

7. Publication List

Structures and Materials

Acharya, A., H. Cherukuri, and R. M. Govindarajan, A New Proposal in Gradient Plasticity; Applications to 1-D Quasi-Statics and Dynamics, *Journal of Cohesive-Frictional Materials*, accepted for publication.

Balagangadhar D. and D. A. Tortorelli, Design and Analysis of Rolling Processes with a Steady-Displacement-Based Finite Element Formulation, to be presented at the *7th International Symposium on Plasticity and Its Current Applications*, A. S. Kahn, ed., Cancun, Mexico, January 1999.

Balagangadhar, D. and D. A. Tortorelli, A Displacement Based Reference Frame Formulation for the Analysis of Steady Manufacturing Processes, *Proceedings of The Sixth International Conference on Numerical Methods*, Enschede, The Netherlands, June 1998.

Balagangadhar, D. and D. A. Tortorelli, Analysis and Design of Manufacturing Processes, *Proceedings of the Seventh AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization*, St. Louis, MO, September 1998.

Balagangadhar, D. and D. A. Tortorelli, Design of Steady Processes via a Displacement Based Reference Formulation, *Proceedings of The Sixth International Conference on Numerical Methods*, Enschede, The Netherlands, June 1998.

Balagangadhar, D., G. A. Doria, and D. A. Tortorelli, A Displacement Based Reference Frame Formulation Suitable for Steady-State Thermo-Elasto-Plastic Material Processes, *International Journal of Solids and Structures*, to appear.

Beldica, C. E., H. H. Hilton, and S. Yi, Viscoelastic, Structural and Piezo-Electric Damping for Flutter Control: A Sensitivity Analysis, in press *Proceedings DOD High Performance Computing Modernization Program 1998 Users Group Conference*, Houston, TX, June 1998.

Breitenfeld, M. S. and P. H. Geubelle, Parallel Implementation of a Spectral Scheme for the Simulation of 3D Dynamic Fracture Events, *Int. J. Supercomp. Appl. & High Performance Computing*, submitted.

Bruns, T. E. and D. A. Tortorelli, Topology Optimization of Geometrically Nonlinear Structures and Compliant Mechanisms, *Proceedings of the Seventh AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization*, St. Louis, MO, September 1998.

Carranza, F. L., B. Fang, and R. B. Haber A Moving Cohesive Interface Model for Fracture in Creeping Materials, *Computational Mechanics* 19, 517-521, 1997.

Carranza, F. L., B. Fang, and R. B. Haber, An Adaptive Space-Time Finite Element Model for Oxidation-Driven Fracture, *Computer Methods in Applied Mechanics and Engineering* 157, 399-423, 1998.

Danyluk, M. J., P. H. Geubelle, and H. H. Hilton, 2D and 3D Dynamic Fracture in Viscoelastic Materials, *International Journal of Solids and Structures* 35, 3831-1997, 1998.

- Danyluk, M. J., P. H. Geubelle, and H. H. Hilton, 2D and 3D Dynamic Fracture in Viscoelastic Media, *Int. J. Solids Structures* 35:28-29, 3831-3853, 1998.
- Fang, B., F. L. Carranza, and R. B. Haber, An Adaptive Discontinuous Galerkin Method for Viscoplastic Analysis, *Computer Methods in Applied Mechanics and Engineering* 150, 191-198, 1997.
- Geubelle, P. H. and J. Baylor, "Impact-Induced Delamination of Composites: A 2D Simulation, *Composites B*, 29B, 589-602, 1998.
- Geubelle, P. H., M. J. Danyluk, and H. H. Hilton, Dynamic Mode III Fracture in Viscoelastic Media, *International Journal of Solids and Structures* 35, 761-782, 1998.
- Guenza, M. and K. S. Schweizer, Mode-Coupling Theory of Self-Diffusion in Diblock Copolymer Fluids. II. Model Calculations and Experimental Comparisons, *J. Chemical Physics* 108, 1271, 1998.
- Guenza, M., H. Tang, and K. S. Schweizer, Mode-Coupling Theory of Self-Diffusion in Diblock Copolymer Fluids. I. General Derivation and Qualitative Predictions, *J. Chemical Physics* 107, 1257, 1997.
- Guenze, M. and K. S. Schweizer, Fluctuation Effects in Diblock Copolymer Fluids: Comparison of Theories and Experiment, *J. Chemical Physics* 106, 7391, 1997.
- Hilton, H. H., Anisotropic Viscoelastic Fractional Derivative Material Characterization, *International Journal of Solids and Structures*, submitted.
- Hilton, H. H., Nonlinear Viscoelastic Characterization and Failure Analysis of Solid Propellants and Composite Cases, in press *Materials Science and Engineering - A*, 1998.
- Hilton, H. H., Nonlinear Viscoelastic Characterization and Failure Analysis of Solid Propellants and Composite Cases, *Proceedings of the NSF-Institute of Mechanics and Materials Symposium on Micromechanics of Industrial Materials*, 25-27, University of Washington, Seattle, 1998.
- Hilton, H. H., Structural Reliability and Minimum Weight Analysis for Combined Random Loads and Strengths, *Journal of Probabilistic Engineering Mechanics*, submitted.
- Hjelmstad, K. D., and S. Shin, Damage Detection and Assessment of Structures from Static Response, *Journal of Engineering Mechanics* 123:6, 568-576, 1997.
- Hjelmstad, K. D., *Fundamentals of Structural Mechanics*, Prentice Hall, Inc., Upper Saddle River, NJ (ISBN 0-13-48236-2), 448 pp., 1997.
- Jung, D., A. Hegeman, N. R. Sottos, P. H. Geubelle, and S. R. White, Self-Healing Composites Using Embedded Micro-Spheres, Composite and Functionally Graded Materials, eds., Jacob, K., Katsube, N., and Jones, W., Vol. MD-80, in *Proceedings of the ASME International Mechanical Engineering Conference and Exposition*, 265-275. Also submitted to *Polymer Composites*.
- Lin, G., P. H. Geubelle, and N. R. Sottos, Simulation of Fiber Debonding and Frictional Sliding in a Model Composite Pushout Test, *Int. J. Solids Structures*, submitted.

