

Part IV

Activity Data

Publications

Appeared

Refereed Journals

1. B. Balachandran and D. Gilsinn, "Nonlinear Oscillations of Milling," *Journal of Mathematical and Computer Modeling of Dynamical Systems* **11** (2005), pp. 273-290.
2. I. Beichl and F. Sullivan, "The Other Monte Carlo Method," *Computing in Science & Engineering* **8** (2) (2006), pp. 42-46.
3. H. S. Bennett, H. Hung, and A. Heckert, "Dependence of Electron Density on Fermi Energy in Compensated n-Type Gallium Antimonide," *Journal of Applied Physics* **98** (10) (November 15, 2005), 103705, 6 pages.
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5. M. W. Berry, S. A. Pulatova, and G. W. Stewart, Computing Sparse Reduced-Rank Approximations to Sparse Matrices, *ACM Transactions on Mathematical Software* **31** (2005) pp. 252-269.
6. G. K. Brennen, S. S. Bullock, and D. P. O'Leary, "Efficient Circuits for Exact-Universal Computation with Qudits," *Quantum Information and Computation* **6** (2006), pp. 436-454.
7. A. Carasso, "APEX Blind Deconvolution of Color Hubble Space Telescope Imagery and Other Astronomical Data," *Optical Engineering* **45** (2006), 107004.
8. T. S. Clement, P. D. Hale, D. F. Williams, C. M. Wang, A. M. Dienstfrey, and D. Keenan, "Calibration of Sampling Oscilloscopes with High-Speed Photodiodes," *IEEE Transactions on Microwave Theory and Techniques* **54** (8) (August 2006), pp. 3173-3181.
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11. A. Dienstfrey, P. Hale, D. Keenan, T. Clement, and D. Williams, "Minimum Phase Calibration of Sampling Oscilloscopes," *IEEE Transactions on Microwave Theory and Techniques* **54** (8) (August 2006), pp. 3197-3208.
12. S. D. Dyer, T. Dennis, L. K. Street, S. M. Etzel, T.A. Germer, and A. Dienstfrey, "Spectroscopic Phase-dispersion Optical Coherence Tomography Measurements of Scattering Phantoms," *Optics Express* **14** (2006), pp. 8138-8153.
13. S. T. Erdogan, P. N. Quiroga, D. W. Fowler, H. A. Saleh, R. A. Livingston, E. J. Garboczi, P. M. Ketcham, J. G. Hagedorn, and S. G. Satterfield, "Three-dimensional Shape Analysis of Coarse Aggregates: New Techniques for and Preliminary Results on Several Different Coarse Aggregates and Reference Rocks," *Cement and Concrete Research* **36** (9) (September 2006), pp. 1619-1627.
14. H. Fang and D. P. O'Leary, "Stable Factorizations of Symmetric Tridiagonal and Triadic Matrices," *SIAM Journal on Matrix Analysis and Applications* **28** (2006), pp. 576-595.
15. J. T. Fong, J. J. Filliben, R. deWit, R. J. Fields, B. Bernstein, and P. V. Marcal, "Uncertainty in Finite Element Modeling and Failure Analysis: A Metrology-based Approach," *ASME Journal of Pressure Vessel Technology* **128** (2006), pp. 140-147.
16. E. J. Garboczi, J. F. Douglas and R. B. Bohn, "A Hybrid Finite Element-Analytical Method for Determining the Intrinsic Elastic Moduli of Particles having Moderately Extended Shapes and a Wide Range of Elastic Properties," *Mechanics of Materials* **38** (2006), pp. 786-800.
17. D. E. Gilsinn and F. A. Potra, "Integral Operators and Delay Differential Equations," *Journal of Integral Equations and Applications* **18** (3) (2006), pp. 297-336.
18. S. Glancy and E. Knill, "Error Analysis for Encoding a Qubit in an Oscillator," *Physical Review A* **73** (2006), 012325.
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26. R. Kacker, B. Toman, and D. Huang, “Comparison of ISO GUM, Draft GUM Supplement 1, and Bayesian Statistics Using Simple Linear Calibration,” *Metrologia* **43** (2006), pp. S167-S177.
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28. A. J. Kearsley Algorithms for Optimal Signal Set Design, *Optimization Methods and Software* **21**(6), (December 2006), pp. 977-994.
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30. D. Leibfried, E. Knill, S. Seidelin, J. Britton, R. B. Blakestad, J. Chiaverini, D. B. Hume, W. M. Itano, J. D. Jost, C. Langer, R. Ozeri, R. Reichle and D. J. Wineland, “Creation of a Six-Atom Schrodinger Cat State,” *Nature* **438** (2005), pp. 639-642.
31. D. P. O’Leary, G. K. Brennen, and S. S. Bullock, “Parallelism for Quantum Computation with Qudits,” *Physical Review A* **74** (2006), 032334.
32. X. Liu and F.A. Potra, “Corrector-predictor Methods for Sufficient Linear Complementarity Problems in a Wide Neighborhood of the Central Path”, *SIAM Journal on Optimization* **17** (3) (2006), pp. 871-890.
33. M. H. Park, Y .K. Hong, B. C. Choi, M. J. Donahue, H. Han, and S. H. Gee, “Vortex Head-to-head Domain Walls and Their Formation in Onion-state Ring Elements,” *Physical Review B* **73** (2006), 094424.
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37. F. A. Potra and X. Liu, “Protein Image Alignment via Tensor Product Cubic Splines”, *Optimization Methods and Software* **22** (1) (2007), pp. 155-168.
38. F. A. Potra, “Corrector--predictor Methods for Monotone Linear Complementarity Problems in a Wide Neighborhood of the Central Path,” *Mathematical Programming*, DOI 10.1007/s10107-006-0068-2, Online Date: Friday, December 08, 2006.
39. R. Radebaugh and A. O’Gallagher, “Regenerator Operation at Very High Frequencies for Microcryocoolers,” *Advances in Cryogenic Engineering* **51** (2006), American Institute of Physics, pp. 1919-1928.
40. R. Reichle, D. Leibfried, E. Knill, J. Britton, R. B. Blakestad, J. D. Jost, C. Langer, R. Ozeri, S. Seidelin, and D. J. Wineland, Experimental Purification of Two-Atom Entanglement, *Nature* **443** (2006), pp. 838-842.
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43. J. Slutsker, K. Thornton, A. Roytburd, J. Warren, and G. McFadden, “Phase Field Modeling of Solidification Under Stress,” *Physical Review B* **74** (2006), 014103.
44. R. Somma, H. Barnum, G. Ortiz, and E. Knill, “Efficient Solvability of Hamiltonians and Limits on the Power of Some Quantum Computational Models,” *Physical Review Letters* **97** (2006), 190501/1-4.

