proceedings of the National Academy of Sciences, Evolution 81, 1984, pp. 6078-6079. [A]
10. *Gamete Motion, Search, and the Evolution of Anisogamy, Oogamy and Chemotaxis*, with P.A. Cox, American Naturalist, 125, January, 1985. [A]
11. *Derivation and Numerical Solution of the Equations of Low Mach Number Combustion*, with Majda, A., Combustion Science and Technology, 42, 1984, pp. 185-205. [A]
12. *Vortex Methods and Turbulent Combustion*, American Mathematical Society Publications, Lectures in Applied Mathematics, 22, 1985. [AC]
13. *Curvature and the Evolution of Fronts*, Communications of Mathematical Physics, 101, 4, 1985.[A]
14. *Dynamics of Turbulent Structure in a Recirculating Flow; A Computational Study*, with Ghoniem, A.F., AIAA 23rd Aerospace Sciences Meeting, AIAA-85-0146, Reno, Nevada, Jan.14-17, 1985 [AP]

15. *Effect of Reynolds Number on the Structure of Recirculating Flow*, with Ghoniem, A.F., AIAA Journal, 25, 1, 1987. [A]
16. *Numerical Methods for Propagating Fronts*, Variational Methods for Free Surface Interfaces, Editors: P. Concus and R. Finn, Springer-Verlag, 1987. [AP]
17. *Large Eddy Interaction with Propagating Flames*, in "Computational Fluid Mechanics and Reacting Gas Flows", Editors: B. Engquist, A. Majda, Institute for Mathematics and Its Applications, IMA Vol. 12, 1988. [AC]
18. *Validation Study for Vortex Methods*, with A.F. Ghoniem, Jour. Comput. Phys., 74, 283, 1988. [A]
19. *Fronts Propagating with Curvature-Dependent Speed: Algorithms based on Hamilton-Jacobi Formulations*, with S. Osher, J. Comp. Phys., 79, pp.12-49, (1988). [A]
20. *The Design of Algorithms for Hypersurfaces moving with Curvature-Dependent Speed*, in Nonlinear Hyperbolic Equations-Theory, Numerical Methods, and Applications, Notes on Numerical Fluid Mechanics, 24, Ballman, J. and Jeltsch, R. Eds., Vieweg, 1988. [AP]
21. *Interactive Scientific Visualization and Parallel Display Techniques*, With J. Salem, and A.F. Ghoniem, Proceedings of Supercomputing '88, IEEE, Lake Buena Vista, Florida, 1988. [AP]
22. *On Measuring the Accuracy of the Vortex Method: On Using a Random Method to Model Stable and Unstable Flow*, in Vortex Methods, C. Anderson and C. Greengard, Eds., Lecture Notes in Mathematics, 1360, Springer-Verlag, New York, 1988. [AC]
23. *Animation of Interactive Flow Visualization Tools on a Data Parallel Machine*, with J. Salem, Inter. Jour. SuperComp. Appl., 3.2, (1989). [A]
24. *A Connection Machine Implementation of Tracer Flow Particle Visualization*, in Proceedings of the Conference on Scientific Applications of the Connection Machine, with J. Salem, Ed. Simon, H., World Scientific, New Jersey, 1989. [AP]
25. *A Review of Recent Numerical Algorithms for Hypersurfaces Moving with Curvature-Dependent Speed*, J. of Diff. Geom., 31, pp. 131-161, (1989). [A]
26. *The Collapse of a Dumbbell Moving Under its Mean Curvature*, in Geometric Analysis and Computer Graphics, P. Concus, R. Finn, D. Hoffman, Eds., Mathematical Sciences Research Institute Publications, Springer-Verlag, 1991. [AC]
27. *Video-Based Scientific Visualization*, in Geometric Analysis and Computer Graphics, P. Concus, R. Finn, D. Hoffman, Eds., Mathematical Sciences Research Institute Publications, Springer-Verlag, 1991. [AC]
28. *Vortex Methods and Vortex Motion*, Eds. K. Gustafson and J.A. Sethian, SIAM Publications, Philadelphia, 1991. [B]
29. *A Brief Overview of Vortex Methods*, in Vortex Methods and Vortex Motion, Eds. K. Gustafson and J.A. Sethian, SIAM Publications, Philadelphia, 1991. [AC]
30. *A Gallery of Fluid Motion using Vortex Methods*, in Vortex Methods and Vortex Motion, Eds. K. Gustafson and J.A. Sethian, SIAM Publications, Philadelphia, 1991. [AC]
