

UNIVERSITY OF NEW HAMPSHIRE
COLLEGE OF ENGINEERING AND PHYSICAL SCIENCES

Curriculum Vitae

NAME: Joseph C. Klewicki

TITLE: Professor/Dean

BIRTHDATE: October 16, 1959

EDUCATION: Ph.D. 1989 Michigan State University, Mechanical Engineering, GPA 3.75/4.0, Dissertation: "On the Interactions Between the Inner and Outer Region Motions in Turbulent Boundary Layers"
M.S. 1985, Georgia Institute of Technology, Mechanical Engineering
B.S. 1983 Michigan State University, Mechanical Engineering
A.D. 1981 Lansing Community College, Associates Degree in Science

AREAS OF

SPECIALIZATION: Experimental methods in fluid mechanics, turbulent and unsteady flows, vorticity dynamics, boundary layers, atmospheric surface layer phenomena

HONORS AND

AWARDS: 19th ASME Freeman Scholar, 2008
Michigan State University, Mechanical Engineering, Distinguished Alumnus Award, 2005
Fellow, American Society of Mechanical Engineers, 2004
University of Utah, College of Engineering, Outstanding Teaching Award, 2003
University of Utah, Mechanical Engineering Professor of the Year 2003
Invited Attendee, National Academy of Engineering, 8th Annual Frontiers of Engineering Symposium, 2002
University of Utah, Mechanical Engineering Professor of the Year 2001
University of Utah, Mechanical Engineering Professor of the Year 2000
Finalist, University of Utah Presidential Teaching Scholar 1997
ASME Outstanding Graduate Student Award, MSU 1989
MSU College of Engineering Outstanding Mechanical Engineering Graduate Student Award, 1989

WORK HISTORY,

EXPERIENCE: 8/05 – present: Dean, College of Engineering and Physical Sciences, University of New Hampshire
8/05 – present: Professor, Department of Mechanical Engineering, University of New Hampshire

7/01 – 7/05: Professor and Chair, Department of Mechanical Engineering, University of Utah
 7/96 - 6/01: Associate Professor, Department of Mechanical Engineering, University of Utah
 9/90 - 7/96: Assistant Professor, Department of Mechanical Engineering, University of Utah
 7/89 - 9/90: Research Associate, Turbulence Structure Laboratory, Department of Mechanical Engineering, Michigan State University
 3/85 - 6/89: Research Assistant, Turbulence Structure Laboratory, Department of Mechanical Engineering, Michigan State University
 9/83 - 85: Research Assistant, Department of Mechanical Engineering, Georgia Institute of Technology

**TEACHING
 RESPONSIBILITIES,
 ASSIGNMENTS:**

UNIVERSITY OF NEW HAMPSHIRE

Fall 2007, ME 608, Fluid Mechanics, 66 students
 Spring 2007, ME 895, Fluid Dynamical Phenomena, Boundary Layers and Turbulence, 6 students

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Spring 2005, ME 4010, Engineering Design II, 91 students
 Fall 2004, ME 3700, Fluid Mechanics, 122 students
 Fall 2004, ME 5960/6960, Fluid Dynamical Phenomena, Boundary Layers and Turbulence, 20 students
 Fall 2003, ME 6005, Exploration of Complex Continuum Phenomena, 7 students
 Spring 2003, ME 3700, Fluid Mechanics, 41 students
 Fall 2002, ME 3700, Fluid Mechanics, 78 students
 Spring 2002, ME 3700, Fluid Mechanics, 28 students
 Fall 2001, ME 3700, Fluid Mechanics, 49 students
 Summer 2001, ME 5960/6960, Fluid Dynamical Phenomena, Boundary Layers and Turbulence, 25 students
 *Spring 2001, ME 3700, Fluid Mechanics, 45 students
 Fall 2000, ME 3700, Fluid Mechanics, 43 students
 Fall 2000, ME 4005/6005, Design/Exploration of Complex Continuum Systems, 16 students
 Spring 2000, ME 3700, Fluid Mechanics, 49 students
 Fall 1999, ME 6005, Exploration of Complex Continuum Phenomena, 7 students
 Fall 1999, ME 4005, Design of Complex Continuum Systems, 18 students
 Fall 1999, ME 3700, Fluid Mechanics, 41 students
 Fall 1998, ME 3700, Fluid Mechanics, 44
 Spring 1998, ME 351, Fluid Mechanics II, 40 students

Winter 1998, ME 654, Viscous Flow I, 4 students
 Spring 1997, ME 351, Fluid Mechanics II, course/lab coordinator and TA, 20 students
 Winter 1997, ME 557, Experimental Methods in Fluid Mechanics, 9 students
 Winter 1997, ME/CE 350, Fluid Mechanics I, 37 students
 Fall 1996, ME 650, Fluid Mechanics, 10 students
 Spring 1996, ME 655, Viscous Flow II, 8 students
 *Winter 1996, ME 557, Experimental Methods in Fluid Mechanics, 9 students
 Winter 1996, ME 654, Viscous Flow I, 14 students
 Fall 1995, ME 364, Heat Transfer, 38 students
 Spring 1995, ME 351 (2 sections), Fluid Mechanics II, 63 students
 *Winter 1995, ME 557, Experimental Methods in Fluid Mechanics, 15 students
 *Fall 1994, ME/CE 350, Fluid Mechanics I, 72 students in lecture, 114 students in lab (extra students due to change to concurrent lab/lecture course structure)
 Spring 1994, ME 655, Viscous Flow II, 11 students
 Winter 1994, ME 654, Viscous Flow I, 12 students
 *Winter 1994, ME 557, Experimental Methods in Fluid Mechanics, 14 students
 Fall 1993, ME 360, Thermodynamics I, 67 students
 Spring 1993, ME/CE 350, Fluid Mechanics, 68 students
 *Winter 1993, ME 557, Experimental Methods in Fluid Mechanics, 14 students
 Fall 1992, ME 360, Thermodynamics I, 81 students
 Fall 1992, ME/CE/ChE 650, Fluid Mechanics, 31 students
 Summer 1992, ME/CE 350, Fluid Mechanics, 37 students
 *Spring 1992, ME 655, Viscous Flow II, 12 students
 Winter 1992, ME 654, Viscous Flow I, 20 students
 *Fall 1991, ME 360, Thermodynamics I, 35 students
 Spring 1991, ME/CE 350, Fluid Mechanics, 71 students
 Winter 1991, ME 360, Thermodynamics I, 74 students

"*" indicates made Dean's List for top 15% teaching score in the College of Engineering

DEVELOPMENT OF NEW

COURSES/LABS: UNIVERSITY OF NEW HAMPSHIRE

ME 895 Fluid Dynamical Phenomena, Boundary Layers and Turbulence, Spring 2007, added new set of lectures on MMB analysis, added analysis of boundary layer hot-wire data.

