

Kenneth Allen Walz

Madison Area Technical College
Department of Science & Engineering
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University of Wisconsin
Department of Civil &
Environmental Engineering

Education:

University of Wisconsin - Madison	B.S.	Science Education	1995
University of Wisconsin - Milwaukee	M.S.	Biological Sciences	1999
University of Wisconsin - Madison	Ph.D.	Environmental Chemistry & Technology	2006

Certifications:

WI Technical College System	Science & Engineering Instructor	2003
Solar Energy International	Solar Professional Certification Program	2012
Association of Energy Engineers	Certified Renewable Energy Professional	2016

Teaching and Education Experience:

Science, Engineering, and Renewable Energy Instructor - (2003 – present)

Madison Area Technical College, Madison, WI

Full time instructor teaching both lecture and lab sections of General Chemistry I & II. Represented the chemistry department for the search and screen process to hire seven new chemistry faculty members and several part time instructors, and served as a mentor for new teaching staff. Developed and team-teach Introduction to Engineering Design course for transfer students pursuing a BS degree in engineering. With funding from the National Science Foundation created a new Survey of Renewable Energy online class. Also developed a Renewable Energy for International Development study abroad course in Central America that formed the basis for a State Department initiative to found the Community Colleges for Sustainable Development Network, which received the prestigious Andrew Heiskell Award for International Education. Also developed and team teach courses in Solar Photovoltaic Technology and Solar Photovoltaic Installation.

Adjunct Professor (2006 – present)

Department of Civil and Environmental Engineering, University of Wisconsin-Madison

Team-teach “Water Chemistry for Practical Applications” and “Environmental Engineering and Green Applications” with the UW Engineering Professional Development Program. Also team-teach “Methods in Science and Engineering Education” for graduate students and post-docs aspiring to be future faculty. Served as a faculty mentor for nine graduate students completing Teaching Internships as part of the NSF funded Center for the Integration of Research, Teaching, and Learning (CIRTL).

Associate Lecturer (2008-Present)

K-12 Energy Education Program, University of Wisconsin-Stevens Point

Teach continuing education courses for middle and high school teachers through the Wisconsin K-12 Energy Education Program (KEEP). Responsible for creation of content for face-to-face and online courses in renewable energy and bioenergy. Served as lead instructor for a DOL WIRED grant providing energy education targeted for HS STEM instructors. Have taught over 400 K-12 teachers to date.

Adjunct Instructor (2011-present)

Teacher Enhancement Program, Colorado School of Mines

Teach continuing education Summer Renewable Energy Institute with the National Renewable Energy Laboratory (NREL) Office of Educational Programs, training over 200 teachers to date.

Director and Principal Investigator (2016 – present)

Center for Renewable Energy Advanced Technological Education (CREATE)

The goal of the CREATE Center is to advance the field of renewable energy by supporting two-year college renewable energy programs. This goal is accomplished by: 1) Providing support and mentoring for faculty in renewable energy technology 2) Supporting renewable energy industry, business and academic partnerships. 3) Promoting technician careers and visibility of renewable energy. 4) Addressing knowledge, skills, and competencies needed for the evolving renewable energy technical workplace. 5) Screening, validating, distributing exemplary renewable energy materials, curricula, and pedagogical practices adapted or designed by other NSF projects.

Director and Principal Investigator (2005 – 2016)

Consortium for Education in Renewable Energy Technology (CERET)

Served as project director and principal investigator for four NSF grant awards in Advanced Technical Education. The CERET consortium included colleges, universities, and non-profit organizations involved in renewable energy education from across the U.S. Served as the primary contact and public representative for the consortium. Coordinated with multiple instructors to develop online and face-to-face classes and certificates in wind, solar, biomass, biofuels, and renewable energy technology. Provided “Train the Trainers” professional development in biofuels and solar energy for over 300 two-year college instructors from 41 U.S. States and Territories.

Science Teacher (1998 – 2002)

Menomonee Falls High School, Menomonee Falls, WI

Taught accelerated physical science, biology, and organic chemistry for honors level students. Responsible for maintenance, repair, inventory, and purchasing of supplies and equipment. Created curriculum and laboratory activities for organic chemistry, modeled on courses taught at UW-Milwaukee. Wrote a new physical science curriculum that emphasized laboratory investigation and computer data analysis. Developed a water chemistry unit that monitored physio-chemical parameters of the Menomonee River and tracked annual changes in water quality. Supervised two student teachers completing field assignments to meet degree and license requirements.

Summer Science Adjunct Instructor (1999- 2002)

Office of Science Outreach, University of Wisconsin-Oshkosh

Taught summer graduate courses in chemistry and physical science for approximately 100 teachers fulfilling requirements for license renewal and working towards M.S. degrees.

Teaching Assistant (1996 - 1997)

Department of Biological Sciences, University of Wisconsin-Milwaukee

Taught field ecology laboratory for 80 undergraduate students majoring in STEM subject areas.

Science Teacher (1995 – 1996)

East Troy High School, East Troy, WI

Taught honors physics, physical science and biology in a medium sized rural high school.

Exchange Teacher (April - July 1995)

Walton Comprehensive School, Peterborough England

Taught chemistry, physical science, and biology to year 8-10 students of diverse ethnic backgrounds. Also conducted several comparative visits to other schools within the English educational system.