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46. G. W. Stewart, "A Note on Generalized and Hypergeneralized Projectors," *Linear Algebra and Its Application* **412** (2006), pp. 408-411.
47. X. Tang, L. Ma, A. Mink, A. Nakassis, H. Xu, B. Hershman, J. C. Bienfang, D. Su, R.F. Boisvert, C.W. Clark and C.J. Williams, "Polarization Coding Quantum Key Distribution Generating Sifted-Key at Over 2 Mbit/s," *Optics Express* **14** (March 20, 2006), pp. 2062-2070.
48. D. Williams, A. Lewandowski, T. Clement, C. Wang, P. Hale, J. Morgan, D. Keenan, and A. Dienstfrey, "Covariance-Based Uncertainty Analysis of the NIST Electro-optic Sampling System," *IEEE Transactions in Microwave Theory and Techniques* **54** (1) (2006), pp. 481-491.
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50. E. Zotenko, D. P. O'Leary, and T. M. Przytycka, "Secondary Structure Spatial Conformation Footprint: A Novel Method for Fast Protein Structure Comparison," *BMC Structural Biology* **6** (12) (2006), 12 pages. doi: 10.1186/1472-6807-6-12.

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2. A. Kalsi and D. P. O'Leary, "Algorithms for Structured Least Squares Problems and Total Least Squares Problems," *Journal of Research of the NIST* **111** (2) (2006), pp. 113-119.
3. A. J. Kearsley, Projections onto Ordered Simplexes and Isotonic Regression, *Journal of Research of the NIST* **111**(2), (March-April 2006) pp. 121-125.
4. J. Lawrence, "Three Rings of Polyhedral Simple Functions," *Journal of Research of the NIST* **111**(2), (March-April 2006) pp. 127-134.
5. W. Stone and C. Witzgall, "Evaluation of Aerodynamic Drag and Torque for External Tanks in Low Earth Orbit," *Journal of Research of the NIST* **111**(2), (March-April 2006) pp. 143-159.
6. C. Witzgall, D. E. Gilsinn, M. A. McClain, "An Examination of New Paradigms for Spline Ap-

proximation," *Journal of Research of the NIST* **111** (2) (March/April, 2006), pp. 57-77.

Other Invited Publications

1. Y. Cai and J. D. Terrill, "Visual Analysis of Human Dynamics: Introduction to the Special Issue," *Information Visualization* **5** (2006), pp. 235-236.
2. P. C. Hansen, J. G. Nagy, and D. P. O'Leary, *Deblurring Images: Matrices, Spectra, and Filtering*, SIAM Press, Philadelphia, 2006.
3. J. Hagedorn, J. Dunkers, A. Peskin, J. Kelso, and J. Devaney Terrill, "Quantitative, Interactive Measurement of Tissue Engineering Scaffold Structure in an Immersive Visualization Environment", *Biomaterials Forum* **28** (4) (2006), pp. 6-9.
4. D. P. O'Leary, "Fast Solvers and Sylvester Equations: Both Sides Now," *Computing in Science & Engineering*, Solution: **8** (1) (January/February 2006), pp. 81-83.
5. D. P. O'Leary, "Computational Software: Writing Your Legacy," *Computing in Science & Engineering*, Project: **7** (6) (January/ February 2006), pp. 78-80, Solution: **8** (1) (March/April 2006), pp. 70-71.
6. D. P. O'Leary, "Updating and DOWndating Matrix Factorizations: A Change in Plans," *Computing in Science & Engineering*, Project: **8** (2) (March/April 2006), pp. 66-70, Solution: **8** (3) (May/June 2006), pp. 90-91.
7. D. P. O'Leary, "Computer Memory and Arithmetic: A Look under the Hood," *Computing in Science & Engineering*, Project: **8** (3) (May/June 2006), pp. 86-89, Solution: **8** (4), (July/August 2006).
8. D. P. O'Leary, "Iterative Methods for Linear Systems: Following the Meandering Way," *Computing in Science & Engineering*, Project: **8** (4) (July/August 2006), pp. 74-78, Solution: **8** (5) (September/October 2006), pp. 91-93.
9. D. P. O'Leary, "Multigrid Methods: Managing Massive Meshes," *Computing in Science & Engineering*, Project: **8** (5) (September/October 2006), pp. 86-90, Solution: **8** (6) (November/December 2006), pp. 89-91.
10. D. P. O'Leary, "Sensitivity Analysis: When a Little Means a Lot," *Computing in Science & Engineering*, Project: **8** (6) (November/December 2006), pp. 86-89.
11. B. Rust and D. Donnelly, "The Fast Fourier Transform for Experimentalists, Part III: Classical Spec-

- tral Analysis,” *Computing in Science & Engineering* **7** (5) (Sep./Oct. 2005), pp.74-78.
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 13. J. Slutsker, A. Roytburd, G. McFadden, and J. Warren, “Phase Field Modeling of Solidification and Melting of a Confined Nano-particle,” *Nanomechanics of Materials and Structures*, eds. T.-J. Chuang, P.M. Anderson, M.-K. Wu, and S. Hsieh, Springer, The Netherlands, (2006), pp. 33-43.
- ### Conference Proceedings
1. J. M. Conroy, J. D. Schlesinger, D. P. O’Leary, and J. Goldstein, “Back to Basics: CLASSY 2006,” in *DUC 06 Conference Proceedings*, 2006, <http://duc.nist.gov/>.
 2. J. M. Conroy, D. P. O’Leary, and J. D. Schlesinger, “CLASSY Arabic and English Multi-Document Summarization,” in *Multi-Lingual Summarization Evaluation 2006*, [http://www.isi.edu/\\$sim\\$cy1/MTSE2006/MSE2006/papers/index.html](http://www.isi.edu/simcy1/MTSE2006/MSE2006/papers/index.html), 2006.
 3. J. M. Conroy, J. D. Schlesinger and D .P. O’Leary, “Topic-Focused Multi-Document Summarization Using an Approximate Oracle Score,” in *Proceedings of ACL’06 / COLING ’06*, 2006.
 4. J. Dunkers, J. Hagedorn, A. Peskin, J. Kelso, J. Terrill, and L. Henderson, “Interactive, Quantitative Analysis Of Scaffold Structure Using Immersive Visualization,” in *Proceedings of the 2006 Summer Bioengineering Conference*, Amelia Island Plantation, Amelia Island, FL, June 21- 25, 2006.
 5. J. T. Fong, J. J. Filliben, R. deWit, and B. Bernstein, “Stochastic Finite Element Method and Design of Experiments for Pressure Vessels & Piping Decision Making,” in *Proceedings of the ASME Pressure Vessels & Piping Conference*, July 23-27, 2006, Vancouver, Canada, Paper No. 93927. New York, NY: ASME (2006), pp. 1-23.
 6. J. T. Fong, B. Bernstein, and L. J. Zapas, “Construction of a Helmholtz Free Energy Function for an Isotropic Elastic-Viscoplastic Material (extended abstract),” in *Proceedings of the Symposium in Memory of Ronald S. Rivlin*, 43rd Annual Meeting of the Society of Engineering Science, Penn State University, University Park, PA, Aug. 13-16, 2006, p. 150.
 7. J. H. Jung and D. P. O’Leary, “Cholesky Decomposition and Linear Programming on a GPU,” Workshop on Edge Computing Using New Commodity Architectures (EDGE), Chapel Hill, NC, (May 2006).
 8. A. Mink, X. Tang, L. Ma, T. Nakassis, B. Hershman, J. C. Bienfang, D. Su, R. F. Boisvert, C. W. Clark, and C. J. Williams, “High Speed Quantum Key Distribution System Supports One-Time Pad Encryption of Real-Time Video,” in *Proceedings of SPIE* **6244**, page 62440M-1-62440M-7 (April 2006).
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 10. X. Tang, L. Ma, A. Mink, T. Nakassis, H. Xu, B. Hershman, J.C. Bienfang, D. Su, R. F. Boisvert, C. W. Clark, and C. J. Williams, “Quantum Key Distribution System Operating at Sifted-key Rate Over 4 Mbit/s,” in *Proceedings of SPIE* **6244**, page 62440P-1-62440P-8 (April 2006).
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 12. C. Witzgall, G. Choek and A. Kearsley, Recovering Circles and Spheres from Point Data, in *Perspectives in Operations Research: Papers in Honor of Saul Gass’ 80th Birthday* (Frank B. Alt, Michael C. Fu, and Bruce L. Golden, eds.), Springer, (Operations Research/Computer Science Interfaces Series), 2006.
 13. A. Youssef, “Roles of Math Search in Mathematics”, in *Mathematical Knowledge Management*, Proceedings of the 5th International Conference on Mathematical Knowledge Management, Lecture Notes in Computer Science **4108**, Springer-Verlag, 2006.
 14. D.M. Zajic, B. Dorr, J. Lin, D .P. O’Leary, J.M. Conroy, and Judith D. Schlesinger, “Sentence Trimming and Selection: Mixing and Matching,” in *DUC 06 Conference Proceedings*, 2006, <http://duc.nist.gov/>.