Schweizer, K. S., M. Fuchs, G. Szamel, M. Guenza, and H. Tang, Mode-Coupling Theory of the Slow Dynamics of Entangled macromolecular Fluids, *Macromolecular Theory and Simulation* 6, 1037, 1997.

Tortorelli, D. A. and D. Balagangadhar, Analysis and Design of History Dependent Steady Processes via Displacement Based Reference Frame Formulations, *Proceedings of the 1998 NSF Design and Manufacturing Grantees Conference*, Monterrey, Mexico, 139-140, January 1998.

Tortorelli, D. A., Inverse Problems in Mechanics, *Proceedings of the 8th Inverse Problems in Engineering Seminar*, A. Maniatty, ed., Rensselaer Polytechnic Institute, Troy, NY, June 1997, invited lecture.

Yi S., H. H. Hilton, and M. F. Ahmad, Viscoelastic Finite Element Analysis Algorithms Performance on Course Grained and Massively Parallel Supercomputers, in press *Proceedings of 4th NASA National Symposium on LARGE-Scale Analysis and Design on High-Performance Computers and Work Stations*, Williamsburg, VA, October 1997.

Yi, S., M. F. Ahmad, and H. H. Hilton, Finite Element Algorithms for Dynamic Simulations of Viscoelastic Composite Shell Structures Using Conjugated Gradient Method on Vector and Coarse Grained and Massively Parallel Machines, *International Journal for Numerical Methods in Engineering* 40, 1857-1875, 1997.

Zuo, Q. H. and K. D. Hjelmstad, Bounds and Approximations for Elastic Wave Speeds in Cubic Crystals, *J. Acoust. Soc. Am.* 101:6, 3415-3420, 1997.

Zuo, Q. H. and K. D. Hjelmstad, Conditions for Bifurcation of a Cantilever Beam Subjected to Generalized Follower Loads: Geometrically Exact Approach, *Journal of Sound and Vibration* 203:5, 889-902, 1997.

Fluid Dynamics

Adrian R. J., Visualization and Interpretation of Turbulent Fields Using Inhomogeneous Filters Based on Proper Orthogonal Decomposition, *13th USNCAM*, Gainesville, FL, June 1998 (abstract only).

Adrian, R. J., K. T. Christensen, S. M. Soloff, C. D. Meinhart, and Z. C. Liu, Decomposition of Turbulent Fields and Visualization of Vortices, *Proc. 9th Int'l Symp. Applications Lasers to Fluid Mechanics*, Lisbon, 16.1.1-8, July 1998.

Adrian, R. J., K. T. Christensen, S. M. Soloff, and C. D. Meinhart, Decomposition of Turbulent Fields and Visualization of Vortices and Turbulent Momentum Transport, CD ROM *Proc. 8th Int'l Symp. on Flow Visualization*, Paper 219, eds. G. M. Carlomagno and I. Grant, Sorrento, Italy, September 1998.

Adrian, R. J. and S. Balachandar, Vortex Packets and the Structure of Wall Turbulence, *Proc. Int'l Symp. On Seawater Drag Reduction*, J.C.S. Meng, ed., Newport, RI, 33-38, July 1998.

Adrian, R. J., D.F.G. Durao, F. Durst, M. V. Heitor, M. Maeda, and J. H. Whitelaw, *Developments in Laser Techniques and Fluid Mechanics*, Springer, Berlin, 477 pp., 1997.

