Susan W. Stewart

The Pennsylvania State University
Assistant Professor and Research Associate
Department of Aerospace Engineering
Research Associate, Architectural Engineering
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PROFESSIONAL EXPERIENCE

Assistant Professor & Research Associate, *Aerospace Engineering*, and **Research Associate**, *Architectural Engineering*, Pennsylvania State University, University Park, PA

- Wind Energy Option Leader, intercollege Master of Professional Studies in Renewable Energy and Sustainability Systems (iMPS-RESS) Program (Sep 2013 – present)
- Member of the Graduate Faculty in Aerospace Engineering (May 2013 – present)
- Member of the Graduate Faculty in Architectural Engineering (Oct. 2013 – present)
- Director, Wind Application Center for Pennsylvania Wind for Schools Program (Dec 2010 – present)
- PI, Penn State 2014 Collegiate Wind Energy Competition Team (Aug 2013 – present)
- Coordinator for renewable energy engineering workforce development programs, Penn State College of Engineering (Jan 2011 – present).

Research Associate, *Applied Research Laboratory, Pennsylvania State University,* State College, PA
March 2007-January 2011

Research Engineer II, *Strategic Energy Institute (SEI), Georgia Institute of Technology,* Atlanta, GA
January 2004 – March 2007

NSF and GE Faculty for the Future Graduate Research Fellow, *George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology,* Atlanta, GA.
August 1999 - December 2003

NSF Summer Undergraduate Research Fellow, *Department of Mechanical Engineering, Pennsylvania State University,* University Park, PA.
May 1998 - August 1998

EDUCATION

Georgia Institute of Technology, Atlanta, Georgia
Ph.D. in Mechanical Engineering, December 2003
M.S. in Mechanical Engineering, December 2001

Pennsylvania State University, University Park, Pennsylvania.
B.S. in Mechanical Engineering, with Distinction, May 1999

FUNDED RESEARCH

Department of Energy, National Renewable Energy Laboratory "2014 Collegiate Wind Competition – Remote Wind Power Systems Unit." August 2013 – June 2014, (PI).

Department of Energy, National Renewable Energy Laboratory "Pennsylvania Wind for Schools Program," December, 2010 – December, 2013 (PI).

Penn State Sustainability Seed Grant "Building-Integrated Wind Energy: Connecting Aesthetics and Performance," July, 2010 – June, 2012 (Co-PI).

Raymond A. Bowers Program for Excellence in Design and Construction of the Built Environment "Building-Integrated Wind Energy: Connecting Aesthetics and Performance" (Matching funds for project above), May, 2010 – June, 2011 (Co-PI).

Department of Energy "GridSTAR: Smart Grid Training and Application Resource Center," August, 2010 – August, 2013 (Key Participant).

Department of Energy "Wind Energy Workforce Development: Engineering, Science, & Technology Meeting the Needs of the Future, Now," December, 2009 – December, 2012 (Key Participant).

Penn State Applied Research Laboratory Internal R&D Competition "Proper Siting of Building Integrated Wind Turbines," November, 2009 – November, 2010 (PI).

Penn State Economic and Workforce Development "Workforce and Research Development to Support Wind Energy in Pennsylvania," March, 2008 – March, 2009 (Co-PI).

Lockheed Martin "Utility Grid Automation and Risk Management," December, 2008 December, 2009 (Co-PI).

Appalachian Regional Commission "Industry Structure and Company Strategies of Major Domestic and Foreign Wind and Solar Energy Manufacturers: Opportunities for Supply Chain Development in Appalachia," October, 2007 – September, 2008 (Key Participant).

Southern Company "Georgia Offshore Wind Conceptual Design Study," 2005-2007 (Key Participant).

Various sources (GA state and entrepreneurial investment) "Ethanol production from Southern Pine in Georgia," 2006-2007 (Key Participant).