Scientific Research and Engineering Experience:

Solar Roadmap Team Lead (Dec 2017 – present)

Madison Area Technical College, Madison, WI

Led a five-member team to develop the **Madison College Solar Roadmap** as part of the 10-year facilities master plan. The fifty-page roadmap document evaluated energy and infrastructure needs and opportunities for fourteen buildings located at nine different campuses. Solar projects were prioritized based on economic returns and technical feasibilities. The first project was executed in summer 2018, resulting in the largest rooftop solar installation in the State of Wisconsin. The 1.85 MW system can power the campus for several hours on a clear sky day, and produces about 25% of the college's annual electricity needs. Subsequent projects are planned for the potential addition of more than 3MW of solar generation to the college's energy portfolio, and possible integration with energy storage for load shifting and demand management.

DOE ACTS Researcher (June 2009 – August 2010)

U.S. Department of Energy, National Renewable Energy Lab, Golden, CO

Conducted research with the NREL Materials Science and Electrochemical Research Group. Studies focused on lithium-ion anode materials prepared by cathodic pulse deposition of manganese oxide active materials. Developed protocols for fabrication of 3D-structured copper nanorod current collectors using sacrificial alumina ceramic templates. Studies also formed the basis of two undergraduate independent study projects.

DOE ACTS Researcher (June 2008 – August 2008)

U.S. Department of Energy, National Renewable Energy Lab, Golden, CO

Conducted research with the NREL Renewable Fuels facility. Studies measured regulated tailpipe emissions for vehicles operating on biodiesel and petroleum based fuels. Installed, calibrated, and implemented monitoring equipment for measurement of NO_x, THC, CO₂, and CO emissions as regulated by the U.S. Environmental Protection Agency. Operated engine and chassis dynamometers in accordance with vehicle Federal Test Procedure standards for hybrid vehicles.

Guest Graduate Student (July 2003 – August 2006)

U.S. Department of Energy, Argonne National Laboratory, Argonne, IL

Developed novel nanoparticulate coatings for manganese oxide cathodes in advanced lithium battery systems for electric and hybrid cars. Tested and analyzed materials to determine charge and discharge characteristics, and stability at elevated temperatures. Compared various sol-gel materials and processing conditions to optimize coating performance. Characterized coating morphology using Scanning Electron Microscopy (SEM) and Braunauer Emmet and Teller (BET) adsorption isotherm techniques. Also investigated the use of ferrate Fe(VI) cathodes in lithium primary batteries. Equipment included PAR and Solartron potentiostats, Maacor and Arbin battery cyclers, and various controlled atmosphere glove boxes and environmental chambers.

Graduate Research Assistant (June 2002-August 2006)

Environmental Chemistry and Technology Program, University of Wisconsin – Madison

Designed, planned, and conducted research in novel electrical and water treatment materials. Lead investigator in a collaborative project between Rayovac Inc. and the Central Intelligence Agency to develop new materials based on Fe(VI) "super iron" ferrate chemistry. Directed all aspects of ferrate synthesis, conversions, and incorporation into electrochemical cells. Coordinated and supervised multiple studies of metal oxide thin-film membranes, semiconductor coatings, batteries and ultracapacitors. Experiments included synthesis and testing of conductive indium tin oxide glass, and various other surface coating applications. Responsibilities included overseeing of chemical supplies and expenditures, repair and maintenance of laboratory instruments, and ensuring compliance with safety protocols. Employed and directed several undergraduate hourly and independent study students. Instrumentation

used included: Inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES), Electrochemical Impedance Spectrometer (EIS), Zeta Potential Electrophoretic Mobility Analyzer (ZPEMA), X-Ray Diffractometer (XRD), X-Ray Photoelectron Scattering Spectrometer (XPS), Atomic Force Microscope (AFM), and Variable Angle Scanning Ellipsometer (VASE)

Visiting Scientist (June – August 2001)

Department of Chemistry, University of Rochester

Tested and developed a new optical imaging system for a DNA hybridization biochemical sensor. Constructed an optical bench and chemical cell to verify proof of principle for the proposed imaging design. Performed chemical preparations and reactions to test sensor binding and recognition performance. Also troubleshot numerous imaging problems and participated in the review of existing patent claims. Equipment used included a pulsed N₂ pumped dye laser, fixed-angle scanning ellipsometer, Fourier transform infrared spectrometer (FTIR), automated rapid micro-arrayer, silicon wafer dicer, CCD spectrophotometer and lock-in amplifier.

National Science Foundation Research Experience for Teachers (June - August 2000)

Center for Photo-induced Charge Transfer, University of Rochester

Worked with a dynamic research center that included individuals from Xerox, Eastman Kodak, AT&T Bell Labs, and the University of Rochester. Characterized luminescent properties of polyphenylene vinylene (PPV) derivative materials targeted for potential use as conducting polymers in organic light emitting diode (OLED) display technologies. Tested the photoemission of organic materials in solution, as thin films, and in LED devices. Duties included operation of UV-VIS spectrophotometer, fluorimeter, and cyrostat equipment. Key experiments involved the use of a single-photon counting apparatus based on phase locked neodymium YAG and DCM dye lasers. Also trained in the use of a scanning tunneling microscope (STM).

Research Assistant & Graduate Research Fellow (June 1997 - August 1998)

Great Lakes WATER Institute, UW-Milwaukee

Investigated the respiratory physiology of bluegill and long ear sunfish. Field work included the use of SCUBA equipment, backpack electro shocker, hydro lab data logger, GPS, small engine generators and motors, and various boats and other vessels. Designed aquaculture systems and a variable flow, multiple channel respirometer using dissolved oxygen electrochemical sensors. Participated in the Pike River Restoration Project and the Allenton Creek Mitigation Project (WI Department of Transportation) providing data analysis for environmental and civil engineering projects.