Technical Reports

1. D. M. Dunlavy, D. P. O'Leary, J. M. Conroy, and J. D. Schlesinger, "QCS: A System for Querying, Clustering, and Summarizing Documents," *SANDIA Technical Report*, July 2006.
2. H. Fang and D. P. O'Leary, "Modified Cholesky Algorithms: A Catalog with New Approaches," *Computer Science Department Report*, CS-TR-4807 (42 pages), University of Maryland, August 2006.
3. A. Fein, W. Mitchell, and J. Sims, "The Physics Laboratory Guide to the Central Scientific Computing Linux Cluster, The Raritan Cluster," April 3, 2006, online at <http://www-i.nist.gov/cio/esd/services/sc/pcluser/doc/guide4.3.06.pdf>
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5. W. F. Mitchell, "PHAML User's Guide," NISTIR 7374, 2006.
6. D. E. Gilsinn, F. A. Potra, "Integral Operators and Delay Differential Equations," *Journal of Integral Equations and Applications*.
7. D. E. Gilsinn, "Computable Error Bounds for Approximate Periodic Solutions of Autonomous Delay Differential Equations," *Nonlinear Dynamics*.
8. J. Hagedorn, S. Satterfield, J. Kelso, W. Austin, J. Terrill, and A. Peskin, "Correction of Location and Orientation Errors in Electromagnetic Motion Tracking," *Presence*.
9. Z. Levine, A. Kearsley, and J. Hagedorn, "Bayesian Tomography for Projections with an Arbitrary Transmission Function with an Application to Electron Tomography," *Journal of Research of NIST*.
10. L. Melara, A. Kearsley, and R. Tapia, "Augmented Lagrangian Homotopy Method for the Regularization of Total Variation Denoising Problems," *Journal of Optimization Theory and Applications*.

Accepted

1. D. M. Anderson, P. Cermelli, E. Fried, M. E. Gurtin, and G. B. McFadden, "General dynamical sharp-interface conditions for phase transformations in viscous heat-conducting fluids," *Journal of Fluid Mechanics*.
2. D. Cotrell and A. Kearsley, Flow Control Through the Use of Topography, *Journal of Research of NIST*.
3. J. T. Fong, J. J. Filliben, and R. J. Fields, "Uncertainty Quantification of Material Properties of Two Types of Steels at Elevated Temperatures for Stochastic Modeling of Structures on Fire," *Proceedings of a Three Metals Society (TMS) Symposium on Innovations in Measurement Science to Assess the Performance of New Materials in the Real-World*, Feb. 25-Mar. 1, 2007, Orlando, FL.
4. J. T. Fong, J. J. Filliben, W. F. Ranson, and P. V. Marcal, "A Real-Time Non-Contact and Direct-Measurement-based Fatigue Life Prediction Methodology with Uncertainty & Risk Analyses," *Proceedings of the National Nuclear Security Administration (NNSA) Future Technologies Conference II, Track Four (Future Trends in Analysis and Characterization)*, Oct. 11-12, 2006, Washington, DC.
5. J. T. Fong, J. J. Filliben, R. J. and R. J. Fields, "An Uncertainty & Risk-based Approach toward a Cost-Effective High-Temperature Material Property Database," *Proceedings of the National Nuclear Security Administration (NNSA) Future Technologies Conference II, Track Three (Materials Technology Trends for Defense & National Security)*, Oct. 11-12, 2006, Washington, DC.
11. J. Miltat and M. Donahue, "Numerical Micromagnetics: Finite Difference Methods," in *Handbook of Magnetism and Advanced Magnetic Materials*, Wiley.
12. W. F. Mitchell, "A Refinement-tree Based Partitioning Method for Dynamic Load Balancing with Adaptively Refined Grids," *Journal of Parallel and Distributed Computing*.
13. R. Radebaugh, A. O'Gallagher, M.A. Lewis, and P.E. Bradley, "Proposed Rapid Cool Down Technique for Pulse Tube Cryocoolers," *Cryocoolers*.
14. B. Rust, "Carbon Dioxide, Global Warming, and Michael Crichton's 'State of Fear'," *Computing Science and Statistics* **37**.

Submitted

1. I. Beichl, S. Bullock, and D. Song, "A Quantum Algorithm Detecting Concentrated Maps," *Journal of Research of the NIST*.
2. D. L. Cotrell, G. B. McFadden, W. E. Alley, and B. J. Alder, "Effect of an Axially-periodic Radius of the Linear Stability of Pipe Flow," *Journal of Fluid Mechanics*.
3. T. Dennis, S. D. Dyer, and A. Dienstfrey, "Phase-Dispersion Light-Scattering for Quantitative Size-Imaging of Spherical Scatterers," *Optics Express*.

