

W. Roger Briley

Education

PhD, Mechanical Engineering, University of Texas at Austin, 1968

MS, Mechanical Engineering, University of Texas at Austin, 1967

BS, Mechanical Engineering, Louisiana Tech University, summa cum laude, 1965

Appointments

Professor, Graduate School of Computational Engineering, University of Tennessee at Chattanooga, 2002-Present

Professor, Department of Mechanical Engineering, and NSF/ERC for Computational Field Simulation, Mississippi State University, 1991-2002

Co-Founder, Vice-President and Senior Research Scientist, Scientific Research Associates, Inc., Glastonbury, Connecticut, 1977-1991

Supervisor, Theoretical Gas Dynamics Group, United Technologies Research Center, East Hartford, Connecticut, 1974-1977

Research Engineer, Theoretical Gas Dynamics Group, United Technologies Research Center, East Hartford, Connecticut, 1968-1974

Research Engineer, Shell Development Company, Houston, Texas, Summer 1966

Research Interests

Computational Fluid Dynamics, Field Simulation Algorithms, Parallel Computing, Viscous Flow and Heat Transfer

Advisory Boards

Engineering and Science Foundation Director, Louisiana Tech University (1999-2002) External Advisory Council for Mechanical and Industrial Engineering, Louisiana Tech University (1990-1996) Consultant for the Chief of Naval Research (1998-2002) NSF Engineering Research Center for Computational Field Simulation, Mississippi State University: Co-Principal Investigator, Research Council, Thrust Leader for Solution Algorithms, Computational Engineering Education Board (1991-2002)

Selected Publications

1. Briley, W. R.: An Introduction to Cartesian Tensors from a Computational Perspective, UTC-CECS-SimCenter Report 2012-01, 2012.
2. Briley, W. R. and H. McDonald: Reflections on the Evolution of Implicit Navier–Stokes Algorithms. *Computers and Fluids*, **41**(1):15-19, 2011.
3. Hyams, D.G., Sreenivas, K., Pankajakshan, R., Nichols, D.S., Briley, W.R., and Whitfield, D.L., "Computational Simulation of Model and Full Scale Class 8 Trucks with Drag Reduction Devices. *Computers & Fluids*, **41**(1):27-40, 2011.
4. Sivakumar, P., Hyams, D. G., Taylor, L.K., and W. R. Briley: A Primitive-Variable Riemann Method for Solution of the Shallow-Water Equations with Wetting and Drying. *Journal of Computational Physics*, **228**(19):7452-7472, 2009.
5. K. Sreenivas, L. Taylor, and R. Briley, "A Global Preconditioner for Viscous Flow Simulations at All Mach Numbers," AIAA-2006-3852, June 2006.
6. Sreenivas, K., Hyams, D. G., Nichols, D. S., Mitchell, B., Taylor, L. K., Briley, W. R., and Whitfield, D. L., "Development of an Unstructured Parallel Flow Solver for Arbitrary Mach Numbers," AIAA Paper No. 20050325, 43rd Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2005.