Physical Science Technician (September 1993 - January 1995)

USDA Forest Products Laboratory, Madison WI

Developed thermoplastic composites incorporating cellulosic fibers in polymer resins. Tested and evaluated tensile, flexural, and impact properties using ASTM instruments and protocols. Designed and conducted a series of experiments to optimize incorporation of binding agents, lubricants, and colorants in composite products. Operated numerous polymer processing machines including single and twin screw extruders, injection molder, thermal k-mixer, granulator, and several hydraulic presses.

Laboratory Assistant (August 1992 - September 1993)

Department of Forest Science, UW - Madison

Participated in field research in northern Wisconsin and western Montana. Studies focused on nutrient cycles, carbon allocation, and forest productivity measurements. Operated numerous field instruments including CO₂ residual gas analyzer, solar photometers, and remote powered weather stations.

Business and Industry Experience:

Scientific Consultant (2016-2018)

Solar Kleen Tech LLC, Madison, WI

Provide technical consultation and experimental design assistance for a small start-up firm developing UV activated titanium-dioxide self-cleaning glass for solar photovoltaic panels. Supervised three undergraduate students implementing field trials of the company's product on full size solar arrays using Enphase module level power electronics for data acquisition and analysis.

Scientific Consultant (2016-2018)

Galvanacar LLC, Madison, WI

Provide technical consultation and experimental design assistance for a small start-up firm developing electrochemical energy storage devices based on aqueous lithium-ion battery capacitor hybrid devices.

Scientific Consultant (2009-2014)

Solrayo Inc., Madison, WI

Provide technical consultation and experimental assistance for a small start-up firm developing manganese oxide lithium-ion batteries using thin film coating technologies. Responsibilities included preparation of proposals to the U.S. Air Force, DOE, and NSF to develop specialized power sources for military, space exploration, and electric vehicle applications. Worked with former students to implement SBIR/STTR Phase 1 and Phase 2 awards, along with REU and CC supplemental grants.

Scientific Consultant (2005-2013)

Great Lakes Ag Energy LLC, Madison, WI

Provided technical consultation, engineering services, grant writing assistance, and market development advice for a local bioenergy firm. Aided in the evaluation of bio-refinery construction design proposals. Oversaw the design and fabrication of an aquaponic system for cultivation of algal turf grass. Edited biofuels media communications and educational materials to ensure accuracy of scientific content.

Scientific Consultant (May 2009-2011)

Silatronix LLC, Madison, WI

Provided technical consultation, and advice on experimental design and product development for a small start-up firm developing specialized electrolyte materials for advanced lithium ion batteries. Served as a faculty mentor for a student completing an NSF funded REU experience and an independent study project related to battery materials R&D. The company currently employs two of my former students.

R&D Scientist (August 2002 – August 2004)

SLIP Technologies Inc., Madison, WI

Developed and marketed super laminar coatings for marine applications. Produced and characterized nanoparticulate SiO₂ suspensions using sol-gel techniques. Tested and modified drag reducing surface treatments for use on sailboat racing hulls. Products were evaluated by Stars and Stripes and Oracle/BMW America's Cup teams. Conducted hydrodynamic tests of nanoparticulate coatings with the University of Southampton Woolfson Unit Test Facility and the GBR Challenge America's Cup Team.

Synergistic Activities:

Clean Lakes Alliance, Volunteer Scientific Consultant, Lake Algae Remediation Project (2012-present)

Wisconsin K-12 Energy Education Program, Advisory Board Member (2009-present)

Wisconsin Distributed Resources Collaborative, a non-profit organization advocating for generation of electricity from renewable sources. Secretary and Steering Committee member (2005-present)

University of Wisconsin-Madison Delta Program and Center for the Integration of Research, Teaching, and Learning. Faculty Teaching Mentor (2004-2016)

Wisconsin Biodiesel Association, a non-profit organization advocating for biodiesel research, development, production, and utilization. Board Member and Education Chair (2006-2011)

MATC Environmental Sustainability Alliance, a college entity responsible for developing a campus sustainability plan. Treasurer and Steering Committee member (2007-2010)

Sustain Dane, Volunteer Scientific Consultant, Rain Barrel Project (2006-2010)

Grants and Extramural Funding

CREATE Energy Resource Center, NSF grant # 2000714
Principal Investigator, Madison College, 2020-2022, \$1,055,000

Reedsburg and Fort Atkinson Solar, Solar On Schools, Panel Donation Grants
Principal Investigator, Madison College, 2020, \$50,000

Reedsburg and Fort Atkinson Solar, Focus on Energy Grants
Principal Investigator, Madison College, 2020, \$39,500

Reedsburg Ground Mount Solar for Non-Profits Grant, WPPI Energy
Principal Investigator, Madison College, 2020, \$20,000

Career Advancement Strategies for Two-Year Technical Educators, NSF grant #1903498
Consultant, University of Oregon, 2019-2020, \$100,000

CREATE Renewable Energy SCADA Project, NSF Grant # 1901852
Principal Investigator, Madison College, 2019-2022, \$588,000

Solar Ready Wisconsin, Dept of Energy Award #: DE-EE0008573
Co-Principal Investigator, Midwest Renewable Energy Association, 2019-2022, \$800,000

CREATE Energy Storage Project, NSF Grant # 1800893
Principal Investigator, Madison College, 2018-2021, \$600,000

CREATE Germany International Learning Exchange Supplement, NSF Grant # 1838041
Principal Investigator, Madison College, 2018-2019, \$48,000

CREATE Center for Renewable Energy Advanced Technological Education, NSF Grant # 1600934
Principal Investigator, Madison College, 2016-2020, \$1,600,000

Rooftop Solar PV System for Madison Truax Campus, Madison Gas and Electric and US EPA
Principal Investigator, Madison College, 2017-2019, \$500,000

Wisconsin Solar Educators Academy, Wisconsin Distributed Resources Collaborative Grant
Co-Principal Investigator, Madison College, 2015 & 2016, \$10,000 total