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- ME 3700, Fluid Mechanics, Fall 2004, added acoustic Doppler velocimeter measurements to flow visualization experiment
- ME 3700, Fluid Mechanics, Fall 2002, developed new fully developed pipe flow experiment
- ME 5960/6960, Fluid Dynamical Phenomena, Boundary Layers and Turbulence, Summer 2001, completely new course, 4 new experiments, all new lectures
- ME 4005/6005 Design of Complex Continuum Systems/Exploration of Complex Continuum Phenomena, Fall 1999, completely new course, 9 new experiments, all new lectures
- ME 3700, Fluid Mechanics, Fall 1998, Combined and reorganized lecture and lab material from two quarter courses (ME/CE 350 & ME 351)
- ME 654, 655, Viscous Flow I & 2, new text, new course structure
- ME 557, Experimental Methods in Fluid Mechanics, Winter 1993, took existing course and completely re-worked the laboratory experiments and lecture content
- ME/CE 350, Fluid Mechanics I, Fall 1994, combined laboratory and lecture materials into one concurrent package, rearranged lecture material to fit labs, developed five new laboratory experiments
- ME 557, Experimental Methods in Fluid Mechanics, Winter 1995, redesigned four of the five existing labs for use with new instrumentation and facilities
- ME 351, Fluid Mechanics II, Spring 1995, new core undergraduate course containing elements of boundary layer theory, basic aerodynamics, and one-dimensional compressible flows, developed 2 new laboratory experiments
- ME 364, Heat Transfer, Fall 1995, developed new transient heat conduction experiment

Note that overall more than \$800,000 in facilities and instrumentation has been acquired from grants and donations in service of undergraduate instruction.

**GRADUATE
STUDENTS
SUPERVISED:**

UNIVERSITY OF NEW HAMPSHIRE

- Z. Hauptman, M.S. student, Thesis Topic: "Design and Characterization of a Subsonic Wind Tunnel," expected December 2009.
- F. Mehdi, Ph.D. student, Dissertation Topic (tentative): "Reynolds Stress Structure and Scaling of Rough-Wall Turbulent Boundary Layers," expected may 2010.

- V. Korchagina, MS student, Thesis Topic: "Correlation Structure of Turbulent Boundary Layer Wall-Pressure Fluctuations" expected May 2008.
- N. Souitat, M.S. Student, Thesis Topic: "Design and Testing of a Ducted Wind Turbine," expected May 2008.
- S. Guntur, M.S. Student, Thesis Topic: "TBD," expected May 2009.

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- T.F. Femenias, M.S. student, Thesis Title: "Modification and Qualification of a Large Scale Wind Tunnel", Graduated August 1993.
- J.M. Murray, M.S. student, (non-thesis) graduated June 1993.
- Kiyoung Lee, Ph.D. student, Dissertation Title: "Shear-Wake Interactions with Circular Cylinders" graduated August 1994.
- R.B. Hill, Ph.D. student, Dissertation Title: "Boundary Layer Vortex Generation," graduated Spring 1996.
- J. Guilkey, Ph.D. student, Dissertation Title: "On Pipe Mixing," graduated March 1997.
- D. Maynes, Ph.D. student, Dissertation Title: "Unsteady Separated Flow Around a Rotating Bluff Body," graduated March 1997.
- W.S. Grosvenor M.E. student, "Preliminary Energy Analysis of a Corporate Campus, graduated January 1998.
- M. Metzger, M.S. student, (non-thesis) graduated January 1998.
- E. Thurlow, Ph.D. student, Dissertation Title: "Experimental Study of Turbulent Poiseuille-Couette Flow," graduated December 1998.
- Q.-X. Zheng, Ph.D. student, Dissertation Title: "Near Wall Structures and Interactions of the Transverse Jet," graduated August 1999.
- P. Sefcik, M. Phil. student, Research Topic: "Experimental Study of Particle Dispersion in the Near-Field of a Particle Laden Coaxial Confined Jet," graduated May 2000.
- R. Sadr, Ph.D. student, Dissertation Title: "Spatial Structure of a Particle Laden, Coaxial Confined Jet," graduated May 2002.
- M. Metzger, Ph.D. student, Dissertation Title: "Scalar Dispersion in High Reynolds Number Turbulent Boundary Layers," graduated May 2002.
- C. Brydon, M.S. student, Thesis Title: "Design of a Large Scale Subsonic Wind Tunnel," graduated May 2004.
- P. Priyadarshana, Ph.D. student, Dissertation Title, "Reynolds Number Influences on Turbulent Boundary Layer Momentum Transport," graduated May 2005.
- M. Nelson, M.S. student, non-thesis (graduated) May 2004.
- N. Arnim, M.S. student, Thesis Title: "Spectral Transfer of Scalar Variance at High Reynolds Number," graduated May 2005.
- S. Miles, M.S. student, Thesis Title: "Flow Physics of the Cold-Restart of a Gelled Waxy Oil," graduated December 2004.

- E. Wheeler, M.S. student, Thesis Title: "Evaluation of the Simulated Cold-Restart of a Gelled Crude Oil ," graduated May 2004.
- B. Waite, M.S. student, Thesis Title: "On the Downstream Evolution of Laminar Initial Condition Shear-Wake Flows," graduated Summer 2004.
- J. Elsnab, Ph.D. student: Thesis Topic: "Spatially and Temporally Resolved Velocity Field Measurements in Microchannels," (co-advised with T. Ameen), expected December 2006.
- S. Pohl, M.S. student, Thesis Title: "Sensitivity of the Flow Characteristics of an Urban Street Canyon to Upper-Level Wind Direction and Stability ," graduated December 2005.
- D. Kenney, M.S. student, Thesis Title: "Surface Vorticity Flux Measurements in a High Reynolds Number Boundary Layer," graduated, August 2005.
- D. Challa, M.S. student, Thesis Title: "On the Downstream Evolution of Turbulent Initial Condition Shear-Wake Flows," graduated August 2005.
- H. Miner, M.S. student, Thesis Topic: "Atmospheric Plume Dispersion through a Compact Cylinder Array," graduated December 2005.
- S. Kandarpa, M.S. student, Thesis Title: "Development and Testing of an Oil-Film Interferometric Skin Friction Measurement Technique," graduated May 2006.
- R. Joshi, M.S. student, Thesis Title: "A Data Analysis and Management Web Service for Experimental Fluid Dynamics," graduated August 2006.
- V. Rapp, M.S. student, Thesis Title: "Re-instrumentation and Characterization of a $Ma = 2.0$ Wind Tunnel," graduated August 2005.
- A. Fershtut, M.S. student, Thesis Title: "Reynolds Number Dependence of Sublayer Pockets," graduated December 2006.