31. *Animation Tools for Interactive Flow Visualization*, with James Salem, Transactions of the American Nuclear Society, 1990. [A]
32. *Computing Interface Motion in Compressible Gas Dynamics*, with W. Mulder and S.J. Osher, J. Comp. Phys., 100, 2, pp. 209-228 (1992). [A]
33. *Crystal Growth and Dendrite Formation*, with J. Strain, J. Comp. Phys. 98, 2, pp. 231-253, (1992). [A]
34. *Two-Dimensional, Viscous, Incompressible Flow on a Massively Parallel Processor*, with J.P. Brunet, A. Greenberg, J. Mesirov, J. Comp. Phys. 101, 1, pp. 185-206 (1992).[A]
35. *A Parallel Implementation of the Random Vortex Method*, with J.P. Brunet, A. Greenberg, J. Mesirov, in Plenary Lectures and Expanded Selected Papers from the IMACS 1st International Conference on Computational Physics, Boulder, USA, 11-15 June 1990, Editors: K. Gustafson and W. Wyss, North-Holland, Elsevier-Science Publications, B.V., The Netherlands, 1991. [AP]
36. *Vortex Methods and Massively Parallel Processors*, in Vortex Methods, with J.P. Brunet, A. Greenberg, J. Mesirov, Eds. C. Anderson and C. Greengard, Lectures in Applied Mathematics, Vol. 28, American Mathematical Society, pp. 597-612 (1991). [AC]

37. *Turbulence, Fluid Mechanics, and Massively Parallel Machines*, in Conference on Very-Large-Scale-Scientific Computing, Cape Cod, MA, 1990, J. Mesirov, Ed. SIAM Press, Philadelphia, pp. 77-86 (1991). [AC]
38. *Computing the Motion of Curves and Evolving Surfaces*, in Computing Optimal Geometries, J. Taylor, Ed. American Mathematical Society Publications, Video Publications, 1991. [AC]
39. *Projection Methods Coupled to Level Set Interface Techniques*, with J. Zhu, J. Comp. Phys., 102, 1, pp.128-138, 1992.[A]
40. *Algorithms for Computing Crystal Growth and Dendritic Solidification*, with J. Strain, Institute of Mathematics and its Applications, University of Minnesota, pp. 107-126 (1992).[A]
41. *Computing Turbulent Flow in Complex Geometries on a Massively Parallel Processor*, with J. Brunet, A. Greenberg, and J.P. Mesirov, IEEE Publications, Supercomputer 91, pp. 230-241, (1991).[A]
42. *Flow under Curvature: Singularity Formation, Minimal Surfaces, and Geodesics*, with D. Chopp, J. Exper. Math., v. 2, No. 4, pp. 235-255, 1993.[A]
43. *Programming Direct N-Body Solvers on Connection Machines*, with A. Greenberg and J.P. Mesirov, Thinking Machines Corporation, 1992. [TR]
44. *An Interactive, Animated Visualization Environment for Three-dimensional Fluid Flow*, with K. Lowther and J.B. Salem, International Journal on Supercomputer Applications, 7, 4, 1993. [A]
45. *A Topology Independent Shape Modeling Scheme*, with R. Malladi, and B. Vemuri, Proceedings of SPIE Conference on Geometric Methods in Computer Vision II, Vol. 2031, San Diego, California, pp. 246-258, July 1993. [AP]
46. *Front Propagation: A Framework for Shape Modeling and Image Segmentation*, with R. Malladi, and B. Vemuri, in Proceedings of the AAAI Spring Symposium Series on the Applications of Computer Vision in Medical Image Processing, Stanford University, CA, March 21-23, 1994. [AP]
47. *Evolutionary Fronts for Topology-Independent Shape Modeling Recovery*, with R. Malladi, and B. Vemuri, in Proceedings of the Third European Conference on Computer Vision, LNCS Vol. 800, pp. 3-13, Stockholm, Sweden, May 1994. [AP]
48. *Shape Modeling with Front Propagation: A Level Set Approach*, with R. Malladi, and B. Vemuri, IEEE Trans. on Pattern Analysis and Machine Intelligence, Vol. 17, No. 2, February 1995. [A]
49. *A Fast Level Set based Algorithm for Topology-Independent Shape Modeling*, with R. Malladi, and B. Vemuri, J. Mathematical Imaging and Vision, Special issue on Topology and Geometry in Computer Vision, (1996), Vol. 6, pp. 269-289, 1996. [A]