TEACHING

Wind Turbine Systems (AERSP 880, formerly AERSP 597C) *Department of Aerospace Engineering, Pennsylvania State University*, University Park, PA. Course Instructor FA 2012, 2013.

Online graduate course required for the iMPS-RESS Wind Energy Option. Provides a detailed understanding of the wind turbine as a system as well as the interconnected design elements of a modern horizontal axis wind turbine and how their design relates to their site specific implementation

- FA '12, 4 students, SRTE: Overall Course Quality: 6.5/7, Overall Quality of Instructor: 6.5/7.

Distributed Energy Engineering and Management (AE 862, formerly EGEE 597D) *Department of Architectural Engineering, Pennsylvania State University*, University Park, PA.
Course Instructor, SP 2011, FA 2013.

Online graduate course elective for the iMPS-RESS Solar Energy Option. Provides an overview of the modern electric grid and its challenges, the technologies which will enable a smarter grid, the approaches to managing this smarter grid as well as the integration of distributed generation technologies.

- SP '11, 11 students, SRTE: Overall Course Quality: 5.86/7, Overall Quality of Instructor: 6.14/7.

Wind and Hydropower Energy Conversion (formerly Sustainable Energy Options) (EGEE 438/EGEE 597C) *Department of Energy and Mineral Engineering, Pennsylvania State University,* University Park, PA. Course Instructor, SP 2009, 2010 & 2011, 2012, 2013 (co-taught '09 &'12) Guest lecturer, SP 2008

Junior/Senior level course required for the Energy Engineering major. Examines the principles of sustainability and renewable energy conversion with emphasis on wind and hydro energy resources.

- SP '13, 61 students, SRTE: Overall Course Quality: 5.63/7, Overall Quality of Instructor: 5.65/7.
- SP '12, 77 students, SRTE: Overall Course Quality: 5.06/7, Overall Quality of Instructor: 5.27/7.
- SP '11, 70 students, SRTE: Overall Course Quality: 5.33/7, Overall Quality of Instructor: 5.28/7.
- SP '10, 45 students, SRTE: Overall Course Quality: 5.11/7, Overall Quality of Instructor: 5.06/7.
- SP '09, 11 students, SRTE: Overall Course Quality: 5.92/7, Overall Quality of Instructor: 6.08/7.

Solar Project Development and Finance (AE 878, formerly AE 897A) *Department of Architectural Engineering, Pennsylvania State University,* University Park, PA. Course Coordinator, FA 2011, Instructor SP 2014.

Online graduate course required for the iMPS-RESS Solar Energy Option. Designed to provide practicing engineers with an understanding of how the economic, policy, and marketing aspects of solar projects impact design and implementation.

Penn State Wind Energy Engineering Short Course
Coordinator and instructor. Dec. 2010 at Fairless Hills, PA & August 2011 at University Park, PA

Four day short course, taught by over ten faculty from across Penn State aimed at providing early career wind energy engineers with a detailed engineering overview of the wind turbine as a system as well as the project development process.

Woodruff School Doctoral Teaching Intern, Thermodynamics, *George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology,* Atlanta, GA.
August 2003-December 2003. Assisting: Dr. Andrei Fedorov

Prepared material for and taught 2/3 of a semester long course in Thermodynamics.

Guest Lecturer, Graduate Applications of Thermodynamics, *George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology,* Atlanta, GA.
Spring 2001, 2002, 2003, 2004, 2005. Assisting: Dr. Sam Shelton

Lecture topics: Introduction to Engineering Equation Solver (EES), The Einstein Absorption Refrigeration Cycle, Heat Exchanger Optimization, Adiabatic Flame Temperature, Energy Quality & Second Law Efficiency, Entropic Average Temperatures.

Doctoral Teaching Practicum Participant, Thermodynamics, *George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology,* Atlanta, GA.
August 2002-December 2002. Assisting: Dr. Marc Smith

Prepared material for and presented six lectures and two review sessions.

