Gordon Erlebacher

Curriculum Vitae
April 2006

• Department of Mathematics • School of Computational Science & Information Technology
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Personal

- Date of birth: March 7, 1957

- Place of birth: New York, NY

- Citizenship: American

Education

- 1974–1978:   B.Sc., Free University of Brussels, Belgium

- 1979:   M.Sc., Free University of Brussels, Belgium

- 1979–1983:   Ph.D., Columbia University, New York, NY

Experience

- 1983-1989:   Research Scientist
                             NASA Langley Research Center
                             Hampton, VA

- 1989-1994:   Senior staff scientist
                             Institute for Computer Applications in Science and Engineering
                             Hampton, VA

- 1995-1996:   Research Fellow
                             Institute for Computer Applications in Science & Engineering
                             Hampton, VA

- Aug. 1996–Summer 2000:   Associate Professor (Full Professor, Summer 2000)
                             Department of Mathematics
                             Florida State University
                             Tallahassee, FL

- Spring 2000–Present: Professor
                             Department of Computer Science, Courtesy Appointment
                             Florida State University
                             Tallahassee, FL

- Aug. 1996–Nov. 1999:   Affiliated Faculty
  Program in Computational Science & Engineering
  Florida State University
  Tallahassee, FL

- Aug. 1999–2005:   Affiliated Faculty
  School of Computational Science & Information Technology
  Florida State University
  Tallahassee, FL

- Aug. 2005–2006:   Faculty
  School of Computational Science
  Florida State University
  Tallahassee, FL

- Aug. 2006–present: Director Visualization Laboratory
  School of Computational Science
  Florida State University
  Tallahassee, FL

Awards

- 1985: NASA Special Achievement Award *for pioneering effective use of the Numerical Aerodynamics Simulator for Langley Research Center*

- 1988: NASA Group Achievement Award as a member of the 8-Foot High-Temperature Tunnel Nozzle Design Team *for Highly innovative, critical synthesis, and application of design and analysis procedures resulting in nozzle designs which will produce extremely high-quality flow at Mach 4, 5, and 7.*

- 1989: NASA Group Achievement Award as a member of the Hypersonic Boundary-Layer Transition Team *for Significantly enhancing understanding of hypersonic transition flow physics and for developing and demonstrating hypersonic transition boundary-layer prediction capability for design of hypersonic airbreathing vehicles, in particular, the National Aero-Space Plane.*

- 1993: NASA Achievement Award for work on Parallelization of Transition code on Flex-32.

- 1994: ICASE Fluid Mechanics Group Achievement Award presented by NASA Langley Research Center for "development of important insights into basic fluid mechanical phenomena and theoretical analysis tools which have contributed to major advances in flow prediction and control including laminar flow control basic fluid mechanical phenomena.

- 1996: ICASE Milton E. Rose Research Fellow Award.

Professional Societies

- Member of the American Physical Society (APS).

- Senior member of American Institute of Aeronautics & Astronautics (AIAA).

- Member of the Society of Industrial and Applied Mathematics (SIAM).

- Member of the IEEE Computer Society.

- Member of the the Americal Geophysical Society (AGU)

Academic/Teaching Experience

- 1993:   Invited speaker at the ICASE/LaRC Shortcourse on Transition to Turbulence.
- Spring 1997:   Scientific Visualization (new course)
- Fall 1997:   Grid Generation (new course for CSE)
- Spring 1998:   Scientific Visualization (new course for CSE)
- Fall 1998:   Numerical Methods I
- Spring 1999:   Numerical Methods II
- Fall 1999:   High Performance Scientific Visualization
- Fall 1999:   Numerical Methods I
- Fall 1999:   Numerical Methods I
- Spring 2000:   Numerical Methods II
- Fall 2000:   Scientific Visualization (CSIT course)
- Fall 2000:   Numerical Methods I
- Spring 2001:   Grid Generation (CSIT course)
- Fall 2001:   Numerical PDE Methods I
- Spring 2002:   Calculus II (35 students)
- Spring 2002:   Programming Tools Seminar (not for credit)
- Fall 2002:   Calculus I (36 students)
- Fall 2002:   Geometric Algebra (DIS, 2 students)
- Spring 2002:   Calculus I (33 students)
- Spring 2003:   Feature Extraction (CSIT course, 5 students)
- Fall 2003:   Sabbatical (no teaching)
- Spring 2004:   Sabbatical in Puebla, MX. Taught Scientific Visualization (1 student) and Scien

Matlab (6 students) and Scientific Visualization (1 student) at the University de las Americas in Puebla, MX.
- Spring 2005: Calculus I (30 students)
- Spring 2005: Numerical methods II (1 student, given as DIS)
- Fall 2005: Scientific Computing (SCS course, 12 students)
- Spring 2006: Calculus I (20 students)   • Fall 2006: Scientific Programming (15 students)   • Spring 200

Consultant Activities

- 1989: Consultant to High Technology Corporation, Hampton, VA to offer expertise on transition, turbulence, computer graphics and computational techniques.

- 1993-1996: Consultant to Vigyan Corporation, Hampton, VA to help develop interactive graphics software for 1-D and 2-D plotting.

Service Activities at FSU

Past Committees

1. Examination committee member for Mr. Gang Ryung Uh, (Received Ph.D. in 1998), chair Professor David Whalley, Department of Computer Science, FSU.

2. Examination committee member for Jichuan Li, (received Ph.D. in 1998), chair Professor Michael Navon, Department of Mathematics, FSU.

3. Examination committee member for Ms. Ky Duyen Nguyen, (Failed prospectus exam, 1998), chair Professor Chris Lacher, Department of Computer Science, FSU.

4. Examination committee member for Mr. Greg Rebholz, (received Master in CS in 2000), chair Kyle Gallivan, Department of Computer Science, FSU.

5. Examination committee member for Xiang Rao, (received Master in CS in Spring 2000), chair Professor Kyle Gallivan, Program in Computational Science & Engineering, FSU.

6. Examination committee member for Zhong Ding, (Ph.D. candidate), chair Professor Yousuff Hussaini, Program in Computational Science & Engineering, FSU. He received his Ph.D Jan. 2001.

7. Examination committee member for Andrea Mask, (Ph.D. candidate), chair Professor Jim O'Brien, Department of Oceanography, FSU. She received her Ph.D. 2002.

8. Department of Mathematics, Florida State University: Faculty recruiting committee, (Fall 1998-Spring 1999).

9. Program in Computational Science & Engineering: Curriculum Committee member, (Summer 1996-Fall 2000).

10. Department of Mathematics, Florida State University: committee for the development of a curriculum for a Professional Masters degree in Industrial Mathematics, (Spring 1999-Spring 2000).

11. School of Computational Science & Information Technology: served on the acquisition committee for a Terascale Computer facility, (Spring 2000).

12. School of Computational Science & Information Technology: Curriculum Committee member, (Fall 1999–2000).

13. Department of Mathematics, Florida State University: Graduate Student Recruitment committee and Financial aid Committee (Fall 1996 – 2000).

14. CSIT, several faculty recruitment committees (climate, geology).

15. Member of the Terascale computer acquisition committee. The first installement of the supercomputer was acquired Summer 2000.

16. Department of Mathematics, Florida State University: equipment committee (Fall 1996-2000).

17. Program in Computational Science & Engineering, Florida State University: curriculum committee, (Fall 1996-Winter 1999).

18. Responsible for setting up benchmarks for the Teraflop CSIT supercomputer.

19. Examination committee Member of Ph.D committee for Mark Loizeaux. Chair Professor Ian W. McKeague Department of Statistics, FSU. He received Ph.D, 2001.

20. Member of Ph.D. committee for Nikolai Pastouchenko. Chair Professor Christopher Tam, Department of Mathematics, FSU. He received Ph.D., 2001.

21. Pursued possible interaction (through faculty and student exchange and the development of a master's program modeled on the one in our department) between the department of Applied Mathematics at the Universidad de las Americas, Puebla (through Dr. Garrett Sobcyzk) and the Mathematics Department at Florida State University through the Training Internships, Education and Scholarship (TIES) partnership.

22. Help evaluate MapleTA, a web-based grading system based on Maple. Used MapleTA in my Calculus I class.

23. Member of the LSC (Local Scientific Computing) committee. This committee Supervises the deployment of CSIT is tasked with the overseeing of all computer-related activities at CSIT and the establishment of procedures relating to equipment purchase, equipment distribution, etc.

24. Co-Director of the Visualization Laboratory until Spring 2004.

25. Member of search committee for a researcher in climate.

26. Interviews with range of CSIT candidates for geosciences, mathematics, economics, climate.

27. Member of Supercomputer User Group, chair: Professor OBrien.

28. Member of search committee for a researcher in climate (Fall 2002)

29. Interviews with range of CSIT candidates for geosciences, mathematics, economics, climate.

30. Member of SCS Web committee (2004-2005)

31. Member of climate search committee for CSIT (2004).

32. Member of Ph.D. committee for Samet Kadioglu. Chair Professor Mark Sussman, Department of Mathematics, FSU. Ph.D. received 2005.

33. Member of PH.D. committee for Guangquan Li (Ph.D. candidate), chair Professor Dave Loper, GFDI, FSU.

34. Member of SCS faculty search committee for Mechanical Engineering Department.

35. Member of the Local Scientific Computing (LSC) committee (2002-2006) CSIT.

36. Member CSIT Curriculum Committee (2004-2006)

37. Director of SCS Visualization Laboratory (2006-present)

Ongoing Committees

1. Examination Member of Ph.D. committee for Justin Sloane. Chair Professor Kyle Gallivan, Department of Computer Science, FSU.

2. Examination Member of Ph.D. committee for Burt Walsh. Chair Professor Kyle Gallivan, Department of Computer Science, FSU.

3. Outside Examination Member for Meteorology student Jeffrey Baum (2005-present), Chair: Professor Nicholson.

4. Outside Examination Member for Material Science student Sam Hill Thompson (2005-present). Chair: Professor Per Rikvold

5. Member of the Local Scientific Computing (LSC) committee (2005-present) SCS.

6. Member SCS Curriculum Committee (2006-present)

7. Member of SCS Faculty Evaluation Committee (2006-present)

Miscellaneous Activities

1. Organizer of a special session on High-Order Methods for Domain Decomposition at the SIAM Student Conference and Annual Meeting of the Southeastern Atlantic Section, (March 19–21, 1998).

2. Represented FSU at the Advanced Computing Workshop held in Roanoke, VA, (Aug 16, 1999).

3. Keep abreast of supercomputing hardware and software for CSIT.

4. Adapted and developed software for the successful deployment of the Powerwall at the CSIT inaugural workshop November 1999.

5. Co-Director of Visualization Laboratory in CSIT (with D. Banks). Duties involve the acquisition of new hardware, overseeing the laboratory, promoting current visualization techniques for use by departments affiliated with CSIT, develop new visualization techniques for future use, (1999-2004).
   Director of the Vis. Lab., 2006-present.

