Kris Stewart

Education Center on Computational Science and Engineering (NPACI/CSU)
San Diego State University (SDSU), San Diego, CA 92182-8050

EDUCATION

1981-1987, University of New Mexico, Ph.D., Applied Mathematics
1976-1979, San Diego State University, MS, Computer Science
1969-1973, University of California, San Diego, BS, Mathematics

PROFESSIONAL EXPERIENCE

1997-present, Director, NPACI Education Center on Computational Science and Engineering, SDSU
1999-present, Professor, Computer Science Department, SDSU
1991-1999, Associate Professor, Computer Science Division, Mathematical & Computer Sciences Department, SDSU
1984-1991, Assistant Professor, Dept. Mathematical Sciences, SDSU
1982-1984, Lecturer, Numerical Analysis, Mathematical Sciences Department, SDSU
1979-1981, Programming Analyst, Jet Propulsion Laboratory, Numerical Mathematics Group, Pasadena, CA

AWARDS AND HONORS

- Spring 2002, TRW Excellence in Teaching Award for Computer Science
- Spring 2001, Distinguished Computer Science Faculty Recognition, SDSU Commencement.
- June 1996, Computerworld/Smithsonian Recognition Medal for "Supercomputer Teacher Enhancement Program (STEP)." Stewart received the medal due to her leadership of and curriculum development for the program from the Smithsonian Museum, Washington, DC. STEP is part of the permanent research collection of the American History Museum.
- September 1994, Undergraduate Computational Science Award, Department of Energy, Ames Laboratory, to Stewart for "Developing Undergraduate Computational Science, A Personal QUEST." Ceremony Washington, DC, September 1994.
- San Diego Science Educators' Association award to Stewart for Outstanding Contributions to Science Education, University Level, 1994.

PUBLICATIONS

- Turner, P. R., Cunningham, S., Phillips, A. T., Shiflet, A. B., Stewart, K., and Vakalis, I. (2002) Undergraduate Computational Science and Engineering: Programs and Courses. ACM SIGCSE Northern Kentucky. New York City, NY, 96-97.
- Stewart, K. and Zaslavsky, I., "Building the Infrastructure for High Performance Computing in Undergraduate Curricula: Ten Grand Challenges and the response of the NPACI Education Center," IEEE/ACM SC98 Conference, Orlando FL, November 1998.[1]
- Stewart, K. and Bowers, J. "STEP: A Case Study on Building a Bridge between HPC Technologies and the Secondary Classroom," IEEE/ACM SC97 Education Program, San Jose, CA, November 1997.[2]
- Stewart, K., "HPC Undergraduate Curriculum Development at SDSU Using SDSC Resources," IEEE/ACM Supercomputing '95 Conference, San Diego, December 1995.[3]
- Geveci, T., and Stewart, K., "Numerical Experiments with a Nonlinear Evolution Equation which Exhibits Blow-up," *Applied Numerical Mathematics*, 10, pp. 139-147, 1992.
- Stewart, K., "A Model for Stability of the Semi-implicit Backward Differentiation Formulas," J. Computational and Applied Mathematics, 33, pp. 245-259, November 1990.
- Stewart, K., "Avoiding Stability-induced Inefficiencies in BDF Methods," *Journal of Computational and Applied Mathematics, 29,* pp 357-367, 1990.

OTHER RECENT INVITED/REFEREED PRESENTATIONS

- "Assessment of Change in Student Learning within Computational Science," and "Computational Science Imperative in Undergraduate Curricula," SIAM 2000 Conference, Washington, DC, September 2000.
- "Using IT in Formal Education," an invited presentation to PITAC's "Transforming Learning Workshop," July 17, 2000. PITAC is the President's Information Technology Advisory Committee, part of the National Coordination Office for Information Technology Research and Development (NCO/IT R&D).
- Stewart, K. and Zaslavsky, I., "High-Performance Computing Technologies, and Pre-Service Teacher Preparation: Is There an Overlap?" SITE 2000 Conference, San Diego, CA, February 2000.

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[1] http://www.supercomp.org/sc98/TechPapers/sc98_FullAbstracts/Stewart1310/index.htm IEEE/ACM home page with SC98 conference proceedings
[2] http://www.supercomp.org/sc97/proceedings/EDU/STEWART/INDEX.HTM IEEE/ACM home page with SC97 conference proceedings
[3] http://www.supercomp.org/sc95/proceedings/704_KSTE/SC95.HTM IEEE/ACM home page with SC95 conference proceedings