COURSES UNDER DEVELOPMENT

Engineering of Wind Project Development (AERSP 886) *Department of Aerospace Engineering, Pennsylvania State University,* University Park, PA. Planned offering for Summer 2014.

Online graduate course required for the iMPS-RESS Wind Energy Option. Provides a detailed overview of the wind project development process and technical considerations for onshore and offshore applications.

PUBLICATIONS

Book co-authored

Committee on Offshore Wind Energy Turbine Structural and Operating Safety; Transportation Research Board. 2011. *Structural Integrity of Offshore Wind Turbines: Oversight of Design, Fabrication, and Installation - Special Report 305*. National Research Council, The National Academies Press, 2011.

Refereed Journal Publications

Gandhi, F., Albanese, L., and Stewart, S.W. "Adaptive Geometry Wind Turbine Blades for Increased Performance and Load Reduction." Under revision for *Journal of Wind Energy*, 2012.

Stewart, S.W., Haupt, S.E. "Assessing Wind Resource Conditions in the Built Environment." Under revision for *Journal of Wind Engineering and Industrial Aerodynamics*, 2012.

Stewart, S.W. 2010. "Finned-Tube Condenser Design Optimization Using Thermoeconomic Isolation." *Applied Thermal Engineering*, 30(14-15): 2096-2102.

Stewart, S.W., Shelton, S.V., and Aspelund, K.A. 2005. "Finned Tube Heat Exchanger Optimization Methodology." *Heat Transfer Engineering*, 26(7):1-8.

Shelton, S.V. and Stewart, S.W. 2002. "Bubble Pump Design for Single Pressure Absorption Refrigeration Cycles." *ASHRAE Transactions*, 108(1): 867-876.

<u>In Preparation</u>

Flagg Díaz, R.B., Brownson, J.R.S. and Stewart, S.W. "Use of Concentrated Solar Thermal Energy System to Enhance Sea Salt Production in Southern Spain." Presented at the 2012 World Renewable Energy Forum, Denver, CO. May 13-17, 2012. Manuscript in preparation for *Sustainable Energy Technologies and Assessments*.

Stewart, S.W., Witmer, L., Zhang, Q., and Brownson, J.R.S. 2012. "Geyser pump model development for improved design of a solar thermal water heating system," Presented at *The International Conference on Solar Heating and Cooling for Buildings and Industry*, San Francisco, July 9-11. Manuscript in preparation for *Solar Energy Journal*.

Stewart, S.W. Barj, L. "Navigating Extreme Wind Approximations for U.S. Offshore Wind Development." Manuscript in preparation for *TBD*.

Refereed Conference Proceedings

Stewart, S.W., Witmer, L., Zhang, Q., and Brownson, J.R.S. 2012. "Geyser pump model development for improved design of a solar thermal water heating system," Presented at *The International Conference on Solar Heating and Cooling for Buildings and Industry*, San Francisco, July 9-11.

Stewart, S.W., Haupt, S.E., and Cole, J.A. 2011 "Addressing Wind Resource Potential in the Built Environment," *Proceedings of ASME Energy Sustainability 2011*, Washington DC.

Poerschke, U., Woollen, M., Srebric, J., Stewart, S., and Murtha, T. 2011 "Design Investigations on Building-Integrated Wind Energy: Lessons from an Architecture Studio," *Proceedings of 2011 American Solar Energy Society Meeting*, Raleigh, NC.

Albanese, L. C., Gandhi, F., and Stewart, S.W. 2010 "Adaptive Geometry Wind Turbine Blades for Increasing Performance," *Proceedings of ASME Energy Sustainability 2010*, Phoenix, AZ.

Stewart, S.W. 2009. "Economical Design of Wind-Solar Hybrid Renewable Energy Systems," *Proceedings of ASME Energy Sustainability 2009*, San Francisco, CA.

Stewart, S.W. 2008. "Offshore Wind Shear Estimations for Windpower Assesment." *Proceedings of ASME Energy Sustainability 2008*, Jacksonville, FL.