- Adrian, R. J., Dynamic Ranges of Velocity and Spatial Resolution of Particle Image Velocimetry, *Meas. Sci. Technol.*, December 1997.
- Adrian, R. J., S. M. Soloff, Z.-C. Liu, C. D. Meinhart, and W. Lai, Stereoscopic PIV Applications to the Study of Turbulence, *Proc. Workshop on PIV*, Fukui, 75-84, July 1997.
- Aref, H. and D. L. Vainchtein, Asymmetric Equilibrium Patterns of Point Vortices, *Nature* 392, 769-770, 1998.
- Aref, H. and M. Brons, On Stagnation Points and Streamline Topology in Vortex Flows, *J. Fluid Mech.* 370, 1-27, 1998.
- Aref, H., P. L. Boyland, M. A. Stremler, and D. L. Vainchtein, Turbulent Statistical Dynamics of a System of Point Vortices, *Proceedings of the Second Monte Verità Colloquium on Turbulence*, Ascona, Switzerland, eds. A. Gyr and A. Tsinober, Birkhauser, in press.
- Balsara, D. and C.-W. Shu, Monotonicity Preserving Weighted Essentially Non-Oscillatory Schemes with Increasingly High Order of Accuracy, *J. Comput. Phys.*, submitted.
- Balsara, D., An Analysis of the Hyperbolic Nature of the Equations of Radiation Hydrodynamics, *J. Quant. Spectroscopy & Rad. Transf.* 70, 1998, to appear.
- Balsara, D., and D. Spicer, Maintaining Divergence Free Magnetic Fields in MHD Simulations, *J. Comput. Phys.*, submitted.
- Balsara, D., and D. Spicer, Maintaining Pressure Positivity in MHD Flows, *J. Comput. Phys.*, accepted for publication.
- Balsara, D., Exact Jacobians of Roe-Type Flux Difference Splitting of the Equations of Radiation Hydrodynamics (and Euler Equations) for Use in Time-Implicit Higher Order Godunov Schemes, *J. Quant. Spectroscopy & Rad. Transf.*, accepted for publication.
- Balsara, D., Linearized Formulation of the Riemann Problem for Radiation Hydrodynamics, *J. Quant. Spectroscopy & Rad. Transf.* 71, 1998, to appear.
- Balsara, D., Linearized Formulation of the Riemann Problem for Radiation Magnetohydrodynamics, *J. Quant. Spectroscopy & Rad. Transf.*, accepted for publication.
- Balsara, D., The Eigenstructure of the Equations of Radiation Magnetohydrodynamics, *J. Quant. Spectroscopy & Rad. Transf.* 71, 1998, to appear.
- Ciucci, A., G. Iaccarino, R. Moser, F. Najjar and P. Durbin, Simulation of Rocket Motor Internal Flows with Turbulent Mass Injection, *Proceedings of the Summer Program 1998*, Center for Turbulence Research, Stanford University.
- DeJong, N. C., L. W. Zhang, A. M. Jacobi, S. Balachandar, and D. K. Tafti, A Combined Experimental and Numerical Study of Flow and Heat Transfer in Offset Strip-Fin Heat Exchangers, *J. Heat Transfer*, accepted for publication.
- Jimenez, J. and R. D. Moser, LES: Where Are We and What Can We Expect?, *AIAA* 98, 2891, 1998.
- Kaehler, C., R. J. Adrian, and C. Willert, Turbulent Boundary Investigations with Conventional and Stereo PIV, *Proc. 9th Int'l Symp. Applications Lasers to Fluid Mechanics*, Lisbon, 11.1.1-8, July 1998.

Liu Z. C., R. J. Adrian, C. D. Meinhart, and W. Lai, Structure of a Turbulent Boundary Layer Using a Stereoscopic, Large Format Video-PIV, *Developments in Laser Techniques and Fluid Mechanics*, R. J. Adrian, et al., eds., Springer, Berlin, 1997.

Liu, Z. C. and R. J. Adrian, Visualization of Hairpin Vortex Structure with PIV and DNS, CD ROM *Proc. 8th Int'l Symp. on Flow Visualization*, Paper 8, eds. G. M. Carlomagno and I. Grant, Sorrento, Italy, September 1998.

Mei, R., R. J. Adrian. and T. J. Hanratty, Turbulent Dispersion of Heavy Particles with Non-linear Drag, *J. Fluids Engr.* 119, 170-179, 1997.

Moser, R. D. and R. J. Adrian, Turbulence Data for LES Development and Validation, ASME CD ROM Paper FEDSM98-5092, *Proc. ASME Fluids Engineering Div. Summer Meeting*, Washington, DC, June 1998.

Moser, R. D. and R. J. Adrian, Turbulence Data for LES Development and Validation, *ASME* paper FEDSM98, 5092, 1998.

Moser, R. D., M. M. Rogers, and D. W. Ewing, Self-Similarity of Time-Evolving Plane Wakes, *J. Fluid Mech.* 367, 255-289, 1998.

Moser, R. D., Summary and Appraisal of Self-Sustaining Mechanisms, *AIAA* 98, 3002, 1998.

Mukhopadhyay, A., P. Venugopal and S. P. Vanka, Numerical Study of Vortex Shedding from a Circular Cylinder in Linear Shear Flow, Communicated to *Journal of Fluids Engineering*, ASME.