**INDEPENDENT STUDY
STUDENTS SUPERVISED:**

At the undergraduate level, over 140 independent research and/or design students have been mentored. Most of these students have also been financially supported either through an NSF-REU grant, CIMD student grants, or UofU UROP or SROP grants.

At the graduate level, over 35 independent study projects have been supervised.

**UNDERGRADUATE RESEARCH
PAPERS/POSTERS COMPETITIONS:**

A number of the above undergraduate research projects have resulted in participation in papers/posters/presentation competitions:

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- A. Terry and M. Gill, "Spatial Investigation of Turbulent Flow around a Surface Mounted Cube," winner, national ASME-FED student paper competition, 1995.
- M. Colton and W. Decker, "Inflectional Velocity Profile Turbulent Boundary Layer Interaction with a Surface Mounted Cylinder," winner, national ASME-FED student paper competition, 1996.
- L. Hansen, "Effect of Initial Conditions on Turbulent Pipe Flow Mixing," finalist, ASME-FED student paper competition, 1997.
- C. Hirschi, "Characteristics of Visually Detected Coherent Motions in Turbulent Boundary Layers," finalist, national ASME-FED student paper competition, 2001.
- H. Miner, "Near Surface Atmospheric Plume Dispersion through a Compact Cylinder Array," winner, student poster competition, AMS, 4th Symposium on the Urban Environment, 2002.
- J. Campbell and W. Coppom, "Influence of Velocity Ratio on the Downstream Mixing Evolution in an Axial Flow Mixer," winner, national ASME-FED student paper competition, 2002.
- H. Miner and A. Rasmussen, "Evolution of Ground Level Scalar Concentrations through a Compact Cylinder Array Embedded in the Atmospheric Surface Layer," finalist, national ASME-FED student paper competition, 2002.
- N. Arnim, T. Wall and J. Waterhouse, "The Use of Wind Tunnel, Field and Computational Studies to Determine Building Wake Effects on the Hill Air Force Base Runway," finalist, national ASME-FED student paper competition, 2002.
- J. Hall, S. Miles, G. Wheeler, L. Shunn, E. Landis and R. Whicker, "Experimental Study of the Cold Restart of a Pipeline Filled with Gelled Waxy Oil," finalist, national ASME-FED student paper competition, 2002.
- B. Perkins, "Well Resolved Pressure Measurements in a High Reynolds Number Turbulent Boundary Layer," finalist, national ASME-FED student paper competition, 2004.

**RESEARCH, SCHOLARSHIP
AND OTHER CREATIVE WORK:**

EXTRA MURAL

GRANTS/FUNDING: UNIVERSITY OF NEW HAMPSHIRE

- "Toward Scaling the Momentum Redistribution Mechanisms of Rough-Wall Turbulent Boundary Layers," ONR, Award Amount: \$364,000 5/08-5/11.
- "Advice and Consultation on the Environmental Fate of Chemical Warfare Agents," SAIC/DTRA, Award Amount: \$23,254, 5/06-5/08.
- "REU associated with Scaling and Dynamics of Boundary Layer Turbulence," NSF, Award Amount: \$12,000, 11/05-11/08.
- "Scaling and Dynamics of Boundary Layer Turbulence," NSF, Award Amount: \$270,850, 5/05-4/09.
- "Large Scale Wind Tunnel for the Study of High Reynolds Number Phenomena," NSF-EPSCoR-RII, Sub-award Amount: \$1.57M 8/07-8/10.
- "Advanced Ducted Wind Turbine Technology for Small Scale Wind Energy Generation," NHIRC/Turbocam, Award Amount: \$196,363, 6/06-8/08.
- "Cluster for Integrated Computation and Analysis of Reconnection and Turbulence," DOE-EPSCoR, PI: A. Bhattacharjee, co-PI: J. Klewicki and a number of others, Award Amount: \$1.7M 6/07-6/10.

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- "Dual, Two Component, LDA for Turbulent Boundary Layer Studies," ONR-DURIP, Award Amount, \$276,000, 5/05-6/07.
- "Technical Consultation on Agent Fate Wind Tunnel Studies," U.S. Army Aberdeen Proving Ground, Award Amount: \$22,532, 1/05-1/06.
- "Joint Urban-2003 Field Experiment," U.S. Department of Energy, Award Amount: \$118,000, (PI: E. Pardyjak, Co-PI: J. Klewicki) 4/03-2/05.
- "BE/CNH: Urban Trace-Gas Emissions Study (UTES): Interactions Among Canopy Processes, Anthropogenic Emissions and Social Institutions in the Salt Lake Valley, Utah" NSF, Award Amount: \$1,498,000, (PI: D. Pataki, co-PI: J. Klewicki and others) 9/02-3/06.
- "Weber Canyon Winds and Building Wake Effects on the Hill Air Force Base Runway," U.S. Air Force, Award Amount: \$63,739, 2/02-6/02.
- "Reynolds Number Dependence of Turbulent Boundary Layer Transport," NSF, Award Amount: \$120,000, 11/01-11/04.
- "Downstream Development of Turbulent Scalar Transport," U.S. Army DPG, Award Amount: \$10,000, 9/01-12/01.
- "ITR/IM: Raw Data as Scientific Assets – A Sharable Repository for Experimental Data," NSF, Award Amount: \$370,000, 8/01-8/05.
- "Close Range Dispersion Trials," UCR/CARB, Award Amount: \$50,880, 5/01-10/01.