6. Served on the acquisition committee for Teragold, CSIT's new 2 1/4 Teraflop supercomputer. I put together a range of acceptance benchmarks, maintained a web site for the acquisition, fielding questions on the benchmarks. After the award, I supervised the acceptance benchmarks, and conducted some of them. (2001).

7. Member of LSC (Local Scientific Computing) committee at CSIT. This committee is tasked with overseeing all computer-related activities at CSIT and suggest procedures relating to equipment purchase, equipment distribution, etc. (2001-present).

8. Member of FSU Supercomputer user committee, chaired by Prof. O'Brien. The committee oversees proper use of our IBM supercomputers, determines software/hardware needs, etc. (2002-present).

9. Server as CSIT liaison with IBM to coordinate synergistic research activities.

10. Member of the University Senate (2002-2003).

11. Member of SUSSAI Evaluation Committee (2002–2003)

12. Co-chaired session on Recent Advances in Nonlinear Geophysics I: Model Testing and Validation at the Fall AGU Meeting, San Francisco, December 2002.

13. Co-organized and co-chaired three sessions in Visualization, Analysis and Distributed Computing in Nonlinear Geosciences: I,II (oral session), III (poster session) at the Fall AGU Meeting, San Francisco, December 2003.

14. Member of steering committee of to evaluate the hardware and software needs in the Earth Sciences in the next decade. Committee is chaired by Ronald Cohen (Carnegie Institution of Washington), 2003.

15. Chair of subcommittee (see above) to evaluate the hardware and software needs for visualization, feature extraction, data mining in the Earth Sciences, 2003.

16. Presented talk on the needs of visualization in the next decade in the geosciences, at a NSF-sponsored workshop in Washington D.C., May 2-4, 2004.

17. Mehmet Nacar, Mehmet Aktas, Marlon Pierce, Zhenyu Lu, Gordon Erlebacher, Dan Kigelman, Evan F. Bollig, Cesar De Silva, Benny Sowell, and David A. Yuen VLab: Collaborative Grid Services and Portals to Support Computational Material Science at GCE'05 Workshop on Grid Computing. Seattle, WA. November 18 2005 .

18. Co-chaired the session: Visualization, Analysis, Data Mining, and Distributed Computing in the Geosciences I (invited talks) and II (Posters), chaired by G. Erlebacher, with D. A. Yuen, B.J. Travis, A. Braverman, K.F. Tiampo at the Fall AGU Meeting, San Francisco, December 2004.

19. Visualization, Analysis, and Distributed Computing in Nonlinear Geosciences I (poster session) and II/III (Invited Speakers) at AGU 2004 Fall Meeting (chaired poster session: G. Erlebacher and D. A. Yuen).

20. Member of Task Force to develop strategy for replacement to Eclipse/Teragold supercomputers (2005-2006).

21. Co-chaired session on Visualization of Large Data Sets in Earth and Space Sciences (oral sessions and posters) at the AGU 2005 Fall Meeting in San Francisco.

Service Activities Outside FSU

1. Reviewed Small Business Innovative Research (SBIR) while at NASA Langley Research Center, (1984–1989).

2. Reviewed proposals and monitored grants while at NASA Langley Research Center, (1984–1989).

3. Served as a reviewer for the following Journals:
   Journal of Supercomputer Applications and High Performance Computing
   Theoretical and Computational Fluid Dynamics
   Journal of Applied Numerical Mathematics
   Journal of Computational Physics
   Advances in Engineering Software
   Europeen Journal of Mechanics

IEEE Graphics & Applications
Electronic (Visual) Geosciences
Siggraph Proceedings
IEEE Visualization Proceedings
Numerical Methods in Fluids
Journal of Fluid Mechanics
Journal of Oceanography
Physics of Fluids
AIAA Journal

4. Reviewed proposals for the National Science Foundation (NSF) and the Air Force Office of Scientific Research (AFOSR).

5. Served on the examination committee for Dr. Francoise Bataille (Received Ph.D, 1994), chair Prof. Bataille, Ecole Centrale de Lyons, Lyons, France.

6. Served on NASA Langley committee to address issues related to the strategic use of the National Aerodynamic Simulation Simulation (NAS) supercomputers at NASA Ames Research Center, (1995).

7. Associate Editor: Journal of Fluids Engineering, (1997–1999).

8. Participated in preliminary combustion group meeting held at Washington Dulles to discuss the content of the Combustion Simulation and Modeling Initiative, (June 29–July 2, 1998).

9. Served on a visualization panel at the Computer Science/Enabling Technologies meeting Chicago, (July 19–22, 1998).

10. Served on examination committee member for Mr. Bruno Jobard (Ph.D. defended January 2000), chair Prof. Wilfred Lefer, Ecole Litorale, Labo d'Informatique du Littoral, Calais CEDEX, France. The defense is scheduled for Fall 1999.

11. Member of organizing committee of the Grid on the Go Conference, held in Urbana-Champaign, NCSA, May 21–23, 2001.

12. NSF panel, Spring 2004

13. NSF ITR panel, Spring 2005

14. High Performance Computing Requirements for the Computational Solid Earth Science, Edited R. Cohen, Contributors: 16 scientists, among which, G. Erlebacher. This document grew out of a Workshop on Computational Geoinformatics, May 2-4, 2004, document written by committee.

Past Undergraduate Students

1. Supervisor of research for Beatriz Garcia, visiting student from l'Ecole d'Ingenieur, at l'INSA in Lyons, France, April 1999-September 1999.

2. Supervisor of research for Thomas Rasheed (Fine Art Department), Fall 1998.

3. Supervisor of research for Hassan Bounaim, visiting student from l'INRIA, Paris, France, April 2000-September 2000. Work involved the development of optimization-based techniques to automatically clean scalar data for topologically correct contouring.

4. Supervisor of Jean Frederick Boisdet, visiting student from University de Marne La Vallee, France, April 2001–August 2001.

5. Supervisor of Vincent Chich, visiting student from University de Marne La Vallee, France, April 2001–August 2001.

6. Supervisor of Mitschner Dubreus, visiting student from University de Marne la Vallee, France, April 2002–September 2002.

7. Supervisor of Juliette Colmant, visiting student from University de Marne la Vallee, France, April 2002–September 2002.

8. Patrick Crawley (Computer Science). Working on GPU-based algorithms.

Current Undergraduate Students

1. Sylvain Castillon and Mathieu Hicauber: students from Pau, France, visiting for 5 months, working on NSF ITR grant related to distributed middleware.

Past Graduate Students

1. Co-Advisor of Zhong Ding (Ph.D. received Dec. 2000), Department of Mechanical Engineering (with Prof. M. Y. Hussaini, Mathematics, advisor).

2. Dongliang Chen (Master student, Computer Science Department) investigated user interfaces for multi-user interaction across multi-tiered architectures. MS degree, Summer 2001.

3. Josh Grant (Master student, Computer Science Department, co-advisor Jim O'Brien, COAPS) is investigating the use of texture advection techniques for the display of three-dimensional unsteady vector fields, in particular, how to display the normal velocity component of a predominantly two-dimensional vector field. MS degree, Summer 2002.

4. Yunsong Wang (M.S., Computer Science).

5. Rahul Aggrawal (Master student, Computer Science Department).

6. Mathew Hesher (Computer Science Department, Ph.D. student).

7. Yunsong Wang (Computer Science, M.S. student). He is working on a web-based interface to work with an advanced visualization program from remote locations.

8. Sang Boem Lim (Ph.D. 2003, Computer Science).

9. Han-Ku Lee (Ph.D. 2003, Computer Science).

10. Sangmi Lee (Ph.D. 2003, Computer Science).

11. Ozgur Balsoy (Ph.D., Computer Science), scientific advisor, Geoffrey Fox. (Ph.D. not completed)

12. Brian Bouta (Ph.D. not completed, Mathematics)

13. Annette Samuelson (Oceanography, Ph.D. 2005), recipient of a CSIT Fellowship, 2000. Her work is concerned witb biological processes in the ocean. It is done in collaboration with James O'Brien (COAPS).

14. Zhenyu Lu (Computer Science, 2003-2004). Studying collaborative systems through middelware infrastructure. Currently inactive and in a full time job.

Current Graduate Students

1. Ji Shen (Mathematics, Ph.D.). Studying the application of curvelets to Geosciences.

2. Qin Li (Mathematics, Ph.D.). Studying theoretical aspects of curvelets.

3. Henry Winterbottom (Meteorology, Ph.D., shared with X. Zou). Studying the generation, analysis and visualization of real time tropical storm and hurricane data.

4. Evan Bollig (SCS, Ph.D.)). Studying Middlware and Grid computing for Geosciences.

Postdoctoral Researchers

1. Bruno Jobard, research in scientific visualization, (1999-2001).

Books Edited/Reviewed

1. *Wavelets: Numerical Methods and Applications*, edited by G. Erlebacher, M. Y. Hussaini, L. Jameson. Oxford University Press, ICASE/LaRC series in Computational Science & Engineering, (1994). Formal notes of the short course on wavelets conducted by the Institute for Computer Applications in Science and Engineering (ICASE) and NASA Langley Research Center (LaRC), (February 22–26, 1993).

2. 1994–1996: Editor of the ICASE Quarterly Newsletter, published bimonthly.

3. *Transition, Turbulence and Noise: Theory and Applications for Scientists and Engineers*, by Reda R. Mankbadi. *Applied Mechanics Reviews*, Vol. 49, No. 1, page B8, (1996).

4. *CRPC Parallel Computing Handbook*, pre-press editing of an early draft by G. Erlebacher. Authors: Jack dongarra, Ian foster, Geoffrey Fox, Ken Kennedy, Linda Torczon, Andy White, editors.

5. Review of the book: *Physics of Solitons*. Authors: Thierry Dauxois and Michel Peyrard. Cambridge University Press, 434 pages, 2006. Review in progress.

Grant Activity *Past Support*

1. NASA Langley Research Center – *Prediction of Compressible Jet Flow Field and Aerodynamic Sound Fields*. $433,373. May 1997–December 1999.

2. IBM Partnership Award – *Performance Analysis of a Java Implementation of a Parallel 3-D Unstructured Compressible Navier-Stokes Code*. $20,000. 1998.

3. NSF – *Interactive Concurrent Visualization of Unsteady Flows on Parallel Architectures*, $291,085. January 1999–January 2002.

4. *ERDC Pet Support Agency*, Nichols Research Corporation, $559,910, 03/27/00-09/30/01. Acting PI for Geoffrey Fox.

5. *ASC On Campus*, Nichols Research Corporation, 05/13/00-09/30/01, $289,553. Acting PI for Geoffrey Fox.

6. *ASC Off Campus*, Nichols Research Corporation, 05/13/00-09/30/01, $213,573. Acting PI for Geoffrey Fox.

7. NSF – *Realistic Illumination for Scalar Field and Vector Field Visualization*, 9/2000 – 8/2003. Budget: $300,000. Erlebacher Co-PI. With D. Banks (Computer Science, PI).

