

Education

Harvard University, September 1978 – June 1984: M.S. in Applied Mathematics (June 1979), Ph.D. in Applied Mathematics (June 1984)

Princeton University, September 1974 – June 1978: B.S.E., *summa cum laude*, in Aerospace and Mechanical Sciences (June 1978), Certificate, Program in Engineering Physics (June 1978)

Major Appointments

KAUST, August 2009 – present: Founding Dean, Division of Mathematical and Computer Sciences and Engineering

Columbia University, July 2003 – present: Fu Foundation Professor of Applied Mathematics, Department of Applied Physics and Applied Mathematics

Old Dominion University, August 1993 – July 2003: Director, Center for Computational Science (September 2001 – July 2003), Chair, Department of Mathematics & Statistics (July 1999 – June 2001), Richard F. Barry Professor, Department of Mathematics & Statistics (July 1999 – July 2003), Adjunct Professor of Computer Science (July 1999 – present), Associate Professor of Computer Science (July 1993 – June 1999)

NASA-Langley Research Center, August 1993 – December 2002: Associate Research Fellow, Institute for Computer Applications in Science and Engineering (ICASE)

Yale University, August 1984 – June 1994: Associate Professor of Mechanical Engineering (July 1990 – June 1994), Assistant Professor of Mechanical Engineering (January 1986 – June 1990), Research Associate, Research Center for Scientific Computation (August 1984 – December 1985)

Selected Part-time Appointments

Lawrence Livermore National Lab, November 1997 – April 2009: Acting Director (June 1999 – September 2008) and Strategic Partner, Institute for Scientific Computing Research (ISCR)

Brookhaven National Lab, October 2003 – present: Faculty Affiliate

Oak Ridge National Lab, October 2003 – September 2008: Distinguished Visiting Scientist

Argonne National Lab, July 1997 – present: Faculty Research Participant

NASA-Langley, June 1986 – August 1993: Consultant, Institute for Computer Applications in Science and Engineering (ICASE)

Five Representative Technical Publications

Implicit Symmetrized Streamfunction Formulation of Magnetohydrodynamics, K. S. Kang & D. E. Keyes, 2008, Int. J. Numer. Meths. Fluids **58**:1201-1222.

Reconstructing Parameters of the Fitzhugh-Nagumo System from Boundary Potential Measurements, Y. He & D. E. Keyes, 2007, J. Comput. Neurosciences **23**:251–264.

Implicit Solvers for Large-scale Nonlinear Problems, D. E. Keyes, D. R. Reynolds & C. S. Woodward, 2006, J. Phys.: Conf. Ser. **46**: 433–442.

Jacobian-Free Newton-Krylov Methods: A Survey of Approaches and Applications, D. A. Knoll & D. E. Keyes, 2004, J. Comp. Phys., **193**:357–397.

High Performance Parallel Implicit CFD, W. D. Gropp, D. K. Kaushik, D. E. Keyes & B. F. Smith, 2001, Parallel Computing **27**:337–362.

Five Representative Programmatic Publications

Fusion Simulation Project Workshop Report, A. Kritz & D. E. Keyes, 2009, *J. Fusion Energy* **28**:1-59.

Petaflops Opportunities for the NASA Fundamental Aeronautics Program, D. J. Mavriplis, D. Darmofal, D. Keyes, and M. Turner, AIAA Paper 2007-4084, 2007, AIAA, Washington, DC.

Real-Time PDE-Constrained Optimization, L. Biegler, O. Ghattas, M. Heinkenschloss, D. Keyes, and B. van Bloemen Waanders, eds., 2007, SIAM, Philadelphia.

Simulation-based Engineering Science, J. T. Oden, T. Belytschko, J. Fish, T. J. R. Hughes, C. Johnson, D. Keyes, A. Laub, L. Petzold, D. Srolovitz, S. Yip, 2006, National Science Foundation
http://www.nsf.gov/pubs/reports/sbes_final_report.pdf.

A Science-based Case for Large-scale Simulation, D. E. Keyes, editor-in-chief, 2003 (Volume 1) and 2004 (Volume 2), U.S. Department of Energy, <http://www.pnl.gov/scales>.

Synergistic Activities

lead 9-institution “Towards Optimal Petascale Simulations” (TOPS) SciDAC project to develop scalable solver software in collaboration with DOE-funded applications in accelerator design, astrophysics, combustion, fusion energy, quantum chromodynamics, and subsurface flow, since 2001

directed the Institute for Scientific Computing Research (ISCR) at Lawrence Livermore National Laboratory, fostering academic collaborations for LLNL’s Computation Directorate, 1999–2008

Vice President-at-Large for SIAM, 2006–2009; member of Council, 2000–2005; Visiting Lecturer, 1992–present

member of Advisory Committee, Mathematics and Physical Sciences Directorate (MPSAC), National Science Foundation, since 2006

member of Advisory Committee, Office of Cyberinfrastructure (ACCI), National Science Foundation, effective January 2008

member of Technical Advisory Group, Networking and Information Technology, Presidential Council of Advisors on Science and Technology (PCAST), since 2006

lead advisory board for DOE’s Computational Science Graduate Fellowship (CSGF) program, since 2004

taught short courses for DoD Modernization Program, SIAM, Supercomputing, Europar, Domain Decomposition, DOE CSGF, and other conferences

organized/co-organized programs for Parallel CFD, Domain Decomposition, Supercomputing, SIAM Parallel Processing, SIAM Computational Science & Engineering, and various one-time meetings

edit or serve on editorial board for six journals or book series

editor/co-editor of fourteen conference proceedings volumes

delivered over 300 invited presentations in over 25 countries and over 35 states of the USA

served on program development panels and program review panels for NSF, DOE, and DoD

Relevant Awards

Sidney Fernbach Award, IEEE Computer Society, 2007

Gordon Bell Prize, special category, ACM, 1999