CERET - Career Education in Renewable Energy Technologies, NSF Grant # 1205015
Principal Investigator, Madison College, 2012-2016, \$855,000

Low Temperature Cathode Materials, NSF STTR Phase 2 Community College Supplemental Award
Principal Investigator, Solrayo LLC & Madison College, 2013-2014, \$40,000

Nanoparticulate Cathode Materials for Lithium Ion Batteries, NSF Phase 2 STTR Grant #1156229
Consulting Scientist, Solrayo LLC & UW-Madison, 2012-2014, \$500,000

Expanding Study Abroad Capacity in Energy and STEM fields, U.S. State Dept Grant #10582954
Co-Principal Investigator, Madison College, 2010-2013, \$360,000

Nanoparticulate Cathode Materials for Lithium Ion Batteries, NSF Phase 1 STTR Grant #1010409,
Consulting Scientist, Solrayo LLC & UW-Madison, 2010-2011, \$175,000

CERET - Resources for Renewable Energy Technologies, NSF Grant #0903293
Principal Investigator, Madison College, 2009-2012, \$900,000

WI Energy Workforce Innovation & Regional Economic Development, Dept of Labor WIRED Grant
Co-Principal Investigator, WI Tech College System & UW-Stevens Point, 2009-2010, \$340,000

Madison College/UW-Madison Engineering Transfer Program, UW-System Grant
Senior Personnel, Madison College & UW-Madison, 2008-2010, \$143,000

Renewable Energy Train the Trainer Academy, WI Technical College System Grant #04823112138
Co-Principal Investigator, Madison College, 2008, \$15,500

Global Horizons Renewable Energy International Education, US DOE Title VI Grant
Senior Personnel, Madison College, 2007-2009, \$170,000

Building Integrated Photovoltaic Project, Wisconsin Focus on Energy Incentive Grant
Principal Investigator, Madison College, 2006-2008, \$16,500

CERET - Partnerships for Renewable Energy Technologies, NSF Grant #0501764,
Principal Investigator, Madison College, 2005-2009, \$500,000

Institution-Level Reform of Technician Education, NSF Grant #0501816
Co-Principal Investigator, Madison College, 2005-2008, \$150,000

CERET - Consortium for Education in Renewable Energy Technology, NSF Grant #0202352
Project Director, Madison College, 2002-2006, \$420,000

Publications

K.A. Walz, J.B. Shoemaker, S. M. Ansorge, A. Gusse and N. J. Hylla. Enlightened Education: Solar Engineering Design to Energize School Facilities. **Best Paper Award**, Energy Conversion and Conservation Division. *ASEE Annual Conference Proceedings*, Montreal, CA Paper #30133 (2020)

M. Slowinski, G. Temple and K.A. Walz. International Faculty Professional Development: Utilizing Online and Hybrid Environments to Deepen Learning and Grow Community. *ASEE Annual Conference Proceedings*, Montreal, CA Paper #30904 (2020)

L. Bosman, J. Brinker, and K.A. Walz. A comparison of the renewable energy and energy storage sectors in Germany and the United States, and recommendations for engineering teaching practices. **Best Paper**

- Award**, Energy Conversion and Conservation Division. *ASEE Annual Conference Proceedings*, Montreal, CA Paper #29546 (2020)
- S. Ansorge and K. Walz Ten Step Guide to Creating a Solar Photovoltaic Roadmap. Madison Area Technical College. Madison, WI. (2018)
- S. Ansorge, T. Helbig, W. Marquardt, M. Thomas, and K. Walz. Madison College Solar Photovoltaic Roadmap. Madison Area Technical College. Madison, WI. (2018)
- K.A. Walz, J.B. Shoemaker, A. Scholes, H. Jiang, J.L. Sanfilippo, J. M. Silva, W.A. Zeltner, and M.A. Anderson. Experimental Field Trial of Self-Cleaning Solar Photovoltaic Panels. *ASEE Annual Conference Proceedings*, Salt Lake City, UT. Paper # 22061 (2018)
- K.A. Walz, C. Folk, S. Liddicoat, and J.B. Shoemaker. Impacts on Teaching Practices from a Solar Photovoltaic Institute Faculty Professional Development Program. *ASEE Annual Conference Proceedings*, Salt Lake City, UT. Paper #23357 (2018)
- K.A. Walz and J.R. Christian. Engineering Design Projects for Community Colleges. *American Journal of Engineering Education*. 8(1): 1-11 (2017)
- K.A. Walz, and J.B. Shoemaker. Preparing the Future Sustainable Energy Workforce and The Center for Renewable Energy Advanced Technological Education. *The Journal of Sustainability Education* Vol 17, March (2017)
- K.A. Walz, M. Slowinski, and K. Alfano. International Approaches to Renewable Energy Education – A Faculty Professional Development Case Study and Recommended Practices for STEM Educators. *American Journal of Engineering Education*. 7(2): 97-115 (2016)
- M. Slowinski, K.A. Walz, and K. Alfano. Renewable Energy Technician Education: The Impact of International Faculty Collaboration. **Best Paper Award**, Energy Conversion and Conservation Division. *ASEE Annual Conference Proceedings*, New Orleans, LA. Paper # 12643 (2016)
- D. Gillian-Daniel and K.A. Walz. Teaching Internships: A model for the development of future faculty and the improvement of teaching in science, technology, engineering and math. *Community College Journal of Research and Practice*, 40(2):133-145 (2016)
- M. Kleeman, H. Zhang, K. Magara-Gomez, M. Olson, T. Okuda, K. Walz and J.J. Schauer. Black Carbon Emissions Reductions through the Strategic Use of Biodiesel in California. *Science of the Total Environment*. 538:412-22 (2015)
- W. Zeltner, K. Walz, and R. Perez. Protective Nanoparticulate Coatings for Cathode Materials for Metal-Ion Rechargeable Batteries. US patent application # 14196218 (2014)
- K.A. Walz, A. Hoffman, S. Britton, K. Cadwell, J. Crain, and P. Morschauer. Biodiesel Synthesis, Viscosity, and Quality Control for an Introductory Chemistry Lab. *The Chemical Educator* 19:342-346 (2014)
- K.T. Magara-Gomez, M.R. Olson, T. Okuda, K.A. Walz, and J.J. Schauer. Sensitivity of Diesel Particulate Material Emissions and Composition to Blends of Petroleum Diesel and Biodiesel Fuel *Aerosol Science and Technology* 46(10):1109-1118 (2012)