Martin, K.A., Schmidt, M.F., Shelton, S.V. and Stewart, S.W. 2007. "Site Specific Optimization of Rotor/Generator Sizing of Wind Turbines," *Proceedings of ASME Energy Sustainability 2007*, Long Beach, CA.

Stewart, S.W. and Shelton, S.V. 2004. "The Usefulness of Entropic Average Temperatures." *Proceedings of the ASME Advanced Energy Systems Division, AES*, v. 44, p 151-155.

Stewart, S.W. and Shelton, S.V. 2003 "Finned-Tube Condenser Design Optimization Using Thermoeconomic Isolation," *Proceedings of the 21st IIR International Congress of Refrigeration*, Paper # ICR0634, Washington D.C.

Stewart, S.W. and Shelton, S.V. 2003 "Design Study Comparison of Plain versus Louvered Finned-Tube Condenser Heat Exchangers." *Proceedings of the 2003 ASME Summer Heat Transfer Conference*, v. 1, p. 703-710.

Stewart, S.W., Shelton, S.V., and Aspelund, K.A. 2003 "Finned Tube Heat Exchanger Optimization." *Proceedings of the 2nd International Heat Transfer Fluid Mechanics and Thermodynamics (HEFAT) Conference*, Paper # SS2, Victoria Falls, Zambia.

Gao, J.W., White (Stewart), S.J., and Wang, C.Y. 1999 "Solidification Processing of Functionally Graded Materials by Sedimentation," *ASME Heat Transfer Division, HTD*, v. 364-2, p. 289-301.

Abstract Reviewed & Invited Conference Papers

Flagg Díaz, R.B., Brownson, J.R.S. and Stewart, S.W. 2012. "Use of Concentrated Solar Thermal Energy System to Enhance Sea Salt Production in Southern Spain." Presented at the 2012 World Renewable Energy Forum, Denver, CO. May 13-17, 2012.

Zhang, Q., Stewart, S.W., Witmer, L., and Brownson, J.R.S. 2012. "Geyser Pump Modeling for Solar Hot Water Heater System Design Optimization," Presented at the 2012 World Renewable Energy Forum, Denver, CO. May 13-17, 2012.

Haupt, S.E., Stewart, S.W., Cole, J.A., Zajaczkowski, F.J., and Schmehl, K.J. 2011. "Mapping Wind Power Resources Around Buildings, for Siting Building Integrated Wind Turbines," Second Conference on Weather, Climate, and the New Energy Economy, Seattle, WA, Jan. 23-27.

Bulpitt, W., Stewart, S., Hunt, M. 2006. "Offshore Wind Farm Feasibility Study for the Southeast," *Proceedings of POWER-GEN 2006*, Orlando, FL, November.

Bulpitt, W., Stewart, S., Hunt, M, and Shelton, S. 2006. "Innovative Partnerships for Offshore Wind Development." *Proceedings of Windpower 2006*, Pittsburgh, PA, June 4-7.

Bulpitt, W., Stewart, S., Hunt, M. and Shelton, S. 2006. "Feasibility of Offshore Wind Power in the South Atlantic Bight," *Proceedings of Offshore Technology Conference 2006*, Houston, TX, May 1-3. (Invited Paper).

Abstract Reviewed Posters

Barj, L. Stewart, S., Stewart, G., Lackner, M., Jonkman, J., Robertson, A., Haid, L., and Matha, D. ”Impact of Wind/Wave Misalignment in the Loads Analysis of a Floating Wind Turbine,” presented at Windpower 2013, Chicago, IL, May 5-8, 2013.

Stewart, S.W., Cunningham, L., and Barj, L. 2012. ”Lessons from Hurricane Irene: Offshore Wind Turbine Design Issues for the U.S.,” presented at Windpower 2012, Atlanta, GA, June 3-6, 2012.