4. R. Dersimonian and R. Kacker, "Quantification of Uncertainty in Meta-analysis," *Controlled Clinical Trials*.
5. M. J. Donahue and R. D. McMichael, "Micromagnetics on curved geometries using rectangular cells: error correction and analysis," *IEEE Transactions on Magnetics*.
6. D. E. Gilsinn, "On Algorithms for Estimating Computable Error Bounds for Approximate Periodic Solutions of an Autonomous Delay Differential Equation," *Communications in Nonlinear Science and Numerical Simulation*.
7. D. E. Gilsinn, M. A. McClain, C. Witzgall, "Non-Oscillatory Splines on Irregular Data," *Proceedings of SIAM Conference on Geometric Design & Computing*, October 30 – November 3, 2005, Phoenix, AZ.
8. D. E. Gilsinn, G. S. Cheok, C. Witzgall, A. M. Lytle, "Construction Object Identification from LADAR Scans: An Experimental Study Using I-Beams," *Automation in Construction*.
9. D. E. Gilsinn, "Approximating Periodic Solutions of Autonomous Delay Differential Equations," *NISTIR*.
10. J. Hagedorn, J. Dunkers, S. Satterfield, A. Peskin, J. Kelso, and J. Terrill, "Measurement Tools for the Immersive Visualization Environment: Steps Toward the Virtual Laboratory," *Virtual Reality*.
11. F. Y. Hunt, A. K. Gaigalas, and L. Wang, "Mathematical Foundation of the Frequency Domain Technique for Measuring Photodegradation," *Journal of Physical Chemistry A*.
12. R. N. Kacker, and J. F. Lawrence, "Trapezoidal and Triangular Distributions for Type B Evaluations of Standard Uncertainty," *Metrologia*.
13. E. Knill, "On Protected Realizations of Quantum Information," *Physical Review A*.
14. E. Knill, G. Ortiz, R. Somma, "Optimal Quantum Measurements of Expectation Values of Observables," *Physical Review A*.
15. Y. Lei, R. Carver, R. Kacker, and D. Kung, A Combinatorial Testing Strategy for Concurrent Programs, *Software Testing, Verification, and Reliability*.
16. Y. Lei, R. Kacker, R. Kuhn, V. Okum, and J. Lawrence, IPOG: A General Strategy for t-way Software Testing, *IEEE Conference on Engineering of Computer-Based Systems*.
17. Y. Lei, R. Carver, R. Kacker, and D. Kung, "Combinatorial testing for concurrent programs," *Software Testing, Verification, and Reliability*.
18. Z. H. Levine, A. Volkovitsky, and H. K. Hung, "Alignment of Fiducial Marks in a Tomographic Tilt Series with an Unknown Rotation Axis", *Computer Physics Communications*.
19. N. Mastronardi and D. P. O'Leary, "Robust Regression and Approximations for Toeplitz Problems," *Computational Statistics and Data Analysis*.
20. P. Naidon, E. Tiesinga, W. F. Mitchell and P. S. Julienne, "Effective-range Description of a Bose Gas under Strong Confinement," *New Journal of Physics*.
21. D. P. O'Leary, Z. Strakovs, P. Tichy, "On Sensitivity of Gauss-Christoffel Quadrature," *Numerische Mathematik*.
22. R. Somma, G. Ortiz, H. Barnum and E. Knill, "Efficient Solvability of Hamiltonians and Limits on the Power of Some Quantum Computational Models," *Physical Review Letters*.
23. B.J. Thijsse and B.W. Rust, "Freestyle Data Fitting and Global Temperatures," *Computing in Science & Engineering*.
24. W. E. Wallace, C. M. Guttman, K. M. Flynn, and A. J. Kearsley Numerical Optimization of Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry: Application to Synthetic Polymer Molecular Mass Distribution Measurement, *Analytical Chemistry*.

Presentations

Invited Talks

1. I. Beichl, "Graphs and Matchings," National Security Agency, Fort Meade, MD, Sept., 19, 2006.
2. T. Burns, "Steel Flow Stress Sensitivity to Temperature and Heating Rate: Recent Results from the NIST Pulse Heated Kolsky Bar," International Symposium on Plasticity, Halifax, Nova Scotia, Canada, July 17-22, 2006.
3. A. Carasso, "APEX Blind Deconvolution of Hubble Telescope Imagery and the Use of Levy Stable Laws," University of Minnesota School of Statistics Colloquium, October 20, 2005.
4. A. Carasso, "APEX Blind Deconvolution of Hubble Space Telescope Imagery and Other Astronomical Data," Second International Conference on Scientific Computing and Partial Differential

- Equations and First East Asia SIAM Symposium, Hong Kong, China, December 12-16, 2005.
5. A. Carasso, "Blind Deconvolution of Hubble Space Telescope Imagery," SIAM 2006 Image Science Meeting, Minisymposium on Variational and PDE Methods in Image Decomposition, Minneapolis, MN, May 17, 2006.
 6. M. J. Donahue, "Micromagnetics on Curved Geometries Using Rectangular Cells: Error Correction and Analysis," Micromagnetics: Experiments, Modeling, and Mathematical Theory Workshop, Bonn, Germany, Sept. 5, 2006.
 7. J. Fong, "NAS/NRC Postdoctoral Research Opportunities in Engineering and Mathematical Sciences at National Institute of Standards and Technology," Drexel University, Philadelphia, PA, Oct. 21, 2005.
 8. J. Fong, "Stochastic Modeling of Complex Structural System Failures and a Metrology-based Approach to V&V of Computer Simulations," Drexel University, Philadelphia, PA, Oct. 21 2005.
 9. J. T. Fong, "Scientific and Engineering Software (S&ES) Verification for Metrology and High-Consequence Engineering Applications," Computational & Statistical Science Seminar, Savannah River National Laboratory, Aiken, SC, April 27, 2006.
 10. J. Fong, "A Real-Time Non-Contact Direct-Measurement-based Reserve Capacity Modeling of an Earthquake Monitoring System," University of British Columbia, Vancouver, B.C., Canada, July 21, 2006.
 11. J. Fong, "A Reference-Benchmark Approach to Verification and Validation of High-Consequence Engineering System Simulations," University of British Columbia, Vancouver, B.C., Canada, July 28, 2006.
 12. J. Fong, "Scientific and Engineering Software Verification for Metrology and High-Consequence Engineering Applications," Louisiana State University, Baton Rouge, LA., Sept. 29, 2006.
 13. J. Fong, "Stochastic Finite Element Method and Design of Experiments for Pressure Vessels & Piping Decision Making," ASME Pressure Vessels & Piping Conference, Vancouver, B.C., Canada, July 26, 2006.
 14. J. Fong, "Construction of a Helmholtz Free Energy Function for an Isotropic Elastic-Viscoplastic Material," 2006 Meeting of the Society of Engineering Science, Penn State University, State College, PA, Aug. 14, 2006.
 15. F. Hunt, "Visualizing the Frequency Patterns of DNA," New York University Faculty Resource Network Summer Program, New York, NY, June 16, 2006.
 16. S. Glancy, "Error Analysis For Encoding A Qubit In An Oscillator," Linear Optical Quantum Information Processing Workshop, Baton Rouge, Louisiana, April 9 - 12, 2006.
 17. E. Knill, "Quantum Computing With Very Noisy Gates," Workshop on Trapped Ion Quantum Computing, NIST Boulder, February 21-24, 2006.
 18. E. Knill, "Fault-tolerant Architecture for Very Noisy Gates," University of Calgary, June 7, 2006.
 19. D. W. Lozier, "The DLMF Project: Lessons Learned and Future Directions," AMS Eastern Section Meeting, Bard College, Annandale-on-Hudson, NY, October 8, 2005.
 20. D. W. Lozier, "Math on the Web and the Digital Library of Mathematical Functions Project," SIAM Washington-Baltimore Section Meeting, Johns Hopkins University, Baltimore, MD, November 9, 2005.
 21. D. W. Lozier, "The Role of Computer Algebra in the DLMF Project," East Coast Computer Algebra Day, Drexel University, Philadelphia, PA, May 6, 2006.
 22. G. McFadden, "Steady States and Oscillations in the p53/Mdm2 Network," NIH Laboratory of Molecular Pharmacology in the National Cancer Institute, Modeling Journal Club, October 18, 2005.
 23. B. Miller, DLMF, "LaTeXML and Some Lessons Learned", Hot Topic Workshop on The Evolution of Mathematical Communication in the Age of Digital Libraries, Institute for Mathematics and Its Applications, University of Minnesota, Minneapolis, December 8-9, 2006.
 24. D. P. O'Leary, "Matrix Factorizations for Information Retrieval," Stanford/Yahoo! Workshop on Modern Massive Datasets, Stanford, CA, June 2006.
 25. D. Porter, Tcl Core Team Town Meeting, panel member, Portland, OR, October 26, 2005.
 26. B. Saunders, "Dynamic 3D Visualizations for the NIST Digital Library of Mathematical Functions," Twenty-first Willie Bee Rajanna Lecture, Department of Mathematics, Morgan State University, April 20, 2006.
 27. A. Youssef, "Relevance Ranking and Hit packaging in Math Search," Hot Topic Workshop on The Evolution of Mathematical Communication in the Age of Digital Libraries, Institute for Mathematics