Najjar, F. M. and S. Balachandar, Three-Dimensional Wake Dynamics in a Nominally 2-D Bluff Body, *FED* 245, 1998 ASME Fluids Engineering Summer Meeting, Washington, DC, June 1998.

Rizwan-uddin, A Hybrid Nodal Integral/Finite-Element Method for Arbitrary Geometries, *Trans. Am. Nuc. Soc.* 76, 170-172, 1997.

Rizwan-uddin, A Second Order Space and Time Nodal Method for the One-Dimensional Convection-Diffusion Equation, *Computers and Fluids* 26:3, 233-347, 1997.

Rizwan-uddin, An Approximate Solution Based Numerical Scheme for Stefan Problem with Time-Dependent Boundary Conditions, *Numerical Heat Transfer, Part B: Fundamentals* 33, 269-285, 1998.

Rizwan-uddin, An Improved Coarse-Mesh Nodal Integral Method for partial Differential Equations, *Num. Meth. for Partial Diff. Equations* 13, 113-145, 1997.

Rizwan-uddin, Bubble-Bubble Interaction for Lagrangian Treatment of Multiphase Flow, *Annals of Nuclear Energy* 24:6, 423-438, 1997.

Tafti, D. K. and L. Zhang, A Time Dependent Calculation Procedure for Flow and Heat Transfer in a Periodic Array of Louvered Fins, Proceedings of the Third ISHMT-ASME Heat and Mass Transfer Conference, IIT-Kanpur, paper No. HT-97-097, 721-728, December 1997.

Tafti, D. K., and G. Wang, Application of Embedded Parallelism to large Scale Computations of Complex Industrial Flows, to be presented at 1998 IMECE, Anaheim, CA, November 1998.

Tafti, D. K., G. Wang and W. Lin, Flow Transition in a Multilouvered Fin Array, *Int. J. Heat Mass Transfer*, submitted.

Tafti, D. K., G. Wang, and W. Lin, Transitional Flow and Heat Transfer Characteristics of Developing Flow in Louvered Fin Arrays, Int. Conference and Exhibit - Heat Exchangers for Sustainable Development, Lisbon, Portugal, June 1998.

Tafti, D. K., L. W. Zhang, and G. Wang, A Time-Dependent Calculation Procedure for Fully Developed and Developing Flow and Heat Transfer in Louvered Fin Geometries, *Numerical Heat Transfer*, accepted for publication.

Tomkins C. and Adrian R. J. (1998) Patterns of Vortex Packet Growth in a Turbulent Boundary Layer, *13th USNCAM*, Gainesville, FL, June 1998 (abstract only).

Tomkins, C. D., R. J. Adrian, and S. Balachandar, The Structure of Vortex Packets in Wall Turbulence, AIAA Paper 98-2962, *29th AIAA Fluid Dynamics Conf.*, Albuquerque, NM, 13 pp., June 1998.

Toreja, A. J. and Rizwan-uddin, A Nodal Integral Method for the Convection-Diffusion Equation Using a Quadratic Fit for the Transverse Leakage Approximation, presented at *Numerical Analysis Days*, Western Illinois University, McComb, IL, April 1998.

Wang, G. and D. K. Tafti, A Parallel Programming Model for Industrial CFD Applications on Microprocessor Based Systems, *Proceedings of the ASME Fluids Engineering Division FED 244*, 493-500, ASME-IMECE, Dallas, Texas, November 1997.

Wang, G. and D. K. Tafti, Parallel Performance of Additive Schwarz Preconditioners on Origin 2000, *Advances in Engineering Software* 29:3-6, 433-439, 1998.

Wang, G. and D. K. Tafti, Performance Enhancement on Microprocessors with Hierarchical Memory Systems for Solving Large Sparse Linear Systems, *Int. J. of Supercomputing Applications and High Performance Computing*, in press, 1998.

Wang, G. and D. K. Tafti, Uniprocessor Performance Enhancement by Additive Schwarz Preconditioners on Origin 2000, *Advances in Engineering Software* 29:3-6, 443-439, 1998.

Wescott, B. L. and Rizwan-uddin, Reduced Computation in the Modified Nodal Integral Method for Burgers' Equation, presented at *Numerical Analysis Days*, Western Illinois University, McComb, IL, April 1998.

Zhong, J., T. S. Huang, and R. J. Adrian, Extracting Vortices in Turbulent Fluid Flow, *IEEE Trans. Pattern Anal. Machine Intell.* 20, 193-199, 1998.

Zhou J., R. J. Adrian, S. Balachandar, and T. Kendall, Hairpin Vortices in Near-Wall Turbulence and Their Regeneration Mechanisms, *J. Fluid Mech.*, 1998.

Zhou, J., C. D. Meinhart, S. Balachandar, and R. J. Adrian, Formation of Hairpin Packets in Wall Turbulence, *Self-Sustaining Mechanisms in Wall Turbulence*, R. Panton, ed., 109-134, 1997.