Stewart, S.W., Shelton, S.V., and Hunt, M.H. 2010. ”The Impact of Hurricanes on Offshore Wind Development,” presented at 2010 North American Offshore Wind Conference, Atlantic City, NJ, Oct. 5-7.

Cole, J.A., Haupt, S.E., Stewart, S.W. 2010. ”CFD Investigation of Near Building Flows for Integrated Wind Applications,” presented at the 14th Annual George Mason University Conference on Atmospheric Transport and Dispersion Modeling, Fairfax, VA, July 13-15.

Stewart, S.W., White, E.R., Roeckel, M.W. and Hendrick, E.J. 2009. “Predictive Enterprise Modeling and Simulation of the Utility Grid,” presented at the *Lockheed Martin Poster Session*, University Park, PA, October 29.

Stewart, S.W. and Brownson, J.R.S. 2008. “Hybrid Renewable Energy Systems: Design Optimization Analysis and Tools” presented at *The Pennsylvania Wind Energy Symposium 2008: Power for the Future*, State College, PA, November 17-18.

Stewart, S.W. 2008. “U.S. Offshore Extreme Wind Analysis Based on Hurricane Return Probabilities” presented at the *AWEA Offshore Windpower Workshop*, Wilmington, DE, September, 9-10.

Stewart, S.W. 2008. “Developing a Large Scale Wind Turbine Drivetrain Test Facility in the U.S.” presented at *Windpower 2008*, Houston, TX, June 1-4.

Reports

Utility Grid Automation and Risk Management Final Project Report. Susan W. Stewart, Eric. R. White and Michael W. Roeckel, Penn State Applied Research Laboratory. For Lockheed Martin Corporation, December 2009.

Southern Winds: An Offshore Wind Feasibility Study for the South Atlantic Bight. Southern Company & Georgia Institute of Technology, August 2006.

Selected Invited Presentations

Install a Wind Turbine at Your School, “PA Wind for Schools: Case Studies,” Distributed Wind Expo 2013, Rochester, NY, June 11, 2013.

Saint Francis University, Wind Energy Workshop, “Wind Industry Overview,” Loretto, PA, May 14, 2013.

ASES Forum: Schools Going Renewable, “PA Wind for Schools Project: Engaging Teachers and Students in STEM Education,” 2013 ASES Conference, Baltimore, MD, April 18, 2013.

Freiburg University – Penn State Energy Conversion Workshop, “Design of Renewable Energy Technologies for Site Specific Resources. Freiburg,” Germany, July 12-13, 2012.

Virginia Statewide Wind Energy Symposium, “Workforce Needs.” Harrisonburg, VA, June 20-22, 2012.

Invited Moderator, Windpower 2012, "Offshore Wind, Scientific Session." Atlanta, GA June 6, 2012.

Fulbright Scholars, "Wind Energy & Geothermal Energy in PA," Nov. 12, 2011.

Green Bag Lunch Series, "Wind Energy Technology," Oct. 15, 2011.

Community Wind Across America, "Penn State Wind Energy Education and Outreach," State College, PA. Feb. 8, 2011.

NREL Rooftop and Built Environment Wind Turbine Workshop, "Mapping Wind Power Resources Around Buildings," NREL NWTC near Boulder, CO. Aug. 12, 2010.

NYU Faculty Resource Network, Faculty Enrichment Seminar on Energy & Environment, Jan. 15, 2010: "The Cutting Edge in Large Scale Wind Energy Technology."

Pennsylvania Department of Community and Economic Development, Oct. 27, 2009: "Energy Research @ Penn State," with Prof. Tom Richard.

Offshore Wind Development Summit, March 31, 2009: Panelist on "Identifying Opportunities for Offshore Wind Development."

Pennsylvania Wind Energy Symposium, Nov. 17-18, 2008: "Wind Energy: Challenges & Opportunities."

Northeast Renewable Energy Conference, Aug. 27-28, 2008: "Wind Energy 101."