and Its Applications, University of Minnesota, Minneapolis, December 8-9, 2006.

28. A. Youssef, "Roles of Math Search in Mathematics", 5th International Conference on Mathematical Knowledge Management, Wokingham, UK, August 11-12, 2006.

Conference Presentations

1. D. M. Anderson, "Sharp-interface conditions for fluid-fluid systems undergoing phase transformation," American Physical Society, Division of Fluid Dynamics Annual Meeting, Tampa, FL, November 19-21, 2006.
2. H. Bennett, A. Dienstfrey, L. Hudson, T. Oreskovic, T. Fuerst, and J. Sheppard, "Bone Mineral Density as a Biomarker for Assessing Bone Health: Bone Imaging," U.S.M.S. Workshop: Imaging as a Biomarker, NIST, Gaithersburg, Sept. 14-15, 2006.
3. T. Burns, "Effect of Rapid Heating on the Flow Stress in a Carbon Steel of Interest in Manufacturing," 6th European Solid Mechanics Conference, Budapest, Hungary, August 28 - September 1, 2006.
4. M. J. Donahue and D. G. Porter, "Magnetization Normalization Methods for Landau-Lifshitz-Gilbert," MMM 2005, San Jose, California, Nov. 1, 2005.
5. J. Dunkers, J. Hagedorn, A. Peskin, J. Kelso, J. Terrill, and L. Henderson, "Interactive, Quantitative Analysis of Scaffold Structure Using Immersive Visualization," poster presentation at 2006 Summer Bioengineering Conference, Amelia Island Plantation, Amelia Island, FL, June 21 - 25, 2006
6. W. George, J. Lancien, J. Terrill, "MPMD Program Model for Scientific Computing," Scatter/Gather Session II, Supercomputing 2005, Seattle, WA, Nov. 12-18, 2005.
7. D. E. Gilsinn, M. A. McClain, and C. Witzgall, "Non-Oscillatory Splines on Irregular Data," SIAM Conference on Geometric Design and Computing, Phoenix, AZ, October 30-November 3, 2005.
8. S. Glancy, H. Vasconcelos, and E. Knill, "Production of Optical Coherent State Superpositions Using the Kerr Effect," Southwest Quantum Information and Technology, Albuquerque, NM, Feb. 16-19, 2006.
9. J. Hagedorn, J. Terrill, J. Kelso, and J. Dunkers, "Measurement of Tissue Engineering Scaffold Material," (video) DIVERSE Birds of a Feather session at the SIGGRAPH 2006 Conference, Boston, MA, August 2, 2006.
10. R. Kacker, "Uncertainty Associated with Virtual Measurements from Computational Quantum Chemistry Models," National Conference of Standards Laboratories International (NCSLI) (www.ncsli.org), Nashville, TN, August 7-10, 2006.
11. A. Kearsley, "Recovery of Spheres from LADAR Data," IEEE Applied Imagery Pattern Recognition Workshop, Washington DC October 10, 2006
12. J. Kelso, "DIVERSE," DIVERSE Birds of a Feather (BOF) session; IEEE Visualization 2005 Conference, Seattle, WA, Nov. 12-18, 2005.
13. J. Lancien, W. George, and N. Martyrs, "Quaternion Dissipative Particle Dynamics," VCCTL Annual Meeting, NIST, Gaithersburg, MD, Nov. 29, 2005.
14. W. F. Mitchell, "The Addition of hp-Adaptivity to a Parallel Adaptive Finite Element Program," Twelfth SIAM Conference on Parallel Processing for Scientific Computing, San Francisco, CA, February 23, 2006.
15. W. F. Mitchell, "PHAML: A Parallel hp-Adaptive Multigrid Program for 2D Elliptic Problems," Fifth International Conference on Scientific Computing and Applications, Banff, Alberta, Canada, May 18-21, 2006.
16. S. Satterfield, "Shell Script VR," DIVERSE Birds of a Feather (BOF) session; IEEE Visualization 2005 Conference, Seattle, WA, Nov. 12-18, 2005.
17. B. Saunders, "From B-Spline Mesh Generation to Effective Visualizations for the NIST Digital Library of Mathematical Functions" Sixth International Conference on Curves and Surfaces, Avignon, France, June 29 - July 5, 2006.
18. J. Sims, G. Bryant, and H. Hung, "Excitons in Negative Band Gap Nanocrystals," American Physics Society March Meeting, Baltimore, MD, March 14, 2006.
19. W. E. Wallace, C. M. Guttman, K. M. Flynn, and A. J. Kearsley, "Development of NIST SRM 2881, an Absolute Molecular Mass Distribution Polymer Standard," American Society for Mass Spectrometry Annual Meeting, Seattle, WA, May 28, 2006.

