Eric R. Pardyjak
Curriculum Vitae

Office Address
University of Utah
Department of Mechanical Engineering
50 S. Central Campus Drive
Room 2110
Salt Lake City, UT 84112-9208
(801) 585-6414
E-Mail: pardyjak@eng.utah.edu

Home Address
2626 S. Beverly St.
Salt Lake City, UT

Biographical Data

Birth date: 9/19/72
Place of Birth: Rochester, NY
Citizenship: United States

Research Interests

Fundamental and applied fluid mechanics research. In particular, the application of fundamental turbulence concepts to studies in environmental atmospheric flows in complex terrain (i.e., urban and mountainous). Interests include both experimental (field & laboratory based) and computational research. More recent interests include optimization of sustainable urban designs for air quality and energy efficiency.

Education

Doctor of Philosophy Mechanical Engineering - July, 2001
Arizona State University, Tempe, AZ
Specialization: Dynamics of the Atmospheric Boundary Layer
Master of Science - Mechanical Engineering - August, 1996
University of Wisconsin, Madison, WI
Specialization: Turbulence Modeling
Bachelor of Science - May, 1994
Michigan State University, East Lansing, MI
Major: Mechanical Engineering

Professional Experience

University of Utah – Full Professor
Department of Mechanical Engineering, (7/13-present)
Department Chair: Dr. Tim Ameel

University of Utah – Adjunct Full Professor
Department of Atmospheric Sciences, 7/13-present
Department Chair: Dr. Kevin Perry

University of Utah – Associate Professor
Department of Mechanical Engineering, (6/07-6/13)
Department Chair: Dr. Tim Ameel

University of Utah, Department of Mechanical Engineering, Director of Graduate Studies/Associate Department Chair (8/10-7/11)

University of Utah – Adjunct Associate Professor
Department of Atmospheric Sciences, 7/07- 6/13
Department Chair: Dr. Kevin Perry

Université Paul Sabatier, Laboratoire d'Aérologie , Obervatoire Midi-Pyrénées, France - Invited Professor
Host: Marie Lothon, 6/11-7/11

École Polytechnique Fédérale de Lausanne, Switzerland – Visiting Professor
School of Architecture, Civil and Environmental Engineering (ENAC)
EFLUM - Laboratory of Environmental Fluid Mechanics and Hydrology, 9/09-7/10
ENAC Dean and Host: Dr. Marc Parlange

University of Utah – Assistant Professor
Department of Mechanical Engineering, 8/01-6/07
Department Chair: Dr. J.C. Klewicki & Dr. K.S. Udell

University of Utah – Adjunct Assistant Professor
Department of Meteorology, 6/06-7/07
Department Chair: Dr. James Steenburgh

At the University of Utah, my research activities have included dispersion and transport studies in the atmospheric boundary layer utilizing both experimental and numerical techniques. Model development has included GPU-based, 3D fast response urban wind, energy and moisture transport modeling for dispersion around buildings. This work includes urban energy balance computations to allow for simultaneous air quality and energy use estimates. Experimental work includes: atmospheric boundary layer field measurements in urban and mountain terrain. Laboratory work includes PIV wind tunnel measurements designed to improve turbulent stress parameterizations.

Instructional activities have included teaching undergraduate Fluid Mechanics, Intermediate Fluid Mechanics, Introduction to Numerical Methods and Thermal Systems Design. Additional activities have included developing a graduate level Environmental Fluid Dynamics course that integrates real world field research measurements with classroom projects.

Los Alamos National Laboratory - Graduate Research Assistant/post-doc
Energy and Environmental Analysis Group, 4/00-8/01
Supervisor: Dr. Michael J. Brown
Research included initial development of the fast response transport and dispersion models QUIC-URB and QUIC-Plume for use in urban areas as part of the Department of Energy's Chemical Biological Nonproliferation Program; participation in the VTMX (Vertical Transport and Mixing eXperiment) and URBAN dispersion field campaigns in Salt Lake City, UT as well as "The Wall" experiment at the Dugway Proving Grounds at the Salt Flats in Utah.

Arizona State University - Graduate Research Assistant
Department of Mechanical and Aerospace Engineering, 8/96-8/01
Supervisor: Professor H.J.S. Fernando

Research included conducting and supervising two, large, multi-disciplinary pollution related field experiments in Phoenix, AZ coined PAFEX-I and PAFEX-II (Phoenix Air Flow Experiment). The projects (funded by NSF and the Arizona Department of Environmental Quality) have been used to gain knowledge of the flow of pollutants in the Phoenix air shed and add insight to the dynamics of the atmospheric boundary layer.

Los Alamos National Laboratory - Visiting Research Scientist
Energy and Environmental Analysis Division, 7/99-8/99
Supervisor: Dr. Michael J. Brown
Development and implementation of a counter gradient turbulent heat transport model for the 3D atmospheric circulation code HOTMAC.

University of Wisconsin-Madison - Graduate Research Assistant
Department of Mechanical Engineering, 8/94-7/96
Supervisor: Professor Christopher J. Rutland
Computation fluid dynamics research. Developed and implemented new turbulence, Very Large Eddy Simulation (VLES) models for the complex flow and internal combustion code KIVA.

Michigan State University - Undergraduate Research Assistant
Department of Mechanical Engineering, 8/93-8/94
Supervisor: Professor John F. Foss
Experimental research in turbulent shear flow laboratory. Co-designed, manufactured and tested a portable multi-wire, hot-wire calibration unit. Conducted preliminary studies and design for an automotive fan testing facility. Provided technical support for undergraduate fluid mechanics laboratory.

E.I. DuPont de Nemours & CO., Inc. - Mechanical Engineering Co-op
Chambers Works Plant, 12/91-3/92 and 6/92-8/92
Niagara Falls Sodium Plant, 1/93-5/93
Supervisor: Mr. Vincent Pun
Provided R&D support for chemical manufacturing process. Worked closely with production; consulted with process engineers and supervised mechanics.

Internally Funded Research Proposals

- Role: PI, Project Title: Scintillometry Measurement System for Quantification of Atmospheric Fluxes. Research Instrumentation Fund, Funding Agency: University of Utah, Vice President for Research, Amount Awarded: $85,000, Duration of Award: One-time award 2013.