- K.T. Magara-Gomez, M.R. Olson, T. Okuda, K.A. Walz, and J.J. Schauer. Sensitivity of Hazardous Air Pollutant Emissions to the Combustion of Blends of Petroleum Diesel and Biodiesel Fuel. *Atmospheric Environment* 50:307-313 (2012)
- A. Hoffman, S. Britton, K. Cadwell, and K.A. Walz. An Integrated Approach to Introducing Biofuels, Flash point, and Vapor Pressure Concepts into an Introductory College Chemistry Lab. *Journal of Chemical Education* 88(2):197–200 (2011)
- K.A. Walz, C.J. Johnson, J. Genthe, L.C. Stoiber, W.A. Zeltner, M.A. Anderson and M.M. Thackeray. Elevated temperature cycling stability and electrochemical impedance of LiMn_2O_4 cathodes with nanoporous ZrO_2 and TiO_2 coatings. *Journal of Power Sources* 195(15):4943-4950 (2010)
- T. Okuda, J. J. Schauer, M.R. Olson, M.M. Shafer, A.P. Rutter, K.A. Walz, P.A. Morschauer. Effects of a platinum-cerium bimetallic fuel additive on the chemical composition of diesel engine exhaust Particles. *Energy and Fuels* 23(10):4974–4980 (2009)
- S.C. Kerr and K.A. Walz. “Holes” in Student Understanding: Addressing Prevalent Misconceptions Regarding Atmospheric Environmental Chemistry. *Journal of Chemical Education* 84(10):1693-1697 (2007)
- K.A. Walz, C.J. Johnson, J.J. Szczech, L.C. Stoiber, A.N. Suyama, W.E. Suyama, W.A. Zeltner, and M.A. Anderson. Evaluation of SiO_2 and TiO_2 Coated BaFeO_4 Cathode Materials for Zinc Alkaline and Lithium Non-Aqueous Primary Batteries. *Journal of Power Sources* 167:545-549 (2007)
- M.J. D’Amato, K.W. Lux, K.A. Walz, H.W. Kerby, and B. Anderegg. Introducing new learning tools for an old classroom: A multi-tool approach to integrating fuel-cell concepts into the introductory college chemistry curriculum. *Journal of Chemical Education* 84(2):248-252 (2006)
- K.A. Walz, J.J. Szczech, L.C. Stoiber, A.N. Suyama, W.E. Suyama, W.A. Zeltner, M.E. Armacanqui, and M.A. Anderson. Stabilization of Iron (VI) Ferrate Cathode Materials using Nanoporous Silica Coatings. *Journal of the Electrochemical Society* 153:6 A1102 (2006)
- J.S. Kim, C.S. Johnson, J.T. Vaughey, S.A. Hackney, K.A. Walz, W.A. Zeltner, M.A. Anderson, and M.M. Thackeray. The Electrochemical Stability of Spinel Electrodes Coated with ZrO_2 , Al_2O_3 , and SiO_2 from Colloidal Suspensions. *Journal of the Electrochemical Society* 151, A1755 (2004)
- K.A. Walz, A.N. Suyama, W.E. Suyama, J.J. Sene, W.A. Zeltner, M.E. Armacanqui, A.J. Roszkowski, M.A. Anderson. Characterization and Performance of High Power Iron (VI) Ferrate Batteries. *Journal of Power Sources*, 134(2):318-323 (2004)
- A. Menon, M. Galvin, K.A. Walz, and L. Rothberg. Structural basis for the spectroscopy and photophysics of solution-aggregated conjugated polymers. *Synthetic Metals* 141(1-2):197-202, (2004)
- J.S. Kim, C.S. Johnson, J.T. Vaughey, S.A. Hackney, K.A. Walz, W.A. Zeltner, M.A. Anderson, and M.M. Thackeray. Stabilization of LiMn_2O_4 spinel electrodes for lithium batteries. *Electrochemical Society Proceedings* Vol. 24, pp. 168-179 (2003)
- A R Sanadi, K Walz, L Wieloch, R E Jacobson, D E Caulfield, R M Rowell. Effect of matrix modification on Lignocellulosic Composite Properties. Wood Fiber Plastic Composites *Forest Products Society Proceedings* No. 7293 pp.166-172 (1995)

A R Sanadi, D E Caulfield, K Walz, L Wieloch, R E Jacobson, R M Rowell. Kenaf fibers - potentially outstanding reinforcing fillers in thermoplastics. *International Kenaf Association Conference Proceedings* pp. 155-160 (1994)

Posters

S. Ansorge, T. Helbig, W. Marquardt, M. Thomas, and K. Walz. Creating a Solar Photovoltaic Roadmap. NSF Advanced Technological Education PI Conference, 2018.