- "Velocity Measurements in the Urban Roughness Sublayer,"
UCR/CARB, Award Amount: \$99,920, 3/01-3/03.
- "Design of a Large Scale High Quality Wind Tunnel," U.S. Army DPG,
Award Amount: \$91,776, 1/00-1/01.
- "Retrofit Specifications For Extended Test Range Capabilities of the
Detector Test System (DTS)," (PI: T. Ameel, co-PI: J. Klewicki)
U.S. Army DPG, Award Amount: \$67,017, 5/00-9/00.
- "Boundary Layer Turbulence Measurements at Submarine Scale
Reynolds Numbers to Support RANS Model Validation and
Development," (PI: J. Klewicki, co-PIs: K. Sreenivasan, J. Foss),
ONR, Award Amount: \$973,193, 5/00-3/04.
- "Interdisciplinary Graduate Education and Research Training in Meso-,
Micro- and Nano- (MMN) Scale Thermalfluid Systems
Engineering and Science," (PI: R. Roemer, co-PI: J. Klewicki and
many others) NSF, Award Amount: \$2,697,920, 7/00-6/05.
- "Reynolds Number Effects on Boundary Layer Turbulent Transport,"
NSF, Award Amount: \$170,000, 11/99-10/01.
- "Research Experiences for Undergraduates," NSF, \$10,000, 11/99-
10/01.
- "Direct Wall Shear Stress Measurements in High and Low Reynolds
Number Turbulent Boundary Layers," WAESO, Award Amount:
\$2,378, 5/99-10/99.
- "Test Fixture Design, Testing and Development," U.S. Army DPG,
Award Amount: \$10,000, 6/99-5/00
- "Automobile Climate Control Studies: Defogging and Defrosting,"
Ford Motor Company, Award Amount: \$12,000, 12/98-6/99
- "Methods for the Reduction of NOx Emissions and Unburned Carbon
in Ash," REI subcontract/DOE flow-through Total Subcontract
Amount: \$549,071 (Phase II mixing portion \$123,283) 3/98-1/00.
- "Measurements of Concentration and Velocity Fluctuations Fluxes and
Gradients in Near-Surface Atmospheric Plumes," U.S. Army DPG,
Award Amount: \$10,213, 7/98-11/98
- "Research and Development of Engineering Designs Associated with
Complex Continuum Systems," NSF-CRCD, Award Amount:
\$421,118 (PI: P. McMurtry, co-PI: J. Klewicki and others)
- "Research Experiences for Undergraduates," NSF, \$10,000/year
(renewable), 10/98-9/01. (PI: P. McMurtry, co-PI: J. Klewicki)
- "Microscale Measurements for BIO911 ACTD," U.S. Army DPG,
Award Amount: \$7,408, 5/97-7/97.
- "Experimental Fluid Mechanic Investigation of Hydrodynamic Issues
Associated with Rapid Crystal Growth," (PI: J. Klewicki, co-PI:
P. McMurtry) Lawrence Livermore National Laboratory, Award
Amount: \$78,562 3/97-12/97.
- "Surface Layer Turbulence and Environmental Science Test Facility,"
(PI of UofU subcontract, \$302,500) NSF, Total Award Amount:
\$605,000, 9/96-8/98.
- "Development and Testing of a Scalar Flux Measurement System,"
U.S. Army DPG, Award Amount: \$27,153, 6/96-10/96.

- “Boundary Layer Flow Visualization,” NSF-CIMD, Award Amount: \$2,088, 5/96-10/96.
- “Methods for the Reduction of NO_x Emissions and Unburned Carbon in Ash,” REI subcontract/DOE flow-through Total Subcontract Amount: \$549,071 (Phase I mixing portion \$114,029, Phase II pending)10/95-10/99.
- “Material Test Facility Scale Model Tests,” (PI: J. Klewicki, co-PI: P. McMurtry) U.S. Army DPG, Award Amount: \$25,000, 10/95-12/95.
- “Simultaneous, Noninvasive Multi-Point Measurements of Velocity, Concentration and Temperature,” (co-PI: J. Klewicki, PI: P. McMurtry) The Petroleum Research Fund of the American Chemical Society, Award Amount: \$50,000 7/95-3/98.
- “Passive Sampler Testing Facility,” U.S. Army DPG, Award Amount: \$74,860 1/95-9/97.
- “Evaporation and Recirculation Region Characterization,” U.S. Army DPG, Award Amount: \$12,913 4/95-9/95.
- “Plate and Frame Heat Exchanger,” Tranter Corporation, Gift Amount: \$1,843, Spring 1995.
- “Experimental Study of the Fluid Mechanics in the Rapid Solution Growth of KDP Crystals,” (PI: J. Klewicki, co-PI: P. McMurtry) Lawrence Livermore National Laboratory, Award Amount: \$105,142 12/94-12/96.
- “Design and Construction of a Test Platform for Turbulence Measurements in the Atmospheric Surface Layer,” NSF-CIMD, Award Amount: \$3,140 1/94-6/94.
- “Field Trials Data Analysis,” NSF-CIMD Award Amount: \$2,506 6/94-9/94.
- “Hotwire Measurements in the Atmospheric Surface Layer,” Battelle-U.S. Army, Award Amount: \$9,120 5/94-9/94.
- “Thermal Analysis for INEL MIR Facility,” Idaho National Engineering Laboratory, Award Amount: \$4,470 8/94-9/94.
- “Engineering Review of JSLIST Chamber Designs,” U.S. Army DPG, Award Amount: \$12,940 3/94-10/94.
- “Hot-Wire Measurements and Flow Visualization to Support a Concentration Field Test in the Atmospheric Boundary Layer,” U.S. Army DPG, Award Amount: \$14,547, 4/93-11/93.
- “Hands-On Data Acquisition and Signal Analysis Equipment for the Undergraduate Mechanical Engineering Thermoscience Laboratories,” NSF-ILI, Award Amount: \$33,400, 7/92-7/93.
- “Flow Blockage Effects on the Performance of Sonic Anemometers,” NSF-CIMD, Award Amount: \$1,092, Summer 1992.
- “Space-Time Evolution of Near-Wall Velocity Gradients that Generate Organized Streamwise Vorticity,” NSF, Award Amount: \$198,886, 3/92-8/95.
- “Wind Tunnel Traverse Mechanism,” The Industrial Company, Gift Amount: \$1,000, Spring-Summer 1992.

"Sonic Anemometer Wake Interference Effects," U.S. Army DPG,
Award Amount: \$5,532, 4/92-10/92.

"Three Dimensional Vorticity Dynamics," NSF-CIMD, Award
Amount: \$1,938, Winter 1992.

INTRA MURAL

GRANTS/FUNDING: UNIVERSITY OF NEW HAMPSHIRE

"Development and Evaluation of the CEPS Honors-in-Major Program,"
(J. Klewicki, PI, K. Graham, co-PI) Undesignated Gifts Fund
Competition, Award Amount: \$11,400, 07/06-07/08.