Funded Research Proposals

- Role: PI, Project Title: Localized Distributed Power Generation: Economically Robust, Demand-Optimized Placement of Urban Energy Production Systems, Funding Agency: NSF, Amount Awarded: $309,909, Duration of Award: July, 2015-June, 2018.
- Role: PI, Project Title: Wind energy resource assessment for Washakie Renewable Energy at the Paradise Shrimp Farm, Belize. Funding Agency: Washakie Renewable Energy, Amount Awarded: $28,207, Duration of Award: October, 2013-April, 2015.

- Role: PI, Project Title: The Impact of Green Infrastructure on Urban Microclimate and Air Quality, Funding Agency: NSF, Amount Awarded: $1,000,000, Duration of Award: October, 2011-September, 2015.

- Role: Co-PI, Project Title: Mountain terrain atmospheric modeling and observations (MATERHORN) program Funding Agency, ONR-MURI, Amount Awarded, $1,500,000 (University of Utah portion), Duration of Award: July, 2011-June 2014.

- Role: PI, Project Title: Development of a Windbreak Dust Predictive Model and Mitigation Planning Tool Funding, Agency: SERDP (Strategic Environmental Research and Development Program), Amount Awarded: $356,468, Duration of Award: March, 2010-December, 2012.

- Role: PI, Project Title: Optimization of Urban Designs for Air Quality and Energy, Efficiency Funding Agency: NSF, Amount Awarded: $341,467, Duration of Award: September, 2008-January, 2012.

- Role: PI, Project Title: Rotor blade vortex control using surface roughness, Funding Agency: Korean Institute of Geosciences and Mineral Resource, Amount Awarded: $41,900, Duration of Award: June, 2010-December, 2010

- Role: PI, Project Title: Technical Support For External Modeling Capabilities For Pentagon Shield and Urban Shield Programs, Funding Agency: STAR Institute (formerly NCAR), Amount Awarded: $53,593, Duration of Award: October, 2008-December, 2009.

- Role: PI, Project Title: An Investigation of the relationship between indoor and outdoor air quality during the winter in Nogales, Sonora, Mexico, Funding Agency: SCERP, Amount Awarded: $69,952, Duration of Award: June, 2008-December, 2009.

- Role: Co-PI with Hollerbach, Minor, Willemsen and Metzger, Project Title: Generation of Complex Environmental Flow Patterns for Virtual Environments, Funding Agency: NSF, Amount Awarded: $1,119,215, Duration of Award: October, 2004-September, 2008 (extended through 9/2009).

- Role: PI, Project Title: PIV AND PLIF MEASUREMENTS OF TURBULENT DISPERSION OF CONTAMINANT IN PIPING NETWORKS, Funding Agency: Department of Energy, Los Alamos National Laboratory, Amount Awarded: $85,000, Duration of Award: February, 2006-June, 2008.

- Role: PI, Project Title: Validation of QUIC Disperison System, Funding Agency: Department of Energy, Los Alamos National Laboratory, Amount Awarded: $50,000, Duration of Award: February, 2006-June, 2008.

- Role: Co-PI (PI – Craig Forster), Project Title: Urban Systems Research Center – Synergy Interdisciplinary Award, Funding Agency: University of Utah Office of Research, Amount Awarded: $100,000, Duration of Award: July, 2006-December, 2007.

- Role: PI, Project Title: High PM Episodes in US-Mexico Border Cities, Funding Agency: SCERP, Amount Awarded: $65,299, Duration of Award: June, 2006-December, 2007.

- Role: PI, Project Title: Spanish Fork wind measurements for wind turbine applications, Funding Agency: Wasatch Wind, LLC, Amount Awarded: $6,720, Duration of Award: December, 2005-July, 2006.

- Role: PI, Project Title: EXTENSION AND TESTING OF THE QUICK URBAN and INDUSTRIAL COMPLEX (QUIC) DISPERSION MODELING SYSTEM, Funding Agency: Department of Energy, Amount Awarded: $82,965, Duration of Award: September, 2005-December, 2006.

- Role: PI, Project Title: Development of a Windbreak Dust Control Strategy Tool for Communities in Arid Climates such as the US-Mexico Border Region, Funding Agency: SCERP, Amount Awarded: $67,000, Duration of Award: June, 2005-August, 2006.

- Role: PI, Project Title: Implementation of QUIC into Pentagon Shield, Funding Agency: Department of Energy, Amount Awarded: $53,947, Duration of Award: Feb 28, 2004-Dec 31, 2005.

- Role: PI, Project Title: Wind-tunnel building array experiments using PIV to obtain Reynolds shear stress fields, Funding Agency: Department of Energy, Amount Awarded: $52,051, Duration of Award: Dec 31, 2004-Sep 31, 2006.

- Role: PI, Project Title: The Wind Energy Research Project: Design and Construction of a Modular Test Bed Wind Turbine, Funding Agency: EPA – P3 Sustainability, Amount Awarded: $10,000, Duration of Award: August, 2004-July, 2005.

- Role: PI, Project Title: Fugitive Dust transport, Funding Agency: SCERP, Amount Awarded: $40,000, Duration of Award: June, 2004-August, 2005.

- Role: PI, Project Title: QWIC-URB Continuation + Addendum, Funding Agency: Department of Energy, Amount Awarded: $94,965, Duration of Award: March 20, 2004-April, 2005.

- Role: PI (Co-PI Klewicki), Project Title: Joint Urban 2003 Field Experiment, Funding Agency: H.E. Cramer Company, Inc (subcontract for DTRA, DOD), Amount Awarded: $118,333, Duration of Award: April 16, 2003-September, 2004.

- Role: PI, Project Title: QWIC-URB Continuation, Funding Agency: Department of Energy, Amount Awarded: $60,000+$10k extension, Duration of Award: December 20, 2002-December 20, 2003.

- Role: PI, Project Title: QWIC-URB Continuation, Funding Agency: Department of Energy, Amount Awarded: $60,000, Duration of Award: October 31, 2001-September 30, 2002.

- Role: Co-PI with J.C. Klewicki, Project Title: Weber Canyon Wind Study, Funding Agency: US Air Force - Hill Air Force Base, Amount Awarded: $67,330, Duration of Award: December 2001-June 30, 2002.

- Role: PI, Project Title: Aerosol Collection System Testing, Funding Agency: Phoenix Analysis Design & Technologies, Amount Awarded: $1,500, Duration of Award: September 31, 2002-December 1, 2002.

- Project Title: Phoenix, AZ summer ozone field study, Funding agency: Arizona Department of Environmental Quality and vice president for research at Arizona State University, Funded for the period: August 1 - September 15, 1998, Amount funded: $18k.