8. NSF – *Flowspace: The Space Spanned by Pathlines, Timelines, Streaklines.*, 9/2000 – 8/2003. Budget: $275,000. Erlebacher PI. With D. Banks (Computer Science, Co-PI).

9. NSF – *Development of Geometrical and Statistical Methods for Visual Scene Processing.*. Erlebacher: Co-PI, with Anuj Srivatava (Statistics, PI), Eric Klassen (Mathematics, Co-PI), David Banks (Computer Science, Co-PI). Amount: $522,039.

Current Support

1. *Use of Commodity Graphics Hardware for the Visualization of Large-Scale, Time-Dependent Datasets in the Applied Sciences Program Enhancement Grant,* from FSU Research Foundation, $90,000, G. Erlebacher (PI), J.J. O'Brien (Co-PI), T.N. Krishnamurti (Co-PI), X. Zou (Co-PI), 6/1/03 – 5/31/07.

2. *CMG Research: Collaborative: Wavelet-based Unified Approach for Physical Feature Extraction, Large-Scale Visualization, and Modeling of Multiscale Geological Processes.* G. Erlebacher (PI), D. Yuen (U. Minnesota, PI), O. Vasilyev (U. Colorado, PI). $236,687 (FSU component), 08/01/03 - 07/31/06.

3. NSF - 0446729. *Collaborative Research: Development of middleware/software to allow visualization and analysis of large and complex 4-D Geoscience datasets,* G. Erlebacher, in collaboration with D. Yuen (U. Minnesota) and S. Pallickara (Indiana U.), $220,599 (FSU) 36 months, 09/01/05 - 8/31/08

4. NSF-0426867, *ITR (ASE) -(sim): Collaborative Project: Virtual Laboratory for Earth and Planetary Materials Studies,* G. Erlebacher, (together with U. Minnesota, Indiana U. and others).
$230,266 (FSU), 48 months, 10/01/04 - 09/30/08.

5. *Development of a new methodology for adaptive observations in the framework of four-dimensional variational data assimilation,* D. Daescu (U. Portland, PI), M. Navon (FSU, PI), G. Erlebacher (FSU, Co-PI), NASA Grant, with FSU subcontract for $215,971, June 1, 2006- Feb. 28, 2007.

Invited Talks

1. Naval Research Laboratory (Washington DC), invited by Dr. J. Boris, gave presentation on "Adaptive Triangular Grids," (1982).

2. von Karman Institute (Rhode-St-Genese, Belgium), invited by Prof. J. Wendt, gave a presentation entitled "Adaptive Triangular Grids," (1984).

3. Lawrence Livermore National Laboratory (Livermore, CA), gave presentation entitled "Algebraic Grid Generation," (September 1984).

4. DFVLR Institute (Gottingen, Germany), invited by Prof. H. Kleiser, gave presentation entitled "Transition in Supersonic Flows," (September 1987).

5. University of Manchester (Manchester, UK), Department of Mathematics, invited by Prof. P. Duck, gave presentation entitled "Second Mode Interactions in Supersonic Flows," (September 1987).

6. National Center for Atmospheric Research (Boulder, CO), invited by Dr.J. Herring, gave presentation entitled "Large Eddy Simulation of Compressible Turbulence," (January 1988).

7. Brown University (RI, USA), Division of Applied Mathematics, invited by Prof. D. Gottlieb, gave presentation entitled "Compressible Turbulence," (February 1988).

8. Florida State University (Tallahassee, FL), Department of Mathematics, invited by Prof. D. A. Kopriva, gave presentation entitled "Direct Simulation of Compressible Homogeneous Turbulence," (April 1988).

9. Grumman Corporate Research Center, (Bethpage, Long Island, NY), invited by Dr. Bob Melnik, gave a seminar entitled "State-Of-The-Art in Transition Techniques by Computational Techniques," (August 1988).

10. Ohio State University (Columbus, OH) Department of Mechanical Engineering, invited by Prof. T. Herbert, gave invited presentation entitled "Computation and Visualization of Transition Flows," (September 1988).

11. University of Stuttgart (Stuttgart, Germany), invited by Prof. H. Fasel and Prof. R. Eppler, gave a presentation entitled "Second Mode Interactions in Supersonic Boundary Layers," (September 1989).

12. University of Virginia (Charlottesville, VA), Engineering-Mechanical Department, invited by Prof. H. Haj-Hariri, gave presentation entitled "Computer Graphics in the Sciences," (October 1991).

13. Yale University, CT, Department of Mechanical Engineering (New Haven, CT), invited by Prof. David Keyes, presented talk entitled "Analysis of Compressible Shear Flow Turbulence," (February 1992).

14. Ecole Nationale Superieure D'hydraulique et de Mecanique de Grenoble (Grenoble, France), invited by Prof. M. Lesieur, gave presentation entitled "Compressible Turbulence," (June 1992).

15. University of California at Berkeley (Berkeley, CA), Department of Mechanical Engineering, invited by Prof. S. Berger, gave a presentation entitled "Direct Simulation of Compressible Turbulence on a Parallel Distributed Memory Computer," (October 1993).

16. University of Houston (Houston, TX), Department of Mechanical Engineering, invited by Prof. R. Metcalfe, gave a presentation entitled "Compressible Turbulence Simulations on the Paragon," (October 1993).

17. Old Dominion University (Norfolk, VA), Department of Mechanical Engineering, invited by Prof. Balakumar, gave invited talk entitled "Direct Numerical Simulation of Compressible Turbulence," (March 1996).

18. Grid on the Go Conference (Urbana-Champaign, IL). May 2001. The talk will lay out my research activities in the application of wireless technology to scientific visualization.

19. "Scientific Visualization in the Geosciences," Invited talk at the ACES Meeting in Maui, Hawaii, August, 2001.

20. Presentation given at the University of Stonybrook, invited by Dr. Xiaou Lin Li, entitled "Shock/Vortex/Entropy Interactions," May 2002.

21. Minnesota Supercomputer Institute, invited by Professor D. Yuen, gave presentation entitled "A Wavelet Toolkit for Visualization and Analysis of Large Data Sets In Earthquake Research," talk at the ACES Meeting in Maui, Hawaii, May, 2002.

22. "Web-based Visualization Services for the Geosciences," Invited talk at the AGU Meeting in San Francisco, December, 2002.

23. Erlebacher, G., Web Services for Visualization, presentation at Stuttgart University, Aug. 6, 2003

24. Sobczyk and Erlebacher: Hybrid Matrix Geometric Algebra, presentation at a conference in Beijing, China.

25. Erlebacher, A Mathematica Program for Geometric Algebra, presentation on April 17 at UDLA, Mexico.

26. Erlebacher, G., 2D Texture-Based Flow Visualization, presentation part of a tutorial entitled "Interactive texture-based flow visualization," presented at the Visualization 2004 conference.

27. Presented talk on the needs of visualization in the next decade in the geosciences, at a NSF-sponsored workshop in Washington D.C., May 2-4, 2004.

28. Erlebacher, G., A Unified Framework for Unsteady Vector Field Visualization, presentation at the University of Pau, France, June 17, 2004.

29. Erlebacher, G., Yuen, D. A., Lu, Z., Bollig, E. F., Pierce, M., and Pallickara, S., A Grid Framework for Visualization Services, presented in Beijing China, July 13, 2004 by G. Erlebacher.

30. Amira: Multi-Dimensional Scientific Visualization for the GeoSciences in the 21st Century, Presentation and poster by H. Bartsch and G. Erlebacher, AGU 2003 Fall Meeting.

31. Demonstrating NaradaBrokering as a Middleware Fabric for Grid-based Remote Visualization Services. Presentation and poster by S. Pallickara, G. Erlebacher, D. Yuen, G. Fox, and M. Pierce.

32. WEB-IS (Integrated System): An Overall View, poster by B.J. Kadlec, X. Yang, Y. Wang, E.F. Bollig, Z. A. Garbow, D. A. Yuen, and G. Erlebacher. AGU 2003 Fall Meeting. i

33. WEB-IS2: Next Generation Web Services Using Amira Visualization Package. Poster by X. Yang, Y. Wang, E. F. Bollig, B.J. Kadlec, Z.A. Garbow, D.A. Yuen, and G. Erlebacher, AGU 2003 Fall Meeting.

Extended Visits to Other Institutions

1. University of Exeter, UK. I was invited to spend four weeks to work with Professor Hall on theoretical methods applied to the study of compressible transition. This visit followed the Euromech Conference held in Exeter, (September 21–24, 1987).

2. Indiana University, USA. I worked with Geoffrey Fox and his group to develop web services related to visualization, (July 1–30, 2002).

3. Zuse Institute of Berlin (ZIB), Germany. Worked with the developers of Amira, a powerful visualization package. Point of contact: Matt Zöckler. Three weeks, Sept. 2003.

4. Universidad de las Americas, Puebla, Mexico. Worked on Geometric Algebra with Garrett Sobcyzk. Taught two courses. Spring 2004 Sabattical.

5. University of Stuttgart, Germany (May 2004, May 2005, 1 week visit). Worked with D. Weiskopf on visualization algorithms.

6. University of Pau, France, (May 2004, May 2005). Worked with Bruno Jobard on Visualization algorithms. Two week visits.

7. University of Kaiserslautern (May 2005, 1 week visit). Gave 12 hour workshop on geometric algebra.

8. University of Pau, France (May 2006, 4 week visit). Work with B. Jobard on image processing of butterflies.

Selected Chaired Conference Sessions

1. Chaired Session on *Parallel Algorithms* at the *Fifth International Conference on Numerical Methods in Laminar and Turbulent Flow*, Montreal, Canada, (1987).

2. Organized and chaired a session on "Flow Visualization, Mesh Generation, and AI Interface" at the *Symposium on Advances and Trends in Computational Structural Mechanics and Fluid Dynamics* held at the Sheraton National Hotel in Washington DC, (October 18, 1988).

3. Chaired Session on *Turbulence* at the *Thirteenth U.S. National Congress of Applied Mechanics*, University of Florida, Gainesville, FL, (June 1998).

4. Co-chaired session on *Recent Advances in Nonlinear Geophysics I: Model Testing and Validation* at the Fall AGU meeting, San Francisco, December 2002.

5. Co-organized and co-chaired three sessions in Visualization, Analysis and Distributed Computing in Nonlinear Geosciences: I,II (oral session), III (poster session) at the Fall AGU Meeting, San Francisco, December 2003.

Publications and Supporting Documentation

A complete publication list follows. The publications are divided into the following sections: *Book Chapters*, *Papers in Preparation*, *Papers Submitted to Refereed Conferences (not yet accepted for publications)*, *Papers Submitted to Refereed Journals (not yet accepted for publication)*, *Papers Published in Refereed Journals*, *Technical Reports (reviewed in-house)*, *Technical reports (not reviewed)*, *Conference and Workshop Proceedings and Papers* (unless otherwise noted, the paper is reviewed), *Electronic Journals (reviewed)*, *Abstracts (not reviewed)*, and a *Miscellaneous* section with published items that cannot be classified in any of the above categories. A one sentence summary of all papers published since 1996 is provided.