"A Strategic PhD Recruitment and Retention Initiative," (J. Klewicki,
PI, R. Torbert, co-PI) UNH Research Office, Award Amount:
\$220,000, 9/07-5/10.

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"Unifying Data Acquisition and Control. Part 1: Continuum Systems
Laboratories," BEEF funds, Award Amount: \$66,000, 02/02-02/03

"Radio-Acoustic Sounding System (RASS)," U of U Research
Instrumentation Fund, Award Amount: \$47,290,
6/02-6/03

"Two Stream Shear Layer Transfer from UCLA," facility value:
\$250,000 (approx.), ME Dept cost for transfer and installation:
\$11,000 (approx.), 07/01-09/01

"Undergraduate Research Instrumentation," (with co-PIs, McMurtry,
Lighty, Deo, Rabbitt, Weiss), BEEF funds, Award Amount:
\$66,500, 02/01-02/02.

"Urban Dispersion in a Thermally Stratified Atmosphere," U of U
Research Foundation, Award Amount: \$26,260, 11/99-10/00.

"Near-Surface Atmospheric Velocity and Temperature Sensors," U of
U Research Instrumentation Fund, Award Amount: \$17,050,
7/99-6/00

"Heat and Mass Transfer Instrumentation," BEEF funds, Award
Amount: \$24,000 (not including match) 1/99-1/01 (co-PI)

"Scientific Visualization Instrumentation," BEEF funds, Award
Amount: \$56,330 (not including match) 1/99-1/01

"Building 60 Refurbishment, Deans Research Fund, Award Amount:
\$12,400 6/98-6/99

"Stratified Shear Layer Facility Transfer from Lawrence Livermore
National Laboratory," U of U Research Equipment Fund, Award
Amount: \$4,100, Winter 1997 (facility valued at approx
\$110,000).

"Research Equipment Transfer from Michigan State University," U of
U Research Equipment Support Fund, Award Amount: \$6,000,
Fall 1995 (total value of equipment transferred approx. \$200,000).

- "Fluid Mechanics Studies Utilizing LIPA, LIF and CFI," (with co-PIs P. McMurtry and P. Ligrani) U of U Research Equipment Support Fund, Award Amount: \$8,000, Fall 1993.
- "A Plan to Optimize Use of College of Engineering Fluid Mechanics Laboratory Space, Facilities, and Equipment Resources," (PI: P. McMurtry, co-PI's: J. Klewicki, L.K. Isaacson, R.Decker) U of U College of Engineering (\$2,000), Mech. Eng. Dept. (\$2,500), Civil Eng. Dept. (\$1,500), Total Award Amount: \$6,000, Summer-Fall 1992.
- "The Mechanisms Responsible for Generating Organized Streamwise Vorticity in Turbulent Boundary Layers," U of U Research Committee, Award Amount: \$5,000. 12/91-12/93.
- "A Hot-Wire Maintenance Facility for Undergraduate and Graduate Fluid Mechanics Laboratories," U of U Dept. Mech. Eng., Award Amount: \$5,440, Summer 1991.
- "Portable Data Acquisition and Analysis System for the Undergraduate TFES Laboratories," U of U Dept. Mech. Eng., Award Amount: \$6,400, Summer 1991.
- "Continuing Support for the Wind Tunnel Refurbishment," (PI: J. Klewicki, co-PI: R.Decker) U of U College of Engineering (\$1,000), Mech. Eng. Dept. (\$1,000), Civil Eng. Dept. (\$1,000), Total Award Amount: \$3,000, Summer, 1991.
- "Use of Laser Induced Photo-Chemical Anemometry (LIPA) to Determine Cervical Spine Soft Tissue Deformation," (PI: S. Lantz, co-PI: J. Klewicki) U of U Biomedical Research Support Committee, Award Amount: \$4,000.
- "Refurbishment and Retrofitting the Wind Tunnel Facility," U of U Research Support Committee, (PI: R.Decker, co-PI's: P. McMurtry, J. Klewicki), Award Amount: \$30,000, 9/90-9/91.

PUBLICATIONS:

BOOK CHAPTERS

- J.C. Klewicki, "Measurement Considerations in Wall-Bounded Turbulent Flows: Wall Shear Stress," *Handbook of Fluid Mechanics*, (C. Tropea, A. Yarin and J. Foss, editors), Springer-Verlag, 2007.
- J. Klewicki, "Mean Momentum Balance: Implications for Turbulence Control," in *NUS-IMS Workshop on Transition and Turbulence Control (Volume 8)*, Lecture Note Series, National University of Singapore, Singapore, 283, 2006.
- P. Priyadarshana and J.C. Klewicki, "Reynolds Number Scaling of Wall Layer Velocity Vorticity Products," in *Reynolds Number Scaling in Turbulent Flow*, Smits, A.J. (Ed.), Kluwer Academic Publishers, 2003, 117.
- M.M. Metzger, J.C. Klewicki and P. Priyadarshana "Reynolds Number Dependencies in Boundary Layer Axial Stress and Scalar Variance

- Transport,” in *Reynolds Number Scaling in Turbulent Flow*, Smits, A.J. (Ed.), Kluwer Academic Publishers, 2003, 83.
- J.C. Klewicki and M.M. Metzger, “Studies of High Reynolds Number Turbulence in the Atmospheric Surface Layer Over the Salt Playa of Western Utah,” in *Reynolds Number Scaling in Turbulent Flow*, Smits, A.J. (Ed.), Kluwer Academic Publishers, 2003, 45.
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- D. Maynes, H. Robey, J. Klewicki and P. McMurtry, "Characteristics of the Axial and Tangential Velocities Near a Rotating Bluff Body on a Platform," 50th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, San Francisco CA, November 1997.
- E.M. Thurlow and J.C. Klewicki, "Mean and Instantaneous Axial Profile Measurements in Turbulent Couette-Poiseuille Flow," 49th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Syracuse NY, November 1996.
- J.E. Guilkey, P.A. McMurtry, A.R. Kerstein and J.C. Klewicki, "Low Wavenumber Statistics in Turbulent Pipe Flow," 49th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Syracuse NY, November 1996.
- Q.-X. Zheng, J.C. Klewicki and P.A. McMurtry "Unsteady Sphere Wake Behavior at Intermediate Reynolds Number," 49th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Syracuse NY, November 1996.
- D. Maynes, J.C. Klewicki and P.A. McMurtry "Evolution of the Turbulent Flow Field Around a Rotating Bluff Body," 49th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Syracuse NY, November 1996.
- M.M. Metzger and J.C. Klewicki, "Turbulent Boundary Layer Interaction with a Surface-Mounted Cube: Flow Visualizations and Wall-Pressure Measurements," 49th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Syracuse NY, November 1996.
- K.A. Davis, M.J. Bockelie, P.J. Smith, M.P. Heap, R.H. Hurt and J.C. Klewicki, "Optimized Fuel Injector Design for Maximum In-