- Project Title: Phoenix, AZ pollution dispersion modeling study using CALINE4, Funding agency: Arizona Department of Transportation, Funded for the period: August, 1999 - May, 2000, Amount funded: $13k.

Honors and Awards

Academic

- Dow-Corning Research Internship/Grant, 8/93-8/94
- Tau Beta Pi (Engineering honor society), 4/94
- Pi Tau Sigma (Mechanical Engineering honor society), 10/92
- Phi Kappa Phi honor society, 2/94
- Golden Key National Honor Society, 1/93

Teaching

- Dean recognition for being placed among top instructors in the College of Engineering based on student evaluations for Heat Transfer, Fall 2013
- Dean recognition for being placed among top instructors in the College of Engineering based on student evaluations for Environmental Fluid Dynamics, Spring 2013
- Dean recognition for being placed among top instructors in the College of Engineering based on student evaluations for Thermal System Design, Spring 2008
- Dean recognition for being placed among top instructors in the College of Engineering based on student evaluations for Intermediate Fluid Dynamics, Fall 2007
- Dean recognition for being placed among top 15% of instructors in the College of Engineering based on student evaluations for Environmental Fluid Dynamics, Spring 2007
- Dean recognition for being placed among top 15% of instructors in the College of Engineering based on student evaluations for Intermediate Fluid Dynamics, Fall 2006

Professional

- Researcher of the Award, Department of Mechanical Engineering, University of Utah, 2011.
- Recipient of Technical Achievement Award and nominated for DuPont's Jackson Laboratory `Oscar Award,' 7/92

Invited Talks

- Pardyjak, E.R., "Uncertainty in Evening Transition and Turbulent Flux Characterization in Mountainous Terrain," Workshop on, Microscale Modeling of Complex-Terrain Flows, 25-26 September 2014, University of Notre Dame.
- Pardyjak, E.R, "The MATERHORN Experiments - Toward Improved Numerical Weather Prediction Complex Terrain Environments," Dugway Proving Ground, 11 September 2014.

- Pardyjak, E.R., "Studying Multi-scale/Multi-physics Processes in Complex Terrain Environments for Improved Numerical Weather Prediction," Princeton University, 16 March 2014.
- Pardyjak, E.R. "Impact of Green Infrastructure (GI) on Urban Microclimate & Air Quality," Department of Aerospace & Mechanical Engineering and Environmental Fluid Dynamics Group Seminar, University of Notre Dame, Indian, 28 October 2011.
- Pardyjak, E.R., D. Nadeau, C. Higgins, M. B. Parlange, H.J.S. Fernando, "Modeling the Decay of the Convective Boundary Layer Over Heterogeneous Terrain," BLLAST (Boundary Layer Late Afternoon and Sunset Turbulence) Workshop 17-18 June 2010: Turbulence decay of the afternoon transition, Lannemezan, France.
- Pardyjak, E.R., Flow and Dispersion in Complex Terrain, "Flow and Dispersion in Complex Terrain," WSL Institute for Snow and Avalanche Research SLF in Davos, Switzerland 2 February 2010.
- Pardyjak, E.R., S. Simoni, M. Calaf, R. Mage, and M. Parlange, "Understanding the interaction of diurnal circulation patterns and local turbulent fluxes in an Alpine environment," Nonlinear Processes in Geophysics session, European Geosciences Union, General Assembly 2010, Vienna, Austria, 02 – 07 May 2010. Solicited Presentation.
- Pardyjak, E.R. and H.J.S. Fernando, "The effect of surface type on the decay of turbulence in the surface layer during evening transition," 9th EMS (European Meteorological Society) Annual Meeting, Toulouse, France, 28 September - 2 October 2009. Solicited Presentation.
- Portland Statue University's Green Buildings and the Built Environment Seminar Seriers, "The role of Environmental Fluid Dynamics in sustainable urban design," Portland, OR, May 22, 2009.
- Arizona State University's Ecosystems Engineering Seminar, "The role of Environmental Fluid Dynamics in sustainable urban design," Tempe, AZ, 4 February 2009.
- Border Environment Cooperation Commission Binational Workshop on Paving and Health, "Development of a Windbreak Dust Control Strategy Tool for Communities in Arid Climates such as the U.S.-Mexico Border Region," Cibeles Convention Center, Ciudad Juarez, Chihuahua, 4 December 2007.
- Utah State University Department of Mechanical Engineering Graduate Seminar, "Environmental Fluid Dynamics," Logan, Utah, 6 November 2006.
- University of Utah Department of Meteorology Seminar, Environmental Fluid Dynamics, Salt Lake City, Utah, 29 September 2006.

Academic Supervisory Roles

PhD Students Graduated (8)	**Defense Date**	**Dissertation Project**
Mathew Nelson	3/2006	Urban turbulence characterization
Akshay Gowardhan	6/2008	Urban Large Eddy Simulation
Sandip D. Kulkarni (co-Chair w/Minor)	8/2009	Wind flow control in a virtual environment
Balwinder Singh	1/2010	Urban Lagrangian dispersion modeling
Heather Holmes	10/2010	Atmospheric Transport & Chemistry
Prathap Ramamurthy	04/2011	Urban turbulence and trace gas studies
Bhagirath Addepalli	12/2012	Urban optimization modeling
Scott Speckart	04/2012	Fugitive dust modeling – SCERP

MS Thesis Students Graduated (14)	Defense Date	Thesis Project
Kevin Briggs	12/14	Scalar transport in QUIC-EnvSim
Chad Nielson	08/12	Hydrofoil PIV measurements
Sean Moran	04/12	Particle deposition on vegetative surfaces
Tom Booth	10/11	Fast response data assimilation
Chad Allen	08/10	Building-resolving urban energy model
Holly Oldroyd	08/09	PIV/PLIF measurements in pipes
Tony Favalaro	05/08	QUIC-URB Validation/Sensitivity
Mark Deaver	08/07	Wind display for virtual environment
Jai Kiran	12/06	Urban cold pools – UTES
Amatulnoor Uzma	12/06	Modeling flow through vegetation
Prathap Ramamurthy	07/05	Urban Trace gas Emissions Study
Balwinder Singh	12/04	Lagrangian Dispersion modeling
Nilesh Bagal	11/04	QUIC-URB sensitivity Study
Akshay Gowardhan	11/04	QUIC-URB model evaluation

