Part IV

Activity Data

Publications

Appeared

Refereed Journals

1. M.E. Ali and G.B. McFadden, "Linear Stability of Cylindrical Couette Flow in the Convection Regime," *Physics of Fluids* **17** (2005), p. 054112.
2. B. Alpert and Y. Chen, "A Representation of Acoustic Waves in Unbounded Domains," *Communications on Pure and Applied Mathematics* **58** (10) (2005), pp. 1358-1374.
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) (2005), pp. 103705/1-6.
4. W.J. Boettinger, G.B. McFadden, S.R. Coriell, R.F. Sekerka, and J.A. Warren, "Lateral Deformation of Diffusion Couples," *Acta Materialia* **53** (2005), pp. 1995-2008.
5. M.D. Bowdrey, J.A. Jones, E. Knill, and R. Laflamme, "Compiling Gate Networks on an Ising Quantum Computer," *Physics Review A* **72** (Sept. 13, 2005), pp. 032315/1-5.
6. G.K. Brennen and S.S. Bullock, "Stability of Global Entanglement in Thermal States of Spin Chains," *Physical Review A* **70** (2004), pp. 052303-052315.
7. G.K. Brennen, D.P. O'Leary and S.S. Bullock, "Criteria for Exact Qudit Universality," *Physical Review A* **71** (2005), 052318.
8. S.S. Bullock, G.K. Brennen and D.P. O'Leary, "Time Reversal and n-qubit Canonical Decompositions," *Journal of Mathematical Physics* **46** (2005), 062104.
9. S.S. Bullock, D.P. O'Leary, G.K. Brennen, "Asymptotically Optimal Quantum Circuits for d-level Systems," *Physical Review Letters* **94** (2005), p. 230502.
10. J. Chiaverini, D. Leibfried, T. Schaetz, M.D. Barrett, R.B. Blakestad, J. Britton, W.M. Itano, J.D. Jost, E. Knill, C. Langer, R. Ozeri and D.J. Wineland, "Realization of Quantum Error Correction," *Nature* **432** (2 Dec 2004), pp. 602-605.
11. J. Chiaverini, J. Britton, D. Leibfried, E. Knill, M.D. Barrett, R.B. Blakestad, W.M. Itano, J.D. Jost, C. Langer, R. Ozeri, T. Schaetz, and D.J. Wineland, "Implementation of the Semiclassical Quantum Fourier Transform in a Scalable System," *Science* **308** (13 May 2005), pp. 997-1000.
12. A. Carasso, "Singular Integrals, Image Smoothness, and the Recovery of Texture in Image Deblurring," *SIAM Journal on Applied Mathematics* **64** (2004), pp. 1749-1774.
13. N. Dao, M.J. Donahue, I. Dumitru, L. Spinu, S. L. Whittenburg, and J.C. Lodder, "Dynamic Susceptibility of Nanopillars," *Nanotechnology* **15** (2004), pp. S634-S638.
14. H.C. Elman, O.G. Ernst, D.P. O'Leary, and M. Stewart, "Efficient Iterative Algorithms for the Stochastic Finite Element Method with Application to Acoustic Scattering," *Computer Methods in Applied Mechanics and Engineering*, **194** (2005), pp. 1037-1055.
15. B.R. Fabijonas, D.W. Lozier and F.W.J. Olver, "Computation of Complex Airy Functions and Their Zeros Using Asymptotics and the Differential Equation," *ACM Transactions on Mathematical Software* **30** (4) (December 2004), pp. 471-490.
16. B.R. Fabijonas, "Algorithm 838: Airy Functions," ACM *Transactions on Mathematical Software* **30**(4), December 2004, pp. 491-501.
17. D.E. Gilsinn, "Approximating Limit Cycles of a Van der Pol Equation with Delay," *Proceedings of Dynamic Systems & Applications* **4** (2004), pp. 270-276.
18. C.J. Haecker, E.J. Garboczi, J.W. Bullard, R.B. Bohn, Z. Sun, S.P. Shah, and T. Voigt, "Modeling the linear elastic properties of cement paste," *Cement and Concrete Research* **35** (2005), p. 1948.
19. M. A. Hamstad, A. O'Gallagher, "Modal-Based Identification of Acoustic Emission Sources in the Presence of Electronic Noise," *Journal of Acoustic Emission* **22** (2004), pp. 1-21.
20. F.Y. Hunt, A.J. Kearsley, and A. O'Gallagher, "Constructing Sequence Alignments from a Markov Decision Model with Estimated Parameter Values," *Applied Bioinformatics* **3** (2-3) (2004), pp. 159-165.
21. F.Y. Hunt, "Sample Path Optimality for a Markov Optimization Problem," *Stochastic*

Processes and their Applications **115** (5) (May 2005), pp. 769-779.

22. K. Irikura, R. Johnson, and R. Kacker, "Uncertainty Associated with Virtual Measurements from Computational Chemistry Models," *Metrologia* **41**, (2004), pp.369-375.
23. K. Irikura, R. Johnson, and R. Kacker, "Uncertainties in Scaling Factors for Ab-initio Vibrational Frequencies," *Journal of Physical Chemistry* **A** (109) (2005), pp. 8430-8437.
24. R. Kacker, R. Datla, and A. Parr, "Statistical Analysis of CIPM Key Comparisons Based on the ISO Guide," *Metrologia* **41**, (2004), pp. 340-352.
25. R. Kacker and I. Olkin, "A Survey of Tables of Probability Distributions," *Journal of Research of the NIST* **110** (2005), pp. 67-77.
26. R. Kacker, R. Datla, and A. Parr, "Response to Comments on Statistical Analysis of CIPM Key Comparisons Based on the ISO Guide," *Metrologia* **42** (2005), pp. L13-L14.
27. E. Knill, "Quantum Computing with Realistically Noisy Devices," *Nature* **434** (2005), p. 39.
28. E. Knill, "Scalable Quantum Computing in the Presence of Large Detected-Error Rates," *Physical Review A* **71** (2005), pp. 042322/1-7.
29. E. Mirowski, J. Moreland, A. Zhang, S.E. Russek, and M.J. Donahue, "Manipulation and Sorting of Magnetic Particles by a Magnetic Force Microscope on a Microfluidic Magnetic Trap Platform," *Applied Physics Letters* **86** (2005), 243901.
30. W.F. Mitchell and E. Tiesinga, "Adaptive Grid Refinement for a Model of Two Confined and Interacting Atoms," *Applied Numerical Mathematics* **52** (2005), pp. 235-250.
31. W.F. Mitchell, "Hamiltonian Paths through Two- and Three-Dimensional Grids," *Journal of Research of NIST* **110** (2005), pp. 127-136.
32. D.P. O'Leary and S.S. Bullock, "QR Factorizations Using a Restricted Set of Rotations," *Electronic Transactions on Numerical Analysis* **21** (2005), pp. 35-45.
33. T. Schaetz, M. D. Barrett, D. Leibfried, J. Britton, J. Chiaverini, W. M. Itano, J. D. Jost, E. Knill,, C. Langer, D. J. Wineland, "Enhanced Quantum State Detection Efficiency through Quantum Information Processing," *Physical Review Letters* **94** (2005), 010501.
34. R. Somma, G. Ortiz, H. Barnum, E. Knill, and L. Viola, "Nature and Measure of Entanglement in Quantum Phase Transitions," *Physical Review A* **70** (October 2004), 042311.
35. L. Viola and E. Knill, "Random Decoupling Schemes for Quantum Dynamical Control and Error Suppression," *Physical Review Letters* **94** (2005), 060502.
36. L. Yanik, E. Della Torre, M. J. Donahue, and E. Cardelli, "Micromagnetic Eddy Currents in Conducting Cylinders," *Journal of Applied Physics* **97** (2005), 10E308.