N. Rebernick, K. Montgomery, and K. Walz. Quantifying Electroluminescence Image Data for Multijunction Solar Cells. NSF Advanced Technological Education PI Conference, 2018.

J. Schwarzmeier and K. Walz. Gravitational Energy Storage. NSF Advanced Technological Education PI Conference, 2017.

A. Scholes and K. Walz. Self-Cleaning Solar Panels. NSF Advanced Technological Education PI Conference, 2017.

J. Pintor Cuellar and K. Walz. Development of Lead-Free Perovskite Solar Cells for Undergraduate Laboratory Instruction. NSF Advanced Technological Education PI Conference, 2016.

K. Walz, M. Slowinski, G. Temple, and K. Alfano. Faculty Learning Projects: Adding an International Perspective to Renewable Energy Education. Hi-Tech Conference, 2016.

S. Barron and K. Walz. Developing a Procedure to Construct and Characterize Perovskite Solar Cells. NSF Advanced Technological Education PI Conference, 2015.

R. Morse, and K. Walz. Cost Effective Biodiesel Viscosity Measurement. NSF Advanced Technological Education PI Conference, 2015.

K. Koran and K. Walz. Affect of acid treatment on Manganese Oxide Spinel Lithium Ion Batteries. NSF Advanced Technological Education Conference, 2014.

L. Velazquez and K. Walz. Nanoparticle coated Lithium-Ion Batteries for Cold Temperatures. NSF Advanced Technological Education PI Conference, 2014.

W. Willis, J. Stern, J. Shoemaker, and K. Walz. Renewable Energy for International Development. NSF Advanced Technological Education PI Conference, 2013.

C. Thao, J. Her, and K. Walz. Undergraduate wind turbine design and fabrication project. NSF Advanced Technological Education PI Conference, 2011.

K. Walz, C. Ban, and A. Dillon. Nanostructured Manganese Oxide Anodes for Lithium Ion Batteries. DOE ACTS Symposium, 2010.

K. Walz, C. Ban, and A. Dillon. Fabrication and Characterization of Nanostructured Electrodes for Electrochemical Energy Storage Devices. DOE ACTS Symposium, 2009.

R. Kropp, and K. Walz. Undergraduate Biodiesel Reactor Design and Fabrication Project. NSF Advanced Technological Education PI Conference, 2007.

K. Walz, W. Zeltner, and M. Anderson. Development of Nanoparticulate Coatings for Fe(VI) Ferrate Batteries. NSF Approaches to Combat Terrorism PI Conference, 2005.

Students, programs, and activities featured in the media

Contracting for Evaluator Services. K. Walz

NSF EvaluATE Blog, Nov 13, 2019

Madison College hooks up Wisconsin's largest rooftop solar array. Kelly Pickerel.

Solar Power World, Jan 17, 2019

Alternative energy programs evolve with the market. Elle Ashford.

Community College Daily, Dec 2, 2018

Installation of Solar Panels at Madison College is Underway. Andrew Kicmol.

Clarion Jan 26, 2018.

Students Excel at National Renewable Energy Laboratory. M. Patton.

Community College Daily, Nov 4, 2016

Madison College engineering students think outside the shell in stem cell project.

Morgridge Institute for Research News Archive, May 20, 2016

STEM Education in Action. M. Patton. *Community College Daily*, Nov 16, 2015

Transforming Tech Ed. M. Patton. *Community College Journal*, 86(2):26-32, 2015

Kickstarting STEM to serve communities. M. Patton. *Community College Daily*, Nov 11, 2014

Senator Baldwin visits Madison College to talk about clean energy. F. Sylla, *The Clarion*, Feb 5, 2014

A sample of biofuel programs at two-year colleges. M. Patton. *Community College Times*. May 31, 2013

Capacity building for community colleges: Internationalization and faculty-led service learning.

G.W. Bradshaw. *In New Directions for Community Colleges* 161: 39–53, 2013

Leaving Light Footprints. K. Levitt. *International Educator* 41-52, 2012.

Madison area technical college forges consortium to provide customized training online. B. Anderegg.

Sustainability Education and Economic Development, 2011.

Eco-friendly education: Students install solar panels in tropics. S. Blaskey. *Clarion* Jan 26, 2011.

Hands-on class allows students to manufacture biodiesel. E. Vogeles. *Biodiesel Magazine*. May 14, 2008.

MATC and UW collaborate on biodiesel reactor. *Biodiesel Magazine*. Oct 13, 2006.

Presentations

A comparison of renewable energy and storage in the U.S. and Germany, ASEE, Virtual, 2020

Wisconsin's Largest Rooftop Solar Photovoltaic System, ASEE, Virtual, 2020

The German Energy Storage Sector, Midwest Renewable Energy Association, 2020

Renewable Energy Education Trends and Opportunities, Midwest RENEW Policy Summit, 2020