MS Non-Thesis Students Chair	Exam Date	
Tim Dwyer (ME)	01/08	Contaminant pipe flow dispersion
Cannon Neslen	03/06	Non-Thesis

Present Graduate students (5)	Level	Project
Chaoxun Hang	PhD	Atmospheric Boundary Layer
Derek Jensen	PhD	MOST in complex terrain
Alexei Perelet	PhD	Complex boundary layer processes
Daniel Alexander	MS	Building resolving energy modeling
Nipun Gunawardena	MS	Development low-cost LEM stations
Hanieh Eshagh	MS	Building energy use in cities

Former Post-doctoral Researchers

Researcher	Project
Bhagirath Addepalli (2013)	Urban Form Optimization
Vigneshwaran Kulandaivelu (2012-2014)	Fine scale atmospheric turbulence measurements

Visiting International Scholars

Scholar	Home Institution	Project
C. Roman-Cascon (2015)	Univ. Complutense de Madrid	Mountatin fog formation
Prof. J.J. Kim (2012-14)	Pukyong National Uni. (S. Korea)	QUIC development
Estel Blay (2012)	Univ. Politècnica de Catalunya	Evening trans. processes

Present Undergraduate Researchers

Student	Project
Vignesh Sivaramakrishnan	Improving local energy-budget measurement stations (LEMS)

Former Undergraduate Student research projects

Aaron Burton	Development of a Microcontroller-based Atmospheric Sounding System (M.A.S.S.)
Scott Schoen	Building heat transfer modeling
Nipun Gunawardena*	Development local energy balance measurement stations
Christian Holbert	Cold air pool study in the Salt Lake Valley using remote sensing

Bryon Edmunds*	Wind-tunnel deposition study
Price Lefler	TPAWT dispersion
Daniel Alexander	PIV measurements of flow around sports stadiums
Sydney Stoker	Flow visualization sports stadium (Grinnell College)
Timothy Barber	PIV/PLIF measurements
Hamid Sani	Virtual Wind Tunnel (TPAWT)
Sam Dickman*	PIV measurements of urban street canyons
Seamus Connor	QUIC-URB GUI development
Louis Monaco	Environmental Measurements
Jenny Gill	QUIC-URB GUI development
Holly Oldroyd	QUIC-URB GUI development
Dustin Wallis	Virtual Wind Tunnel (TPAWT)
Jason Hunter	Urban Wind Measurements
Tony Favalaro	QUIC-URB GUI development
Zachery Wilson	Flux Richardson Probe development
Nick Shingleton	QUIC-URB GUI development
Morgan Farley-Crust	TPAWT Virtual Wind Tunnel
Bret Verhoef	Urban Wind measurements
Aaron Barclay	PIV measurements of flow around buildings
Andy Parker	QWIC-URB GUI development
Tom Booth	QWIC-URB GUI development
Austin Van Otten	Drag measurements in urban environments
Jana Price	PIV measurements of flow around buildings
James Allison	Design of sonic anemometer mounting devices
Jeff Waterhouse	CFD of Hill Air Force Base Weber Canyon Study
Brad Hansen	PIV measurements of flow around buildings
Lester Sherrow	Stratified wind tunnel improvements

* indicates a UROP award

Doctoral/Masters Committee member (Mechanical Engineering Students unless specified)

N. Miller	PhD	B. Bailey	MS (2011)
Y. Feng	PhD (CivEng)	C. Workman	MS (2011)
B. Bailey	PhD	W. Flower	MS (CivEng 2011)
C. Gomez-Navarro	PhD (Biology)	J. Lisonbee (Atmos Sci)	MS (2010)
W. Peterson	MS	N. Shingleton	MS (2010)
M. Jemmett	PhD (ChemEng)	L. Richards	MS (Atmos Sci 2009)
T. Edger	PhD (Geog)	I.C. Jaramillo	PhD (Chem Eng 2009)
M. Overby	MS (2014 CS UMD)	C. Davidson	PhD (ESS 2009)
E. Blay-Carreras	PhD (2014 UCP-Barcelona)	D. Torgerson	MS (2009)
		D. Judi	PhD (CivEng 2009)
N. Lareau	PhD (2014 Atmos Sci)	I. Jeyachandran	PhD (CivEng 2008)
H. Zhang	PhD (2013 Atmos Sci)	R. Jamison	MS (2008)
D. Sweeney	PhD (2012)	I. Rodriguez	PhD (Physics 2008)
N. Andrews	MS (2012)	A. Amritkar	MS (2008)
W. Horne	MS (2012)	N. Webb	PhD (Physics 2007)
D. Frei	MS (2012)	J. Kingston	PhD (2006)
P. Jankovich	PhD (2012)	Park	PhD (2006)
A. Gould	MS (2012)	T. Omer	MS (2006)
D. Nadeau	PhD(2011 EPFL)	J. Allen	MS (2006)
J. Mulandi	PhD (CivEng 2011)	R. Joshi	MS (2006)
L. Flemming	PhD (2011)	D. Challa	MS (2006)
A. Kalyanapu	PhD (CivEng 2011)	P. R. Desam	PhD (2006)

T. Deem	MS (2005)	Q. Zhang	PhD (2005)
Sai Ram	MS (2005)	P. Priyadarshana	PhD (2004)
J. Clark	MS (Met U of Ok, 2005)	E. Wheeler	MS (2004)
H. Miner	MS (2005)	B. Waite	MS (2004)
S. Pol	MS (2005)	N. Burgess	Masters (2004)
D. Sandberg	MS (2005)	T. Wei	Doctoral (2004)
Nate Arnim	MS (2005)	L. Sherrow	Masters (2003)

Peer Reviewed Journal Publications (Names in bold are supervised students)