Combustion and Energetic Materials

Aryasetiawan, F., O. Gunarsson, E. Koch, and R. M. Martin, Pauli Susceptibility of A3 C60 (A-K, Rb), *Phys Rev. B. Rapid Comm.* 55, 10165, 1997.

- Ben-Nun, M. and T. J. Martínez, *Ab Initio* Multiple Spawning of Photoinduced *cis-trans* Isomerization in Ethylene, *Chem Phys. Lett.*, submitted.
- Ben-Nun, M. and T. J. Martínez, Direct Evaluation of the Pauli Repulsion Energy using “Classical” Wavefunctions in Hybrid Quantum/Classical Potential Energy Surfaces, *Chem. Phys. Lett.* 290, 289, 1998.
- Buckmaster, J. and T. L. Jackson, The Effects of Time-Periodic Shear on a Diffusion Flame Anchored to a Propellant, submitted.
- Buckmaster, J., T. L. Jackson, and J. Yao, An Elementary Discussion of Propellant Flame Geometry, *Combustion and Flame*, in press.
- Fedkiw, R., T. Aslam, and S. Xu, The Ghost Fluid Method for Deflagration and Detonation Discontinuities, *Computational and Applied Mathematics Reports* (UCLA) 98-36 (in preparation for submission to *Combustion Theory and Modeling*).
- Fonseca, L.R.C., J. L. Jimenez, J. P. Leburton, and R. M. Martin, Self-Consistent Calculation of the Electronic Structure and Electron-Electron Interaction in Self-Assembled InAs-GaAs Quantum Dot Structures, *Phys. Rev. B.* 57, 4017, 1998.
- Fried, E. and G. Grach, An Order-Parameter Based Theory as a Regularization of a Sharp-Interface Theory for Solid-Solid Phase Transitions, *Archive for Rational Mechanics and Analysis* 138, 355-404, 1997.
- Fried, E. and M. E. Gurtin, Coherent Solid-State Phase Transitions with Atomic Diffusion: A Thermomechanical Treatment, *Journal of Statistical Physics*, submitted.
- Fried, E., A. Q. Shen, and S. T. Thoroddsen, Wave Patterns in a Thin Layer of Sand within a Rotating Horizontal Cylinder, *Physics of Fluids* 10, 10-12, 1998.
- Fried, E., Correspondence Between a Phase-Field Theory and a Sharp-Interface Theory for Crystal Growth, *Continuum Mechanics and Thermodynamics* 9, 33-60, 1997.
- Fried, E., Introduction. Fifty years of Research on Evolving Phase Interfaces, in *The Physical and Mathematical Foundations of the Continuum Theory of Evolving Phase Interfaces, A collection of reprints of 14 seminal papers, dedicated to Morton E. Gurtin in honor of his outstanding contributions* (J. M. Ball, D. Kinderlehrer, P. Podio-Guidugli and M. Slemrod, Eds.), Springer-Verlag, Berlin, 1998.
- Grossman, J. C. and L. Mitas, High Accuracy Molecular Heats of Formation and Reaction Barriers: Essential Role of Electron Correlation, *Phys. Rev. Lett.* 79, 4353, 1997.
- Gunnarsson, O., E. Koch, and R. M. Martin, Mott-Hubbard Insulators for Systems with Orbital Degeneracy, *Phys. Rev. B.* 56, 1146, 1997.
- Gunnarsson, O., S. C. Erwin, E. Koch, and R. M. Martin, Important Role of Alkali Atoms in A4 C60, *Phys. Rev. B.*, accepted for publication.
- Jackson, T. L. and J. Buckmaster, Non-Premixed Periodic Flames Supported by Heterogeneous Propellants, submitted.
- Knott, G. M. and M. Q. Brewster, Combustion Modeling of Composite Solid Propellants with Finite Peclet Number, AIAA 98-3233, *34th AIAA/ASME/SAE/ASEE Joint Propulsion Conference*, Cleveland, OH, July 1998.