Other Invited Publications

1. R.F. Boisvert, R. Cools, and B. Einarsson, in "Assessment of Accuracy and Reliability," *Accuracy and Reliability in Scientific Software* (B. Einarsson, ed.), SIAM, Philadelphia (2005), pp. 13-32.
2. R.F. Boisvert and R. Pozo, "Java," in *Accuracy and Reliability in Scientific Software* (B. Einarsson, ed.), SIAM, Philadelphia (2005), pp. 160-169.
3. D. Donnelly and B. Rust, "The Fast Fourier Transform for Experimentalists, Part I: Concepts," *Computing in Science & Engineering* **7** (2) (March/April 2005), pp. 80-88.
4. D. Donnelly and B. Rust, "The Fast Fourier Transform for Experimentalists, Part II: Convolutions," *Computing in Science & Engineering* **7** (4) (July/August 2005), pp. 92-95.
5. D.P. O'Leary, "Blind Deconvolution: Errors, Errors Everywhere," *Computing in Science and Engineering*. Project: **7** (1) (Jan./Feb. 2005), pp. 56-59. Solution: **7** (2) (Mar./Apr. 2005), pp. 63-66.
6. D.P. O'Leary, "Blind Deconvolution: A Matter of Norm," *Computing in Science and Engineering*. Project: **7**, (2) (Mar./Apr. 2005), pp. 60-62. Solution: **7** (3) (May/June 2005), pp. 24-27.
7. D.P. O'Leary, "Finite Differences and Finite Elements: Getting to Know You," *Computing in Science and Engineering*. Project: **7** (3) (May/June 2005), pp. 20-23. Solution: **7** (4) (Jul./Aug. 2005).
8. D.P. O'Leary, "Eigenvalues: Valuable Principles," *Computing in Science and Engineering*. Project: **7** (4) (July/Aug. 2005), Solution: **7** (5), (Sept./Oct. 2005), pp. 67-70.

9. D.P. O'Leary, "Solving Sparse Linear Systems: Taking the Direct Approach," *Computing in Science and Engineering*. Project: **7** (5) (Sept./Oct. 2005), pp. 62-67, Solution: **7** (6) (Nov./Dec. 2005), pp. 77-80.

10. D.P. O'Leary, "Fast Solvers and Sylvester Equations: Both Sides Now," *Computing in Science and Engineering*. Project: **7** (6) (Nov./Dec. 2005), pp. 74-77, Solution: **8** (1) (Jan./Feb. 2006.

11. B. Rust and D. Donnelly, "The Fast Fourier Transform for Experimentalists, Part III: Classical Spectral Analysis," *Computing in Science & Engineering* **7** (5) (Sept./Oct. 2005), pp. 74-78.

12. B. Rust and D. Donnelly, "The Fast Fourier Transform for Experimentalists, Part IV: Autoregressive Spectral Analysis," *Computing in Science & Engineering* **7** (6) (Nov./Dec. 2005), pp. 85-90.

Conference Proceedings

1. M.D. Barrett, T. Schaetz, J. Chiaverini, D. Leibfried, J. Britton, W.M. Itano, J.D. Jost, E. Knill, C. Langer, R. Ozeri, and D.J. Wineland, "Quantum Information Processing with Trapped Ions," in *AIP Conference Proceedings* **770** (May 5, 2005), Issue 1, 350-358

2. T.J. Burns and T.L. Schmitz, "Receptance Coupling Study of the Dynamic Absorber Effect in Long-Overhang Tools," in *Proceedings of the 2004 ASME International Mechanical Engineering Congress and RD&D Expo*, Anaheim, CA, November 13-19, 2004, pp. 1-8.

3. T.J. Burns and T.L. Schmitz, "A Study of Linear Joint and Tool Models in Spindle-Holder-Tool Receptance Coupling," in *Proceedings of the Fifth ASME International Conference on Multibody Systems, Nonlinear Dynamics and Control*, ASME 2005 International Design Engineering Technical Conferences, Long Beach, CA, September 24-28, 2005, DETC2005-85275 (CD).

4. L. Deshayes, L. Welsch, A. Donmez, R. Ivester, D. Gilsinn, R. Rhorer, E. Whitenton, and F. Potra, "Smart Machining Systems: Issues and Research Trends," in *Proceedings 12th CIRP Life Cycle Engineering*, Workshop, Grenoble, France (2005) (CD).

5. J.E. Devaney, S.G. Satterfield, J.G. Hagedorn, J.T. Kelso, A.P. Peskin, W.L. George, T.J. Griffin, H.K. Hung, R.D. Kriz, "Science at the Speed of Thought," *Ambient Intelligence for Scientific Discovery, Lecture Notes in Artificial Intelligence (LNAI)*, Y. Cai (Ed.), **3345** (February 2005), pp. 1-24.

