

Lorie M. Liebrock, Assistant Professor  
Department of Computer Science, New Mexico Institute of Mining and Technology, Socorro, NM 87801  
US Citizen ([liebrock@cs.nmt.edu](mailto:liebrock@cs.nmt.edu))

Education:

- Ph. D. 1994, Computer Science, Rice University, Houston, TX; Advisors: Jack Dongarra & Ken Kennedy
- M.S. 1992, Rice University, Houston, TX
- M.S. 1988, Michigan Technological University, Houghton, MI
- B.S. 1985, Michigan Technological University, Houghton, MI

Professional Experience:

- 2002-: Assistant Professor, Department of Computer Science, New Mexico Institute of Mining and Technology
- 2000-2001: Assistant Professor, Department of Mathematical Science, University of Alaska, Fairbanks
- 2000-2001: Researcher, Arctic Region Supercomputing Center, University of Alaska, Fairbanks
- 1994-: Researcher, Liebrock-Hicks Research
- 1989-1994: Graduate Research Assistant, Computer Science, Rice University
- 1987-1988: Assistant to Director, Institute for the Application of Advanced Computing, Michigan Technological University (MTU)
- 1987, July: Engineer, Scientific Programming and Advanced Graphics Group, Idaho National Engineering Laboratories
- 1985-1987: Graduate Research/Teaching Assistant, Department of Computer Science, MTU
- 1985, July: Parallel Programmer, Outstanding Student Summer Program, Sandia National Laboratory, Abq.
- 1984-1991: Consultant, Advanced Computing Group and Free Electron Laser Group, KMS Fusion

Five Related Publications:

- “Mapping Nuclear Reactor Simulations onto Homogeneous and Heterogeneous Systems” *Mathematics and Computation, Reactor Physics and Environmental Analysis in Nuclear Reactor Applications*, Madrid, Spain, 1999.
- “Automatic Data Distribution for Composite Grid Applications”, with K. Kennedy, *Scientific Programming*, V6, N1, 95-113, 1997.
- “Parallelization of Linearized Applications in Fortran D”, *Proceedings of the International Parallel Processing Symposium*, 51-60, 1994.
- “A Hybrid Hypercube Algorithm for the Symmetric Tridiagonal Eigenvalue Problem”, with J.A. Jackson and L.R. Ziegler, *Proceedings of the Third Conference on Hypercube Concurrent Computers and Applications*, V2, 1988.
- “Parallel Algorithms for Computational Continuum Dynamics”, with J.F. McGrath and D.L. Hicks, *Applied Mathematics and Computation*, V20, N2, 145-173, 1986.

Other Significant Publications:

- “Lanczos’ Generalized Derivative: Insights and Applications”, with D.L. Hicks, *Applied Mathematics and Computation*, (112), 63-73, 2000.
- “SPH Hydrocodes can be Stabilized with Shape-Shifting”, with D.L. Hicks, *Computers and Mathematics with Applications*, V38, Issues 5-6, 1-16, 1999.
- “Automatic Data Distribution of Small Meshes in Coupled Grid Applications”, with K. Kennedy, *Concurrency Practice and Experience*, V 8, 581-615, 1996.
- “Answering von Neumann’s Conjecture on the Convergence of Averages and Analyzing the von Neumann-Richtmyer Scheme via a Material Averaging Method”, with D.L. Hicks, K.L. Kuttler, and C.E. Southwell, *Applied Mathematics and Computation*, V55, N2&3, 265-295, 1993.
- “Parallelization & Automatic Data Distribution for Nuclear Reactor Simulations”, *Proc. of the SIAM Conference on Parallel Processing for Scientific Computing*, 1997.

Recent Grants and Contracts:

- “Coordinated Information Technology and Assurance Development and Education Laboratory, CITADEL”, Scholarship for Service Grant, National Science Foundation, \$2,138,599, Funded May, 2003. Principal Investigator

- “AISTEA”, Capacity Building Grant, National Science Foundation, \$180,985, Funded May, 2003. Co-PI.
- “CITADEL: Capacity Building”, National Security Agency, \$144,448.36, Funded September, 2003. Co-PI.
- “Research Experience for Undergraduates: Automatic Data Distribution”, Research Grant, National Science Foundation’s Partnerships for Advanced Computational Infrastructure (PACI), \$6,000, Funded May, 2003. Principal Investigator
- “Automatic Data Distribution Toolkit for Galaxy Quest”, Research Grant, National Center for Supercomputing Applications, \$85,000, Funded December, 2002. Principal Investigator

#### Honors and Awards

- Patent: “Multiprocessor Parallel Computer Architecture Using a Parallel Machine with Topology-Based Mapping of Composite Grid Applications”, US Patent Serial No. 08/423483, 1995  
Selected as a biographical candidate for Strathmore’s Who’s Who, Who’s Who in the Midwest, and Who’s Who in Science and Engineering, National Register’s Who’s Who in Executives and Professionals, Academic Key’s Who’s Who in Sciences Higher Education
- Outstanding Student Summer Program, Sandia National Laboratory, Albuquerque, 1985

#### Synergistic Activities

- Galaxy Quest Expedition Co-Lead: to develop community cosmology codes. This includes the dissemination of an automatic data distribution system for composite grid applications.
- Co-developed colloquium series: Mathematical Modelling, Computational Science, and Supercomputing, Arctic Region Supercomputing Center & Department of Mathematical Sciences, University of Alaska Fairbanks.
- Arranged inclusion of New Mexico Tech for recruiting to Alaska Research Computing Challenge program for minority undergraduates.

#### Recent Professional Activities

- Member of Academic Computing Machinery (ACM)
- Member of Institute of Electrical and Electronics Engineers (IEEE)
- Member of IEEE Computer Society
- Member of American Nuclear Society (ANS)
- Member of Sigma XI
- Reviewer: Computing Reviews.

#### Collaborators in the Last Four Years

- Brody, Bill (Arctic Region Supercomputing Center, University of Alaska, Fairbanks)
- Clauson, Horst (Computer Science, New Mexico Institute of Mining and Technology)
- Hartman, Chris (Department of Mathematical Sciences, University of Alaska, Fairbanks)
- Hicks, Darrell (Liebrock-Hicks Research)
- Knoke, Pete (Department of Mathematical Sciences, University of Alaska, Fairbanks)
- Mahaffey, John (Dept. of Mechanical & Nuclear Engineering, Pennsylvania State Univ.)
- Rubin, Mike (Nuclear Regulatory Commission)
- Schaffer, Steve (Mathematical Science, New Mexico Institute of Mining and Technology)
- Soliman, Hamdy (Computer Science, New Mexico Institute of Mining and Technology)
- Sung, Andrew (Computer Science, New Mexico Institute of Mining and Technology)
- Teller, Pat (University of Texas, El Paso)
- Wheeler, Mary (University of Texas, Houston)

M.S. Committees: Mike Coyner (UAF), Jinlan Tomasic (UAF)

M.S. Advisor (NMT): Ramesh Naidu Ande, Stephen K. Hess (2003), Aishwarya Kalyanasundaram (2003), Radhadrishna Reddy Mudhiganti (2003), Yuan Ye, Kalyan Bondili, Heather Bitsoi, Steven Sones, Harley Kozushko, Sailaja Mummidi (2003)

Ph.D. Advisor (NMT): Sue Goudy, Naishing Key