Penn State Outreach Energy Efficiency Meeting, July 15, 2008: "Wind Energy Essentials, Challenges and Opportunities."

Penn State Wind Energy Research Organizational Forum, Dec. 19, 2007: "Wind Energy Research Needs: Technical Issues."

Southeast Regional Offshore Wind Symposium, Feb. 26-27, 2007: "Feasibility of Offshore Wind Power in the Southeast."

Alternative Energy Technology Innovations: The Coming Economic Boom, May 12-13, 2005: "Offshore Wind Resources in the Southeast."

AWARDS AND HONORS

- Woodruff School Doctoral Teaching Fellowship, 2003.
- ASME Graduate Teaching Fellowship, 2003-2004.
- ASHRAE Grant-in-Aid, 2002-2003.
- Achievement Rewards for College Scientists (ARCS) Fellowship, 2001-2003.
- ASHRAE Student Engineer of the year, Atlanta Chapter, 2001.
- NSF Graduate Research Fellowship, 2000-2003.
- Georgia Tech President's Fellowship, 1999-2003.
- GE Faculty for the Future Fellowship, 1999-2000.
- (Penn State) Women in the Sciences and Engineering/General Motors Scholarship, 1998.
- (Penn State) Deans List 1995 -1999, 8/8 semesters.

CURRENT STUDENTS

Ph.D.

Peter Austin: Co-advising with Dr. Tom Hughes, Ph.D. Mechanical Engineering, expected May 2014. *Micro-grid Design for Secure, Economic and Uninterruptible Power.*

Kevin Carbonnier: Committee member, Ph.D., Architectural Engineering, expected May 2014. *Mechanical Control of Hybrid Renewable Energy Residence*.

M.S.

Allison Boehm: Co-advisor with Seth Blumsack, M.S. Energy & Mineral Engineering, expected December 2013. *Wind Turbine Decommissioning Costs*

B.S.

Nicholas Ward: Undergraduate Research Supervisor (Senior En. Eng), Fall 2013. B.S. Energy Engineering, May 2013. *A Study of the Product Market for a Small Scale Wind Turbine*.

GRADUATED/PAST STUDENTS

M.S.

Lucie Barj: Co-advisor with Jeffrey Brownson, M.S. Energy & Mineral Engineering, Aug. 2013. *Modeling and Analysis of a Semi-submersible Offshore Wind Turbine.* Currently: Internship at Alstom Wind.

Peter Austin: Co-advisor, M.S. Mechanical Engineering, Dec. 2011. *Practical Use of HOMER in Preliminary Campus Microgrid Design*. Currently: Pursuing Ph.D. at Penn State.

Brenton Forshey: Co-advisor, M.S. Aerospace Engineering, Aug. 2011. *Complex System Monitoring of Wind Turbines*. Currently: Boeing.

Charith Tammineedi: Thesis Committee, M.S. Energy & Mineral Engineering, May 2011. *Modeling Battery-Ultracapacitor Hybrid Systems for Solar and Wind Applications.*

Lucas Witmer: Thesis Committee, M.S. Energy & Mineral Engineering, Dec. 2010. *Green Roof Integrative Photovoltaic Performance Modeling.* Currently: Pursuing Ph.D. at Penn State.

Leonardo Albanese: Co-advisor, M.S. Aerospace Engineering, Aug. 2010. *Adaptive Geometry Wind Turbine Blades for Increasing Performance*. Currently: Lockheed Martin Corporation.

Kirk Martin: Thesis committee member, M.S.M.E. Georgia Tech, Dec. 2006. *Site Specific Optimization of Rotor/Generator Sizing of Wind Turbines*. Currently: Texas A&M.

B.S.