6. J.T. Fong, "A B C of Engineering Statistics and a Reference Benchmark Approach to Verification and Validation (V & V) of Multi-Physics Simulations of High-Consequence Engineering Systems," in *Proceedings, Symposium on Applied Mechanics and Multi-Physics Simulations of High-Consequence Engineering Systems*, Stanford University, CA, April 18, 2005, pp. 169-216.

7. J.T. Fong, "A B C of Statistics for Verification and Validation (V & V) of Simulations of High-Consequence Engineering Systems," in *Proceedings of the. 2005 ASME Pressure Vessels and Piping Conference*, Denver, CO, July 17-21, 2005, paper no. PVP2005-71799.

8. D. E. Gilsinn, G. S. Cheok, and A. M. Lytle, "Pose of I-beams for Construction Site Automation," in *Proceedings of the 21st International Symposium on Automation and Robotics in Construction*, Jeju, Korea, September 21-25, 2004.

9. D. E. Gilsinn, "Discrete Fourier Series Approximation to Periodic Solutions of Autonomous Delay Differential Equations," in *Proceedings 5th ASME International Conference on Multibody Systems, Nonlinear Dynamics and Control*, Long Beach, CA, Sept. 24-28, 2005.

10. D. E. Gilsinn, M. McClain, C. Witzgall, "Using Nonoscillatory Splines to Model Urban Environments," in *Proceedings of the SIAM Conference on Geometric Modeling and Computing: Seattle, 2003*, Ed. M. L. Lucian and M. Neamtu, Nashboro Press, Brentwood (2004), pp. 229-248.

11. B.W. Rust, "Separating Signal from Noise in Global Warming," *Computing Science and Statitstics* **35** (2005), pp. 263-277.

12. B. Saunders and Q. Wang, "Boundary/Contour Fitted Grid Generation for Effective Visualizations in a Digital Library of Mathematical Functions," in *Proceedings of the Ninth International Conference of Numerical Grid Generation in Computational Field Simulations*, pp. 61-71. Also, NISTIR 7228.

13. V.V. Shende, S.S. Bullock, I.L. Markov, A Practical Top-down Approach to Quantum Circuit Synthesis, Proc. *Asia and South Pacific*

Design Automation Conference, pp. 272-275, Shanghai, China, 2005, quant-ph/0406176.

14. X. Tang, L. Ma, A. Mink, A. Nakassis, B. Hershman, J. Bienfang, R.F. Boisvert, C. Clark and C. Williams, High Speed Fiber-Based Quantum Key Distribution using Polarization Encoding, in *Proceedings of SPIE* **5893**, Optics and Photonics Conference, San Diego, California, USA, July 31 - August 4, 2005.
15. Q. Wang and B. Saunders, "Web-Based 3D Visualization in a Digital Library of Mathematical Functions," in *Proceedings of the Web3D 2005 Symposium*, University of Wales, Bangor, UK, March 29-April 1, 2005, pp. 151-157.

Technical Reports

1. J. Bernal and C. Witzgall, "Integer Representation of Decimal Numbers for Exact Computations," *NISTIR 7144*.
2. H.-R. Fang and D.P. O'Leary, "Stable Factorizations of Symmetric Tridiagonal and Triadic Matrices," Computer Science Department Report CS-TR-4733, Institute for Advanced Computer Studies Report UMIACS-2005-41, University of Maryland, July 2005.
3. S.I. Haan, A. Reid, R.E. Garcia, and S. Langer, "The OOF2 Manual," (available on-line only, at http://www.ctcms.nist.gov/oof/oof2man/index.html).
4. F.Y. Hunt and A. O'Gallagher, "Sensitivity of Multiple Sequence Alignments to Perturbations in Cost Matrices, *NIST Technical Note 1472*.

Accepted

1. D.L. Cotrell and G.B. McFadden, "Linear Stability of Spiral Poiseuille Flow with a Radial Temperature Gradient: Centrifugal Buoyancy Effects," *Physics of Fluids.*
2. A. Dienstfrey, and J. Huang, "Integral Representations for Elliptic Functions," *Journal of Mathematical Analysis and Applications*.
3. D.M. Dunlavy, D.P. O'Leary, D. Klimov, and D. Thirumalai, "HOPE: A Homotopy Optimization Method for Protein Structure Predictio n," *Journal of Computational Biology*.
4. 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: Methodology and Preliminary Results on Several Different Coarse Aggregates," *Cement and Concrete Research*.
5. 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 Trans. Journal of Pressure Vessel Technology*.
6. E.J. Garboczi, J.F. Douglas, and R.B. Bohn, "The Intrinsic Elastic Moduli of Rectangular Parallelepiped Inclusions Over a Modest Range of Shape and a Large Range of Property Contrast," *Mechanics of Materials*.
7. C. Holloway, M. Mohamed, E. Keuster, and A. Dienstfrey, "Reflection and Transmission Properties of a Metafilm with Application to a Controllable Surface Composed of Resonant Particles," *IEEE Transactions on Electromagnetic Compatibility*.
8. A. Kalsi and D.P. O'Leary, "Algorithms for Structured Total Least Squares Problems with Applications to Blind Image Deblurring," *Journal of Research of the National Institute of Standards and Technology*.
9. B.W. Rust, "Carbon Dioxide, Global Warming, and Michael Crichton's 'State of Fear'," *Computing Science and Statistics* **37**.
10. S.P. Schurr, A.L. Tits, and D.P. O'Leary, "Universal Duality in Conic Convex Optimization," *Mathematical Programming A*.
11. J. Sims and S.A. Hagstrom, "High Precision Variational Calculations for the Born-Oppenheimer Energies of the Ground State of the Hydrogen Molecule", *Journal of Chemical Physics*.
12. 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 on Microwave Theory and Techniques*.
13. L. Yanik, E. Della Torre, and M.J. Donahue, "Micromagnetic Calculations of Eddy Currents with Time-Varying Fields," *Physica B*.

Submitted

1. D.M. Anderson, P. Cermilli, E. Fried, M.E. Gurtin, and G.B. McFadden, "Dynamical Sharp-

interface Conditions for Two-phase Viscous Heat-conducting Fluids," WERB.