Next is a list of presentations, separated into *Presentations at International Meetings* and *Presentations at National Meetings*.

Following the list of presentations is the supporting evidence for the papers that have been submitted to a journal but not yet reviewed.

Book Chapters

1. Eiseman, P. R., and Erlebacher, G. "Grid Generation for the Solution of Partial Differential Equations," *State-of-the-Art Surveys on Computational Mechanics*, edited by A. K. Noor and J. T. Oden, pp. 367–440, (1989).

2. Hussaini, M. Y., Erlebacher, G., and Sarkar, S. S. "On Turbulence in Compressible Fluids," Chapter 11 in *New Perspectives in Turbulence*, edited by L. Sirovich, Springer-Verlag, New York, pp. 289–313, (1991).

3. Erlebacher, G., Jobard, B., and Weiskopf, D., Flow Textures, The Visualization Handbook, pp. 261–278, Academic Press, (2005).

4. Weiskopf, D. and Erlebacher, G., Flow Visualization Overview, The Visualization Handbook, pp. 279-294, Academic Press, (2005).

Papers in Preparation

1. Erlebacher, G., Yuen, D. A., Dubuffet, F., and Vasilyev, O. V., "Identification of Mantle Plumes and Relative Contributions of Surface Heat Flow by Wavelet Thresholding".

2. Wang, Y., Bollig, E.F., Kadlec, B.J., Garbow, Z.A., Erlebacher, G., Yuen, D.A., Rudolph, M., Yang, L., Sevre, E., WEB-IS (Integrated System): An Overall View, to be submitted as a discussion paper in *Visual Geosciences*.

Published Papers in Refereed Journals

1. Erlebacher, G. and Eiseman, P. R. "Adaptive Triangular Mesh Generation," *AIAA Journal*, Vol. 25, No. 10, pp. 1356–1364, (1987).

2. Speziale, C. G., Erlebacher, G., Zang, T. A., and Hussaini, M. Y. "The Subgrid-Scale Modeling of Compressible Turbulence," *Physics of Fluids A*, Vol. 31, No. 4, pp. 940–942, (1988).

3. Erlebacher, G., Bokhari, S. H., and Hussaini, M. Y. "Parallelization of a Three-Dimensional Compressible Transition Code," *AIAA Journal*, Vol. 28, No. 1, pp. 83–90, (1990).

4. Erlebacher, G. and Hussaini, M. Y. "Numerical Experiments in Supersonic Boundary Layer Stability," *Physics of Fluids A*, Vol. 2, No. 1, pp. 94–104, (1990).

5. Erlebacher, G., Hussaini, M. Y., Kreiss, H. O., and Sarkar, S. S. "The Analysis and Simulation of Compressible Turbulence," *Theoretical and Computational Fluid Dynamics*, Vol. 2, No. 2, pp. 73–95, (1990).

6. Erlebacher, G. and Hussaini, M. Y. "Nonlinear Evolution of a Second-Mode Wave in Supersonic Boundary Layers," *Applied Numerical Mathematics,* Vol. 7, No. 1, pp. 73–91, (1991).

7. Sarkar, S. S., Erlebacher, G., Hussaini, M. Y., and Kreiss, H. O. "The Analysis and Modeling of Dilatational Terms in Compressible Turbulence," *Journal Fluid Mechanics*, Vol. 227, pp. 473–493, (1991).

8. Sarkar, S. S., Erlebacher, G., and Hussaini, M. Y. "Direct Simulation of Compressible Turbulence in a Shear Flow," *Theoretical and Computational Fluid Dynamics*, Vol. 2, No. 5–6, pp. 291–305, (1991).

9. Pruett, D., Ng, L.L., and Erlebacher, G. "On the Nonlinear Stability of a High-Speed, Axisymmetric Boundary Layer," *Physics of Fluids A*, Vol. 3, pp. 2910–2920, (1991).

10. Erlebacher, G., Hussaini, M. Y., Speziale, C. G., and Zang, T. A. "Toward the Large-Eddy Simulation of Compressible Turbulent Flows," *Journal Fluid Mechanics*, Vol. 238, pp. 155–185, (1992).

11. Ng, L. L. and Erlebacher, G. "Secondary Instabilities in Compressible Boundary Layers," *Physics of Fluids A*, Vol. 4, No. 4, pp. 710–726, (1992).

12. Shu, C.-W., Zang, T. A., Erlebacher, G., Whitaker, D., and Osher, S. "High-order ENO Schemes Applied to Two- and Three-Dimensional Compressible Flow," *Applied Numerical Mathematics*, Vol. 9, pp. 45–71, (1992).

13. Hatay, F. F., Biringen, S., Erlebacher, G., and Zorumski, W. E. "Stability of High Speed Compressible Rotating Couette Flow," *Physics of Fluids*, Vol. 5, No. 2, pp. 393–404, (1993).

14. Erlebacher, G., and Sarkar, S. S. "Statistical Analysis of the Rate of Strain Tensor in Compressible Homogeneous Turbulence," *Physics of Fluids A*, Vol. 5, No. 12, pp. 3240–3254, (1993).

15. Duck, P. W., Erlebacher, G., and Hussaini, M. Y. "On the Linear Stability of Compressible Plane Couette Flow," *Journal of Fluid Mechanics*, Vol. 258, pp. 131–165, (1994).

16. Berger, S. A. and Erlebacher, G. "Vortex Breakdown Incipience Theoretical Considerations," *Physics of Fluids*, Vol. 7, No. 5, pp. 972–982, (1995).

17. Eidson, T. M. and Erlebacher, G. "Implementation of a Fully-balanced Periodic Tridiagonal Solver on a Parallel Distributed Memory Architecture," *Concurrency Practices & Experience*, Vol. 7, No. 4, pp. 273–302, (1995).

18. Joslin, R. D., Nicolaides, R. A., Erlebacher, G., Hussaini, M. Y., and Gunzburger, M. D. "Active Control of Boundary-Layer Instabilities: Use of Sensors and Spectral Controller," *AIAA Journal*, Vol. 33, No. 8, pp. 1521–1523, (1995).

19. Joslin, R. D., Erlebacher, G., and Hussaini, M. Y. "Active Control of Instabilities in Laminar Boundary-Layers — Overview and Concept Validation," *Journal of Fluids Engineering*, Vol. 118, pp. 494–497, (1996).
In this paper, we review the current methodologies in use to delay the onset of transition to turbulence of incompressible boundary-layer flows.

20. Joslin, R. D., Gunzburger, M. D., Nicolaides, R. A., Erlebacher, G., and Hussaini, M. Y. "An Automated Methodology for Optimal Flow Control with Application to Transition Delay," *AIAA Journal*, Vol. 35, No. 5, pp. 816–824, (1997).
In this paper, we compute the optimal blowing and suction profiles to impose near the leading edge of a flat plate to delay transition to turbulence of two-dimensional boundary layer flows.

21. Rubinstein, R. and Erlebacher, G. "Transport Coefficients in Weakly Compressible Turbulence," *Physics of Fluids*, Vol. 9, No. 10, pp. 3037–3057, (1997).
In this paper, we present a general theory based on the application of Two-Scale Direct Interaction Theory to turbulent flows with low turbulence Mach number.

22. Erlebacher, G., Hussaini, M. Y., and Shu, C.-W. "Interaction of a Shock with a Longitudinal Vortex," *Journal Fluid Mechanics*, Vol. 337, pp. 129–153, (April 1997).
In this paper, we study the nonlinear effects of interacting a longitudinal vortex (with axis perpendicular to the shock) with a planar shock as a function of vortex circulation and shock Mach number.

23. Erlebacher, G., Hussaini, M. Y., and Jackson, T. L. "Nonlinear Strong Shock-Vortex Interactions A Shock-Fitted Approach," *Theoretical Computational Fluid Dynamics*, Vol. 11, pp. 1–29, (1998).
In this paper, we study the nonlinear effects of interacting a two-dimensional vortex patch with a planar shock as a function of vortex amplitude and shock Mach number.

24. Hussaini, M. Y. and Erlebacher, G. "Interaction of an Entropy Spot with a Shock," *AIAA Journal*, Vol. 37, No. 3, pp. 346–356, (1999).
In this paper, we study the nonlinear effects of interacting a two-dimensional entropy spot with a planar shock as a function of spot amplitude and shock Mach number.

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26. Woodruff, S. L. , Seiner, J. M., Hussaini, M. Y., and Erlebacher, G. "Evaluation of Turbulence-Model Performance as Applied to Jet-Noise Prediction," *AIAA Journal*, pp. 2402–2404 (2002). In this paper, several Reynolds averages Navier-Stokes calculations of jet flow are performed with several turbulence models and two numerical methods and compared for accuracy.

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29. Erlebacher, G. and Sobczyk, E.G., "First Order Linear Ordinary Differential Equations in Associative Algebras," Journal of Differential Equations, Vol. 2004, No. 1, pp. 118, (2004).

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31. Erlebacher, G. and Yuen, David, Y., A Wavelet Toolkit for Visualization and Analysis of Large Data Sets In Earthquake Research, Pure and Applied Geophysics, pp. 2215-2229, 2004.

32. Yuen, D. A., Garbow, Z. A. and Erlebacher, G., Web- and Wavelet-Based Problem Solving Environment (PSE) for Data Analysis and Visualization in the Geosciences, Workshop on Innovative Solutions for Grid Computing, June 2003, ICCS Conference, Melbourne, Australia.

33. Yuen, D. A., Garbow, Z. A., and Erlebacher, G., Remote Data Analysis, Visualization, and Problem Solving Environment (PSE) Based on Wavelets in the Geosciences, Visual Geosciences, Springer-Verlag, 2004.

34. Erlebacher, G., Yuen, D. A., Lu, Z., Bollig, E. F., Pierce, M., and Pallickara, S., A Grid Framework for Visualization Services in the Earth Sciences. Pure and Applied Geophysics, January 2005.

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37. Mehmet A. Nacar, Mehmet S. Aktas, Marlon Pierce, Zhenyu Lu and Gordon Erlebacher, Dan Kigelman, Evan F. Bollig, Cesar De Silva, Benny Sowell, and David A. Yuen, VLab: Collaborative Grid Services and Portals to Support Computational Material Science, Dec 30, 2005 Special Issue on Grid Portals based on SC05 GCE'05 Workshop, Concurrency and Computation: Practice and Experience, 2006.

Technical Reports (reviewed in-house)

1. Erlebacher, G. and Hussaini, M. Y. "Incipient Transition Phenomena in Compressible Flow over a Flat Plate," ICASE Report 86-39, 21 pages, (1986).

2. Erlebacher, G., Hussaini, M. Y., Speziale, C. G., and Zang, T. A.

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3. Erlebacher, G., Bokhari, S. H., and Hussaini, M. Y. "An Efficient Parallel Algorithm for the Simulation of Three-Dimensional Compressible Transition on a 20 Processor Flex/32 Computer," ICASE Report 87-41, 19 pages, (1987).