Bill Miller: Undergraduate Research Supervisor (Senior En.Eng.), Spring 2013. B.S. Energy Engineering, May 2013. *Investigation of the Siting of the Center of Sustainability's Skystream Wind Turbine and the Effects of Obstacles on Wind Direction, Wind Shear, and Turbine Performance.*

David Moyer: Undergraduate Research Supervisor (Senior En.Eng.), Spring 2013. B.S. Energy Engineering, May 2013. *Comparing Skystream Wind Data with Nearby Sites to Predict the Energy Production.*

Chris Muller: Undergraduate Research Supervisor (Senior En.Eng.), Spring 2013. B.S. Energy Engineering, May 2013. *Investigation of the Performance of the Center of Sustainability's SkyStream Wind Turbine*

Lee Cunningham: Undergraduate Research Supervisor (Senior M.E.), Spring 2012. B.S. Energy Engineering, May 2012. *Offshore Extreme Wind Analysis for Wind Turbine Design Guidelines.*

Matthew Jurgielewicz: Undergraduate Research Supervisor (Senior En.Eng.), Spring 2012. B.S. Energy Engineering, May 2012. *Wind for Schools Assessment for the Central Pennsylvania Institute of Technology.*

Thomas Krupa: Undergraduate Research Supervisor (Senior En.Eng.), Spring 2012. B.S. Energy Engineering, May 2012. *Wind for Schools Assessment for James Buchanan High School.*

Christian Myers: Undergraduate Research Supervisor (Senior En.Eng.), Spring 2012. B.S. Energy Engineering, May 2012. *Wind for Schools Assessment for The Londonderry School.*

Garret Saunders: Undergraduate Research Supervisor (Senior En.Eng.), Spring 2012. B.S. Energy Engineering, May 2012. *Wind for Schools Assessment for Pequea Vallwy School District.*

Drew Gardner: Honors Option Supervisor for EGEE 438, Spring 2012. B.S. Energy Engineering expected May 2014. *Wind Energy Uncertainty Analysis.*

Kathryn Nicol: Honors Option Supervisor for EGEE 438, Spring 2012. B.S. Energy Engineering, May 2012. *Wind Turbine Feasibility and Design Case Study in Maine.*

Thomas Purcell, Honors Thesis Faculty Reader. B.S. Aerospace Engineering, Spring 2011. *Blade Element Momentum Theory Applied to Horizontal Axis Wind Turbines.*

Qi Zhang: McNair Scholar Faculty Research Advisor, Summer – Fall 2011. B.S.M.E Dec. 2011. *Bubble Pump Modeling for Solar Hot Water Heater System Design Optimization.* Currently: Pursuing MS ME at University of Wisconsin.

Robert Flagg: Undergraduate Research and PennTAP Intern Mentor, Fall 2010-Fall 2011. B.S. Energy Engineering Dec. 2011. *Solar Thermal Enabled Salt Production for Southern Spain* & *Wind Energy Resource Assessments for PA Businesses*. Currently: MSc candidate, European Master in Renewable Energy (EUREC).

Amber DiDominic: Undergraduate Research Supervisor (Senior En.Eng.), Fall 2011. B.S. Energy Engineering, May 2012. *Optimizing Wind Turbine Tower Height and Blade Length to Minimize Levelized Cost of Energy.* Currently: Staff Engineer, Environmental Resources Management.

Evan Hendrick: Supervisor, ARL Undergraduate Honors Program, B.S.M.E. May 2010. *Building Demand Model Development & Wind Turbine Data Post-Processing Code Development.* Completed M.S.M.E. at Penn State. Currently: MP Machinery & Testing.

Benjamin Lutz: Undergraduate Research Supervisor (Senior En.Eng.), Spring 2010. B.S. Energy Engineering, May 2010. *Modeling Analysis and Prototype Development of a Building Integrated Wind Turbine*.

Matthew Trudeau: Undergraduate Research Supervisor (Senior M.E.), Fall 2009. *Building Demand Model Validation using Penn State EUMS Data*. Completed M.S.M.E. at Penn State Currently: Boeing.

Michael Schmidt: Undergraduate Research Supervisor, 2006. *Offshore Wave Analysis for coastal Georgia*. Completed MSME at Georgia Tech, five years with GE Wind. Currently: Pursuing MBA at Harvard.