Wisconsin's Largest Rooftop Solar Array at Madison College, WIDRC Meeting, 2019
Scaling Up for the Renewable Energy Challenge, Midwest RENEW Policy Summit, 2019
Self-Cleaning Solar Photovoltaic Panels, ASEE, Salt Lake City, UT, 2018
Solar Faculty Professional Development Program, ASEE, Salt Lake City, UT, 2018
Creating a Multidisciplinary Workforce for Renewable Energy, NSF ATE PI Conference, 2018
Solar Energy Workforce & Economic Growth, WI Academy Local Government Summit, 2018
Solar Institute for STEM Educators, Midwest Renewable Energy Fair, 2018
Renewable Energy Technician Education, Midwest Sustainability Summit, 2018
Solar Energy Growth and Workforce Training, Madison College Tech Academy, 2018
Insights on the renewable energy landscape, WI Electrical Co-Ops Annual Meeting, 2018
Preparing a skilled technical workforce for the energy sector, NSF ATE PI Conference, 2017
Project Based Learning and undergraduate research, NSF ATE PI Conference, 2017
Renewable Energy Technician Education, League of Innovation, San Francisco, CA, 2017
Building Student Leaders through undergraduate research, NSF ATE PI Conference, 2016
International Faculty Professional Development, ASEE Conference, New Orleans, LA, 2016
Renewable Energy Advanced Technological Education, National Energy Summit, Wash DC, 2016
Community College International Collaborations, AAAS, Wash DC, 2016
Renewable Energy and the German Energiewende, ASEE Conference, Seattle, WA, 2015
Renewable Energy and the German Energiewende, STEM-Tech Conference, Denver, CO, 2014
Training Renewable Energy Technicians- International Perspectives, NSF ATE PI Conference, 2014
Biofuels Workforce Development Training, Kapiolani Community College, HI, 2013
Clean Energy Training That Addresses National Trends and Meets Local Needs, Albany, NY 2012
Renewable Energy and International Education Training, Golden CO, 2011
Renewable Energy Train the Trainers Program, Milwaukee, WI 2010
Partnership Models for Renewable Energy Education, Albany, NY 2009
Chemistry and Renewable Energy, WI Chapter of American Chemical Society, Appleton, WI, 2009
Renewable Energy and International Development, Kiwanis Club of Madison, WI, 2009
Renewable Energy Education in Costa Rica, WTCS RE Summit, Milwaukee, WI, 2009
Energy, Education, and Service Learning, Engineers Without Borders, Madison, WI, 2009
Renewable Energy and International Development, Rotary Club of Madison, WI, 2009
Renewable Fuels and STEM Education, UW-Platteville, WI, 2008
Biodiesel Emissions and Exhaust After-treatment, WI Biodiesel Association, Milwaukee, WI, 2008
Biodiesel Chemistry and Compliance with ASTM Fuel Standards, WTCS Diesel Tech Meeting, 2008
Solar Thermal Collector Performance Testing and Certification, RE Conference, Albany, NY, 2008
Renewable Energy Technology for the Developing World, WTCS RE Summit, Milwaukee, WI, 2008
Nanoporous Cathode Materials for Lithium Batteries, Electrochemical Society, Chicago, IL, 2007
Energy Storage Technology for Hybrid Electric Vehicles, WTCS RE Summit, Milwaukee, WI, 2007
Chemical Processing of Vegetable Oil and Biodiesel Fuel, Green Bay, WI, 2007
Biofuel and Biogas for Transportation Applications, Richland Center, WI, 2006
New Models for Renewable Energy Education, RE Workforce Conference, Albany, NY, 2006
CERET Educational Partnerships, Council for Workforce Education, Albuquerque, NM, 2006
Renewable Energy Workforce Development, National Science Foundation, Wash DC, 2006
Peak Oil and Energy for Transportation, Indianhead Technical College, Rice Lake, WI, 2006
Peak Oil and Renewable Energy Education, Madison Rotary Club, WI, 2006
Renewable Energy Technical Education, WI Technical College Summit, WI Rapids, WI 2006
Biodiesel Potential and Limitations, Environmental Chemistry Seminar, UW-Madison, 2006
Renewable Energy Technical Education, WI Solar Decade Conference, Milwaukee, WI 2005
Biomass Energy and Biofuels, WI Agricultural Educators Conference, Madison, WI 2005
Renewable Energy Technical Education, Green Colleges Workshop, Milwaukee, WI 2005
Iron (VI) Ferrate Battery Performance and Stability, Electrochemical Society, Honolulu, 2004
Nanotechnology and Advanced Battery Science, Madison Technical Club, 2004
Advanced Electrochemical Cathode Materials, Materials Science Club, UW-Madison, 2003, 2004

Super-Iron Battery Technology, Physics Club of Milwaukee, WI, 2003
Scanning Tunneling Microscopes, Wisconsin Association of Physics Teachers, 2001

Other Meetings and Conferences

Solar and Energy Storage Midwest, Chicago, IL 2019
SmarterE and Intersolar Europe, Munich, Germany, 2019
DOE Solar Energy Technologies Conference, Wash DC, 2018
Distributech Advanced Electrical Grid Annual Conference, San Antonio, 2018
Midwest Energy Research Consortium, Energy Storage Conference, Milwaukee, WI 2017
Hi Technology Impact Exchange Conference, 2016, 2017
NSF, Advanced Technological Education PI Conference, Wash DC, 2004-present
Midwest Renewable Energy Summit, 2004-2012
NYSERDA Renewable Energy and Energy Efficiency Conference, 2006, 2008, 2009, 2012
WI Green Builders Association, 2005, 2007, 2012
Annual Meeting of the Electrochemical Society, 2004, 2005, 2007, 2010
WI Solar Decade Conference, Milwaukee, WI, 2005-2009
North American Chem Ed Conference, 2001, 2005
Wisconsin Association of Physics Teachers Conference, 2000-2002
Wisconsin Society of Science Teachers Conference, 1995-2003