- Furnace NO_x Reduction and Minimum Unburned Carbon," First Joint Power and Fuel Systems Contractors Conference, U.S. DOE, Pittsburgh Energy Technology Center, Pittsburgh, PA, July 1996.
- J.C. Klewicki, J.F. Foss and J.M. Wallace, "High Reynolds Number [$R_0=O(10^6)$] Boundary Layer Turbulence in the Atmospheric Surface Layer Above Western Utah's Salt Flats," NSF International Workshop on Ultra-High Reynolds Number Flows, Brookhaven National Laboratory, Upton, NY, June 1996.
- P. McMurtry, J. Guilkey, J. Klewicki, A. Kerstein, "Scalar Variance Decay in Turbulent Pipe Flow: Theory, Model, and Experimental Results," 48th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Irvine, CA, November 1995.
- D. Maynes, P. McMurtry, J. Klewicki, J. Ahterton, M. Richardson, "Experimental Techniques Used in the Characterization of the Hydrodynamics Associated with Accelerated KDP Crystal Growth," 48th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Irvine, CA, November 1995.
- J. Guilkey, K. Gee, P. McMurtry, J. Klewicki, "A New Initialization Technique for Studies of Turbulent Scalar Mixing," 48th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Irvine, CA, November 1995.
- J.C. Klewicki, M.M. Metzger, J.D. Adams, "Simultaneous Near-Wall Velocity / Surface Pressure Measurements in a Mud Flats Atmospheric Boundary Layer," 48th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Irvine, CA, November 1995.
- M.M. Metzger, J.C. Klewicki, C. Biltoft, "Field and Wind Tunnel Studies of the Flow Field Around a Surface Mounted Cube," 48th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Irvine, CA, November 1995.
- R.B. Hill, J.C. Klewicki, "Experiments on Shear Layer / Flexible Membrane Interactions," 48th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Irvine, CA, November 1995.
- C.A. Biltoft, E. Yee, J.C. Klewicki, M.M. Metzger and J.F. Bowers, "Turbulence Effects on Concentration Statistics in the Atmospheric Surface Layer", submitted, Ninth Joint Conference on Applications of Air Pollution Meteorology (Frank Pasquill Memorial Session), 1996 Meeting of the American Meteorological Society, Atlanta, GA, January, 1996.
- J. Guilkey, K. Gee, J.C. Klewicki and P.A. McMurtry, "Caged Fluorescent Dye Based Studies of Turbulent Scalar Mixing", International Symposium on Optics, Imaging and Instrumentation, 40th Annual Meeting of The International Society for Optical Engineering, San Diego, CA, July, 1995.

- J.F. Foss, D.G. Bohl, F.D. Bramkamp, and J.C. Klewicki, "Transverse Vorticity Measurements in the NASA Ames 80x120 Wind Tunnel Boundary Layer," CTR Annual Research Briefs, 1994, 263.
- J.C. Klewicki, E. Kelner, E.M. Thurlow and M.M. Metzger, "Statistical Structure in $R_0 O(10^6)$ Turbulent Boundary Layers", 47th Meeting of the American Physical Society, Division of Fluid Dynamics, Atlanta, GA, November, 1994.
- M.M. Metzger, J.C. Klewicki, E. Kelner and E.M. Thurlow, "Visualizations of the Viscous Sublayer at $R_0 \sim 1,000,000$ ", 47th Meeting of the American Physical Society, Division of Fluid Dynamics, Atlanta, GA, November, 1994.
- R. B. Hill, M.L. Gill and J.C. Klewicki, "Vortex Formation in Shear Flow Over a Rotating Disc", 47th Meeting of the American Physical Society, Division of Fluid Dynamics, Atlanta, GA, November 1994.
- R. B. Hill and J.C. Klewicki, "Experiments on Shear Layer/Rotating Disc Interactions", 46th Meeting of the American Physical Society, Division of Fluid Dynamics, Albuquerque, NM, November, 1993.
- Kiyoung Lee and J.C. Klewicki, "Flow Visualizations of Vortex Formation Around Circular Cylinders in Asymmetric Wakes", 46th Meeting of the American Physical Society, Division of Fluid Dynamics, Albuquerque, NM, November 1993.
- J.A. Murray and J.C. Klewicki, "An Experimental Investigation of Sonic Anemometer Wake Blockage Effects", ASME Fluids Engineering Conference, Washington D.C., June, 1993.
- R.B. Hill and J.C. Klewicki, "Experiments on Shear Layer Reorientation", 45th Meeting of the American Physical Society, Division of Fluid Dynamics, Tallahassee, FL, November, 1992.
- J.C. Klewicki, "Wall Region Velocity-Vorticity Interactions in Turbulent Boundary Layers", 45th Meeting of the American Physical Society, Division of Fluid Dynamics, Tallahassee, FL, November, 1992.
- J.C. Klewicki, J.A. Murray and R.E. Falco, "Vortical Motion Contributions to Stress Transport in Turbulent Boundary Layers", Thirteenth Symposium on Turbulence, University of Missouri-Rolla, Rolla, MO, September 1992.
- J.C. Klewicki and P.C. Fife, "Mechanisms for Generating Organized Streamwise Vorticity in Turbulent Boundary Layers", 44th Meeting of the American Physical Society, Division of Fluid Dynamics, Scottsdale, AZ, November 1991.
- J.C. Klewicki and R.E. Falco, "Reynolds Number Dependence of Vorticity Interactions in the Near-Wall Region. Part I: The Interaction Region and Vorticity Reorientation", 43rd Meeting of the American Physical Society, Division of Fluid Dynamics, Ithaca, NY, November 1990.