2. D.M. Anderson, P. Cermilli, E. Fried, M.E. Gurtin, and G.B. McFadden, "Dynamical Sharp-interface Conditions for Two-phase Viscous Heat-conducting Fluids," *Journal of Fluid Mechanics.*
3. I. Beichl, S. Bullock, and D. Song, "A Quantum Algorithm Detecting Concentrated Maps," *NIST Journal of Research*.
4. I. Beichl and F. Sullivan, "The Other Monte Carlo Method," *IEEE Computing in Science and Engineering*.
5. I. Beichl, S. Bullock, and D. Song, "A Quantum Algorithm Detecting Concentrated Maps," *NIST Journal of Research*.
6. D.L. Cotrell and A.J. Kearsley, "Flow Control Through the Use of Topography," *Optimization and Engineering.*
7. D.L. Cotrell and G.B. McFadden, "Axial Flow Effects on the Linear Stability of Circular Couette Flow with Viscous Heating," *Physics of Fluids.*
8. R. Dersimonian and R. Kacker, "Quantification of Uncertainty in Meta-analysis," *Controlled Clinical Trials*.
9. J.P. Dunkers, J.G. Hagedorn, A. Peskin, J.T. Kelso, J.E. Terrill, and L. Henderson, "Interactive, Quantitative Analysis Of Scaffold Structure Using Immersive Visualization," *BIO2006: Summer Bioengineering Conference*.
10. J. T. Fong, "The Role of Engineering Statistics in a Reference Benchmark Approach to Verification and Validation of Multi-Physics Simulations of High-Consequence Engineering Systems," *Proc. of a Stanford Mechanics Symposium, Applied Mechanics and Multi-Physics Simulations of High-Consequence Engineering Systems*, Stanford University, CA, April 18, 2005.
11. S. Glancy and E. Knill, "Error Analysis For Encoding A Qubit In An Oscillator," *Physical Review A*.
12. D.E. Gilsinn and F.A. Potra, "Stability of Delay Differential Equations by Integral Equation Methods," *Journal of Integral Equations and Applications.*
13. K.F. Gurski, G.B. McFadden, and M.J. Miksis, "The Effect of Contact Lines on the Rayleigh Instability with Anisotropic Surface Energy," *SIAM Journal on Applied Mathematics*.
14. J. Hagedorn, S. Satterfield, J. Kelso, W. Austin, J. Terrill, and A. Peskin, "Correction of Location and Orientation Errors in Electromagnetic Motion Tracking," *Presence*.
15. J. Hagedorn, J. Dunkers, A. Peskin, J. Kelso, L. Henderson, J. Terrill, "Quantitative, Interactive Measurement of Tissue Engineering Scaffold Structure in an Immersive Visualization Environment", *IEEE Signal Processing Society International Conference on Image Processing*.
16. M.A. Hamstad and A. O'Gallagher, Effects of Noise on Lamb-Mode Acoustic Emission Arrival Times Determined by Wavelet Transform," *Journal of Acoustic Emission*.
17. R. Kacker, "Simpler Bayesian Alternative to the ISO Guide's Use of the Welch-Satterthwaite Formula," *Metrologia*.
18. Z. Levine, A. Kearsley, and J. Hagedorn, "Bayesian Tomography for Projections with an Arbitrary Transmission Function with an Application in Electron Microscopy", *IEEE Transactions on Image Processing*.
19. M. H. Park, Y. K. Hong, B. C. Choi, S. H. Gee, and M. J. Donahue, "Vortex Head-to-head Domain Walls and Its Formation Process in Onion-State-Stable Ring Elements," *Physical Review Letters.*
20. R. Radebaugh and A. O'Gallagher, "Regenerator Operation at Very High Frequencies for Micro-Cryocoolers," *Advances in Cryogenic Engineering*.
21. J. Slutsker, K. Thornton, A.L. Roytburd, J.A. Warren, G.B. McFadden, and P. Voorhees, "Phase-field Modeling of Solidification under Stress," WERB.
22. J. Slutsker, K. Thornton, A.L. Roytburd, J.A. Warren, and G.B. McFadden, "Phase-field Modeling of Solidification Under Stress," *Acta Materialia.*
23. X. Tang, L. Ma, A. Mink, A. Nakassis, B. Hershman, J. Bienfang, R.F. Boisvert, C. Clark and C. Williams, "High Speed Fiber-Based Quantum Key Distribution using Polarization Encoding," in *Proceedings of SPIE*, Optics and Photonics Conference, San Diego, CA, July 31 - August 4, 2005.

Presentations

Invited Talks

1. R. Boisvert, "A Handbook of Special Functions for the Digital Age," Symposium on Software Environments for Numerical Problems, University of Gent, Belgium, November 18, 2004.
2. S.S. Bullock, "Matrix Decompositions and Quantum Circuit Design," Laboratoire d'Informatique Thèorique et Quantique, University of Montreal, December 1, 2004.
3. T.J. Burns and T.L. Schmitz, "A Study of Linear Joint and Tool Models in Spindle-Holder-Tool Receptance Coupling," Fifth ASME International Conference on Multibody Systems, Nonlinear Dynamics and Control, ASME 2005 International Design Engineering Technical Conferences, Long Beach, CA, September 24-28, 2005.
4. D.L. Cotrell, "Linear Stability of Spiral Poiseuille Flow and Comparison to Experiments," Arryx, Chicago, IL, January 13, 2005.
5. D.L. Cotrell, "Linear Stability of Isothermal and Non-isothermal Spiral Poiseuille Flow," Lawrence Livermore National Laboratory, Livermore, CA, January 24, 2005.
6. D.L. Cotrell, "Linear Stability of Isothermal and Non-isothermal Spiral Poiseuille Flow," NYU, Courant Institute of Mathematical Sciences, New York, NY, January 28, 2005.
7. J. Fong, "Verification and Validation of Computer Models," Southwest Research Institute, Oct. 11, 2004.
8. J. Fong, "A Metrology-based Uncertainty Analysis Approach to V & V of Computer Models of High-consequence Engineering Systems," Foundation '04: A Workshop for V&V in the 21st Century, Tempe, AZ, Oct. 13, 2004.
9. J. Fong, "Verification and Validation of Computer Models of High-consequence Engineering Systems," Lawrence Livermore National Laboratory, Livermore, CA, Oct. 18, 2004.
10. J. Fong, "Verification and Validation of Computer Models of High-Consequence Engineering Systems" NASA Ames Research Center, Moffett Field, CA, Feb. 2, 2005.
11. J. Fong, "A B C of Engineering Statistics and a Reference Benchmark Approach to Verification and Validation (V&V) of Multi-Physics Simulations of High-Consequence Engineering Systems," Stanford University Symposium on Applied Mechanics and Multi-Physics Simulations of High-Consequence Engineering Systems, Stanford, CA, April 18, 2005.
12. J. Fong, "Engineering Statistics for Verification and Validation (V&V) of Computer Simulations of High-Consequence Systems" at a joint colloquium of Departments of Mechanical Engineering and Mathematical Sciences, Clemson University, Clemson, SC, June 10, 2005.
13. J. Fong, "ABC of Statistics for Verification & Validation of Simulations of High Consequence Engineering Systems," ASME Pressure Vessels and Piping Conference, Denver, CO, July 21, 2005.
14. J. Fong, "A Reference-benchmark Approach to Verification and Validation (V&V) of Simulations of High-Consequence Engineering Systems," Battelle Columbus Laboratories, Columbus, OH, July 22, 2005.
15. J. Fong, "Stochastic Modeling of Complex Structural System Failures and a Metrology-based Approach to V&V of Computer Simulations," Departments of Engineering Science and Mechanics, Penn State University, State College, PA, September 23 2005.
16. F. Hunt, "Visualizing Frequency Patterns in DNA," Infinite Possibilities 2005 Conference, Spelman College, Atlanta, GA, April 1, 1005.
17. F. Hunt, "Visualizing Frequency Patterns in DNA," Sonya Kovalevsky Day, New College of Florida, Sarasota, FL, April 9, 2005.
18. F. Hunt, "A Markov Decision Approach to Bioinformatics," 13th INFORMS Applied Probability Conference, Ottawa Canada July 6, 2005.
19. F. Hunt, "Visualizing Frequency Patterns in DNA," Etta Falconer Lecture of the Mathematical Association of America and the Association for Women in Mathematics, MathFest, Albuquerque, New Mexico, August 5, 2005.
20. E. Knill, "Fault-tolerant Architecture for Very Noisy Gates," Fault-tolerant Quantum Computation Workshop, IBM, Yorktown Heights, NY, Aug. 29, 2005.