- Koch, E., O. Gunnarsson, and R. M. Martin, Dielectric Screening in Doped Fullerides, *Proceedings of the International Winterschool on Electronic Properties of Novel Materials*, Kirchberg/Tirol, 1998 (to be published).
- Krier, H., et al., Ignition Dynamics of Boron Particles in a Shock Tube, *J. Propulsion and Power*, 14:2, 166-172, 1998.
- Lee, I.-H. and R. M. Martin, Applications of the Generalized Gradient Approximation to Atoms, Clusters, and Solids, *Phys. Rev. B*. 56, 7197, 1997.
- Lee, I.-H., V. Rao, R. M. Martin, and J. P. Leburton, Shell-Filling of Artificial Atoms within Density Functional Theory, *Phys. Rev. B*. 57, 9035, 1998.
- Loner, P. S. and M. Q. Brewster, On the Laser-Augmented Oscillatory Combustion of HMX, 28th International Symposium on Combustion, Boulder, CO, August 1998.
- Magro, W., B. Militzer, D. Ceperley, B. Bernu, and C. Pierleoni, Restricted Path Integral Monte Carlo Calculations of Hot Dense Hydrogen, *Proc. of SCCS*, Boston, 1997.
- Martin, R. M. and G. Ortiz, Functional Theory of Extended Coulomb Systems, *Phys. Rev. B*. 56, 1124, 1997.
- Martin, R. M. and G. Ortiz, Microscopic Functional Theory of Dielectrics, presented at *Symposium on Density Functional Theory*, Duke University, June 1997.
- Martin, R. M. and G. Ortiz, Recent Developments in the Theory of Electric Polarization in Solids, *Solid State Communications* 102, 121, 1997.
- Martin, R. M., Density Functional Polarization Theory, series of lectures presented at School on Density Functional Theory, Hermanus, South Africa, January 1997 (to be published by Springer-Verlag).
- Militzer, B., W. Magro, and D. Ceperley, Fermionic Path-Integral Simulation of Dense Hydrogen, *Proc. of SCCS*, Boston, 1997.
- Mitas, L., Diffusion Monte Carlo, *Quantum Monte Carlo Methods in Physics and Chemistry*, Kluwer, Dordrecht, 1998 (NATO Advanced Scientific Institute, Cornell University, Ithaca, 1998), to appear.
- Mitas, L., Quantum Monte Carlo, *Current Opinions in Solid State and Materials Research*, Current Chemistry, Ltd., London, 1998.
- Murphy, J. J. and H. Krier, Transient Combustion Response of Homogeneous Solid Propellants to Acoustic Oscillations in a Rocket Motor, paper 5D06, *Proceedings of the 27th International Combustion Symposium*, Boulder, CO, August 1998.
- Orth, L. and H. Krier, Shock Physics for Non-Ideal Detonation of Metalized Energetic Explosives, paper 5D04, *Proceedings of the 17th International Combustion Symposium*, Boulder, CO, August 1998.
- Ortiz, G., I. Souza, and R. M. Martin, Exchange-Correlation Hole in Polarized Insulators: Implications for the Microscopic Functional Theory of Dielectrics, *Phys. Rev. Lett.* 80, 353, 1998.

Shen, A. Q., E. Fried, and S. T. Thoroddsen, Is Segregation-by-Particle-Type a Generic Mechanism Underlying Finger Formation at Fronts of Flowing Granular Media?, *Particulate Science and Technology*, submitted.

Tang, K. C. and M. Q. Brewster, Analysis of Molecular Gas Radiation: Real gas Property Effects, 7th AIAA/ASME Joint Thermodynamics and Heat Transfer Conference, Albuquerque, NM, June 1998. Also in preparation for submission to *Journal of Thermophysics and Heat Transfer*.

Thompson, K. and T. J. Martínez, Hybrid *Ab Initio*/Interpolated Molecular Dynamics on Multiple Electronic States, *J. Chem. Phys.*, submitted.

Computer Science

Chen, Y., M. Winslett, Y. Cho, and S. Kuo, Automatic Parallel I/O Performance Optimization Using Genetic Algorithms, *Proceedings of the 7th IEEE International Symposium on High Performance Distributed Computing*, Chicago, 1998.

Chen, Y., Automatic Parallel I/O Performance Optimization in Panda, Ph.D. thesis, Department of Computer Science, University of Illinois at Urbana-Champaign, May 1998.

Chen, Y., M. Winslett, Y. Cho, and S. Kuo, Automatic Parallel I/O Performance Optimization in Panda, *Proceedings of the 10th Annual ACM Symposium on Parallel Algorithms and Architectures*, Puerto Vallarta, 1998.

Chen, Y., M. Winslett, Y. Cho, and S. Kuo, Speeding Up Automatic Parallel I/O Performance Optimization in Panda, *Proceedings of the 12th International Symposium on High Performance Computing Systems*, Edmonton, 1998.

Cho, Y., M. Winslett, J. Lee, Y. Chen, S. Kuo, and K. Motukuri, Collective I/O on an SGI Cray Origin 2000: Strategy and Performance, *Proceedings of the 1998 International Conference on Parallel and Distributed Processing Technique and Applications*, Las Vegas, NV, 1998.

Cho, Y., M. Winslett, M. Subramaniam, Y. Chen, and S. Kuo, Exploiting Local Data in Parallel I/O on a Network of Workstations, *5th Annual Conference on I/O in Parallel and Distributed Systems*, San Jose, November 1997.

Cho, Y., M. Winslett, M. Subramaniam, Y. Chen, S. Kuo, and K. E. Seamons, Exploiting Local Data in Parallel Array I/O on a Practical Network of Workstations, *Proceedings of the Fifth Workshop on Input/Output in Parallel and Distributed Systems*, San Jose, CA, November 1997.