1. Heather, H., Sriramasamudram, J., Pardyjak, E.R., Whiteman, C., Turbulent fluxes and pollutant mixing during wintertime air pollution episodes in complex terrain, submitted, *Environmental Science & Technology*, May 2015.
2. Feng, Y., S. Burian, Ph.D., and E.R. Pardyjak, Green roof evapotranspiration observation and estimation in Salt Lake City, Utah, submitted, *Ecological Engineering*, May 2015.
3. Román-Cascón, C., C. Yagüe, L. Mahrt, M. Sastre, G. J. Steeneveld, E. Pardyjak, A. van de Boer, and O. Hartogensis, Interactions among Drainage Flows, gravity waves and turbulence: a BLLAST case study, submitted, *Atmos. Chem. Phys.,* April 2015.
4. Overby, M., P. Willemsen, B. N. Bailey, S. Halverson, and E.R. Pardyjak, A rapid and scalable radiation transfer model for complex urban domains, submitted *Urban Climate,* April 2015
5. **Speckart, S.O**., J.M. Veranth, and Pardyjak, Near-source downwind removal of fugitive PM10 dust emitted by vehicle traffic on unpaved roads, submitted, *Atmos. Environ*., February 2015.
6. Kochanski, A. A., E.R. Pardyjak, R. Stoll, **A. Gowardhan**, M.J. Brown, and W.J. Steenburgh, One-way coupling of the WRF-QUIC urban dispersion modeling system, under revision, *J. Appl. Meteorol. Climat*., December 2014.
7. Bailey, B.N., R. Stoll, E.R. Pardyjak, and N.E. Miller, A new three-dimensional energy balance model for complex plant canopy geometries: Model development and improved validation strategies, submitted, *Agricultural and Forest Meteorology,* 2014.
8. **Addepalli, B.,** E.R. Pardyjak, P. Willemsen, and D.E. Johnson, Urban form optimization for improved air quality, to be submitted, *Urban Climate*, 2015.
9. Oldroyd, H.O., E.R. Pardyjak, H. Huwald, M.B. Parlange, Adapting tilt corrections and the governing flow equations for steep, fully three-dimensional, mountainous terrain, *Boundary-Layer Meteor*., DOI 10.1007/s10546-015-0066-0, 2015.
10. **Hang, C.,** D.F. Nadeau, D. D. Jensen, S.W. Hoch and E.R. Pardyjak, Playa soil moisture and evaporation dynamics during the MATERHORN field program, in-press, *Boundary-Layer Meteor.,* DOI: 10.1007/s10546-015-0058-0, 2015.
11. **Jensen, D.D**., D.F. Nadeau, S.W. Hoch and E.R. Pardyjak, Observations of near-surface heat flux and temperature profiles through the early evening transition over contrasting surfaces, revision submitted, *Boundary-Layer Meteor.,* April 2015.
12. **Addepalli, B.** and E.R. Pardyjak, Heuristics for Robust Implementation of Simulated Annealing, submitted, *Inverse Problems in Science and Engineering*, June 2014.
13. Grachev, A.A., L.S. Leo, S. Di Sabatino , H.J.S. Fernando, E.R. Pardyjak, and C.W. Fairall, Structure of turbulence in katabatic flows below and above the wind-speed maximum, *Boundary-Layer Meteor*., 10.1007/s10546-015-0034-8, 2015.

14. Fernando, H.J.S., E.R. Pardyjak, S. Di Sabatino, F.K. Chow, S.F.J. De Wekker, S.W. Hoch, J.P. Hacker, J.C. Pace, T.G. Pratt, Z. Pu; W.J. Steenburgh, C.D. Whiteman, Y. Wang, D. Zajic, B.B. Balsley, R. Dimitrova, G.D. Emmitt, C.W. Higgins, J.C.R. Hunt, J.G. Knievel, D. Lawrence, Y. Liu, D.F. Nadeau, E. Kit, B.W. Blomquist, P. Conry. R.S. Coppersmith, E. Creegan, M. Felton, A.A. Grachev, **N. Gunawardena**, **C. Hang**, C.M. Hocut, G. Huynh, M.E. Jeglum, **D. Jensen**, V. Kulandaivelu, M. Lehner, L.S. Leo, D. Liberzon, J.D. Massey, K. McEnerney, S. Pal, **T. Price**, M. Sghiatti, Z. Silver, M. Thompson, H. Zhang, and T. Zsedrovits, The MATERHORN - Unraveling the Intricacies of Mountain Weather, *Bulletin of the American Meteorological Society*, http://journals.ametsoc.org/doi/abs/10.1175/BAMS-D-13-00131.1, 2015.

15. **Kulkarni, S.**, C. Fisher, P. Lefler, A. Desai, S. Chakravarthy, M. Minor, Mark, E.R. Pardyjak, J.M. Hollerbach, A full-body steerable wind display for a locomotion interface, *IEEE Transactions on Visualization and Computer Graphics*, doi:10.1109/TVCG.2015.2424862 2015.

16. Blay-Carreras, E., E.R. Pardyjak, D. Pino, S.W. Hoch, J. Cuxart, D. Martínez, and J. Reuder, Lifted temperature minimum during the atmospheric evening transition, *Atmos. Chem. Phys*., 15, 6981–6991, 2015.

17. Miller, N.E., R. Stoll, W. Mahafee, T.M. Neill, and E.R. Pardyjak, An Experimental Study of Momentum and Heavy Particle Transport in a Trellised Agricultural Canopy, *Agricultural and Forest Meteorology*, **211–212**, 100–114, 2015.

18. **Ramamurthy, P.** and E.R. Pardyjak, Turbulent transport of carbon dioxide over a highly vegetated suburban neighborhood, in-press, *Boundary-Layer Meteor.,* January 2015.

19. Lehner, M., C.D. Whiteman, S.W. Hoch, **D. Jensen**, E.R. Pardyjak, A case study of the nocturnal boundary-layer evolution on a slope at the foot of a desert mountain, *J. Appl. Meteorol. Climat*., **54**, 732–751., 2015.

20. **Addepalli, B.** and E.R. Pardyjak, A study of flow fields in step-down street canyons, *Environmental Fluid Mechanics*, **15**, 2015.