21. S. Langer, "OOF2: Object-Oriented Finite Element Analysis of Material Microstructures," Physics Department Colloquium, University of Illinois in Chicago, Chicago, IL, November 10, 2004.
22. S. Langer, "OOF2: Object-Oriented Finite Element Analysis of Material Microstructures," MCSD Seminar, January 11, 2005.
23. D.W. Lozier, "Measuring Error in Mathematical Computations and a Proposed Software Test Service for Special Functions," NIST Workshop on Verification and Validation of Computer Models for the Design and Performance Evaluation of High-Consequence Engineering Systems, November 8, 2004.
24. D.W. Lozier, "The DLMF Project: Lessons Learned and Future Directions," Special Functions: Asymptotic Analysis and Computation: A Conference in Honor of Nico Temme's 65th Birthday, University of Cantabria, Spain, July 5, 2005.
25. D.W. Lozier, "The DLMF Project: Lessons Learned and Future Directions," American Mathematical Society Eastern Section Meeting, Bard College, Annandale-on-Hudson, NY, October 8, 2005.
26. D.W. Lozier, "Math on the Web and the Digital Library of Mathematical Functions Project," Society for Industrial and Applied Mathematics Washington-Baltimore Section meeting, Baltimore, MD, November 9, 2005.
27. W.F. Mitchell, "Error Estimators for the hp Version of the Finite Element Method with Newest Node Bisection of Triangles," 8th U.S. National Congress on Computational Mechanics, Austin, TX, July 26, 2005.
28. D.P. O'Leary, "Numerical Linear Algebra in Image Deblurring," Third International School in Numerical Linear Algebra and Applications, Monopoli, Italy, September 11-17, 2005.
29. D.P. O'Leary, "Some Linear Algebra of Quantum Computing," Sandia National Laboratory, Livermore, CA, September 28, 2005.
30. D.P. O'Leary, "HOPE: A Homotopy Optimization Method for Protein Structure Prediction," University of Waterloo, October 21, 2005.
31. D.P. O'Leary, "Multi-Success," Convocation Address, University of Waterloo, October 22, 2005.
32. D. Porter, "Tools for Simulating Magnetic Phenomena at the Nanoscale," NIST/TEDCO Showcase, "Advancing the Frontiers of Bioscience and Nanotechnology," NIST, Gaithersburg, June 9, 2005.
33. B. Saunders, "Using Adaptive Mesh Generation to Capture Key Features of 3D Function Surfaces," Mathematical Association of America, Maryland, D.C., Virginia Section Meeting, Morgan State University, Baltimore, MD, November 6, 2004.
34. B. Saunders, "Dynamic 3D Visualizations of High Level Mathematical Functions," Elizabeth City State University, Elizabeth City, NC, February 22, 2005.

Conference Presentations

1. S.S. Bullock, D.P. O'Leary and G.K. Brennen, "Quantum Circuits for D-level Systems," DARPA Quantum Information Science and Technology PI Meeting, Scottsdale, AZ, November 18, 2004.
2. T. Burns, "Receptance Coupling Study of the Dynamic Absorber Effect in Long-Overhang Tools," International Mechanical Engineering Congress and R&D Expo, Anaheim, CA, November 15, 2004.
3. J. Devaney, S. Satterfield, J. Hagedorn, J. Kelso, A. Peskin, W. George, T. Griffin, and H. Hung, "Science at the Speed of Thought," Bowie State University, Bowie, MD, Oct. 29, 2004.
4. E. Della Torre, L. Yanik, M.J. Donahue, and E. Cardelli, "Micromagnetic Eddy Currents in Conducting Cylinders," Magnetism and Magnetic Materials 2004, Jacksonville, FL, November 7-11, 2004.
5. J. Devaney, "Automating Labeling with Machine Learning," Virtual Cement and Concrete Testing Laboratory Annual Meeting, NIST, Gaithersburg, MD, Nov. 15, 2004.
6. M.J. Donahue, F. da Silva, and D.P. Pappas, "Micromagnetic and Analytic Study of Small Zigzag Sensors," Magnetism and Magnetic Materials 2004, Jacksonville, FL, November 7-11, 2004.
7. M. Donahue, "Micromagnetic Calculations of Eddy Currents with Time-Varying Fields," 5th International Symposium on Hysteresis Modeling and Micromagnetics, Budapest, Hungary, May 30, 2005.