Cho, Y., M. Winslett, S. Kuo, Y. Chen, J. Lee, and K. Motukuri, Parallel I/O on Networks of Workstations: Performance Improvement by Careful Placement of I/O Servers, *Proceedings of HiPer'98, High Performance Computing on Hewlett-Packard Systems*, Zurich, 1998.

Cho, Y., M. Winslett, Y. Chen, and S. Kuo, Parallel I/O Performance of Fine Grained Data Distributions, *Proceedings of the 7th IEEE International Symposium on High Performance Distributed Computing*, Chicago, 1998.

DeRose, L. and D. Padua, IX Simposio Brasileiro de Arquitetura de computadores: Processamento de Alto Desempenho, *Campos do Jordao*, SP, Brazil, 285-299, October 1997.

- Eigenmann, R., J. Hoeflinger, and D. Padua, On the Automatic Parallelization of the Perfect Benchmarks, *IEEE Transactions on Parallel and Distributed Systems* 9:1, 5-23, 1998.
- Elford, C. L. and D. A. Reed, Technology Trends and Disk Array Performance, *Journal of Parallel and Distributed Computing*, 1998.
- Heath, M. T. and P. Raghavan, Performance of a Fully Parallel Sparse Solver, *Internat. J. Supercomput. Appl High Perf. Comput.* 11:1, 49-64, 1997.
- Heath, M. T. and P. Raghavan, Performance of Parallel Sparse Triangular Solution, in *Algorithms for Parallel Processing*, eds. m. T. Heath, A. Ranade, and R. S. Schreiber, Springer Verlag, New York, in press.
- Heath, M. T. and W. A. Dick, Virtual Rocketry: Rocket Science Meets Computer Science, *IEEE Comput. Sci. Engr.* 5:1, 16-26, 1998.
- Heath, M. T., A. D. Malony, and D. T. Rover, Visualization for Parallel Performance Evaluation and Optimization, in *Software Visualization: Programming as a Multimedia Experience*, eds J. Stasko, J. Dominigue, M. H. Brown and B. A. Price, MIT Press, Cambridge, MA, 347-365, 1998.
- Heath, M. T., A. Ranade, and R. S. Schreiber, eds., *Algorithms for Parallel Processing*, Springer-Verlag, New York, in press.
- Heath, M. T., Parallel Direct Methods for Sparse Linear Systems, in *Parallel Numerical Algorithms*, eds D. E. Keyes, A. Sameh, and V. Venkatakrishnan, Kluwer Academic Publishers, Boston, 55-90, 1997.
- Heath, M. T., *Scientific Computing: An Introductory Survey*, McGraw-Hill, New York, 1997.
- Heath, M. T., V. Torczon, et al., eds, *Proc. Eighth SIAM Conf. on Parallel Processing for Scientific Computing*, SIAM, Philadelphia, PA 1997.
- Hovland, P. and M. T. Heath, Adaptive SOR and Automatic Differentiation of Algorithm Parameters, *SIAM J. Sci. Comput.*, submitted.
- Kale, L. V., M. Bhandarkar, and R. Brunner, Load Balancing in Parallel Molecular Dynamics, *Fifth International Symposium on Solving Irregularly Structured Problems in Parallel*, National Energy Research Scientific Computing Center (NERSC), Lawrence Berkeley National Laboratory, Berkeley, CA, August 1998.
- Kale, L. V., M. Bhandarkar, R. Brunner, and J. Yelon, Multiparadigm, Multilingual Interoperability: Experience with Converse, *2nd Workshop on Runtime Systems for Parallel Programming (RTSPP)*, Orlando, FL, March 1998.
- Kuo, S., M. Winslett, Y. Chen, and Y. Cho, Efficient I/O of Grid Hierarchies for AMR Computations on Parallel Disks, *Proceedings of the 10th International Working Conference on Scientific and Statistical Database Management*, Capri, 1998.
- Lee, J., S. Midkiff, and D. Padua, A Constant Propagation Algorithm for Explicitly Parallel Programs, *International Journal of Parallel Programming* 26:5, 563-589, 1998.