PROFESSIONAL MEMBERSHIPS AND SERVICE

- Professional Societies
  - ASME, American Society of Mechanical Engineers, 1997-present.
    - "Wind Energy Systems and Technologies" Track co-chair, Energy Sustainability 2012, Session Chair in 2011.

        - "Exergy Applications: Sustainability, Renewable Energy" Track Chair, *Energy Sustainability 2010*.
        - "Climate, Emissions & Environment" Track co-chair, *Energy Sustainability 2009*.
    - Penn State Mechanical Engineering Society (PSMES)
        - President 2011-2013
        - Vice President/President-elect 2009-2011
        - Chair, Networking Committee
        - Member, Mentor Selection Committee Board
            - Mentor program recipient of 2009 Penn State Alumni Association Professional Development Award.
        - Chaired Penn State Mechanical and Nuclear Engineering Senior Recognition Banquet, February 18, 2008.
    - ASHRAE, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, 2001 - present.
        - Officer (Vice President/Secretary/Graduate Liaison), Georgia Tech Chapter, 2001-2003.
        - Helped re-introduce ASHRAE to Georgia Tech.
        - Organized industry tours & meetings.
        - Managed website and chapter communications.
    - Golden Key National Honor Society, Fall 1997-present.
    - Phi Kappa Phi National Honor Society, Fall 1997-present.
    - Tau Beta Pi National Engineering Honor Society, Fall 1997-present.
- Committees
    - IEC WG-3.1 US Shadow Committee, July 2013-present.
    - Committee Member, National Academy of Sciences Study for the Transportation Research Board on the Structural and Operating Safety of Offshore Wind Turbines, June 2010 – March 2011.
    - American Wind Energy Association, Offshore Wind Working Group
        - Member 2005-present
        - R&D Subcommittee 2009-present.
    - American Wind Energy Association, Education Working Group
        - Member, 2010-present.
    - Founding member and executive officer 2005-2007, Georgia Wind Working Group (www.gawwg.org)
- Conference Organization
    - Mid-Atlantic regional program committee member for Windustry's *Community Wind Across America* Conference series, Aug 2010-Feb 2011. (www.windustry.org/cwaa)
    - Co-organized the Pennsylvania Wind Energy Symposium 2008, held at Penn State, November 17-18, 2008. (www.windenergypa.org)
    - Co-organized the Northeast Renewable Energy Conference, held at Penn State, August 26-28, 2008. (http://energy.extension.psu.edu/news/presentations)
    - Organized Penn State Energy Efficiency Forum, April 28, 2008.
    - Organizational committee for the Southeast Regional Offshore Wind Symposium, Charleston, SC Feb. 26-27, 2007. (http://www.clemson.edu/scies/WindProceedings.htm)
    - Co-organized Penn State Wind Energy Research Organizational Forum, December 19, 2007
    - Organized workshop on Alternative Energy Technology Innovations: The Coming Economic Boom, Savannah, GA May 12-13 2005. (http://www.gtsav.gatech.edu/outreach/workshop/presentations.html)
- Reviews
    - Reviewer, National Science Foundation, Generation 3 Engineering Research Center

        - Pre-proposals - January 2010;
        - Full Proposals - June 2010;
        - Site Visit Reviewer - September 2010.
    - Reviewer, 2010 and 2011 Windpower conference offshore wind abstracts.
    - Reviewer, ASME Energy Sustainability 2007-2013; Advanced Energy Systems Division, ASME, International Mechanical Engineering Congress and Exposition, 2000, 2002, 2006; ASHRAE HVAC&R Research Journal, 2004; ASCE Journal of Hydraulic Engineering, 2005; Civil Engineering and Environmental Systems, 2013; ASME Journal of Energy Resources Technology, 2005.
- Facilitator
    - Facilitator for Penn State Energy Efficiency Steering Committee, March-June, 2008.