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9. Singer, B.A., Zang, T. A., and Erlebacher, G. "TS-Dean Interactions in Curved Channel Flow," ICASE Report 90-9, 44 pages, (1990).

10. Ng, L. L., and Erlebacher, G. "Secondary Instabilities in Compressible Boundary Layers," ICASE Report 90-58, 52 pages, (1990).

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13. Harris, J. E., Marvin, J. G., Erlebacher, G., and Liou, M.-S. "Turbulence Modeling for Hypersonic Flows," *NASP Technical Memorandum 1114*, (June 1990).

14. Sarkar, S. S., Erlebacher, G., and Hussaini, M. Y. "Direct Simulation of Compressible Turbulence in a Shear Flow," ICASE Report 91-29, 41 pages, (1991).

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17. Duck, P. W., Erlebacher, G., and Hussaini, M. Y. "On the Linear Stability of Compressible Plane Couette Flow," ICASE Report 91-64, 52 pages, (1991).

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19. Erlebacher, G., and Sarkar, S. S. "Statistical Analysis of the Rate of Strain Tensor in Compressible Homogeneous Turbulence," ICASE Report 92-18, 39 pages, (1992).

20. Berger, S. A., and Erlebacher, G. "Vortex Breakdown Incipience Theoretical Considerations," ICASE Report 92-63, 26 pages, (1992).

21. Singer, B. A., Erlebacher, G., and Zang, T. A. "A Weakly Nonlinear Theory for Wave-Vortex Interactions in Curved Channel Flow," NASA Technical Paper 3158, 26 pages, (1992).

22. Chang, C.-L., Malik, M. R., Erlebacher, G., and Hussaini, M. Y. "Linear and Nonlinear PSE for Compressible Boundary-Layers," ICASE Report 93-70, 47 pages, (1993).

23. Eidson, T. M., and Erlebacher, G. "Implementation of a Fully-Balanced Periodic Tridiagonal Solver on a Parallel Distributed Memory Architecture," ICASE Report 94-37, 49 pages, (1994).

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26. Joslin, R. D., Gunzburger, M. D., Nicolaides, R. A., Erlebacher, G., Hussaini, M. Y. "A Self-Contained, Automated Methodology for Optimal Flow Control Validated for Transition Delay," ICASE Report 95-64, 46 pages, (1995).

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30. T. B. Gatski and G. Erlebacher, "Numerical Simulation of a Spatially Evolving Supersonic Turbulent Boundary Layer," NASA/TM-2002-211934, pp. 23, (September 2002).

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1. Bertelrud, A., Erlebacher, G., Dussouillez, Ph., Liandrat, M. P., Liandrat, J., Bailly, F. Moret, Tchamitchian, Ph. "Development of Wavelet Analysis Tools for Turbulence," ICASE Interim Report IR-23, 19 pages, (1992).

2. Kadlec, B.J., Sevre, O.D., Yuen, D.A., Lilli, X.L., Bollig, E.F., Wang, Y., Erlebacher, G., Rudolph, M., Web-cam as an Easy-to-Use Way Distant Collaborative Activities, University of Minnesota Supercomputing Institute Research Report UMSI 2003/194, December 2003.

Conference and Workshop Proceedings and Papers

1. Erlebacher, G. and Eiseman, P. R. "Adaptive Triangular Mesh Generation," reviewed paper at the *Seventeenth Fluid Dynamics, Plasma Dynamics, and Lasers Conference*, Snowmass, CO, AIAA paper AIAA-84-1607, 13 pages, (1984).

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3. Erlebacher, G., Kumar, A., Anderson, E. C., Rogers, R. C., Dwoyer, D. L. Salas, M. D., and Harris, J. E. "A Computational Design Procedure for Actively Cooled Hypersonic Wind-Tunnel Nozzles Subject to Wall Shape Constraints," UTSI Publication No. E02-4005-029-85, pp. 10.0–10.33, (1985).

4. Erlebacher, G. "Transition Phenomena over a Plate for Compressible Flows," *Lecture Notes in Physics*, Springer-Verlag, Vol. 264, pp. 264–269, (1986).

5. Erlebacher, G., Hussaini, M. Y., Speziale, C. G., and Zang, T. A. "Numerical Simulation of Homogeneous, Isotropic, Compressible Turbulence," proceedings of the *Fifth International Conference on Numerical Methods in Laminar and Turbulent Flow*, Montreal, Canada, edited by C. Taylor, W. G. Habashi, andM. M. Hafez, Pineridge Press, Vol. 5, Part 2, pp. 1932–1943, (1987).

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13. Ashpis, D. E., and Erlebacher, G. "On the Continuous Spectra of the Compressible Boundary Layer Stability Equations," *Instability and Transition, Vol. II*, edited by M. Y. Hussaini and R. Voigt, *ICASE/NASA LaRC Series*, Springer-Verlag, pp. 145–159, (1990).

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25. Marsilio, R., Erlebacher, G., and Hussaini, M. Y. "Interaction of Homogeneous Turbulence with a 3-D Shock Wave," proceedings of the *Third ECCOMAS CFD Conference*, Volume CFD96, edited by Desideri, Hirsh, Pandolfi, and Periaux, Wiley & Sons, pp. 1092–1099, (1996). In this paper, we perform high accurate numerical simulations of the passage of a planar shock over three-dimensional disturbances.

26. Hussaini, M. Y. and Erlebacher, G. "Numerical Simulations of Shock-Entropy Spot Interactions," proceedings of the *Fifteenth International Conference on Numerical Methods in Fluid Dynamics*, Monterey, California, (June 1996), edited by P. Kutler, J. Flores, and J.-J. Chattot, *Lecture Notes in Physics*, Vol. 490, pp. 572–577, (1997). In this paper, we analyze the nonlinear interactions between a planar shock and localized upstream entropy perturbations.

27. Erlebacher, G., Hussaini, M. Y., Jackson, T. L. "Numerical Simulation of Shock-Turbulence Interactions," proceedings of the *IUTAM Symposium Combustion in Supersonic Flows*, Poitiers, France, October 2–6, 1995, edited by M. Champion and B. Deshaies, Kluwer Academic Publishers, pp. 317–324, (1997). In this paper, we study the nonlinear interaction between a planar shock and localized transverse (axis parallel to the shock) vortices over a wide range of shock Mach numbers and vortex circulations.

28. Rai, M. M., Gatski, T. B., and Erlebacher, G. "Direct Simulation of Spatially Evolving Compressible Turbulent Boundary Layers," reviewed paper at the *Thirty-Third Aerospace Sciences Meeting*, Reno, Nevada, AIAA paper AIAA 95-0583, 11 pages, (1995). In this paper, we present numerical results from the simulation of spatially developing turbulence in a supersonic boundary layer.

29. Hayder, M. E., Erlebacher, G., Hussaini, M. Y. "Computations of Acoustic Scattering off a Circular Cylinder," *Second Computational Aeroacoustics (CAA) Workshop on Benchmark Problems*, edited by C. K. W. Tam and J. C. Hardin, NASA Conference Publications 3352, pp. 93–100, (1997). In this paper, we describe the application of a high order multidomain simulation code to the acoustic scatering of acoustic waves off circular geometries.

30. Bataille, F., Erlebacher, G., and Hussaini, M. Y. "Structure of Irrotational Energy Spectrum in Compressible Isotropic Turbulence," proceedings of the *ASME Fluid Dynamics Conference*, Vancouver, Canada, 8 pages, (June 1997). In this paper, we compare the energy spectra between EDQNM and direct numerical simulations of compressible isotropic turbulence.

31. Hussaini, M. Y., Erlebacher, G. "Interaction of 2-D and Axisymmetric Entropy Spots with a Shock," reviewed paper at the *Twenty-Eighth Fluid Dynamics Conference*, Snowmass Village, Colorado, AIAA paper 97-1836, 11 pages, (1997). In this paper, we calculate the nonlinear interaction between two-dimensional localized temperature disturbances and a planar shock over a range of Mach numbers and spot amplitude.

32. Rubinstein, R., Zhou, and Erlebacher, G. "Transport Coefficients in Rotating Weakly Compressible Turbulence," *Modeling Complex Turbulent Flows,* edited by M. Salas, J. Hefner, and L. Sakell, Kluwer Academic Publishers, pp. 329–348, (1999). In this paper, we present a general theory based on the application of Two-Scale Direct Interaction Theory to turbulent flows with low turbulence Mach number and rotation.

33. Erlebacher, G. and Hussaini, M. Y. "On Shock Shape Alteration due to Interaction with Organized Structures," reviewed paper at the *Thirtieth Fluid Dynamics Conference*, Norfolk, Virginia, AIAA paper AIAA-99-3526, 11 pages (1999). In this paper, we discuss the structure of a shock (velocity and displacement) after passage of a two-dimensional vortex patch and an entropy spot as a function of shock Mach number and disturbance amplitude.

34. Jobard, B., Erlebacher, G., and Hussaini, M.Y. "Hardware-Accelerated Texture Advection for Unsteady Flow Visualization," reviewed paper in *IEEE Visualization '2000*, (October 2000). In this paper, we present a new algorithm to track a dense collection of particles in a 2D time-varying flow using an Eulerian algorithm, solely based on the advanced hardware characteristics of the SGI workstation. The technique is several times faster than competing methods.

35. Jobard, B., Erlebacher, G., and Hussaini, M.Y. "Tiling strategies for hardware-accelerated unsteady flow visualization," reviewed paper in Graphicon 2000, the 10th International Conference on Computer Graphics and Vision, (August 2000). In this paper, we show how to improve the accuracy of the previous hardware algorithm through a multidomain strategy.

36. Jobard, B., Erlebacher, G., and Hussaini, M.Y. "Lagrangian-Eulerian Advection for Unsteady Flow Visualization," reviewed paper in *IEEE Visualization '2000*, (October 2001). In this paper, we present a software implementation of dense vector field animations of unsteady flows that is competitive with the best hardware-based algorithms.

37. Hussaini, M. Y., Erlebacher, G., and Jobard, B., "Real-Time Visualization of Unsteady Vector Fields," *AIAA paper 2002-0749*. In this paper, we apply the texture advection method for unsteady vector fields to flow around a circular cylinder, shock/vortex interaction, and flow in the Gulf of Mexico.

38. Grant, J., Erlebacher, G., and O'Brien, J., "Case Study: Visualization of Thermoclines in the Ocean using LETS," *IEEE Visualization '2002/*, (October 2002).

39. Erlebacher, G., Yuen, D. A., and Dubuffet, F., "Case Study: Visualization and Analysis of High Rayleigh Number – 3D Convection in the Earth's Mantle," *IEEE Visualization '2002/*, pp. 529–532, (October 2002).