7. Taylor, L. K., Pankajakshan, R., Briley, W. R., and Whitfield, D. L., "Scalable Parallel Implicit Algorithm for Advanced Turbulence Closures," AIAA Paper No. 2005-0876, 43rd Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2005.
8. Briley, W. R., Taylor, L. K., and D. L. Whitfield: High-Resolution Viscous Flow Simulations at Arbitrary Mach Number. *Journal of Computational Physics*, **184**(1):79-105, 2003.
9. Lambert, B. K., Taylor, L. K., and W. R. Briley, Evaluation of a Preconditioned Flow Solver for a Broad Range of Mach Number and Temperature Ratio. Numerical Simulation of Incompressible Flows, M. M. Hafez, Ed., River Edge, NJ: World Scientific Publishing Co., 2003, pp. 605-621.
10. Pankajakshan, R., Taylor, L. K., Briley, W. R., and Whitfield, D. L., "Arbitrary Mach Number Flow Simulations," AIAA Paper No. 2003-1236, 41st Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2003.
11. Pankajakshan, R., Taylor, L. K., Sheng, C., Briley, W. R., and D. L. Whitfield: Scalable Parallel Implicit Multigrid Solution of Unsteady Incompressible Flows. Frontiers of Computational Fluid Dynamics 2002, Edited by D. A. Caughey and M. M. Hafez, World Scientific Publishing Company PTE. LTD., Singapore, pp. 181-195, 2002.
12. W. R. Briley, Keynote Address: Computational Fluid Dynamics and Computational Engineering Education. Forum on Advances in Fluids Engineering Education, FEDSM2002-31378, ASME Joint U.S.-European Fluids Engineering Division Summer Meeting, Montreal, Canada, July 2002.
13. Pankajakshan, R., Remotigue, M. G., Taylor, L. K., Jiang, M., Briley, W. R., and D. L. Whitfield: Validation of Control-Surface Induced Submarine Maneuvering Simulations Using UNCLE. 24th Symposium on Naval Hydrodynamics, Fukuoka, Japan, July 8-13, 2002.
14. Briley, W. R. and H. McDonald: An Overview and Generalization of Implicit Navier-Stokes Algorithms and Approximate Factorization. *Journal of Computers and Fluids*, **30**:807-828, 2001.
15. Chen, J. P., and W. R. Briley: A Parallel Flow Solver for Unsteady Multiple Blade Row Turbomachinery Simulations. ASME Paper 2001-GT-0348, presented at ASME TURBO EXPO 2001, New Orleans, LA, June 2001.
16. Sreenivas, K., Hyams, D. G., Mitchell, B., Taylor, L. K., Briley, W. R., and D. L. Whitfield: Physics-Based Simulations of Reynolds Number Effects in Vortex Intensive Incompressible Flows. Symposium of Advanced Flow Management, Applied Vehicle Technology Panel Meeting, Norway, May 2001.
17. Hyams, D. G., Sreenivas, K., Sheng, C., Briley, W. R., Marcum, D.L., and D. L. Whitfield: An Investigation of Parallel Implicit Solution Algorithms for Incompressible Flows on Multielement Unstructured Topologies. *AIAA Paper 2000-0271*, 38th Aerospace Sciences Meeting, Reno, NV. 2000.
18. Briley, W. R., and B. K Hodge: A CFD Project Combining Solution Algorithms, Software Development/Validation and Viscous Flow Calculations. *Computer Applications in Engineering Education*, **5**(3): 161-168, 1997.
19. Briley, W. R., S. S. Neerarambam and D. L. Whitfield: Implicit Lower-Upper/ Approximate-Factorization Algorithms for Incompressible Flows. *Journal of Computational Physics*, **128**: 32-42, 1996.
20. Pankajakshan, R. and W. R. Briley: Parallel Solution of Viscous Incompressible Flow on Multi-Block Structured Grids Using MPI. Parallel Computational Fluid Dynamics - Implementations and Results Using Parallel Computers, Edited by S. Taylor, A. Ecer, J. Periaux, and N. Satofuca, Elsevier Science, B. V., Amsterdam, pp. 601-608, 1996.
21. R. Pankajakshan and W. R. Briley: Parallel Solution of Viscous Incompressible Flow on Multi-Block Structured Grids Using MPI. Presented at Parallel CFD '95, California Institute of Technology, June 26-29, 1995.
22. Govindan, T. R., W. R. Briley, and H. McDonald: General Three-Dimensional Viscous Primary/Secondary Flow Analysis. *AIAA Journal*, **29**(3): 361-390, 1991.
23. N.-S. Liu, F. Davoudzadeh, W. R. Briley and S. J. Shamroth: Navier-Stokes Simulation of Transonic Blade-Vortex Interactions, *Journal of Fluids Engineering*, **112**: 501-509, 1990.
24. W. R. Briley and H. McDonald: Three Dimensional Viscous Flows with Large Secondary Velocity. *Journal of Fluid Mechanics*, **144**: 47-77, 1984.
25. S. J. Shamroth, H. McDonald and W. R. Briley: Prediction of Cascade Flow Fields Using the Averaged Navier Stokes Equations. *Journal of Engineering for Gas Turbines and Power*, **106**: 383-390, 1984.
26. J. P. Kreskovsky, W. R. Briley and H. McDonald: Investigation of Mixing in a Turbofan Exhaust Duct, Part I: Analysis and Computational Procedure. *AIAA Journal*, **22**(3): 374-382, 1984.
27. W. R. Briley, H. McDonald and S. J. Shamroth: A Low Mach Number Euler Formulation and Application to Time Iterative LBI Schemes. *AIAA Journal*, **21**(10): 1467-1469, 1983.
28. W. R. Briley and H. McDonald: On the Structure and Use of Linearized Block Implicit and Related Schemes. *Journal of Computational Physics*, **34**: 54, 1980.
29. W. R. Briley and H. McDonald: Solution of the Multidimensional Compressible Navier Stokes Equations by a Generalized Implicit Method. *Journal of Computational Physics*, **24**(4): 372-397, 1977.
30. J. P. Kreskovsky, S. J. Shamroth and W. R. Briley: A Numerical Study of the Unsteady Leading Edge Separation Bubble on an Oscillating Airfoil. *Computer Methods in Applied Mechanics and Engineering*, **11**: 39-56, 1977.