50. *Physics and Geometry of Flow under Curvature; Singularity Formation, Minimal Surfaces, Geodesics, and Surface Tension*, with D.L. Chopp, in Motion by Mean Curvature, Proceedings of the International Conference, Eds. Buttazzo, G., and Visintin, A., Walter de Gruyter, New York, pp.168-185, 1994. [AP]
51. *Computational Fluid Mechanics and Massively Parallel Processors*, IEEE Supercomputer '93, Portland, Oregon, IEEE Publications, pp.74-82, ACM Transactions, 1993. [AP]
52. *Recognizing Knots Using Simulated Annealing*, with T. Ligoeki, Journal of Knot Theory and its Ramifications, Vol. 3, No. 4, 1994.[A]
53. *A Fast Level Set Method for Propagating Interfaces*, with D. Adalsteinsson, J. Comp. Physics, 118, pp.269-277, 1995.[A]
54. *Curvature Flow and Entropy Conditions Applied to Grid Generation*, J. Comp. Phys., 1994 115, 2, pp. 440-454.[A]
55. *Dynamical Behavior of a Premixed Turbulent Open V-Flame*, with C. Rhee and L. Talbot, J. Fluid Mechanics, 300, pp. 87-115, 1995.[A]
56. *Unified Framework for Shape Segmentation, Representation and Recognition*, with R. Malladi, Center for Pure and Applied Mathematics, Report 614, University of California, Berkeley, 1994.[TR]
57. *A Level Set Approach to a Unified Model for Etching, Deposition, and Lithography, I: Two-dimensional Simulations*, with D. Adalsteinsson, Jour. Comp. Phys. Vol. 120, No. 1, pp. 128-144, 1995.[A]
58. *A Level Set Approach to a Unified Model for Etching, Deposition, and Lithography, II: Three-dimensional Simulations*, with D. Adalsteinsson, J. Comp. Phys., Vol. 122, No. 2, pp. 348-366, 1995. [A]

59. *Algorithms for Tracking Interfaces in CFD and Material Science*, Annual Review of Computational Fluid Mechanics, 1995. [B]
60. *Image Processing via Level Set Curvature Flow*, with R. Malladi, Proceedings of the National Academy of Sciences, Vol. 92(15), pp. 7046–7050, July 1995. [A]
61. *Image Processing: Flows under Min/Max Curvature and Mean Curvature*, with R. Malladi, Graphical Models in Image Processing, 58(2) pp. 127-141, March, 1996. [A]
62. *Level Set Techniques for Tracking Interfaces; Fast Algorithms, Multiple Regions, Grid Generation and Shape/Character Recognition*, Proceedings of the Levico Conference, 1994, Ed. A. Damlamian, J. Spruck, and A. Visintin, Gakuto International Series, Vol. 5, Tokyo, 1995. [AP]
63. *A Unified Approach to Noise Removal, Image Enhancement, and Shape Recovery*, with R. Malladi, IEEE Transactions on Image Processing, 5, 11, pp. 1154-1168, 1996. [A]
64. *Theory, Numerics, and Algorithms of Level Set Techniques for Propagating Interfaces*, Acta Numerica, 1996. [A]
65. *A Fast Marching Level Set Method for Monotonically Advancing Fronts*, Proceedings of the National Academy of Sciences, 93, 4, 1996. [A]
66. *Fast Marching Level Set Methods for Three-Dimensional Photolithography Development*, Proceedings, SPIE 1996 International Symposium on Microlithography, Santa Clara, California, March, 1996. [AC]
67. *High Density Plasma Deposition Modeling Using Level Set Methods*, with D. Adalsteinsson and J. Rey, Proceedings Second International Dielectrics for VLSI/ULCI Multilevel Interconnection Conference, Santa Clara, California, pp. 116-123, Feb., 1996. [AC]
68. *Level Set Methods; Evolving Interfaces in Geometry, Fluid Mechanics, Computer Vision and Material Sciences*, Cambridge University Press, 1996. [B]
69. *An Overview of Level Set Methods for Etching, Deposition, and Lithography Development*, with D. Adalsteinsson, IEEE Transactions on Semiconductor Devices, 1996. 10, 1, pp.167-184.[A]
70. *Tracking Interfaces with Level Sets*, American Scientist, May-June, 1997.[A]
71. *Etching and Deposition Modeling Using Level Set Methods*, with D. Adalsteinsson and J. Rey, 13th International VMIC Meeting, Santa Clara, California, June 18th-20th, 1996. [AP]