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- J. Clark, A. Larson, P. Willemsen, and E. Pardyjak, 2009: Particle Dispersion Modeling and Visualization in Urban Environments Using CUDA, NVIDIA GPU Technology Conference, Sept 30-Oct 2, 2009 – San Jose, CA.
- Pardyjak, E.R., P. Willemsen and D. E. Johnson, 2009: Optimization of urban designs for air quality and energy efficiency, Amer. Meteor. Soc., Eighth Symposium on the Urban Environment, Phoenix, AZ, 10-16 January 2009.
- Pardyjak, E.R., **U.N. Amatul**, M. A. Nelson, and M. J. Brown, 2009: Development of a vegetation deposition model for a fast response urban Lagrangian dispersion model, Amer. Meteor. Soc., Eighth Symposium on the Urban Environment, Phoenix, AZ, 10-16 January 2009.
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- Jeyachandran, I., Burian, S.J., and Pardyjak, E.R., 2008: Effects of urbanization on interconnected water cycle, microclimate and energy usage in semi-arid regions. AGU fall conference, Dec 15- Dec 19, San Francisco, CA.
- Dwyer, T., Farley-Chrust, M.; McMurtry, P., and Pardyjak, E., 2007: Siting Wind Farms in Complex Terrain: Spanish Fork Canyon a Case Study, Conferencia Inernacional de energía removable, ahorro de energía y educación energética, May 23, 2007 Havana, Cuba.
- **Holmes, H.A**., B.J. Tyler, R.E. Peterson, E.R. Pardyjak, 2007: Surface Chemistry Analysis of Urban and Rural Aerosols During a Night-time High PM Burning Event in Yuma, AZ. American Association for Aerosol Research 26th Annual Meeting, Reno, NV, 24-28 September 2007. Abstract 17E.1.
- Veranth, J., **S. Speckart**, E. Pardyjak, Experimental and modeling study of particle deposition near roads. American Association for Aerosol Research 26th Annual Meeting, Reno, NV, 24-28 September 2007. Abstract 11G.8.

- **Addepalli, B.,** M. J. Brown, E. R. Pardyjak, and I. Senocak, 2007: Investigation of the Flow Structure around Step-Up, Step-Down, Deep Canyon and Isolated Tall Building Configurations using Wind-Tunnel PIV Measurements, Seventh Symposium on the Urban Environment, San Diego, CA, 10-13 September 2007, Poster P1.19.
- **Gowardhan**, A., E. Pardyjak, I. Senocak, and M. Brown, 2007: An investigation of thermal effects on flow and dispersion in an idealized urban area using LES , Seventh Symposium on the Urban Environment, San Diego, CA, 10-13 September 2007, P1.11.
- Pataki, D. E.; Dudley-Murphy, E. A.; Emmi, P. C.; Forster, C. B.; Mills, J. I.; Pardyjak, E. R.; Peterson, T. R., 2007: Improving fossil fuel emissions scenarios with urban ecosystem studies: A case study in the Salt Lake-Ogden metropolitan region. 2006 AGU Fall Meeting, San Francisco, CA, 11-15 December 2006.
- Pardyjak, E.R., D.E. Pataki, **P. Ramamurthy**, **J. Kiran**, Measurements of trace-gas fluxes and the surface energy budget in the semi-arid urban Salt Lake Valley, Utah, U.S.A. First International Conference on Carbon Management at Urban and Regional Levels: Connecting Development Decisions to Global Issues, Mexico City, September 4-8, 2006.
- **Addepalli, B**. and Pardyjak, E.R., 2006: Experimental Investigation of the Effect of Reynolds Number and H / δ Value on Flow Fields in Street Canyons with Cubical Buildings, American Physical Society, 59th Annual Meeting of the APS Division of Fluid Dynamics, Chicago, IL, November 19-21, 2006, abstract #HG.003
- **Addepalli, B.** and E.R. Pardyjak, 2005: 2D PIV Measurements of flow between a pair of model buildings with varying geometries, American Physical Society, 58th Annual Meeting of the APS Division of Fluid Dynamics, Tampa Bay, FL, November 19-21, 2006, abstract #HG.003.
- **Speckart, S**., E.R. Pardyjak and J. Veranth. Assessment of Windbreaks as a Dust Control Strategy in Arid Climates. The 2006 SCERP Annual Technical Conference, San Diego, CA January 17, 2006.
- Veranth , J., **S. Speckart**, E. Pardyjak, V. Etyemezian, Experimental and numerical studies of near source fugitive dust transport, American Association for Aerosol Research, 2005 Annual Conference, Austin, Texas October 17 - 21, 2005.
- Veranth, J.M., E.R. Pardyjak, **S. Speckart**, K. Perry, J. Chow, J. Watson, V. Etyemezian COMPUTATIONAL MODELING OF NEAR-SOURCE DEPOSITION OF FUGITIVE DUST ON VEGETATIVE SURFACES Air and Waste Management Association meeting, June 2005.
- Pataki, D.E., J.R. Ehleringer, C.B. Forster, J.C. Klewicki, E.R. Pardyjak, R.E. Peterson, W. J. Steenburgh, B. J. Tyler, Understanding urban atmospheric CO2: Challenges and opportunities. 2004 AGU Fall Meeting, San Francisco, CA, 13-17 December 2004.
- Kastner-Klein, P., E.R. Pardyjak, **A. Gowardhan**, M.J. Brown. Evaluation of the fast response model QWIC-URB based on wind tunnel flow measurements idealized street canyons. 11th *International Conference on Wind Engineering*, Lubbock, TX June 2003.
- M.E. Tuohig, J.P. Mattson,E.R. Pardyjak, J.C. Martin 2003: A linear damper model does not fully predict passive muscle work during cyclic length change. Presented at the *50th annual meeting of the American College of Sports Medicine*, San Francisco CA.
- Pardyjak, E.R. Decay of Turbulence in the Atmospheric Surface Layer During Evening Transition. *Ninth Annual Workshop on Weather Prediction in the Intermountain West,* Salt Lake City, UT 2002.
- Pardyjak, E.R., P. Monti, and H.J.S. Fernando. Mixing Efficiency Parameterization During Stable Periods in Complex Terrain, Seventeenth Arizona Fluids Conference, Tucson, AZ. February, 2001.
- Fernando, H.J.S, J.C.R. Hunt, and E.R. Pardyjak. Thermal Circulation in Complex Terrain, International Symposium of Stratified Flows - British Columbia, CA. June, 2000.