31. H. McDonald and W. R. Briley: Three Dimensional Supersonic Flow of a Viscous or Inviscid Gas. *Journal of Computational Physics*, **19**(2): 150-178, 1975.
32. W. R. Briley and H. McDonald: Numerical Prediction of Incompressible Separation Bubbles. *Journal of Fluid Mechanics*, **69**(4): 631-656, 1975.
33. W. R. Briley: A Numerical Method for Predicting Three Dimensional Viscous Flows in Ducts. *Journal of Computational Physics*, **14**(1): 8-28, 1974.
34. W. R. Briley: A Numerical Study of Laminar Separation Bubbles Using the Navier Stokes Equations. *Journal of Fluid Mechanics*, **47**(4): 713-736, 1971.
35. W. R. Briley and H. A. Walls: Numerical Study of Time Dependent Rotating Flow in a Cylindrical Container at Low and Moderate Reynolds Numbers. *Proceedings, 2nd International Conference on Numerical Methods in Fluid Dynamics* (Univ. California, Berkeley), Springer Verlag, New York, 1971, pp. 377-384.

Professional Affiliations

Associate Fellow, American Institute of Aeronautics and Astronautics American Society of Mechanical Engineers American Society for Engineering Education

University Service

Primary Author, PhD Proposal for Computational Engineering (UTC, 2002-2003) Program Coordinator for Computational Engineering (UTC, 2002-2005) Project Leader for two Grand Challenge Projects (Department of Defense High Performance Computing Modernization Office (1997-2002)

Graduate Students: Major Professor for 7 PhD and 4 MS graduates (1993-present)

PhD - Mechanical Engineering

Daniel G. Hyams, 2000 (UTC SimCenter)

PhD - Computational Engineering

Ramesh Pankajakshan, 1998 (UTC SimCenter) Shyam S. Neerarambam, 1998 (Rolls Royce) Kelly P. Gaither, 2000 (U Texas Austin) Brian K. Lambert, 2004 (Boeing) Pradeep Sivakumar, 2006 (Northwestern U) Zain Dweik, 2007 (General Electric Engines)

MS - Mechanical Engineering

Andrew W. Coleman, 1997

MS - Computational Engineering

Jennifer L. Boyd, 1993; Shyam S. Neerarambam, 1993; Brian K. Lambert, 2001

Dissertation Advisor: Hugh A. Walls, University of Texas at Austin