72. *An  $O(N \log N)$  Algorithm for Shape Modeling*, with R. Malladi, Proceedings of the National Academy of Sciences, Vol. 93, pp. 9389-9392, September 1996. [A]
73. *Fast Marching Methods for Computing Distance Maps and Shortest Paths*, with R. Kimmel, CPAM Report, University of California, Berkeley, 1996. [TR]
74. *Level Set Methods for Curvature Flow, Image Enhancement, and Shape Recovery in Medical Images*, with R. Malladi H.C. Hege, K. Polthier (eds), Visualization and Mathematics, Springer, Berlin, Heidelberg, New York, pp. 329–345, 1997. [AC]
75. *A Level Set Approach to a Unified Model for Etching, Deposition, and Lithography, III: Re-Deposition, Re-Emission, Surface Diffusion, and Complex Simulations*, with D. Adalsteinsson, J. Comp. Phys., 138, 1, pp. 193-223, 1997. [A]
76. *Void Development in Plasma Enhanced CVD Models*, with D. Adalsteinsson and J. Rey, Proceedings Third International Dielectrics for VLSI/ULCI Multilevel Interconnection Conference, Santa Clara, California, Feb., 1997. [AC]
77. *Application of Fast Marching Methods to Robotic Navigation and Construction of Optimal Paths*, LBNL report., 1998. [TR]
78. *Shape Modeling in Medical Imaging with Marching Methods*, with R. Malladi, Report LBNL-39541, LBNL, University of California, Berkeley, Oct. 1996. [TR]
79. *Level Set and Fast Marching Methods in Image Processing and Computer Vision*, with R. Malladi, Proceedings of IEEE International Conference on Image Processing, Lausanne, Switzerland, Sept. 16-19, 1996. [AP]
80. *A Geometric Approach to Segmentation and Analysis of 3D Medical Images*, with R. Malladi, R. Kimmel, D. Adalsteinsson, G. Sapiro, and V. Caselles, A Geometric Approach to Segmentation and Analysis of 3D Medical Images, Proceedings of IEEE/SIAM Workshop on Mathematical Methods in Biomedical Image Analysis, pp. 244-252, San Francisco, CA, June 1996. [AP]

81. *Flows under Min/Max Curvature and Mean Curvature: Applications in Image Processing*, with R. Malladi, Proceedings of the Fourth European Conference on Computer Vision, LNCS Vol. 1064, pp. 251-261, University of Cambridge, Cambridge, England, April 1996. [AP]
82. *Image Smoothing and Enhancement via Min/Max Curvature Flow*, with R. Malladi, Proceedings of SPIE Conference on Image and Video Processing IV, Vol. 2666, pp. 84-96, San Jose, CA, Feb. 1996. [AP]
83. *A Real-Time Algorithm for Medical Shape Recovery*, with R. Malladi, in *Proceedings of ICCV '98*, Bombay India, pp. 304-310, 1998. [AP]
84. *Three dimensional traveltimes computation using the Fast Marching Method*, with M. Popovici, 64,2, Geophysics, 1999. [A]
85. *Numerical Schemes for the Hamilton-Jacobi and Level Set Equations on Triangulated Domains*, with T. Barth, J. Comp. Phys., 145, 1, pp. 1-40, 1998 [A]
86. *Adaptive Fast Marching and Level Set Methods for Propagating Interfaces*, Acta Numerica, Proceedings of ALGORITHMY '97, Zuberec, 1997. [A]
87. *The Fast Construction of Extension Velocities in Level Set Methods*, with D. Adalsteinsson, 148, J. Comp. Phys., 1999, pp. 2-22. [A]
88. *Fast Marching Methods on Triangulated Domains*, with R. Kimmel, Proc. Nat. Acad. Sci., 37, 1, pp. 5253-5261, 1998. [A]
89. *Fast Marching Methods and Level Set Methods for Propagating Interfaces*, von Karman Institute Lecture Series, Computational Fluid Mechanics, 1998. [A]
90. *Implementation of Hamilton-Jacobi and Level Set Equations on Triangulated Domains*, with T. Barth, von Karman Institute Lecture Series, Computational Fluid Mechanics, 1998. [A]
91. *Level Set Methods and Fast Marching Methods*, Cambridge University Press, 1999. [B]
92. *Fast Marching Methods*, SIAM Review, 41,2, 1999, pp. 199-235. [A]