- Pardyjak, E.R., H.J.S. Fernando, G. Wang, J. Anderson, N.S. Berman. Breakdown of Complex Terrain Atmospheric Boundary Layers, Fifty-Second Annual Meeting, American Physical Society, Division of Fluid Dynamics, November 21-23, 1999. New Orleans, LA.
- Pardyjak, M. Brown, D. Decroix and H.J.S. Fernando, Development of a Counter Gradient Transport Model for HOTMAC, 1999 SCERP Technical Conference, November 18, 1999. Las Cruces, NM.
- Yu, F., N.S. Berman, H.J.S. Fernando, E. Pardyjak, and A. Mahalov. Stable Nocturnal Vertical Structure of the Atmospheric Boundary Layer in Phoenix, Fifteenth Arizona Fluid Mechanics Conference, April 23,1999, Tucson, AZ.
- Pardyjak, E.R., A.A. Grachev, H.J.S. Fernando, J.C.R. Hunt, N.S. Berman, J.R. Anderson, M.L. Hildebrandt, and D.S. McGuiness. Structure of the Atmospheric Boundary Layer Over the Complex Terrain of Phoenix: In Site Measurements during PAFEX-I, Fourteenth Arizona Fluid Mechanics Conference, March 27-28, 1998, Tempe, AZ.
- Grachev, A.A., E.R. Pardyjak, H.J.S. Fernando, J.C.R. Hunt. Some Observations of the Atmospheric Nocturnal Boundary Layer Over Complex Terrain, Fourteenth Arizona Fluid Mechanics Conference March 27-28, 1998, Tempe, AZ.
- Mahalov, A., N.S. Berman, H.J.S. Fernando, F. Yu, E.R. Pardyjak, Stable Layers in the Atmospheric Boundary Layer. Bulletin of the American Physical Society. 51st Annual Meeting of the Division of Fluid Mechanics. November 22-24, 1998. Philadelphia, PA. November 1998. Volume 43, No.9.

Other Publications

- Streit, G.E., M.J. Brown, M.D. Williams, and E.R. Pardyjak, Urban Dispersion Studies for Determination of the Sensor Upwind Area of Influence, LA-CP-00-219. 2000.
- Fernando, H.J.S., Pardyjak, E. and Hunt J.C.R., PAFEX: A Joint Arizona State University/Arizona Department of Environmental Quality Study of Meteorology and Air Quality in the Phoenix Valley, *MAE Newsletter*, 1998.

Teaching Experience (All classes taught at the University of Utah)

- Environmental Instrumentation (co-taught with ATMOS SCI): Spring 2012
- Thermal Systems Design: Spring 2008, Fall 2008
- Intermediate Fluid Mechanics: Fall 2005, 2006, 2007
- Environmental Fluid Dynamics: Fall 2002, 2004, Spring 2007, 2009
- Design of Complex Cont. Systems/Complex Continuum Phenomena: Fall 2004
- Introduction to Numerical Methods: Spring 2002, 2003, 2004, 2006
- Introduction to Sustainable Energy Systems Design I: Fall 2010, 2011
- Undergraduate Fluid Mechanics: Fall 2001, 2003, 2012
- Undergraduate Heat Transfer: Fall 2013

Guest Lectures in classes around the University of Utah campus including Civil and Environmental Engineering, Atmospheric Sciences, and Architecture and Urban-Planning.

Senior Design Project Advisor

- Assistant Faculty advisor for UofU solar vehicle team (Spring 2003)
- Advisor for UoU Modular Test-Bed Wind Turbine (2004-2005)
- Advisor for UoU Modular Test-Bed Wind Turbine (2005-2006)
- Advisor for UoU Modular Test-Bed Wind Turbine (2006-2007)

- Advisor for Tornado Machine project (2006-2007)
- Advisor for Boulder Kinetics human powered vehicle (2007-2008)
- Advisor Tiny Turbine team I (2008-2009)
- Advisor Tiny Turbine team II (2008-2009)
- Advisor Supercharger team (2008-2009)
- Co-Advisor Chimp Grip Strength team (2008-2009)
- Advisor MASS – tethered balloon sensors (2012-2013)
- Advisor Snow Depth Sensor (2014-2015)

New Course/Curriculum Development

Environmental Fluid Dynamics (EFD) Graduate Track – Currently working with ME Department colleagues including Metzger and Stoll as well as members of Global Change & Ecosystem Center (GCEC) to develop an interdisciplinary program of study designed to provide MS and PhD students in Mechanical Engineering with a unique coursework emphasis in areas of study related to the environmental sciences (e.g. Biology and Atmospheric Sciences) and EFD applications. This highly interdisciplinary track will build on existing collaborations across the department, college and university such as the Center for Sustainability and the Global Change and Ecosystems Center. The program is designed to provide an academic infrastructure to help develop a nationally recognized program in EFD through improved recruiting and the promotion of interdisciplinary research. The program will be composed of three course areas: (1) traditional thermal-fluid sciences taught in mechanical engineering, (2) applied mathematics and (3) environmental science. The tracks will allow students to take courses from traditionally non-ME courses without having special approval.

Undergraduate "Spiral" Curriculum – Worked with colleagues Roemer, Bamburg and Mascaro to develop the sophomore level "Introduction to Sustainable Energy Systems Design I" class that is part of a new two year Mechanical Engineering sequence at the University of Utah. This project was part of an NSF CCLI grant.

Fluid Mechanics Curriculum – Working with M. Metzger and P. McMurtry significant changes have been implemented into the undergraduate and graduate fluid mechanics curriculum. This includes removing out of date classes and replacing them with classes that more appropriately fit the needs of the undergraduate and graduate students. As part of this work, for the first time during the Fall 2005 semester, I developed the lectures and taught the new graduate level Intermediate Fluid Dynamics. The class has now been taught successfully three times.

Environmental Fluid Dynamics – the purpose of this class was to fill a void in the fluid mechanics curriculum that focused on length and time scales ranging from traditional micrometeorological scales to scales associated with classical engineering fluid mechanics. This class was taught for the first time in the Fall 2002 and then in Fall 2005, Spring 2007. The class typically has had predominate graduate student enrollment from mechanical and chemical engineering as well as meteorology. The class is now a regularly taught upper level graduate fluid mechanics class.