40. Weiskopf, D., Erlebacher, G., Hopf, M., and Ertl, T., "Hardware-Accelerated Lagrangian-Eulerian Texture Advection for 2D Flow Visualization," 7th Fall Workshop Vision, Modeling, and Visualization 2002 (VMV2002)

41. Yuen, D. A., Garbow, Z. A. and Erlebacher, G., "Web- and Wavelet-Based Problem Solving Environment (PSE) for Data Analysis and Visualization in the Geosciences," *Workshop on Innovative Solutions for Grid Computing, June 2003*, ICCS Conference, Melbourne, Australia.

42. Yuen, D. A., Garbow, Z.A., and Erlebacher, G., "Remote Data Analysis, Visualization, and Problem Solving Environment (PSE) Based on Wavelets in the Geosciences," Visual Geosciences, Springer-Verlag, 2003.

43. Weiskopf, D., Erlebacher, G., and Ertl, T., "A Texture-Based Framework for Spacetime-Coherent Visualization of Time-Dependent Vector Fields," IEEE Visualization 2003 Proceedings, October 2003, pp. 107–114.

44. Weiskopf, D. , Schramm, F., Erlebacher, G. and Ertl, T., Particle and Texture Based Spatial-Temporal Visualization of Time-Dependent Vector Fields, IEEE Visualization 2005 Proceedings, 639-646, 2005.

45. Ananthuni, R., Karki, B. B., Bollig, E. F., Da Silva, C. R. S, and Erlebacher, G., "A Web-Based Visualization and Reposition Scheme for Scientific Data," in press, Proceeedings of the 2006 International Conference on Modeling Simulation and Visualization methods (MSV'06), 2006.

46. Erlebacher, G. and Peterson, J., The School of Computational Science at Florida State University. Proceedings of the International Conference on Computational Science (ICCS) held in Reading, UK, May 28-31, 2006.

Electronic Journals (reviewed)

1. Erlebacher, G., Yuen, D. A., and Dubuffet, F., "Current trends and demands in visualization in the geosciences," *Electronic Geosciences*, Vol. 4, 2001.

2. Garbow, Zachary A., Erlebacher, Gordon, Yuen, David A., Boggs, John M., and Dubuffet, Fabien W., "Web-Based Interrogation of Large-Scale Geophysical Data," *Visual Geosciences*, Vol. 4, pp. 1–11, 2003.

3. Garbow, Z.A., Yuen, D.A., Erlebacher, G., Bollig, E., Kadlec, B., "Remote Visualization and Cluster Analysis of 3-D Geophysical Data over the Internet using Off-screen Rendering," Visual Geosciences, June, 2003.

4. Kadlec, B.J., Sevre, O.D., Yuen, D.A., Lilli, X.L., Bollig, E.F., Wang, Y., Erlebacher, G., Rudolph, M., Web-cam's Potential for Collaborative Activities in the Earth Sciences, Visual Geosciences (c) Springer-Verlag 2004, DOI: 10.1007/s10069-004-0018-1, ISSN: [1610-2924].

Abstracts (not reviewed)

1. Elkin, D., Erlebacher, G., and Johnston, S. "Plasma Caustics," *Bulletin of the American Physical Society*, Vol. 26, No. 7, p. 949, (September 1981).

2. Erlebacher, G. "A Variational Method for the Evolution of Toroidal Plasmas," *Bulletin of the American Physical Society*, Vol. 26, No. 7, p. 1055, (September 1981).

3. Erlebacher, G., Eiseman, P. R., Levinton, F. M., and Navratil, G. A. "High-Beta Equilibrium in Torus II," *Bulletin of the American Physical Society*, Vol. 27, No. 8, Part I, p. 1130, (November 1982).

4. Erlebacher, G. "Weak Shock Waves in Compressible 2-D Isotropic Turbulence," *Bulletin of the American Physical Society*, Vol. 33, No. 10, p. 2264, (November 1988).

5. Ng, L. L. and Erlebacher, G. "Linear Secondary Instability of Compressible Boundary Layers," *Bulletin of the American Physical Society*, Vol. 19–21, p. 2267, (November 1989).

6. Erlebacher, G., Sarkar, S., and Kreiss, H. O. "Modeling of the Pressure-Dilatation and the Dilatational Variance Correlations in Compressible Turbulence," *Bulletin of the American Physical Society*, Vol. 19–21, p. 2346, (November 1989).

7. Ashpis, D. E. and Erlebacher, G. "Continuous Spectra of the Compressible Boundary Layer Stability Equations," *Bulletin of the American Physical Society*, Vol. 19–21, p. 2282, (November 1989).

8. Sarkar, S., Erlebacher, G., and Hussaini, M. Y. "Direct Simulation of Compressible Homogeneous Shear Flow," *Bulletin of the American Physical Society*, Vol. 35, No. 10, p. 2254, (November 1990).

9. Hatay, F. F., Biringen, S., Zorumski, W. E., and Erlebacher, G. "Stability of High Speed Compressible Rotating Couette Flow," *Bulletin of the American Physical Society*, Vol. 36, No. 10, p. 2677, (November 1991).

10. Sarkar, S., Erlebacher, G., and Hussaini, M. Y. "Turbulence Anisotropy in Compressible Homogeneous Shear Flow," *Bulletin of the American Physical Society*, Vol. 36, No. 10, p. 2675, (November 1991).

11. Erlebacher, G., Sarkar, S., and Hussaini, M. Y. "Analysis of Rate of Strain Tensor in Compressible Homogeneous Turbulence," *Bulletin of the American Physical Society*, Vol. 36, No. 10, p. 2674, (November 1991).

12. Erlebacher, G. "Simulations and Analysis of Compressible Turbulence on Touchstone Delta," *Bulletin of the American Physical Society*, Vol. 37, No. 8, p. 1789, (November 1992).

13. Rai, M. M., Gatski, T. B., and Erlebacher, G. "Towards Direct Simulation of Spatially Evolving Compressible Turbulent Boundary Layers," *Bulletin of the American Physical Society*, Vol. 38, No. 12, p. 2311, (November 1993).

14. Dinavahi, S. P. G., Ristorcelli, J. R., and Erlebacher, G. "Statistics of Compressible DNS relevant to Turbulence Modeling: Effects of Mean Density Gradients," *Bulletin of the American Physical Society*, Vol. 38, No. 12, p. 2265, (November 1993).

15. Rubinstein, R., Erlebacher, G., Zhou, Y. "Inertial Scaling in the Theory of Weakly Compressible Turbulence," *Bulletin of the American Physical Society*, (November 1995).

16. Erlebacher, G. and Rubinstein, R. "Acoustic Wave Effects in Non-Homogeneous Compressible Turbulence," *Bulletin of the American Physical Society*, (November 1996).

17. Erlebacher, G. and Hussaini, M. Y. "Shock Shape Alteration due to Interaction with Organized Structures," *Bulletin of the American Physical Society*, (November 1998).

18. Yuen, D. A., Erlebacher, G., Dubuffet, F., and Vasilyev, O., "Identification of 3-D Mantle Plumes the relative Contributions of the Surface Heat Flow by Wavelet Thresholding," *Abstracts of the AGU Fall Conference*, December 2002.

19. Erlebacher, G. and Yuen, D. A., "Web-based Visualization Services for the Geosciences," *Abstracts of the AGU Fall Conference*, December 2002.

20. Garbow, Zachary A., Erlebacher, G., Yuen, D. A., Sevre, Erik O.D., Nagle, Adam R. Nagle, Kaneko, JBD Yoshi, "Web-Based Interrogation of Large-Scale Geophysical Data Sets and Clustering Analysis of Many Earthquake Events From Desktop and Handheld Computers," *Abstracts of the AGU Fall Conference*, December 2002.

Miscellaneous

1. Erlebacher, G., "Etude D'un Plasma Hydrogenoide Autour de la Limite d'Ionisation," Master's Thesis, Free University of Brussels, Brussels, Belgium, 100 pages, (1979).

2. Erlebacher, G., "Solution Adaptive Triangular Meshes with Application to the Simulation of Plasma Equilibrium," Ph.D. Thesis, Columbia University, New York, NY, 199 pages, (1984).

3. Erlebacher, G., "Direct Simulation of Isotropic Homogeneous Compressible Turbulence,", presentation at the status review for *Turbulence Modeling for Hypersonic Flows*, NASA Ames Research Center, (August 24–25, 1989).

4. Erlebacher, G. "Group Summary: Boundary Layer Stability," *Instability and Transition, Vol. II*, Materials of the Workshop held May 15–June 9, 1989, Hampton, VA, *ICASE/NASA LaRC Series*, Springer-Verlag, New York,

   pp. 81–82, (1990).

5. Erlebacher, G. "Group Summary: Simulation III," *Instability, Transition and Turbulence*, proceedings of the *Workshop on Instability, Transition and Turbulence*, edited by M. Y. Hussaini, A. Kumar, and C. L. Streett, Springer-Verlag, ICASE/NASA LaRC Series, 389–392, (1992).

6. Erlebacher, G. "Group Summary: Simulation II," in *Transition, Turbulence and Combustion, Volume I Transition*, proceedings of the *Workshop on Transition, Turbulence and Combustion*, held June 7–July 2, 1993 in Hampton, VA, edited by M. Y. Hussaini, T. B. Gatski, and T. L. Jackson, *ICASE/LaRC Interdisciplinary Series in Science and Engineering*, Kluwer Academic Publishers, pp. 341–342, (1994).

7. Erlebacher, G. "Theory and Simulation of Compressible Turbulence," presentation given at a peer review at NASA Ames Research Center, (September 22–24, 1994). The objective of the presentation was to promote the NASA Langley Turbulence Program to industry and the universities.

8. Represented Florida State University at the Advanced Computing Workshop held in Roanoke VA, (August 16, 1999).

9. "Large Eddy Simulation and Shock/Turbulence Interaction," presented for the Army research Office during a visit to CSIT, January 2000.

10. Presentation on the upcoming new CSIT Teraflop computer at the Computational Biology Soiree, organized by Jack Quine, February 22, 2000.

11. Invited presentation at the Grid on the Go Conference at Urbana-Champaign, NCSA, "Wireless Web at FSU," May 21–23, 2001.

12. "Scientific Visualization in the Biosciences," presented at the Biology luncheon seminar series at CSIT, 2001.

13. "Challenges of Vector Field Visualization," Invited seminar presented at the applied math seminar series organized by Chris Tam.

14. Earthscope, March 2002 Workshop. "Demands in Visualization for EarthScope from Current Trends," D. Yuen and G. Erlebacher. Presented by David Yuen.

15. High Performance Computing Requirements for the Computational Solid Earth Science, 2005. Edited R. Cohen, Contributors: 16 scientists, among which, G. Erlebacher. This document grew out of a Workshop on Computational Geoinformatics, May 2-4, 2004, document written by committee.

16. Application of Multidimensional Wavelets to Unveiling Multi-Phase Diagrams and in Situ Rock Physical Properties. Poster by O.V. Vasilyev, T.V. Gerya, D.A. Yuen, and G. Erlebacher, AGU 2003 Fall Meeting.