93. *Fast Voronoi Diagrams and Offsets on Triangulated Surfaces*, with R. Kimmel, Proceedings of AFA Conference on Curves and Surfaces, Saint-Malo, France, July, 1999 [AP]
94. *Motion by Intrinsic Laplacian of Curvature Marching Methods*, with D. Chopp, Interfaces and Free Boundaries, 1, 107-123, 1999. [A]
95. *Advancing Interfaces: Level Set and Fast Marching Methods*, Plenary Address, Proceedings of the International Congress on Industrial and Applied Mathematics, 1999. [AP]
96. *Computational Methods for Advancing Interface*, Proceedings, Conference on Interfaces in the 21st Century, Monterey, Aug, 1999, Eds. M. Smith, M. Miksis, G. McFadden, and D. Canright, World Scientific, 2002 [AP]
97. *Fast Methods for the Eikonal and Related Hamilton-Jacobi Equations on Unstructured Mesh*, with A. Vladimirsky, Proceedings of the National Academy of Sciences, 97, pp. 5699-5703, 2000. [A]
98. *Structural Boundary Design via Level Set and Immersed Interfaces Methods*, with A. Wiegmann, J. Comp. Phys., 163, 2, Sep 2000, pp. 489-528 [A]
99. *Optimal Algorithm for Shape from Shading*, with R. Kimmel, Proc. of 4-th Asian Conf. on Computer Vision. Taipei, Taiwan, January 8-11, 2000. [AP]
100. *Subjective surfaces: A method for completing missing boundaries*, with A. Sarti and R. Malladi, Proc. Nat. Acad. Sciences, 97, pp. 6258-6263, 2000. [A]
101. *Subjective Surfaces: a Geometric Model for Boundary Completion*, with A. Sarti and R. Malladi, ICCV, 46, 3, pp.201-221, 2002, [A]
102. *Evolution, Implementation, and Application of Level Set and Fast Marching Methods for Advancing Fronts*, J. Comp. Phys., vol. 169, pp. 503-555, 2001. [A]
103. *Ordered Upwind Methods for Static Hamilton-Jacobi Equations*, with A. Vladimirsky, Proceedings of the National Academy of Sciences, 98, 11069-11074, 2001. [A]
104. *Modeling a Growth Instability in a Stressed Solid*, with A-B Phan, T. Kaplan, L.J. Gray, D. Adalsteinsson, W. Barvosa-Carter, and M.J. Aziz, Modelling Simulation Materials Science Engineering, 9, pp. 309-235, 2001. [A]

105. Fast Methods for Shape Extraction in Medical and Biomedical Imaging, with R. Malladi, in *Geometric Methods in Biomedical Image Analysis*, Ed. R. Malladi, pp. 1–13, Springer Verlag, 2002 [A]. [Old #104]
106. *Fast algorithms for optimal control, anisotropic front propagation and multiple arrivals*, Proceedings of the International Congress Mathematicians, Beijing vol. 3, 735–746, 2002 [AP]. [Old #105]
107. *Ordered Upwind Methods for Static Hamilton-Jacobi Equations: Theory and Algorithms*, with A. Vladimirov, SIAM J. Numer. Anal., 41, 1, pp. 325-363, 2003 [A] [Old #106]
108. *Fast Phase Space Computation of Multiple Arrivals*, with S. Fomel, Proceedings of the National Academy of Sciences, 99, 11, pp. 7329-7334, 2002 [A]. [Old #107]
109. *Level Set Methods for Fluid Interfaces*, with P. Smereka, Annual Review of Fluid Mechanics, 35, pp.341-372, 2003. [B] [Old #108]
110. *Transport and Diffusion of Material Quantities on Propagating Interfaces via Level Set Methods*, with D. Adalsteinsson, J. Comp. Phys, 185, 1, pp. 271-288, 2002. [A] [Old #109]
111. *Ordered Upwind Methods for Hybrid Control*, with A. Vladimirov, Proceedings Fifth International Conference on Hybrid Systems and Control, Ed. C. Tomlin and M.R. Greenstreet, LCNS 2289, Springer, pp. 393, 2002. [AP] [Old #110]
112. *A Coupled Level Set Projection Method Applied to Ink Jet Simulation*, with J. Yu and S. Sakai, Interfaces and Free Boundaries, 193, No. 1, pp 275-305, 2003. [A] [Old #111]
113. *A numerical model of stress driven grain boundary diffusion*, with J. Wilkening, J. Comp. Phys., 193, 1, pp. 275-305, 2003. [A] [Old #112]