Software Released

1. J. Lancien, W. George, and N. Martys, Parallel QDPD code, Virtual Cement and Concrete Testing Laboratory.
2. S. Langer, OOF2, Version 2.0 beta 8, Version 2.0.0, Version 2.0.1, <http://www.ctcms.nist.gov/oof/oof2>
3. B. Miller, LaTeXML, Versions 0.4.1, 0.5.0, 0.5.1. <http://dlmf.nist.gov/LaTeXML/>
4. W. F. Mitchell, PHAML, Version 0.9.22, Version 0.9.23, Version 0.9.24, Version 0.9.25. <http://math.nist.gov/tphaml>
5. W. F. Mitchell, f90gl, Version 1.2.11, Version 1.2.12. <http://math.nist.gov/xf90gl>
6. W. F. Mitchell (co-developer), Zoltan, Version 2.0, Version 2.1. <http://www.cs.sandia.gov/Zoltan/>
7. D. Porter (release manager), Tcl/Tk, Version 8.4.12, Version 8.4.13, Version 8.5a4. <http://www.tcl.tk/>
8. R. Pozo, Sparse Basic Linear Algebra Subprograms (Sparse BLAS), ANSI C++ reference implementation. <http://math.nist.gov/spblas/>
9. R. Pozo, Template Numerical Toolkit (TNT), Version 3.0, Version 3.0.1, Version 3.0.2, Version 3.0.3. <http://math.nist.gov/tnt>
10. R. Pozo, SciMark 2, Version 1.c (C version). <http://math.nist.gov/scimark/>
11. S. Satterfield, SAVG Visualization demos, <http://math.nist.gov/mcsd/savg/demos/index.html>
4. D. Tolani (Intelligent Automation, Inc.), "Symbolic Time Series Analysis (STSA) for Anomaly Detection," December 6, 2005.
5. J. Boyar (University of Southern Denmark), "Scheduling Jobs on Grid Processors," Jan. 10, 2006.
6. S. Hagstrom (Indiana University), "Hylleraas-CI Calculations on the Beryllium Atom: A Progress Report," Jan. 24, 2006.
7. C. Shakarji (MEL), "A Look at Mathematical and Computational Issues in Manufacturing Inspection Using Coordinate Measuring Machines," Jan. 31, 2006.
8. S. Dey (Naval Research Laboratory), "Recent Advances in Finite Element Methods for Structural Acoustics," Mar. 28, 2006.
9. A. Varshney (University of Maryland), "Visual Computing: At the Crossroads of Realism, Modeling, and Perception," Apr. 12, 2006.
10. C. Witzgall (ITL), G. Cheok (BFRL), A. Kearsley (ITL), "Recovery of Spheres from LADAR Data," May 23, 2006.
11. J. Teresco (Williams College), "Parallel Adaptive Scientific Computation in Heterogeneous, Hierarchical, and Non-Dedicated Computing Environments," June 15, 2006.
12. B. Sneiderman (University of Maryland), "The Thrill of Discovery: Information Visualization for High Dimensional Spaces," Oct. 3, 2006.
13. M. Mascagni (Florida State University), "Using Simple Stochastic Differential Equations to Solve Complicated Partial Differential Equations," Oct. 18, 2006.
14. S. Bullock (IDA Center for Computing Sciences), "Projecting onto Qubit Irreps of Young Diagrams," Nov. 21, 2006.
15. B. Alpert (MCS D), "Sparse Representations and High Dimensional Geometry: What's the Excitement?" Dec. 5, 2006.

Conferences, Minisymposia, Lecture Series, Shortcourses

MCS D Seminar Series

1. G.W. Stewart (MCS D), "Sparse Low-Rank Approximations to Sparse Matrices," October 12, 2005.
2. J. Benedetto (University of Maryland), "Sigma-Delta Quantization and Finite Frames," November 2, 2005.
3. B. Layton (Drexel University), "Nanometrology and Micrometrology in Biological Systems," November 29, 2005.

Local Events Organized

1. S. Langer, Organizer, OOF2 Workshop, August 2006.
2. A. Peskin, Member, Planning Board, Metrology for the Magnetic Data Storage Industry, USMS Workshop, October 20-21, 2005.
3. J. Terrill, Member, Planning Board, Developing New Standards for Antibody Measurement: Bring-

ing Metrology to Serology, USMS Workshop, February 21-22, 2006.

External Events Organization

1. R. Boisvert, Organizing Committee, IFIP Working Conference on Grid-based Problem Solving Environments: Implications for Development and Deployment of Numerical Software, Prescott, Arizona, July 17-21, 2006.
2. R. Boisvert, Co-organizer, Minisymposium on "Recent Advances in Software Tools for Scientific Computing", International Congress on Industrial and Applied Mathematics (ICIAM), Zurich, July 2007.
3. J. Fong, Co-developer, Panel Session, ASME Pressure Vessels and Piping Division Conference, July 23-27, 2006, Vancouver, Canada.
4. D. W. Lozier, Co-organizer, Minisymposium on "Computation and Application of Special Functions in Scientific Computing," SIAM Annual Meeting, Boston, MA, July 10-14, 2006.
5. D.W. Lozier, Program Committee, Fifth International Conference on Mathematical Knowledge Management, Reading, UK, August 10-12, 2006.
6. D. W. Lozier, Co-organizer, Minisymposium on "Mathematical Knowledge Management", International Congress on Industrial and Applied Mathematics (ICIAM), Zurich, July 2007.
7. W. Mitchell, Scientific Committee, International Conference of Numerical Analysis and Applied Mathematics, Crete, Greece, September 2006.
8. W. Mitchell, Program Committee, International Conference on High Performance Computing, Networking and Communication Systems, Orlando, FL, July 2007.
9. F. Potra, Co-organizer, Minisymposium on "Interior Point Methods for Linear Programming", International Congress on Industrial and Applied Mathematics (ICIAM), Zurich, July 2007.
10. S. Satterfield and J. Kelso, Co-organizers, Birds of a Feather Session on "DIVERSE", IEEE Visualization 2005 Conference, Minneapolis, MN, Oct. 23-28, 2005.
11. S. Satterfield and J. Kelso, Organizers, Birds of a Feather Session on "DIVERSE", SIGGRAPH 2006 Conference, Boston, MA, Aug. 2, 2006.

Other Professional Activities

Internal

1. R. Boisvert and Abbie O'Gallagher, ITL Diversity Committee.
2. R. Boisvert, ITL representative, NIST Nanotechnology Strategic Working Group.
3. R. Boisvert, ITL representative, NIST Scientific Computing Steering Group.
4. D. Porter, MCSD representative, ITL Awards Committee.
5. Staff members regularly review manuscripts for the Washington Editorial Review Board (WERB) and the Boulder Editorial Review Board (BERB), as well as proposals for the NIST ATP and SBIR programs.

External

Editorial

1. B. Alpert, Associate Editor, *SIAM Journal on Scientific Computing*.
2. I. Beichl, Column Editor, *Computing in Science & Engineering*.
3. R. Boisvert, Associate Editor, *ACM Transactions on Mathematical Software*.
4. R. Boisvert, Area Editor (Numerical Analysis, Mathematical Software, and Computational Engineering, Finance, and Science), Computing Research Repository (CoRR), www.arXiv.org.
5. D. Gilsinn, special issue editor, *Journal of Research of the NIST*, Vol. 111, no. 2, March-April, 2006.
6. D. Gilsinn, Associate Editor, *ASME Journal of Computational and Nonlinear Dynamics*.
7. R. N. Kacker, Member, Editorial Board, *Journal of Applied Statistics*.
8. R. N. Kacker, Member, Editorial Board, *Total Quality Management and Business Excellence*.
9. D. Lozier, Associate Editor, *Mathematics of Computation*.
10. G. McFadden, Associate Editor, *Journal of Crystal Growth*.
11. G. McFadden, Associate Editor, *Interfaces and Free Boundaries*.
12. G. McFadden, Associate Editor, *SIAM Journal on Applied Mathematics*.

13. W. Mitchell, Associate Editor, *Applied Numerical Analysis and Computational Mathematics*.
14. W. Mitchell, Associate Editor, *Journal of Numerical Analysis, Industrial and Applied Mathematics*
15. W. Mitchell, Associate Editor, *International Journal of Applied Mathematics and Computational Science*.
16. R. Pozo, Associate Editor, *ACM Transactions on Mathematical Software*.
17. J. Terrill, Special Issue Co-Editor (with Yang Cai of Carnegie Mellon University), *Journal of Information Visualization* (on Visual Analysis of Human Dynamics).