- R.E. Falco and J.C. Klewicki, "Reynolds Number Dependence of Vorticity Interactions in the Near-Wall Region. Part II: Velocity Gradients Associated with the Sublayer Response", 43rd Meeting of the American Physical Society, Division of Fluid Dynamics, Ithaca, NY, November, 1990.
- R.E. Falco, J. C. Klewicki, K. Pan, "Production of Turbulence in Boundary Layers and Modification of the Near Wall Region", Second IUTAM Symposium on Turbulence and Drag Reduction, Zurich, July, 1989.
- R.E. Falco, J.C. Klewicki and K. Pan and C.P. Gendrich, "Production of Turbulence in Boundary Layers", Seventh Symposium on Turbulent Shear Flows, Stanford, CA, August 1989.
- R.E. Falco, J.C. Klewicki and C.P. Gendrich, "Eduction of Inner Region Turbulent Boundary Layer Structure from Two-Point Spanwise Vorticity and Reynolds Stress PDF's", 42nd Meeting of the American Physical Society, Division of Fluid Dynamics, NASA Ames Research Center, CA, November, 1989.
- C.P. Gendrich, R.E. Falco and Klewicki, J.C., "Comparison of Event Detection Schemes Used in both the Inner and Outer Regions of Turbulent Boundary Layers", 42nd Meeting of the American Physical Society, Division of Fluid Dynamics, NASA Ames Research Center, CA, November, 1989.
- J.C. Klewicki and R.E. Falco, "Reynolds Number Dependence of Reynolds Stress Transport in Turbulent Boundary Layers", 41st Meeting of the American Physical Society, Division of Fluid Dynamics, Buffalo, NY, November, 1988.
- J.C. Klewicki and J.J. McGrath, "On Entropy Generation in Viscous Shear Flows", Society of Industrial and Applied Mathematics, Annual Meeting, Minneapolis, MN, July 1988.
- J.C. Klewicki "Turbulence Production in Boundary Layers", AFOSR Contractor's Meeting on Turbulence, Los Angeles, CA, June, 1988.
- J.C. Klewicki "Vorticity Field Measurements Using Photochomic Materials", AFOSR Contractor's Meeting on Turbulence, Los Angeles, CA, June 1988.
- J.C. Klewicki and R.E. Falco, "Two Point Vorticity Correlations in a Turbulent Boundary Layer", 40th Meeting of the American Physical Society, Division of Fluid Dynamics, Eugene, OR, November, 1987.
- J.C. Klewicki and R.E. Falco, "Spanwise Vorticity Distributions and Correlations in a Turbulent Boundary Layer", 39th Meeting of the American Physical Society, Division of Fluid Dynamics, Columbus, OH, November 1986.

**DEPARTMENTAL
REPORTS:**

- J.C. Klewicki and E.R. Pardyjak, "Building Array Drag Characterization Experiments," Rep. PFD-01-01, Dept. Mech. Eng., Univ. of Utah.
- M.M. Metzger and J.C. Klewicki, "BIO911: Velocity Measurements Inside the MAAF Hanger," Rep. PFD-97-01, Dept. Mech. Eng., Univ. of Utah.
- Q.X. Zheng, J.C. Klewicki and P.A. McMurtry, "Wake Velocity Measurements of a Sphere in Uniform Flow," PFD-96-02, Dept. Mech. Eng., Univ. of Utah.
- M.M. Metzger and J.C. Klewicki, "Statistics of Velocity and Pressure in the Surface Layer Over the Salt Flats of Utah's West Desert," Rep. PFD-96-01, Dept. Mech. Eng., Univ. of Utah.
- J.C. Klewicki, M.M. Metzger and E. Kelner, "Statistical Structure of the Axial Velocity Fluctuations in a Near-Neutral Atmospheric Boundary Layer in the Immediate Vicinity of a Mud Flats Ground Plane" Rep. PFD-95-01, Dept. Mech. Eng., Univ. of Utah.
- J.C. Klewicki, E. Kelner and J.M. Murray, "Hot-Wire Measurements of Atmospheric Turbulence: Concentration Fluctuation Trials, Dugway Proving Ground, May 5-25, 1993", Rep. PFD-93-2, Dept. Mech. Eng., Univ. of Utah.
- J.A. Murray and J.C. Klewicki, "An Experimental Investigation of Sonic Anemometer Wake Effects", Rep. PFD-93-1, Dept. Mech. Eng., Univ. of Utah.
- J.C. Klewicki and R.E. Falco, "Effects of Reynolds Number of Turbulent Boundary Layer Statistics", *Rep. TSL-89-4*, Dept. Mech. Eng., Mich. State Univ.
- J.C. Klewicki, S.M. Hasan, and A.G. Haddow, "The Documentation and Testing of Computer Programs used in the Estimation of Hausdorff Dimension", a MSU Dynamical Systems Group Report (1988).
- J.C. Klewicki and R.E. Falco, "On Accurately Measuring Statistics Associated with Small Scale Structure in Turbulent Boundary Layers", *Rep. TSL-88-4*, Dept. Mech. Eng., Mich. State Univ.

**INVITED
LECTURES:**

The following indicate the location and number of technical lectures given as a result of being invited by a colleague at the given institution.

- 1989: Michigan State University, Lehigh University, University of Maryland, University of Kentucky, University of Notre Dame.
- 1990: University of Illinois (Chicago), Massachusetts Institute of Technology, University of Utah, University of Wyoming
- 1991: Michigan State University (2).
- 1992: University of Utah
- 1993: Idaho National Engineering Laboratory
- 1995: University of Utah

- 1996: AIAA, Summer Annual Meeting, New Orleans, LA
- 1997: University of Utah
- 1998: 13th U.S. National Congress of Applied Mechanics, Gainesville, FL, AIAA Summer Annual Meeting Albuquerque MN, Utah State University, University of Utah
- 1999: University of Utah, Arizona State University
- 2000: ONR Turbulence and Wakes program review, Tucson, AZ, University of Utah
- 2001: ONR Turbulence and Wakes program review, Seattle, WA, University of Utah
- 2002: IUTAM Symposium on Reynolds Number Scaling in Turbulent Flow, Princeton University, Johns Hopkins University, California Institute of Technology, ONR Turbulence and Wakes program review, Washington, DC
- 2003: ONR Turbulence and Wakes program review, San Diego, CA, BYU, University of Utah
- 2004: University of Minnesota, University of Utah, ICTP Workshop on Wall Bounded Turbulence, Trieste, Italy, NUS-IMS Workshop on Transition and Turbulence Control, Singapore.
- 2005: Clarkson University, University of Utah, 4th AIAA Theoretical Fluid Mechanics Conference, Toronto, Workshop on Wall Bounded Turbulence, Chicago, IL.
- 2006: University of New Hampshire, Workshop on Wall Bounded Turbulence, Erice, Sicily.
- 2008: Brown University, CUNY

The following lectures were either associated with a contract function or as part of a short course/symposium.