8. M. Donahue, "Vortex Head-to-Head Domain Walls and Their Formation in Onion-State Ring Elements," 5th International Symposium on Hysteresis Modeling and Micromagnetics, Budapest, Hungary, May 31, 2005.
9. W. George, J. Lancien, and J. Terrill, MPMD Program Model for Scientific Computing, SC05, Scatter Gather Session II, Seattle, WA, November 16, 2005.
10. D.E. Gilsinn, "Discrete Fourier Series Approximation to Periodic Solutions of Autonomous Delay Differential Equations," 5th ASME International Conference on Multibody Systems, Nonlinear Dynamics and Control, Long Beach, CA, September 24-28, 2005.
11. S. Glancy, "Quantum Computation with Optical Coherent States," QIP2005: Eighth Workshop on Quantum Information Processing, MIT, Cambridge, MA, January 16, 2005.
12. S. Glancy, "Error Analysis For Encoding A Qubit In An Oscillator," Quantum Information, Computation and Logic: Exploring New Connections Perimeter Institute, Waterloo, Ontario, Canada, July 20, 2005.
13. A. Kearsley, "Automated Algorithms for Applied Spectral Analysis," NMIJ/BIPM Workshop on the Impact of Information Technology in Metrology, Tskuba, Japan, May 19, 2005.
14. J. Kelso, "Shell DIVERSE," ACM SIGGRAPH 2005 Conference, DIVERSE Birds of a Feather (BOF) session, Los Angeles, CA, August 4, 2005.
15. J. Kelso, "Shell DIVERSE," IEEE Visualization Conference, DIVERSE Birds of a Feather (BOF) session, Minneapolis, MN, October 27, 2005.
16. J. Lancien, "Quaternion Dissipative Particle Dynamics," Virtual Cement and Concrete Testing Laboratory Annual Meeting, NIST, November 8, 2005.
17. W.F. Mitchell, "Multigrid Methods for the hp Version of the Finite Element Method," 8th U.S. National Congress on Computational Mechanics, Austin, TX, July 25, 2005.
18. B. Rust, "Carbon Dioxide, Global Warming, and Michael Crichton's 'State of Fear'," Interface 2005 Conference, St. Louis, MO, June 10, 2005.
19. S. Satterfield, "Shell Script VR," ACM SIGGRAPH 2005 Conference, DIVERSE Birds of a Feather (BOF) session, Los Angeles, CA, August 4, 2005.
20. S. Satterfield, "Shell Script VR," IEEE Visualization Conference, DIVERSE Birds of a Feather (BOF) session, Minneapolis, MN, October 27, 2005.
21. B. Saunders, "Boundary/Contour Fitted Grid Generation for Effective Visualizations in a Digital Library of Mathematical Functions," Ninth International Conference of Numerical Grid Generation in Computational Field Simulations, San Jose, CA, June 11-18, 2005.
22. J. Sims, G. Bryant, and H. Hung, "Intrinsic Surface States in Semiconductor nanocrystals: HgS Quantum Dots," American Physical Society meeting, Los Angeles, CA, March 21-25, 2005.

Software Released

1. S. Bullock and D. P. O'Leary, MATLAB code for producing d-level quantum circuits, http://www.arxiv.org/abs/quant-ph/0410116.
2. D. Porter (contributors), Tcl/Tk 8.4.8 released November 22, 2004, Tcl/Tk 8.4.9 released December 7, 2004, and Tcl/Tk 8.5a2 released December 8, 2004, Tcl/Tk 8.4.10 and 8.5a3 released June 4, 2005.
3. D. Porter, trofs 0.4, December 21, 2004. http://math.nist.gov/~DPorter/tcltk/trofs/
4. J. Kelso, frameGrabber DSO, http://math.nist.gov/mcsd/savg/software/dsos/#id107212.
5. J. Kelso, frameTimeStamp DSO, http://math.nist.gov/mcsd/savg/software/dsos/#id105790.
6. S. Langer, OOF2 version 2.0.b3, 2.0b4, 2.0b5, 2.0b6, http://www.ctcms.nist.gov/oof/oof2.html.
7. A. Peskin, Image Filters, http://math.nist.gov/mcsd/savg/software/filters/
8. A. Peskin, light loader (lgt), http://math.nist.gov/mcsd/savg/software/loaders/#id100960.
9. R. Pozo, Template Numerical Toolkit (TNT), Version 1.2.4, Version 1.2.5, Version 1.2.6, Version 1.9, http://math.nist.gov/tnt/.
10. R. Pozo, Jama/C++ linear algebra package, Version 1.2.3.

11. R. Pozo, C++ reference implementation of the Sparse BLAS standard.
12. R. Pozo, Jama/TNT numerical linear algebra library, Version 1.2.6.
13. S. Satterfield and A. Peskin, Visualization Demos, http://math.nist.gov/mcsd/savg/demos/.

Conferences, Minisymposia, Lecture Series, Shortcourses

MCSD Seminar Series

1. E. Vogel (EEEL), "Emerging Devices and Materials for Beyond CMOS," October 5, 2004.
2. S. Stein (CSTL), "How We Handle Mass Spectra," October 26, 2004.
3. A. Ray (Pennsylvania State University), "Anomaly Detection and Failure Mitigation in Complex Dynamical Systems," November 19, 2004.
4. R. Rehm (BFRL), "Mathematical Modeling of Community-Scale Fires," December 14, 2004.
5. S. Langer (MCSD), "OOF2: Object-Oriented Finite Element Analysis of Material Microstructures," January 11, 2005.
6. J. Warren (MSEL), "Modeling Polycrystalline Growth," January 25, 2005.
7. P. Marcal (MPAVE Corp.), "From Computer Aided Engineering Software to Information Driven Decision Making for High-Consequence Engineering Systems," February 8, 2005.
8. S. Gabriel (University of Maryland), "A Nash-Cournot Equilibrium Model for the North American Natural Gas Sector," February 16, 2005.
9. D. Wheeler (MSEL), "A Finite Volume PDE Solver Using Python (FiPy)," March 1, 2005.
10. M. Emelianenko (Pennsylvania State University), "A New Algorithm for the Automation of Phase Diagram Calculation," March 22, 2005.
11. M. De Graef (Carnegie Mellon University), "Beyond the Spherical Cow: A New Approach to Modeling Physical Quantities for Objects of Arbitary Shape," April 27, 2005.
12. L. Petrelli (Mount St. Mary's University), "PDEs from Monge-Kantorovich Mass Transporation Theory," May 11, 2005.
13. R. Szalai (Badapest University of Technology and Economics), "Bifurcations and Chaos in High-Speed Milling," June 1, 2005.
14. M. Mascagni (Florida State University), "Stochastic Methods in Electrostatics: Applications to Biological and Physical Science," June 16, 2005.
15. J. Lei (University of Texas at Arlington), "In-Parameter-Order: A Test Generation Strategy for Pairwise Testing," June 21, 2005.
16. G. Forney (BFRL), "Modeling and Visualizing Fire Without Getting Burned," June 29, 2005.
17. R. Lua (University of Minnesota), "Untangling Knots in Lattices and Proteins: A Computational Study," July 12, 2005.
18. R. van de Geijn (University of Texas at Austin), "Towards the Final Generation of Dense Linear Algebra Libraries," Aug. 25, 2005.
19. L. Melara (Colorado College), "A Homotopy Method in Regularization of Total Variation Denoising Problems," Aug. 30, 2005.
20. B. Rust (MCSD), "Carbon Dioxide, Global Warming, and Michael Crichton's State of Fear," Sept. 13, 2005.