17. Wavelet and Statistical Thresholding of Convection Plumes in High-Rayleigh Number Flows. Invited presentation by G. Erlebacher, D. A. Yuen, and O.V. Vasilyev. AGU 2003 Fall Meeting.

18. Interactive Collaborative Visualization in the Geosciences by E.f. Bollig, B.J. Kadlec, G. Erlebacher, D. A. Yuen, Y. M. Paichuk, poster at AGU 2004 Fall Meeting.

19. A Grid Framework for Visualization Services by G. Erlebacher, Z. Lu, E.F. Bollig, D.A. Yuen, M. Pierce, S. Pallickara, poster at AGU 2004 Fall meeting.

20. Adaptive Multi-Resolution Data Structure for large-Scale Visualization and Modeling of Multi-Scale Geological Processes, by A. Vezolainen, O. Vasilyev, D. Yuen, G. Erlebacher, poster at AGU 2004 Fall Meeting.

21. Visualizing 3D Turbulence On Temporally Adaptive Wavelet Collocation Grids, by D.E. Goldstein, B.J. Kadlec, D.A. yuen, G. Erlebacher, poster at the AGU 2005 Fall Meeting.

22. Grid Based Techniques for Visualization in the Geosciences, E.F. Bollig, B. Sowell, Z. Lu, G. Erlebacher, D.A. Yuen, poster at the AGU 2005 Fall Meeting,

23. Volumetric Rendering of Geophysical Data on Adaptive Wavelet Grid, Vezolainen, A., Erlebacher, G., Vasilyev, O., Yuen, D. A., poster at the AGU 2005 Fall Meeting.

24. VLab: A Grid for Planetary Materials Computations, da Silva, C.R., Erlebacher, G., Pierce, M., Karki, B., Yuen, D. A., Wentzcovitch, R. M., poster at the AGU 2005 Fall Meeting.

Presentations at International Meetings

1. Erlebacher, G. "Interactive Algebraic Grid Generation," *Short Course on Grid Generation*, Old Dominion University, (May 1985).

2. Erlebacher, G. "Transition Phenomena over a Flat Plate for Compressible Flows," *Tenth International Conference on Numerical Methods in Fluid Dynamics,* Beijing, China, (June 1986). Refereed.

3. Erlebacher, G. "Transition Phenomena over a Flat Plate for Compressible Flows," *Workshop on Computational Fluid Dynamics*, Davis University, (June 1986). Invited talk.

4. Erlebacher, G., Hussaini, M. Y., Speziale, C.G., and Zang, T. A. "Numerical Simulation of Homogeneous, Isotropic, Compressible Turbulence," *Fifth International Conference,* Montreal, Canada, (July 6–10, 1987),

5. Erlebacher, G. and Hussaini, M. Y. "Numerical Simulation of Stability and Transition to Turbulence in Shear Flows," *Second Euromech 228 Colloquium on Boundary Layer Instability and Transition,* Exeter, (September 20–24, 1987). Reviewed.

6. Erlebacher, G. and Hussaini, M. Y. "Numerical Simulation of Transition," *Second EU-ROMECH 228 Colloquium on Boundary Layer Instability and Transition*, Exeter, UK, (1987).

7. Bokhari, S., Erlebacher, G., and Hussaini, M. Y. "Three-Dimensional Compressible Transition on a 20 Processor Flex/32 Minicomputer," *Sixth IMACS International Symposium on Computer Methods for Partial Differential Equations,* Bethlehem, PA, USA, (June 23–25, 1987).

8. Erlebacher, G. and Hussaini, M. Y. "Stability and Transition in Supersonic Boundary Layers," International Symposium on Computational Fluid Dynamics, Sydney, Australia, (August 24–27, 1987). Refereed.

9. Erlebacher, G. and Hussaini, M. Y. "Second Mode Interactions in Supersonic Boundary Layers," *Third IUTAM Symposium on Laminar-Turbulent Transition,* Toulouse, France, September 11–15, (1989). Refereed.

10. Erlebacher, G., Hussaini, M. Y., Sarkar, S., and Kreiss, H.O. "Direct Simulation of Compressible Turbulence," at the *Third Symposium on Hyperbolic Systems,* Uppsala, Sweden, (June 11–15, 1990).

11. Sarkar, S., Erlebacher, G., and Hussaini, M. Y. "The Modeling of Turbulent Dissipation in Compressible Turbulence," *International Symposium on Engineering Turbulence Modeling and Measurements*, Dubrovnik, Yugoslavia, (September 1990).

12. Erlebacher, M. Y. and Hussaini, M. Y. "Direct Numerical Simulation and Large Eddy Simulation of Compressible Turbulent," *International Workshop "Large Eddy Simulation – Where Do We Stand?"*, St. Petersburg, FL, (December 19–21, 1990). Invited talk, the conference paper was not reviewed.

13. Erlebacher, G. and Hussaini, M. Y. "High-order methods for the Simulation of Compressible Turbulence," *Joint U.S.-Israel Workshop on Advanced Scientific Computing for the 90's*, Neve Ilan, Israel, (1992). Refereed.

14. Erlebacher, G., and Sarkar, S. S. "Statistical Analysis of the Rate of Strain Tensor in Compressible Homogeneous Turbulence," *First European Computational Fluid Dynamics Conference,* Brussels, Belgium, (September 7–11, 1992). Refereed.

15. Marsilio, R., Erlebacher, G., and Hussaini, M. Y. "Three-Dimensional Numerical Simulations of Shock-Vortex Interactions," *International Workshop on Shock Wave-Vortex Interaction*, Tokyo, Japan, (September 5–9, 1995).

16. Erlebacher, G., Hussaini, M. Y., Jackson, T. L. "Numerical Simulation of Shock-Turbulence Interactions," *IUTAM Symposium Combustion in Supersonic Flows,* Poitiers, France, (October 2–6, 1995). Refereed.

17. Marsilio, R., Erlebacher, G., and Hussaini, M. Y., "Interaction of Homogeneous Turbulence with a 3-D Shock Wave," *Third ECCOMAS Computational Fluid Dynamics Conference*, Paris, France, (September 9–13, 1996).

18. Hussaini, M. Y. and Erlebacher, G. "Numerical Simulations of Shock-Entropy Spot Interactions," *Fifteenth International Conference on Numerical Methods in Fluid Dynamics*, Monterey, California, (June 24–28, 1996).

19. Bataille, F., Erlebacher, G., and Hussaini, M. Y., "Structure of Irrotational Energy Spectrum in Compressible Isotropic Turbulence," *1997 ASME Fluid Dynamics Conference*, Vancouver, Canada, 8 pages, (June 22–26, 1997). Visualization," *IEEE Visualization '2000*, Utah, (October 2000).

20. Jobard, B., Erlebacher, G., and Hussaini, M.Y. "Tiling strategies for hardware-accelerated unsteady flow visualization," Submitted to Graphicon 2000, the 10th International Conference on Computer Graphics and Vision, Moscow, August 2000. Presented B. Jobard.

21. Erlebacher, G., Yuen, D., and Dubuffet, F.,

    "Current Trends and Demands in Visualization in the Geosciences," Presented at the AGU Meeting by D. Yuen, (December 2001).

22. Weiskopf, D., Erlebacher, G., Hopf, M., and Ertl, T., "Hardware-Accelerated Lagrangian-Eulerian Texture Advection for 2D Flow Visualization," 7th Fall Workshop Vision, Modeling, and Visualization 2002 (VMV2002) , Presented by Weiskopf.

23. Erlebacher, G. and Yuen, D. A., "A Wavelet Toolkit for Visualization and Analysis of Large Data Sets In Earthquake Research," Presentation at the ACES 2002 Meeting, held in Maui, HW, May 2002.

24. Yuen, D. A., Erlebacher, G., Vasilyev, O., Goldstein, D., Fuentes, M.," Role of Wavelets in the Physical and Statistical Modelling of Complex Geological Processes. Presentation at the ACES 2002 Meeting, held in Maui, HW, May 2002 (by D. Yuen).

25. Erlebacher, G. and Yuen, D. A., "Web-based Visualization Services for the Geosciences," Invited talk at the AGU 2002 Fall Meeting in San Francisco, December, 2002.

26. Fault Tolerant Distributed Middleware for VLAB, by Lu, Z, Bollig, E F, Erlebacher, G, Gardgil, H, Yuen, D, Pierce, M, Pallickara, S, presented at the AGU 2005 Fall Meeting by G. Erlebacher.

27. Automated Generation of Web Services for Visualization Toolkits, by P.A. Jensen, D.A. Yuen, G. Erlebacher, E.F. Bollig, D.G. Kigelman, E.A. Shukh, presented at the AGU 2005 Fall meeting by P. Jensen.

28. The School of Computational Science at Florida State University, by G. Erlebacher and J. Peterson. Presented by G. Erlebacher at the International Conference on Computational Science (ICCS) held in Reading, UK, May 28-31, 2006.

Presentations at National Meetings

1. Erlebacher, G. "A Variational Method for the Evolution of Toroidal Plasmas," *Twenty-Third Annual Meeting of the Division of Plasma Physics at the Applied Physical Society*, Philadelphia, PA, (October 12–16, 1981).

2. Elkin, D., Erlebacher, G., and Johnston, S. "Plasma Caustics," *Twenty-Third Annual Meeting of the Division of Plasma Physics at the Applied Physical Society*, Philadelphia, PA, (October 12–16, 1981).

3. Erlebacher, G., Eiseman, P. R., Levinton, F. M., and Navratil, G. A. "High-Beta Equilibrium in Torus II," *Twenty-Fourth Annual Meeting of the Division of Plasma Physics in the Applied Physical Society*, New York, NY, (November 3–5, 1982).

4. Erlebacher, G. and Eiseman, P. R. "Adaptive Triangular Mesh Generation," *Seventeenth Fluid Dynamics, Plasma Dynamics, and Lasers Conference,* Snowmass, CO, (June 25–27, 1984).

5. Erlebacher, G., Kumar, A., Anderson, E. C., Rogers, R. C., Dwoyer, D. L., Salas, M. D., and Harris, J. E. "A Computational Design Procedure for Actively Cooled Hypersonic Wind-Tunnel Nozzles Subject to Wall Shape Constraints," *CFD in Aerospace Design Workshop*, Tullahoma, Tennessee, (June 4–6, 1985).

6. Erlebacher, G. "Finite-Difference Operators on Unstructured Triangular Meshes," *State-of-the-Art Free-Lagrangian Methods*, Hilton Head Island, South Carolina, (March 4–6, 1985). Invited paper.

7. Erlebacher, G. "Interactive Algebraic Grid Generation for 2-D Flowfield Calculations," *Twenty-Third Aerospace Sciences Meeting*, Reno, Nevada, (January 14–17, 1985).

8. Zang, T. A., Drummond, J. P., Erlebacher, G., Speziale, C., and Hussaini, M. Y. "Numerical Simulation of Transition, Compressible Turbulence, and Reacting Flows," *Twenty-Fifth Aerospace Sciences Meeting,* Reno, Nevada, (1987).