Boards and Committees

1. R. Boisvert, Co-chair, Publication Board, Association for Computing Machinery (ACM).
2. R. Boisvert, Ex-Officio Member, ACM Council.
3. R. Boisvert, Member, ACM Awards Committee.
4. R. Boisvert, Chair, International Federation for Information Processing's Working Group 2.5 (Numerical Software).
5. R. Boisvert, Member, External Review Panel, Institute for Defense Analysis' Center for Computing Sciences.
6. F. Hunt, Member, Executive Committee, Association for Women in Mathematics.
7. F. Hunt, Organizer, Joint Association for Women in Mathematics and European Women in Mathematics Olga Taussky Todd Prize Committee.
8. D. Lozier, Vice Chair, SIAM Activity Group on Orthogonal Polynomials and Special Functions.
9. B. Miller, Member, Math Working Group, W3C (the World Wide Web Consortium).
10. D. Porter, Member, Tcl Core Team.
11. J. Terrill, OpenFPGA Working Group.
12. J. Terrill, Federal High End Computing Implementation Task Force.
13. J. Terrill, Federal High End Computing Research and Development, and Infrastructure Interagency Working Groups, Networking and Information Technology Research and Development Program.

Reviewing

1. Division staff members referee manuscripts for a wide variety of journals including *ACM Transactions on Mathematical Software*, *Applied Mathe-*

matics Letters, *ASME Journal of Computational and Nonlinear Dynamics*, *ASME Journal of Manufacturing Science and Engineering*, *Computing in Science and Engineering*, *IEEE Society for Signal Processing*, *IEEE Transactions on Magnetics*, *IEEE Transactions on Microwave Theory and Techniques*, *International Journal of Plasticity*, *International Journal of Information Visualization*, *International Journal of Plasticity*, *Journal of Computational and Nonlinear Dynamics*, *Journal for Computer-Aided Engineering and Software*, *Journal of Information Visualization*, *Journal of Magnetism and Magnetic Materials*, *Journal of Mass Spectroscopy*, *Journal of Mathematical Analysis and Applications*, *Journal of the Mechanics and Physics of Solids*, *Journal of Physics D: Applied Physics*, *Journal of Vibration and Control*, *Nonlinear Dynamics*, *Physical Review A*, *Physical Review B*, *Physical Review Letters*, *Physics Letters A*, *SIAM Journal on Optimization*, *SIAM Journal of Scientific Computing*, *Software - Practice and Experience*, *The International Journal for Human Computer Studies*.

2. Staff members review proposals for the following research programs: Department of Energy, Department of Homeland Security, Engineering and Physical Sciences Research Council (EPSRC), and the NSF.

External Contacts

MCS D staff members make contact with a wide variety of organizations in the course of their work. Examples of these follow.

Industrial Labs

3M
 3Motion Project (UK)
 American Concrete Assoc.
 American Hydro Corp.
 Apple Computer
 Bank of America
 Borg Warner Transmission Systems
 Chesapeake Cryogenics
 Cisco Systems
 DrecWay
 Dupont
 Electro Science Technologies
 Elligno Inc.
 Fakespace
 Ford Research Labs
 GE Corporate R&D
 GeoCap
 IBM Research

Industrial Light and Magic
 Intelligent Automation, Inc.
 Invensys
 JAMSTEC
 JP Engineering
 KTH Solid Mechanics
 Landacorp
 Mac.com
 Medical Media Lab
 Merck Pharmaceutical
 Northwest Numerics, Inc.
 O'Donnell Consulting Engineers
 Proctor & Gamble
 Pulsic
 Quovadx
 Rationelle Software-Entwicklung
 Raytheon Corp.
 RedOlive, Inc.
 Roche Molecular Systems, Inc.
 Schweitzer Engineering Laboratories, Inc.
 Setterholm, Inc.
 SGI
 Siemens
 Siemens Westinghouse Power Corporation
 Simplified Logic, Inc.
 The MathWorks, Inc.
 Timken Company
 Torrent Corp. (Spain)
 UGS Corp.
 United Technologies Research Center
 Verari Systems
 Xerox
 Xilinx

Government/Non-profit Organizations

Air Force Research Lab
 Army Research Lab
 Catania Astrophysical Observatory
 Hanscom Air Force Base
 Institute for Defense Analysis
 J. Stefan Institute
 N. Inst. Adv. Industrial Sci. Tech. (AIST, Japan)
 Kirtland Air Force Base
 Lawrence Livermore National Laboratory
 Los Alamos National Laboratory
 Medical Res. Council Lab. of Molecular Biology (UK)
 NASA
 National Institutes of Health
 Naval Research Laboratory
 National Security Agency
 National Science Foundation
 Oak Ridge National Laboratory
 Ohio Supercomputer Center
 Sandia National Laboratories
 Savannah River National Laboratory
 U.S. Department of Defense

Universities

A&T State University
 Arizona State University
 Bard College
 Beloit College
 Carnegie Mellon University
 California Institute of Technology
 Columbia University
 Dalhousie University (Canada)
 Delft University of Technology (The Netherlands)
 Dresden University (Germany)
 Drexel University
 Federal University of Parana (Brazil)
 Florida State University
 Georg August Universität Göttingen (Germany)
 George Mason University
 Georgetown University
 George Washington University
 Hong Kong University (China)
 Howard University
 Indiana University
 Indiana University - Purdue University Indianapolis
 International University of Bremen (Germany)
 Jackson State University
 Johns Hopkins University
 Louisiana State University
 Macalester College
 Massachusetts Institute of Technology
 Monash University (Australia)
 Moscow State Technical University (Russia)
 Penn State University
 Polish Academy of Sciences (Poland)
 Purdue University
 Rudjer Boskovic Institute (Croatia)
 Russian Academy of Sciences (Russia)
 San Diego State University
 Siena College
 Southern Methodist University
 Stanford University
 State University of New York
 Technische Universität Berlin (Germany)
 Technische Universität Darmstadt (Germany)
 Technische Universität München (Germany)
 Tel Aviv University
 Trinity University
 Tufts University
 Tulane University
 U. Católica de Valparaíso
 University College London
 Universidade Federal de Pernambuco (Brazil)
 Universidade Federal do Rio de Janeiro (Brazil)
 Universität GHS Essen
 University of Abertay Dundee (UK)
 University of British Columbia
 University of California Los Angeles
 University of Colorado

University of Edinburgh (IK)	University of Southern Denmark
University of Erlangen (Germany)	University of Strathclyde (Scotland)
University of Ferrara	University of Tech. Belfort-Montbéliard (France)
University of Florida	University of Tennessee
University of Kent at Canterbury (UK)	University of Texas at Arlington
University of Houston	Univ. of Texas, MD Anderson Cancer Ctr.
University of Illinois-Urbana/Champaign	University of Tokyo (Japan)
University of Indiana	University of Torino (Italy)
University of Leeds	University of Toronto (Canada)
University of Liverpool	University of Warwick (United Kingdom)
University of Maryland	University of Washington
University of Massachusetts Amherst	University of Waterloo (Canada)
University of New Mexico	University of Western Australia
University of Maryland College Park	University of Windsor (Canada)
University of Maryland Baltimore Country	University of Wisconsin - Madison
University of Michigan	University of Wisconsin - Milwaukee
University of Minnesota	Virginia Polytechnic Institute and State Univ.
University of Modena (Italy)	Wake Forest University
University of Pittsburgh	Washington University (St. Louis)
University of Sherbrooke (Canada)	Wentworth Institute of Technology
University of South Carolina	Williams College

Part V

Appendices

Staff

MCSD consists of full time permanent staff located at NIST laboratories in Gaithersburg, MD and Boulder, CO. This is supplemented with a variety of faculty appointments, guest researchers, postdoctoral appointments, and student appointments. The following list reflects all appointments held during FY 2006.