Quantum Information Theory and Practice Seminar Series

1. Scott Glancy (MCSD), "Quantum Computation with Optical Coherent States", October 7, 2004
2. Trey Porto and Jamie Williams (PL), "Quantum Information Processing in Lattices", October 21, 2004
3. S. Bullock (MCSD) and G. Brennen (PL), "Quantum Circuits for d-level Systems", November 7, 2004.
4. Fred Strauch (PL), "Higher-order Hamiltonian Simulation and Local Reversibility", January 27, 2005.
5. Hilary Carteret (University of Montreal), "Noiseless Quantum Circuits for Measuring Entanglement", February 24, 2005.
6. Amitkumar Mahadevan (UMBC), "RCD Codes with Possible Quantum Applications", March 10, 2005.

7. Andreas Klappenecker (Texas A&M), "New Tales of the Mean King", March 24, 2005.
8. Lin Tian (PL), "Connecting the Worlds of Solid-state Quantum Devices and Quantum Optics," April 7, 2005.
9. Juha Vartianen (Helsinki University of Technology), "Unitary Transformations for Quantum Computing," April 21, 2005.
10. Howard Barnum (Los Alamos National Lab), "Quantum Query Complexity with Unitary Queries: Semidefinite Programming, Characterization, and Lower Bounds," May 5, 2005.
11. Ben Reichardt (University of California at Berkeley), "Specialized Quantum Error-correction Schemes," May 26, 2005.
12. Mark Byrd (Southern Illinois University), "Error Prevention using Leakage Elimination Operators," June 2, 2005.

Local Events Organized

1. I. Beichl, Co-organizer, SURF Symposium, August 9-12, 2005.
2. J. Fong, Organizer, Workshop on the Verification and Validation of Computer Models of High-consequence Engineering Systems, November 8-9, 2004.
3. D. Porter and A. Peskin, Planning Board Members, Metrology for the Magnetic Data Storage Industry Workshop, U.S. Measurement System Workshop Series.
4. J. Terrill, Planning Board Member, Antibody-based Metrology Workshop U.S. Measurement System Workshop Series.

External Events Organization

1. R. Boisvert, Co-chair of the Program Committee, Symposium on Scientific Computing and Mathematical Software in Emerging Sciences and Technology, Hong Kong, June 14-15, 2005.
2. R. Boisvert, Program Committee, International Symposium on Symbolic and Algebraic Computation, Beijing, China, July 2005.
3. 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.
4. J. Fong Co-chair of the Organizing Committee, Symposium on Applied Mechanics and Multi-Physics Simulations of High-Consequence Engineering Systems, Stanford University, April 18, 2005.
5. J. Fong, Panel Session Chair, "Why do PVP engineers need statistics for decision making?" ASME Pressure Vessels and Piping (PVP) Conference, Denver, Colorado, July 21, 2005.
6. J. Kelso and S. Satterfield, Organizers, DIVERSE Birds of a Feather Session, ACM SIGGRAPH Conference, Los Angeles, CA, July 30 to August 5, 2005.
7. D.P. O'Leary, Organizing Committee, Householder Conferences (formerly the Gatlinburg series of conferences).
8. D.W. Lozier, Co-organizer, Minisymposium on Orthogonal Polynomials and Special Functions, SIAM Annual Meeting, Boston, MA, July 10-14, 2005.
9. D.W. Lozier, Prrogram Committee, Fifth International Conference on Mathematical Knowledge Management, Reading, England, August 10-12, 2006.
10. D. Porter, Session Chairman, "Micromagnetics II" 49th Conference on Magnetism and Magnetic Materials, Jacksonville, Florida, Nov. 8, 2004.
11. R. Pozo, Program Committee, Fifth International Conference on Engineering Computational Technology, Las Palmas de Gran Canaria, September 12-15, 2006.

Other Professional Activities

Internal

1. R. Boisvert and A. O'Gallagher, Members, ITL Diversity Committee.
2. R. Boisvert, Member, NIST People Council.
3. R. Boisvert, ITL Representative, NIST Nanotechnology Strategic Working Group.
4. R. Boisvert, ITL Representative, NIST Scientific Computing Steering Group.
5. A. O'Gallagher, Member, Boulder Exhibits Committee.
6. D. Porter, Member, ITL Awards Committee.

External

Editorial

1. B. Alpert, Associate Editor, *SIAM Journal on Scientific Computing*.
2. I. Beichl, Member, Editorial Board, *Computing in Science and Engineering*.
3. R. Boisvert, Associate Editor, *ACM Transactions on Mathematical Software*.
4. R. Boisvert, Editor of the Numerical Analysis, Mathematical Software, and Computational Engineering, Finance, and Science areas, Computing Research Repository (CoRR) preprint service, www.arXiv.org.
5. D. Gilsinn Special Issue Editor, *NIST Journal of Research*.
6. R. Kacker, Member, Editorial Board, *Total Quality Management and Business Excellence*.
7. R. Kacker, Member, Editorial Board, *Journal of Applied Statistics*.
8. D. Lozier, Associate Editor, *Mathematics of Computation*.
9. G. McFadden Associate Editor, *Journal of Crystal Growth*.
10. G. McFadden Associate Editor, *Interfaces and Free Boundaries*.
11. G. McFadden Associate Editor, *SIAM Journal on Applied Mathematics*.
12. W.F. Mitchell, Member, Editorial Board, *Applied Numerical Analysis and Computational Mathematics*.
13. D.P. O'Leary, Member, Editorial Board, *Computing in Science and Engineering*.