- Zachary, J.L., Miller, P., Stewart, K., Sutner, K., Panel on "Exploiting Computer Algebra Systems in Computer Science Courses," at ACM SIG/Computer Science Education, San Jose, CA, February 28, 1997. Stewart's contribution: "Computational Programming and Visualization with MATLAB Compute Environment."
- Stewart, K. and Zaslavsky, I., "High-Performance Computing in Undergraduate Education: Computers are not Enough," Cause98: The Networked Academy (Educause Conference on Information Technology in Higher Education) Seattle, WA, December 1998.
- Baker, K., Stewart, K., and Zaslavsky, I., "Lecturing over the Web: Pedagogical and Technical Challenges,"[4] Cause98: The Networked Academy (Educause Conference on Information Technology in Higher Education) Seattle, WA, December 1998.
- "Education Issues in Scientific Computing," Minisymposium organized and moderated by K. Stewart, International Conference on Scientific Computation and Differential Equations, Stanford University, March 1995. Panel participants: Charles Swanson, Cray Research Inc.; Richard C. Allen, Sandia National Laboratories, Albuquerque; Dan Sulzbach, Genentech Corporation; Gary Johnson, George Mason University; Tom Marchioro, Ames Laboratory.[5]
- "An Ad Hoc Approach to Undergraduate Curriculum Development in Computational Science," DOE High Performance Computing Education Conference, Albuquerque, NM, February 1994.[6]
- Undergraduate Education Panel, Co-organizer (with Joan Francioni) DOE High Performance Computing Education Conference, Albuquerque, NM, February 1994 (see IEEE Computational Science & Engineering Journal, Summer 1994, pp. 76-77 for review under "University Programs").

FUNDED RESEARCH GRANTS

"Education Center for Computational Science and Engineering," part of the National Partnerships for Advanced Computing Infrastructure (NPACI),[7] for NSF High Performance (Supercomputer) Centers. Beginning October 1, 1997, Stewart is the director of the Center which will build the infrastructure transferring interactive technologies and education activities of the NPACI partnership so that faculty can incorporate these tools of discovery in their undergraduate curricula.[8]

"Supercomputer Teacher Enhancement Projects (STEP)", NSF/EHR Research Grant with Don Anderson (PI), UCSD Extension and SDSC, 1993-96. Provided full time support Spring 1993 and Summer Salary 1993-96 to perform duties as Program Coordinator.

"Undergraduate Curriculum Development in Advanced Computing," NSF/DASC Research Grant with Dan Sulzbach (PI), San Diego Supercomputer Center, 1990-93.

ACADEMIC SERVICE

- Advisory Board for NSF funded "National Computational Science Leadership Program," SC2001, Denver, CO, Nov 2001.[9]
- Advisory Board for NSF funded "Computational Science Across the Curriculum," Capital University, Columbus OH, 1998-present.
- Association for Computing Machinery, SDSU Student Chapter Faculty Sponsor.
- Editorial Board for *SIAM Review* – Education Section, July 1996 – present.

Participation in Professional Associations:

- Member, Association for Computing Machinery (ACM), since 1979.
- Member, Society for Industrial and Applied Mathematics (SIAM), since 1980.
- Member, Institute of Electrical and Electronics Engineers (IEEE), since 1989.
- Member, Association for Women in Mathematics (AWM), since 1990.

COLLABORATORS

Dr. Janet Bowers	Dr. Ilya Zaslavsky	Dr. Roscoe Giles
Math & Computer Sci Dept, SDSU	San Diego Supercomputer Center	Boston University

DISSERTATION ADVISOR

Professor L.F. Shampine, now with Southern Methodist University. Dissertation: "Semi-Implicit Backward Differentiation Formulas," University of New Mexico, Albuquerque, New Mexico, 1989.

Graduate Students Supervised (Masters Degree)

Cecilia Curlango, "Performance Evaluation of the UABC Beowulf Cluster and the CICESE2000," 2002.
Jayne Keller, "Investigations in Parallel ODE Solvers," 1998.

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[4] http://www.educause.edu/asp/conf/function.asp?PRODUCT_CODE=C98/PS42&MEETING=c98 Educom/Cause 98 "The Networked Academy" conference home page"
[5] http://www.stewart.cs.sdsu.edu/scicade/
[6] http://www.stewart.cs.sdsu.edu/hpced/
[7] http://www.npaci.edu/
[8] http://www.edcenter.sdsu.edu
[9] http://www.ecu.edu/si/te/sc2001

M. Fergeson, “Investigation of a Parallel Cyclic Reduction Implementation for Positive Definite Tridiagonal Matrices,” 1995.
Brons Larson, “Test Problem to Compare the Performance of Numerical Solvers for Hamiltonian Equations,” 1993.
Robert Morris, “Using Broyden’s Logorithm to Generate Preconditioners,” 1993.
Eric Reichelt, “Implementing FORTRAN ODE Solver LSODE using MATLAB,” 1993.
Eric Haas, “Investigations of Prony Methods to Enhance Stability of the Backward Differentiation Formula,” 1993.