- 1991: "Flush Mounted and Near-Wall Measurements of Shear Stress in Turbulent Boundary Layers", in short course on Principles of Thermal Anemometry and Its Applications in Fluid Mechanics, Michigan State University.
- 1994: US Army Dugway Proving Ground, 2 lectures on JSLIST chamber designs
- 1995: Hill Air Force Base, Presentation to "Jane's Defense Weekly" on University of Utah / Dugway CRADA.
- 1996: ASME-FED Panel on Multi-wire Measurements-Problems and Solutions (ASME-FED Summer Meeting, San Diego)

CONSULTING:

- 1997: July-November, R.E. Cramer Company, Contract No. 304-11EC0003-97-0003
- 1994: August - November, Andrulis Research Corporation, Contract No. C94-0009/DUG
- 1995: January - Present, Andrulis Research Corporation, Contract No. C94-0009/DUG

UNIVERSITY, PROFESSIONAL AND PUBLIC SERVICE:**UNIVERSITY
COMMITTEES:**UNIVERSITY OF NEW HAMPSHIRE

Co-Chair, COLA Dean Search Committee, 2008
 University Honors Committee, 2006-present
 Faculty Fellow of the University Honors Committee, 2006/2007
 Co-Chair, Library Dean Search Committee, 2007
 Chair, Graduate Student Compensation Committee, Fall 2006
 Central Budget Committee, 2006-present
 University Leadership Council, 2005-present
 UNH Environmental Health and Safety Committee, 2005-present
 NSF-NSEC Institutional Advisory Board 2005-present
 RCM Undergraduate Tuition Review Committee, Fall 2005
 NHIRC Advisory Council, 2005-present
 New Hampshire Statewide EPSCOR Committee, 2005-present
 Space Allocation Renovation and Repair Committee, 2006-present

UNIVERSITY OF UTAH

Administrative Review of the Alumni Association 1998
 Graduate Council Program Review of the Music Department 2001
 Undergraduate Research Committee 2002-2005

**COLLEGE
COMMITTEES:**UNIVERSITY OF NEW HAMPSHIRE

Chair, CEPS Executive Committee, 2005-present
 CEPS Alumni Society, Board of Directors, 2005-present

UNIVERSITY OF UTAH

Mech. Eng. Representative to College Council, 1992-1994
 Mech. Eng. Representative to College Council, 1997-2001
 Member, Engineering Dean Search Committee, 1998
 Member, Engineering Executive Committee, 2001-2005
 Chair, Engineering Dean Search Committee, 2003

**DEPARTMENTAL
COMMITTEES:**UNIVERSITY OF NEW HAMPSHIRE

Chair, Mech. Eng. Faculty Search Committee, 2006
 Chair, Mech. Eng. Faculty Search Committee, 2007

UNIVERSITY OF UTAH

Mech. Eng. Graduate Committee Chair, 2000-2001
 Mech. Eng. Curriculum Committee, 1996-97(Chair starting 1999-2000)
 Interim Chair Thermal-Fluids-Energy-Systems (TFES) Division, 1996
 Mech. Eng. Search Committee, TFES, 1995
 ASME Student Section Advisor, 1995-1999
 Mech. Eng. Graduate Committee, 1992-1999
 Chair, Thermal-Fluids-Energy-Systems (TFES) Division, 1990-1994
 Mech. Eng. Executive Committee, 1993-1994, 1999-present
 Mech. Eng. Search Committee, Heat Transfer, 1992
 Mech. Eng. Search Committee, Design, 1993
 Mech. Eng. Seminar Organizer, 1991

**PROFESSIONAL
 SOCIETIES/
 ACTIVITIES:**

Member, The American Society of Mechanical Engineers (since 1982)
 Member, The American Physical Society (since 1986)
 Member, The Society of Industrial and Applied Mathematics (1988-1995)
 Member, American Institute of Aeronautics and Astronautics (since 1990)
 Reviewer, Journal of Fluids Engineering
 Reviewer, Boundary Layer Meteorology
 Reviewer, Journal of Petroleum Research
 Reviewer, Experiments in Fluids
 Reviewer, Physics of Fluids
 Reviewer, Journal of Experimental Thermal and Fluid Science
 Reviewer, Journal of Fluid Mechanics
 Reviewer, Journal of Turbulence
 Reviewer, Measurement Science and Technology
 Reviewer, NSF, AFOSR, ONR, ARO
 Co-Chair, Induction/Exhaust Systems subgroup, NSF/MSU/Big 3
 Workshop on Fluid Flows/Fundamental Automotive Issues, 8/95 and 5/96.
 Invitee, NASA Langley Workshop on National Transonic Facility Skin Friction Experiments, 8/97.
 Invitee, NSF, ONR, AFOSR, DARPA, DOE-LANL workshop on Turbulence Measurements for LES, 10/99.
 Organizer, U of U, mini-Symposium on Current Topics in Turbulence Research, 8/00
 Organizer, U of U, mini-Symposium on Current Topics in Fluid Dynamics Research, 8/01
 Organizer, U of U, mini-Symposium on Current Topics in Fluid Dynamics Research, 8/02

**PUBLIC
 SERVICE:**

2006-present: Trustee and Chair, New Hampshire Academy of Science and Design (a charter middle/high school).

2004 Fundamentals of Engineering Review Session on Fluid Mechanics
2003 Fundamentals of Engineering Review Session on Fluid Mechanics
2002 Fundamentals of Engineering Review Session on Fluid Mechanics
2001 Fundamentals of Engineering Review Session on Fluid Mechanics
2000 Fundamentals of Engineering Review Session on Fluid Mechanics
1999 Fundamentals of Engineering Review Session on Fluid Mechanics
1998 Fundamentals of Engineering Review Session on Fluid Mechanics
Discovery Class Teacher: "Engineering Science and Experimentation,"
Beacon Heights Elementary School, 14 lectures, Fall 1997.
1997 Fundamentals of Engineering Review Session on Fluid Mechanics
1996 Fundamentals of Engineering Review Session on Fluid Mechanics
Coordinator of 1996 Scout-O-Rama activity booth on hydrodynamic
drag
Coordinator of 1995 Scout-O-Rama activity booth on hydrodynamic
drag
1994 ASME PE Exam Review Session on Fluid Mechanics