- Li, X.-Y. and S.-H. Teng, Dynamic Load Balancing for Parallel Adaptive Mesh Refinement, 5th International Symposium on Solving Irregularly Structured Problem in Parallel (Irregular '98), Berkeley, CA, *Lecture Notes in Computer Science* 1457, Springer, 144-155, 1998.
- Li, X.-Y., A. Ungor, and S.-H. Teng, Simultaneous Refinement and Coarsening: Adaptive Meshing with Moving Boundaries, 7th International Meshing Roundtable, 1998.
- Madhyastha, T. M. and D. A. Reed, Exploiting Global Access Pattern Classification, *Proceedings of SC'97*, San Jose, CA, November 1997 (CD-ROM).
- Madhyastha, T. M. and D. A. Reed, Input/Output Access Pattern Classification Using Hidden Markov Models, *Proceedings of the Workshop on Input/Output in Parallel and Distributed Systems (IOPADS)*, San Jose, CA, November 1997.
- Mendes, C. L. and D. A. Reed, Integrated Compilation and Scalability Analysis for Parallel Systems, *International Conference on Parallel Architectures and Compilation Techniques (PACT '98)*, Paris, France, October 1998.
- Miller, G. L., D. Talmor, and S.-H. Teng, Optimal Coarsening of Unstructured Meshes, *Journal of Algorithms*, invited and accepted for publication in a special issue.
- Nasir, M. A., W. C. Chew, P. Raghavan, and M. T. Heath, A Comparison of Computational Complexities of HFEM and ABC Based Finite Element Methods, *J. Electromagnetic Waves Appl.* 11, 1601-1617, 1997.
- Navarro, A., Y. Paek, E. Zapata, and D. Padua, Compiler Techniques for Effective Communication on Distributed Memory Multiprocessors, *International Conference on Parallel Processing 1997*.
- Padua, D., Concurrent Static Single assignment Form and Constant Propagation for explicitly Parallel Programs. Languages and Compilers for Parallel Computing. *Lecture Notes in Computer Science* 1366. eds. S. Chatterjee, Z. Li, D. Sehr, and P. Yew, Springer-Verlag, 114-130, 1998.
- Paek, Y. and D. Padua, Compiling for Scalable Multiprocessors with Polaris, *Parallel Processing Letters* 7:4, 1997.
- Paek, Y. and D. Padua, Experimental Study of Compiler Techniques for Scalable Shared-Memory Machines, *12th International Parallel Processing Symposium*, March 1998.
- Paek, Y., J. Hoeflinger, and D. Padua, Simplification of Array Access Patterns for Compiler Optimizations, SIGPLAN'98. *Conference on Programming Languages Design and Implementation*.
- Phillips, J. C., R. Brunner, A. Shinozaki, M. Bhandarkar, N. Krawetz, L. V. Kale, R. D. Skeel, and K. Schulten, Avoiding Algorithmic Obfuscation in a Message-Driven Parallel MD Code, in Algorithms for Macromolecular Modelling, *Lecture Notes in Computational Science and Engineering*, eds. P. Deuffhard, J. Germans, B. Leimkuhler, A. Mark, R. D. Skeel, and S. Reich, Springer-Verlag, in press.
- Reed, D. A. and R. L. Ribler, Performance Analysis and Visualization, *Computational Grids: State of the Art and Future Directions in High-Performance Distributed Computing*, eds. I. Foster and C. Kesselman, Morgan-Kaufman Publishers, August 1998.

- Reed, D. A., M. J. Gardner, and E. Smirni, Performance Visualization: 2-D, 3-D, and Beyond, *Proceedings of the International Computer Performance and Dependability Symposium (IPDS'96)*, Urbana, IL, September 1997 (invited paper).
- Reed, D. A., R. A. Aydt, L. DeRose, C. L. Mendes, R. L. Ribler, E. Shaffer, H. Simitci, J. S. Vetter, D. R. Wells, S. Whitmore, and Y. Zhang, Performance Analysis of Parallel Systems: Approaches and Open Problems, *Joint Symposium on Parallel Processing (JSPP)*, 239-256, Nagoya, Japan, June 1998 (invited paper and keynote presentation).
- Reed, D. A., R. C. Giles, and C. E. Catlett, Distributed Data and Immersive Collaboration, *Communications of the ACM* 40:11, 38-49, November 1997.
- Ribler, R. L., H. Simitci, and D. A. Reed, The Autopilot Performance-Directed Adaptive Control System, *Future Generation Computer Systems* special issue (Performance Data Mining), submitted.
- Saylor, P. and D. Smolarski, Why Gaussian Quadrature in the Complex Plane?, *Mathematics of Computation*, submitted.
- Saylor, P., S. Ashby, M. Holst, and T. Manteuffel, The Role of the Inner Product in Stopping Criteria for Conjugate Gradient Iterations, *BIT*, submitted.
- Saylor, P., S. Ashby, and J. Scroggs, Physically Motivated Domain Decomposition Preconditioners, *SIAM Journal on Matrix Analysis*, submitted.
- Simitci, H. and D. A. Reed, A Comparison of Logical and Physical Parallel I/O Patterns, *International Journal of Supercomputer Applications and High Performance Computing* special issue (I/O in Parallel Applications), 1998.
- Smirni, E. and D. A. Reed, Workload Characterization of Input/Output Intensive Parallel Applications, *Performance Evaluation*, 1998.
- Teng, S.-H. and C. W. Wong, Unstructured Mesh Generation 1998: Theory, Practice and Perspectives, *International Journal of Computational Geometry and Applications*, to appear in a special issue on Mesh Generation, December 1998.
- Wu, P. and D. Padua, Beyond Arrays — A Container-Centric approach For Parallelization of Real World Scientific Applications. *Proceedings of the 11th Workshop of Languages and Compilers for Parallel Computing*, University of North Carolina, August 1998.