Boards and Committees

1. R. Bohn, Program Official, Dynamic Data Driven Application Systems Program, NOAA.
2. R. Boisvert, Chair, International Federation for Information Processing (IFIP) Working Group 2.5 (Numerical Software).
3. R. Boisvert, Co-chair, ACM Publications Board.
4. R. Boisvert, Ex-officio Member, ACM Council.
5. R. Boisvert, Member, ACM Award Committee.
6. R. Boisvert, Member, Technical Review Committee, Institute for Defense Analysis Center for Computing Sciences.
7. F. Hunt, Member, Executive Committee, Association for Women in Mathematics.
8. F. Hunt, Member, Strategic Planning Task Force, Association for Women in Mathematics.
9. D.P. O'Leary, Member, External Advisory Board, Computer Science Department, George Washington University.
10. D.P. O'Leary, Member, SIAM-AMS-ASA-AWM-IMS-MAA-NCTM Joint Committee on Women.
11. D. Lozier, Vice Chair, SIAM Activity Group on Orthogonal Polynomials and Special Functions.
12. D. Porter, Member, Tcl Core Team.
13. B. Saunders, Member, Selection Committee, MAA/AWM Etta Z. Falconer Lecture.
14. B. Saunders, Member, Nominating Committee, MD-DC-VA section of the Mathematics Association of America (MAA).
15. J. Terrill, Member, NIST Representative, Federal High End Computing Implementation Task Force.
16. J. Terrill, Member, OpenFPGA Working Group.

Reviewing

1. Division staff members referee manuscripts for a wide variety of journals including *ACM Transactions on Mathematical Software*, ASME, ASME 2005 International Design Engineering Technical Conferences, *Chemical Physics Letters*, *Computing in Science & Engineering,* Fifth ASME International Conference on Multibody Systems, Nonlinear Dynamics and Control, *IEEE Sensors Journal, IEEE Transactions on Computer Aided Design, IMA Journal of Numerical Analysis, International Journal of Fatigue*, *International Journal of Human-Computer Studies, Journal of Physics D: Applied Physics, International Journal of Plasticity*, International Symposium on Symbolic and Algebraic Computation, *Inverse Problems*, *Journal of the American Society for Mass Spectrometry,* Journal of Applied Physics, *Journal of Computational Physics, Journal of Computational Statistics, Journal of Computational and Applied Mathematics*, *Journal of Magnetism and Magnetic Materials,*

Journal of Physics B: Atomic, Molecular & Optical Physics, Mathematics of Computation, Numerical Algorithms, Numerische Mathematik, *Physical Review A*, *Physical Review B, Physical Review E*, *Physical Review Letters, Proceedings of the 2004 ASME International Mechanical Engineering Congress and RD&D Expo*, *Proceedings 5th ASME International Conference on Multibody Sytems, Nonlinear Dynamics and Control*, SIAM book series, *SIAM Journal on Dynamical Systems, SIAM Journal on Optimization*, *SIAM Journal of Scientific Computing*, *SIAM Journal on Optimization*, *Total Quality Management and Business Excellence*,

2. Staff members review proposals for the following research programs: ATP, DoE, NSF.

External Contacts

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

Industrial Organizations

Applied Research Associates
Asian Technology Information Program
Aspeed Software
Charlotte NC Visualization Center
DirecWay
Engineering Software Research & Development, Inc.
Fujitsu
General Dynamics Advanced Information Systems
General Electric Research Lab
IBM
Instituto de Optica (Spain)
Institute for Solid State Electronics (Germany)
Invensys
Mayo Foundation
Novatek Inc.
Paulsson Geophysical Services, Inc.
Pfizer Labs
PicoChip Designs Ltd.
Polyphonic Human Media Interface
Raytheon
Rationelle Software-Entwicklung
Rose Biophysics
Science Information Systems Co., Ltd. (Japan)
Setterholm, Inc.
SGI
Siemens
SIXNET
Southern Appalachian Science & Technology Center
Synelec Visual Systems
Tektronix, Inc.
Transform Software & Services, Inc.
UGS Corp.
Unique Broadband Systems, Inc.
Xilinx, Inc.

Government/Non-profit Organizations

IDA Center for Computing Sciences
Center for Human Genetics
Department of Energy
Institute for Defense Analyses
Lawrence Livermore National Laboratory
L'Institut d'Informatique et Mathématiques Appliquées de Grenoble
NASA
National Center for Supercomputing Applications
National Institutes of Health
Naval Surface Warfare Center
NSA
Oak Ridge National Laboratory
Ohio Supercomputing Center
Office of Science and Technology Policy
Sandia National Laboratory
U.S. Army Armament Research
U.S. Army Research Lab
U.S. Water Conservation Lab

Academic Institutions

American University
Brown University
Carnegie Mellon University
Delft University of Technology (The Netherlands)
Duke University
Dutchess Community College
Emory University
Florida State University
Georgetown University
George Washington University
Hong Kong Baptist University (China)
Hong Kong University of Science & Technology (China)
Konstanz University
Indian Institute of Technology (India)
Indiana University
Jackson State University
Johns Hopkins University
Masaryk Univeristy (Czech Republic)
McGill University (Canada)
Observatory of Paris
Osaka University
Penn State University
Princeton University
Queen's University (Canada)
Rochester University

Savannah College
Seoul National University (South Korea)
Siena College
Swedish Institute of Computer Science (Sweden)
Technical University of Eindhoven (The Netherlands)
Texas A&M University
T.U. Kaiserslautren (Germany)
T.U. Linz (Germany)
University of Connecticut
University of Copenhagen (Denmark)
University of Erlangen-Nurenberg (Germany)
University of Hyderabad (India)
University of Maryland Baltimore County
University of Maryland College Park
University of Minnesota
University of Montreal (Canada)
University of Pennsylvania
University of Sherbrook (Canada)
University of Southern Mississippi
University of Texas at Austin
University of Texas at Arlington
University of Texas at San Antonio
University of Wisconsin Madison
Uppsala University (Sweden)