114. *Analysis of Stress Driven Grain Boundary Diffusion, Part I* with J. Wilkening, SIAM J. Appl. Math., 64, 6, 1839-1863, 2004. [A] [Old #113]
115. *Analysis of Stress Driven Grain Boundary Diffusion, Part II* with J. Wilkening, SIAM J. Appl. Math., 64, 6, 1864-1886, 2004. [A] [Old #114]
116. *Modern Interface Methods for Semiconductor Process Simulation*, Handbook of Materials Modeling, Ed. S. Yip, 1359-1369, 2005. [A]
117. *Wave Breaking over Sloping Beaches using a Coupled Boundary Integral-Level Set Method*, with M. Garzon, D. Adalsteinsson, and L. Gray, Interfaces and Free Boundaries, 7, 3, pp. 229-239, 2005 [A] [Old #115]
118. *Computational Modeling of Solid Tumor Evolution via a General Cartesian Mesh/level set method*, with C.S. Hogue and B.T. Murray, Fluid Dynamics & Materials Processing, Vol., 1, 2, 2005. [A] [Old #116]
119. *Simulating Complex Tumor Dynamics from Avascular to Vascular Growth using a General Level Set Method*, with C.S. Hogue and B.T. Murray J. Mathematical Biology, 53, 1, 2005. [A] [Old #117]
120. *A Coupled Quadrilateral Grid Level Set Projection Method Applied to Ink Jet Simulation*, with J. Yu and S. Sakai, J. Computational Physics, 206, 1, pp. 227-251, 2005. [A] [Old #118]
121. *Wave breaking over sloping beaches using a coupled boundary integral-level set method*, with M. Garzon, Internat. Ser. Numer. Math. 154 (2006), pp. 189-198. [A] [Old #119]
122. *Two-Phase Viscoelastic Jetting*, with J. Yu and S. Sakai, Journal of Computational Physics, 220, 2, pp. 568-585, 2007 [A] [Old #120]
123. *Seismic velocity estimation and time-to-depth conversion of time-migrated images*, with M. Cameron and S. Fomel, SVIP 1.7) SEG conference 2006, New Orleans, LA. [AP] [Old #121]
124. *Seismic Velocity Estimation using Time Migration Velocities*, with M. Cameron and S. Fomel, Inverse Problems, v. 23, 1329,1369, 2007. [A] [Old #122]
125. *Fast Marching Methods for the Continuous Traveling Salesman Problems*, with J. Andrews, Proceedings National Academy of Sciences, v. 104, 4, 2007, pp. 1118-1123. [A] [Old #123]
126. *Solving Partial Differential Equations on Irregular Domains with Moving Interfaces, with Applications to Superconformal Electrodeposition in Semiconductor Manufacturing*, with Y. Shan, J. Comp. Phys, 227, 13, 2008 [A] [Old #124]
127. *Exact Sub-Grid Interface Correction Schemes for Elliptic Interface Problems*, with J. Huh, Proc. Nat. Acad. Sciences, 105, pp. 9874, 2008. [A] [Old #125]

128. *Some free boundary problems in potential flow regime using a Level Set method* , with M. Garzon and N. Bobillo-Ares Nova Publishers, "Recent Advances in Fluid Mechanics", 2008. [A] [Old #126]
129. *Study of a Cauchy Problem for a Nonlinear Elliptic PDE for Seismic Velocity Estimation from Time Migration* , with M. Cameron and S. Fomel, Journal Computational Physics, 228, 7388-7411, 2009. [A] [Old #127]
130. *Numerical simulation of non-viscous liquid pinch off using a coupled level set-boundary integral method* , with M. Garzon and L. Gray, Journal Computational Physics, 228, 17, pp. 6079-6106, 2009 [A] [Old #128]
131. *Navigating Molecular Worms Inside Chemical Labyrinths* , with M. Haranczyk, PNAS, 106, pp. 21472-21477, 2009. [A] [Old #129]
132. *Simulations of solid-fluid coupling with application to crystal entrainment in vigorous convection* , with Suckale, J., Elkins-Tanton, L, and Yu, J-D, American Geophysical Union Abstracts, #DI22A-08, San Francisco, December 2009. [AA] [Old #130]
133. *Bubble stability in vigorous convection: Ramifications for magma-ocean degassing and formation of an early atmosphere* , with Suckale, J., Elkins-Tanton, L, and Yu, J-D, American Geophysical Union Abstracts, #P31A-1231, San Francisco, December 2009. [AA]
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