Department, College and University Service

Department

- Mech. Engineering Thermal-Fluids Energy Systems (TFES) Division Chair (8/11-present, 09/08-05/09)
- Mech. Engineering Executive Committee (8/11-present, 09/08-05/09)
- Mech. Engineering Department TFES Search Committee (2007-2008, 2010-2011, 2011-2012)
- Mechanical Engineering Department Thermal Fluids Faculty Search Committee (2007-2008, 2010-2011, 2011-2012
- Mechanical Engineering Graduate Committee (8/11-present, 8/05-05/09)

- Mechanical Engineering Director of Graduate Studies (8/10-7/11)
- External Relations Committee – Department of Mech. Engineering (10/01-05/09, Chair 9/07-9/08, Chair 9/14-present)
- ME Department Seminar Committee (09/06-05/08, Chair 09/07-05/08)
- ME Department Dynamics Faculty Search Committee (2001-2002)

College
- Excellence in Teaching Committee, College of Engineering (2011-2012)
- University of Utah College Council member (2004 – 2007)
- Environmental Engineering Graduate Program Executive Council (2002-2009)

University
- Seed Grant Committee (2014-present)
- Global Change and Ecosystem Center, Executive committee member (2013-present)
- Global Change and Ecosystem Center, Seminar Committee Chair (2011)
- Global Change and Ecosystem Center, Department Representative (2010-present)
- Global Change and Ecosystem Center, Graduate Fellowship Committee (2011)
- Sustainable Campus Initiative Fund (SCIF) Allocation Committee – Faculty representative (2011-2014)
- University Research Committee – (08/03-05/09)

Professional External Service

- Member of the NCAR (National Center for Atmospheric Research) Observing Facilities Assessment Panel (OFAP) (2015-2018) – this panel monitors NSF-sponsored observing facilities at NCAR and other institutions that manage and operate the NSF's Lower Atmosphere Observing Facilities (LAOF).
- Journal Editorial Board Member – Measurement Science &Technology (2011-present), Section Leader - Measurements for the environment
- Journal Editorial Board Member – Datasets International: Dataset Papers in Atmospheric Sciences (2012-present)
- Special Issue Guest Editor (2013-2015): The Boundary-Layer Late Afternoon and Sunset Turbulence (BLLAST) project (ACP/AMT Inter-Journal SI)
- Regular *ad hoc* Editor - ACP/AMT Inter-Journal SI (2013-present)
- Session Co-convener and Chair, Session ID # 8181, Section: Atmospheric Sciences, Atmospheric Flows Over Complex Terrain, Annual AGU Fall Meeting (2015)
- Session Co-convener and Chair, Session A53O, Observations, Predictions, and Predictability of the Atmosphere Over Complex Terrain, Annual AGU Fall Meeting (2014)
- Session Co-conveners and Chair, Session A058. Research on Improving Weather Prediction for Mountain Terrain, Annual AGU Fall Meeting (2013)
- Session Co-conveners and Chair, Session H004. Advances in spatial scaling of hydrological and biogeochemical processes, Annual AGU Fall Meeting (2013)
- Session Chair, DACA 2013, Davos, Switzerland
- Session Chair, Evaluation Studies and Applications, 92 Annual Meeting of the American Meteorological Society, 17th Conference on Air Pollution Meteorology with the A&WMA, New Orleans (2012)
- Session Chair 2007 Division of Fluid Mechanics American Physical Society annual conference in Salt Lake City, UT

- Session Co-Chair, *Urban Turbulence and Boundary Layers*, American Meteorological Society, San Diego, Seventh Symposium on the Urban Environment (2007)
- Co-Chair of the Organizing Committee for the 2007 Division of Fluid Mechanics American Physical Society annual conference in Salt Lake City, UT
- Chair of the Program Committee for the 2007 Division of Fluid Mechanics American Physical Society annual conference in Salt Lake City, UT
- Co-Organized QUIC Dispersion Modeling Conferences at the University of Utah 2003-2006. Participants included researchers and students from the University of Utah, Arizona State University, University of Oklahoma, University of California-Riverside and Los Alamos National Lab (2003-2006)
- Session Co-Chair American Meteorological Society, Vancouver, Fifth Symposium on the Urban Environment (2004)

Outreach Activities

- Judge for Intermountain Junior Science and Humanities Symposium (2002-2008)
- University of Minnesota – Duluth Bridges to Baccalaureate Degree Program (2008, 2009, 2012, 2013)
- University of Utah – HiGear summer program (2013)

Journal Reviewer

- Advances in Science and Research
- Atmospheric Environment
- Boundary Layer Meteorology
- British Journal of Environment and Climate Change
- Building Research & Information
- Building Simulation
- Civil Engineering and Environmental Systems
- Environmental Fluid Mechanics
- Experiments in Fluids
- Global Change Biology
- International Journal of Climatology
- International Journal of Heat and Fluid Flow
- Journal of Applied Meteorology and Climatology
- Journal of the Air & Waste Management Association
- Journal of Geophysical Research
- Journal of Fluids Engineering
- Journal of Hydrology
- Journal of Solar Energy Engineering
- Land
- Measurement Science & Technology
- Science of the Total Environment
- Transportation Research Part D: Transport and Environment
- Urban Climate

Grant Reviewer

- National Science Foundation (NSF)
- Swiss National Science Foundation (SNSF)
- Natural Sciences and Engineering Research Council of Canada (NSERC)

Professional Registrations and Affiliations

- American Geophysical Union
- American Society of Mechanical Engineers

- American Meteorological Society
- American Physical Society

Interdisciplinary Collaborations:

A thrust of both research and instructional activities has included multidisciplinary collaborations.

- Member and active participant in the Global Change & Sustainability Center (GCSC) at The University of Utah.
- Performing field experiments, laboratory experiments, writing proposals, conference papers and journal papers with Dr. J. Veranth from the department of Pharmacology and Toxicology involving turbulent suspension of particulate matter.
- Performing field experiments, writing proposals, conference papers and journal papers with D. Pataki (Biology, University of California, Irvine), J. Steenburgh (Meteorology, University of Utah), B. Tyler and R. Peterson (Chem. Fuels Eng., University of Utah) on the multidisciplinary NSF funded biocomplexity project, UTES (Urban Trace-gas Emissions Study) designed to investigate emissions of carbon dioxide and water vapor from urban areas. Currently finishing this project and writing a follow on proposal with members of this group. This is an active collaboration.
- Working with Dr. J. Martin of Exercise and Sport Science on visco-elastic muscle models. Currently serving as a PhD committee member for C. Davidson in ESS. The collaboration has produced a conference poster and a journal article. This is an active collaboration, but fairly limited.
- Performing laboratory experiments, numerical code development and writing proposals with J. Hollerbach (Computer Science, University of Utah), P. Willemsen (Computer Science, University of Minnesota – Duluth), M. Metzger and M. Minor (Mechanical Engineering, University of Utah) as part of the NSF funded "Generation of Complex Environmental Flow Patterns for Virtual Environments" project. This project is in the second of four years.
- Working with Dale Clayton's group in Biology at the University of Utah to help them develop a flow measuring system to evaluate head-lice treatment.
- Served on a Masters thesis committee of a student of Dr. Petra Kastner-Klein who works in the Department of Meteorology at the University of Oklahoma.