Legend: F = Faculty Appointee, GR = Guest Researcher, PD = Postdoctoral Appointee, S = Student, PT= Part time

Division Staff

Ronald Boisvert, *Chief*
Robin Bickel, *Secretary*
Jeffrey Fong

Roldan Pozo
Christopher Schanzle
David Warshawsky, S

Mathematical Modeling Group

Geoffrey McFadden, *Leader*
Bradley Alpert (Boulder)
Timothy Burns
Alfred Carasso
Andrew Dienstfrey (Boulder)
Michael Donahue
Fern Hunt
Raghu Kacker
Anthony Kearsley
Peter Ketcham
Stephen Langer
Agnes O’Gallagher (Boulder)
Donald Porter

Mirit Aladjem, GR
Daniel Anderson, GR, F
Richard Braun, F
David Cotrell, GR
Michael Forbes, S
Katharine Gurski, GR
Seung-Il Haan, GR
Sohyoung Kim, GR
Dianne O’Leary, F
Florian Potra, F
Sita Ramamurti, GR
Richard Yeh, G

Mathematical Software Group

Daniel Lozier, *Leader*
Marjorie McClain
Bruce Miller
William Mitchell
Bert Rust
Bonita Saunders
Liuyan Chen, S

Joyce Conlon, GR
Bruce Fabijonas, F
Leonard Maximon, GR
Frank Olver, GR
G.W. Stewart, F
Abdou Youssef, F

Optimization and Computational Geometry Group

Ronald Boisvert, *Acting Leader*

Isabel Beichl

Javier Bernal

David Gilsinn

Emanuel Knill (Boulder)

Stephen Bullock, PD, GR

Zachary Catlin, S

Theodore Einstein, GR

Saul Gass, F

Scott Glancy, PD (Boulder)

James Lawrence, F

David Song, GR

Francis Sullivan, GR

Christoph Witzgall, GR

Anocha Yimsiriwattana, GR

Scientific Applications and Visualization Group

Judith Terrill, *Leader*

Yolanda Parker, *Office Manager*

Robert Bohn

William George

Terence Griffin

John Hagedorn

Howard Hung

John Kelso

Adele Peskin (Boulder)

Steven Satterfield

James Sims

Thomas Bugnazet, GR

Julien Lancien, GR

Adam Lazrus, S

Christine McKay, S

Marc Olano, F

Glossary of Acronyms

ACL	Association for Computational Linguistics
ACM	Association for Computing Machinery
ACS	Advanced Camera for Surveys
ADI	alternating direction implicit
AFM	atomic force microscope
ANSI	American National Standards Institute
APS	American Physical Society
ASME	American Society of Mechanical Engineers
ATP	NIST Advanced Technology Program
BFRL	NIST Building and Fire Research Laboratory
BLAS	Basic Linear Algebra Subprograms
BMC	BioMed Central
BO	Born-Oppenheimer
CEM	computational electromagnetics
CIO	NIST Chief Information Officer
CODATA	Committee on Data for Science and technology
COLING	International Committee on Computational Linguistics
CPU	central processing unit
CSS	Calderbank-Shor-Steane
CSTL	NIST Chemical Science and Technology Laboratory
CWI	Centrum voor Wiskunde en Informatica (Amsterdam)
DARPA	DOD Defense Advanced Research Projects Agency
DIVERSE	Device Independent Virtual Environments — Reconfigurable, Scalable, Extensible (visualization software)
DLMF	Digital Library of Mathematical Functions (MCSD project)
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOJ	U.S. Department of Justice
DPD	dissipative particle dynamics
DSO	distributed shared object
EEEL	NIST Electronics and Electrical Engineering Laboratory
FEM	finite element method
FFT	fast Fourier transform
FY	fiscal year
GAMS	Guide to Available Mathematical Software
GPU	Graphics processing unit
IDA	Institute for Defense Analysis
IEEE	Institute of Electronics and Electrical Engineers
IML++	Iterative Methods Library
IMPI	Interoperable Message Passing Interface
IT	information technology
ITL	NIST Information Technology Laboratory
IV	immersive visualization
IVE	immersive visualization environment
IFIP	International Federation for Information Processing
JAMA	Java Matrix package
LADAR	laser detection and ranging
MALDI-TOF	matrix-assisted laser desorption/ionization time-of-flight
MCSD	ITL Mathematical and Computational Sciences Division
MEL	NIST Manufacturing Engineering Laboratory
MIT	Massachusetts Institute of Technology
MKM	mathematical knowledge management
MPI	Message Passing Interface
MRI	magnetic resonance imaging

MSEL	NIST Materials Science and Engineering Laboratory
MV++	Matrix/Vector Library
μ CT	x-ray micro-computed tomography
μ mag	Micromagnetics Activity Group
NIH	National Institutes of Health
NIST	National Institute of Standards and Technology
NISTIR	NIST Internal Report
NITRD	Networking and Information Technology Research and Development
NASA	National Aeronautics and Space Administration
NOAA	National Oceanographic and Atmospheric Administration
NNSA	National Nuclear Security Administration
NRC	National Research Council
NSA	National Security Agency
NSF	National Science Foundation
OCT	optical coherence tomography
ODE	ordinary differential equation
OLES	NIST Office of Law Enforcement Standards
OOF	Object-Oriented Finite Elements (software package)
OOMMF	Object-Oriented Micromagnetic Modeling Framework (software package)
PDE	partial differential equation
PET	positron emission tomography
PHAML	Parallel Hierarchical Adaptive Multi Level (software)
PITAC	President's Information Technology Advisory Committee
PL	NIST Physics Laboratory
PSF	point spread function
QDPD	quaternion-based dissipative particle dynamics
RAVE	Reconfigurable Automatic Virtual Environment
S&E	science and engineering
SAVG	MCSA Scientific Applications and Visualization Group
SECB	slow evolution from the continuation boundary
SED	NIST/ITL Statistical Engineering Division
SEM	scanning electron microscope
SIAM	Society for Industrial and Applied Mathematics
SIGGRAPH	ACM Special Interest Group on Graphics
SIMA	NIAT Systems Integration for Manufacturing Applications Program
SOR	successive overrelaxation
SPIE	International Society for Optical Engineering
SRM	standard reference material
SSS	Screen Saver Science
SURF	Student Undergraduate Research Fellowship
TNT	Template Numerical Toolkit
UMCP	University of Maryland College Park
VCCTL	Virtual Cement and Concrete Testing Laboratory
VRML	virtual reality modeling language
W3C	World Wide Web Consortium
XML	Extensible Markup Language