9. Zang, A.T, Krist, S. E., Erlebacher, G., and Hussaini, M. Y. "Nonlinear Structures in the Later Stages of Transition," *Nineteenth Fluid Dynamics, Plasma Dynamics and Lasers Conference,* Honolulu, Hawaii, (June 8–10, 1987).

10. Erlebacher, G. and Hussaini, M. Y. "Stability and Transition in Supersonic Boundary-Layers," *Nineteenth Fluid Dynamics, Plasma Dynamics, and Lasers Conference*, Honolulu, Hawaii, (June 8–10, 1987)

11. Erlebacher, G., Zang, T. A., and Hussaini, M. Y. "Spectral Multigrid Methods for the Numerical Simulation of Turbulence," *Third Copper Mountain Conference on Multigrid Methods*, Boulder, CO, (April 6, 1987).

12. Erlebacher, G. "Flow Visualization in Computational Fluid Dynamics: Software," *OSC Workshop on Computational Fluid Dynamics*, Cleveland, OH, (December 9, 1988).

13. Erlebacher, G. "Direct Simulation of Compressible Homogeneous Turbulence," *Eighth Annual Conference on Advances in Fluid Turbulence*, Los Alamos, NM, (May 16–20, 1988). Poster session.

14. Erlebacher, G. "Second Mode Interactions in Wall-Bounded Supersonic Transition," *SAE Aerotech '88 Meeting*, Anaheim, CA, (October 3–6, 1988). Invited talk.

15. Erlebacher, G., Zang, T. A., and Hussaini, M. Y. "Direct Simulation of Compressible Turbulence," *Physics of Compressible Turbulent Mixing Workshop*, Princeton, NJ, (October 24–27, 1988). Poster session.

16. Erlebacher, G. "Weak Shock Waves in Compressible 2-D Isotropic Turbulence," *Forty-First Annual Meeting of the American Physical Society, Division of Fluid Dynamics*, Buffalo, NY, (November 20–22, 1988).

17. Ashpis, D. E. and Erlebacher, G. "Continuous Spectra of the Compressible Boundary Layer Stability Equations," *Forty Second Annual Meeting of the Division of Fluid Dynamics*, Palo Alto, CA, (November 19–21, 1989).

18. Erlebacher, G., Sarkar, S., and Kreiss, H. O. "Modeling of the Pressure-Dilatation and the Dilatational Variance Correlations in Compressible Turbulence," *Forty Second Annual Meeting of the Division of Fluid Dynamics*, Palo Alto, CA, (November 19–21, 1989).

19. Ng, L. L. and Erlebacher, G. "Linear Secondary Instability of Compressible Boundary Layers," *Forty Second Annual Meeting of the Division of Fluid Dynamics*, Palo Alto, CA, (November 19–21, 1989).

20. Hussaini, M. Y. and Erlebacher, G. "On Turbulence in Compressible Fluids," *Newport Conference on Turbulence*, Newport, RI, (June 12–15, 1989).

21. Zang, T., Erlebacher, G., and Hussaini, M. Y. "Direct Simulation of Compressible Turbulence," *NASA CFD Conference*, NASA Ames Research Center, (March 7–9, 1989).

22. Erlebacher, G. and Hussaini, M. Y. "Nonlinear Evolution of a Second Mode Wave in Supersonic Boundary Layers," *NASA CFD Conference*, NASA Ames Research Center, (March 7–9, 1989).

23. Erlebacher, G., Hussaini, M. Y., and Sarkar, S. S. "Direct Simulation of Compressible Isotropic Turbulence," *Forty-Third Annual Meeting of the American Physical Society, Division of Fluid Dynamics*, Cornell University, (November 18–20, 1990).

24. Erlebacher, G. "Symbolic Manipulation and Supersonic Transition," *Symposium on Symbolic Computations and their Impact on Mechanics*, special session at the *Winter Annual Meeting of the American Society of Mechanical Engineers*, Dallas, TX, (November 29, 1990).

25. Sarkar, S., Erlebacher, G., and Hussaini, M. Y. "Direct Simulation of Compressible Turbulence in a Shear Flow," *Lumley Symposium: Recent Developments in Turbulence*, Newport News, VA, (November 12–13, 1990).

26. Sarkar, S., Erlebacher, G., and Hussaini, M. Y. "Direct Simulation of Compressible Homogeneous Shear Flow," *Forty Third Annual Meeting of the Division of Fluids Dynamics at the Applied Physical Society*, Ithaca, NY, (November 18–20, 1990).

27. Erlebacher, G., Sarkar, S., and Hussaini, M. Y. "Analysis of Rate of Strain Tensor in Compressible Homogeneous Turbulence," *Forty-Fourth Annual Meeting of the Division of Fluid Dynamics at the American Physical Society*, Scottsdale, AZ, (November 24–26, 1991).

28. Hatay, F. F., Biringen, S., Zorumski, W. E., and Erlebacher, G. "Stability of High Speed Compressible Rotating Couette Flow," *Forty-Fourth Annual Meeting of the Division of Fluid Dynamics at the American Physical Society*, Scottsdale, AZ, (November 24–26, 1991).

29. Chang, C.-L., Malik, J. R., Erlebacher, G., Hussaini, M. Y. "Compressible Stability of Growing Boundary Layers using Parabolized Stability Equations," *Twenty-Second Fluid Dynamics, Plasma Dynamics and Lasers Conference*, Honolulu, Hawaii, (June 1991).

30. Erlebacher, G. and Hussaini, M. Y. "Data Analysis of Finite-Length Taylor-Couette Flow," *Fourth Nobeyama Workshop on Supercomputing and Experiments in Fluid Dynamics*, Nobeyama, Japan, (September 3–5, 1991). Not reviewed.

31. Hussaini, M. Y. and Erlebacher, G. "Direct Numerical Simulation of Compressible Transition: An Overview," *Fourth International Symposium on Computational Fluid Dynamics*, Davis, CA, (September 9–12, 1991). Invited talk.

32. Eidson, T. M. and Erlebacher, G. "A Parallel/Distributed Memory Programming Strategy for CFD Simulation Codes," *Parallel CFD '92 Conference*, Camden, NJ, (May 18–20, 1992).

33. Erlebacher, G., "Simulations and Analysis of Compressible Turbulence on Touchstone Delta," *Forty-Fifth Annual Meeting of the Division of Fluid Dynamics at the American Physical Society*, Tallahassee, FL, (November 22–24, 1992).

34. Hatay, F. F., Biringen, S., Erlebacher, G., and Zorumski, W. E. "Stability of High Speed Compressible Rotating Couette Flow," *Thirty-First Aerospace Sciences Meeting and Exhibit*, Reno, Nevada, (January 11–14, 1993).

35. Dinavahi, S. P. G., Ristorcelli, J. R., and Erlebacher, G. "Statistics of Compressible DNS relevant to Turbulence Modeling: Effects of Mean Density Gradients," *Annual Meeting of the Division of Fluid Dynamics in the American Physics Society*, Albuquerque, NM, (November 21–23, 1993).

36. Rai, M. M., Gatski, T. B., and Erlebacher, G. "Towards Direct Simulation of Spatially Evolving Compressible Turbulent Boundary Layers," *Annual Meeting of the Division of Fluid Dynamics in the American Physics Society*, Albuquerque, NM, (November 21–23, 1993).

37. Rai, M. M., Gatski, T. B., and Erlebacher, G. "Direct Simulation of Spatially Evolving Compressible Turbulent Boundary Layers," *Thirty-Third Aerospace Sciences Meeting*, Reno, Nevada, (January 9–12, 1995).

38. Patten, J. and Erlebacher, G. "Volumetric Visualization Techniques Applied to the Time Evolution of a Turbulent Supersonic Flow over a Flat Plate at Mach 2.25," *ICASE/LaRC Symposium: Visualizing Time-Varying Data*, Williamsburg, VA, (September 18–19, 1995), video presentation.

39. Rubinstein, R., Erlebacher, G., Zhou, Y.

   "Inertial Scaling in the Theory of Weakly Compressible Turbulence," *Forty-Eighth Annual Meeting of the American Physical Society, Division of Fluid Dynamics*, Irvine, CA, (November 18–21, 1995).

40. Erlebacher, G. and Rubinstein, R. "Acoustic Wave Effects in Non-Homogeneous Compressible Turbulence," *Forty-Ninth Annual Meeting of the American Physical Society,* Division of Fluid Dynamics, Syracuse, NY, (November 24-26, 1996).

41. Hussaini, M. Y. and Erlebacher, G. "Some Nonlinear Problems Involving Shock Interactions," *First International Conference in Aviation and Aerospace*, Daytona Beach, Florida, (May 9–11, 1996). Keynote address.

42. Hayder, M. E., Erlebacher, G., and Hussaini, M. Y. "Computations of Acoustic Scattering off a Circular Cylinder," *Second Computational Aeroacoustics (CAA) Workshop on Benchmark Problems*, (1996).

43. Hussaini, M. Y., Erlebacher, G. "Interaction of 2-D and Axisymmetric Entropy Spots with a Shock," *Twenty-Eighth Fluid Dynamics Conference*, Snowmass Village, Colorado, (June 29–July 2, 1997).

44. Erlebacher, G. and Hussaini, M. Y. "Nonlinear Shock/Turbulence Interactions," *Thirteenth U.S. National Congress of Applied Mechanics*, June 1998, University of Florida, Gainesville, FL, (1998).

45. Erlebacher, G. and Hussaini, M. Y. "Shock Shape Alteration due to Interaction with Organized Structures," *Fifty-First Meeting of the Division of Fluid Dynamics of the American Physical Society*, Philadelphia, PA, (November 22–24, 1998).

46. Woodruff, S. L. , Seiner, J. M., Hussaini, M. Y., and Erlebacher, G. "Evaluation of Turbulence-Model Performance as Applied to Jet-Noise Prediction," *Thirty-Sixth Aerospace Science Meeting and Exhibit*, Reno, Nevada, 8 pages, (January 12–15, 1998).

47. Jobard, B., Erlebacher, G., and Hussaini, M. Y. "Hardware-Accelerated Texture Advection for Unsteady Flow Visualization," Presented at IEEE Visualization by B. Jobard, (October 2000).

48. Jobard, B., Erlebacher, G., and Hussaini, M. Y. "Lagrangian-Eulerian Advection for Unsteady Flow Visualization," Presented at IEEE Visualization, (October 2001).

49. Grant, J., Erlebacher, G., and O'Brien, J., "Case Study: Visualization of Thermoclines in the Ocean using LETS," Presented at *IEEE Visualization '2002/*, (October 2002).

50. Erlebacher, G., Yuen, D. A., and Dubuffet, F., "Case Study: Visualization and Analysis of High Rayleigh Number – 3D Convection in the Earth's Mantle," Presented at *IEEE Visualization '2002/*, (October 2002).

51. Hussaini, M. Y., Erlebacher, G., and Jobard, B., "Real-time Visualization of Unsteady Flow Fields," Presented at the 40th AIAA Meeting in Reno, NV, (January 2002).