Continuing Education and Training

Energy Storage Workshop and Installation Lab, Midwest Renewable Energy Association, 2018
Solar PV Roadmap Development for Universities, Midwest Renewable Energy Association, 2018
Solar PV for Electrical Inspectors and Code Officials, Interstate Renewable Energy Council, 2018
Electric Vehicle Workshop, Midwest Renewable Energy Association, 2018
Energy Storage Conference, Midwest Energy Research Consortium, 2017
Energy Storage Reframing Wholesale Markets, WI Public Utilities Institute, 2016
NSF Virgin Islands/U.S. International Renewable Energy Learning Exchange Network, 2014-2015
Battery Based Photovoltaics Certificate Program, Solar Energy International, 2014
NSF Germany/U.S. International Renewable Energy Learning Exchange Network, 2013-2014
International Photovoltaics Certificate Program, Solar Energy International, 2013
NSF Australia/U.S. International Renewable Energy Learning Exchange Network, 2012-2013
Preparing to Teach Online, WI Technical College System, 2012
Anaerobic Digestion & Renewable Natural Gas Workshop, Madison Area Technical College, 2011
DOE ACTS Teacher Scientist Fellow, National Renewable Energy Lab, Golden, CO, 2008-2010
Energy Utility Basics Shortcourse, WI Public Utilities Institute, UW- Madison, 2008
NSF Advanced Technology Environmental and Energy Center Fellow, Valdez, AK, 2008
Wind Turbine Construction Workshop, Midwest Renewable Energy Association, 2008
Advances in Nuclear Energy, WI Public Utilities Institute, UW- Madison, 2008
Wind Energy in Wisconsin, WI Public Utilities Institute, UW-Madison, 2008
Intermediate Photovoltaics Workshop, Midwest Renewable Energy Association, 2008
Solar Domestic Hot Water Workshop, Albany, NY 2008
NSF Sustainable Energy Education Training Fellow, NREL, Golden, CO, 2007
Process Analytical Chemistry Workshop, Newark NJ, 2007
WI Green Vehicles Workshop, Milwaukee, WI, 2007
Commercial Wind Site Assessment Workshop, Midwest Renewable Energy Association, 2006
Great Lakes Offshore Wind Energy, WI Public Utilities Institute, 2006
Biomass Energy, WI Public Utilities Institute, UW-Madison, 2006
Solar Hot Water and Space Heating Installation, Midwest Renewable Energy Association, 2006
Solar Hot Water and Space Heating Workshop, Midwest Renewable Energy Association, 2006
Solar Hot Water Site Assessment Workshop, Midwest Renewable Energy Association, 2006
Introduction to Photovoltaic Systems Workshop, Midwest Renewable Energy Association, 2006

Solar Photovoltaic Site Assessment Workshop, Midwest Renewable Energy Association, 2006
Biodiesel Fuel Workshop, Midwest Renewable Energy Association, 2005
Distributed Power Generation Workshop, Madison Area Technical College, 2005
Fuel Cell and Hybrid Technologies Workshop, Madison Area Technical College, 2005
Electrochemical Nanotechnology Shortcourse, Electrochemical Society, 2005
Electrochemical Impedance Spectroscopy Shortcourse, Electrochemical Society, 2004
Electrochemical Engineering Shortcourse, Case Western Reserve University, 2004
Process Oriented Guided Inquiry Learning Chemistry Workshop, Coastal Carolina University, 2004
Fuel Cell Vehicle Workshop, California Fuel Cell Partnership, Sacramento, CA 2003
Nuclear Science and Engineering Workshops, UW-Madison, 2001, 2002
Gas Chromatography Shortcourse, Milwaukee Area Technical College, 2000
Global Environmental Change Workshop, UW-River Falls, 1996

Safety Training

Safety & Best Practices for PV Installers, Midwest Renewable Energy Association, 2017
Cyber Security Training, University of Wisconsin, 2016
Environmental Health and Safety Training, National Renewable Energy Lab, 2010
Chemical Safety Training, National Renewable Energy Lab, 2010
Integrated Safety Management Training, National Renewable Energy Lab, 2010
Chemical Communication and Safety Training, MATC, 2006
Hazard Communication Training, Argonne National Lab, 2003
Ionizing Radiation Training, Argonne National Lab, 2003
Counter Intelligence and Cyber-Security Training, Argonne National Lab, 2003
Chemical Storage and Inventory Training, Flinn Scientific, 2001
Chemical Hygiene & Laser Safety Training, University of Rochester, 2000

Institutional Service

Madison College Solar Roadmap Facilities Committee, 2018- present
Promoting Undergraduate Research Committee, MATC, 2019-present
Celebrating Student Achievement Committee, MATC, 2019-present
Chemistry PT Faculty Hiring Committee, MATC, 2006-2017
Madison College Engineering Transfer Committee, 2006-2017
Teaching Intern Supervisor, MATC/UW-Madison, 2005-2016
Chemistry FT Faculty Hiring Committee, MATC, 2004-05, 2005-06, 2011-12, 2014-15, and 2015-16
New Chemistry Faculty Mentor, MATC, 2005-2007, and 2012-2015
Roger and Lucille Warren Engineering Scholarship Fund, Faculty Leader 2012-2013
Director of Grants and Sponsored Projects Hiring Committee, MATC, 2012
Engineering Transfer Program Chair, MATC, 2008-2009 and 2011-2012
Thermo Fisher Scientific Study Abroad Scholarship Fund, Faculty Leader 2011-2013
Grainger Sustainability Scholarship Fund, Faculty Leader, 2008-2009
MATC Environmental Sustainability Alliance, Treasurer, 2007-2009
Focus the Nation – Campus Energy Committee Member, 2007-2009
American College President’s Climate Commitment Committee Member, 2006-2009
Chemistry Curriculum Assessment Coordinator, MATC, 2005-2006
Undergraduate Independent Study Supervisor, UW-Madison, 2003-2006
Mentor for Undergraduate Student Teachers, UW-Milwaukee/MFHS, 2000
Mentor for Undergraduate Student Teachers, Carroll College/MFHS, 1999
Graduate Student Mentor, UW-Milwaukee, 1997
Graduate School Dean Hiring Committee, UW-Milwaukee, 1997
Graduate School Open House Committee, UW-Milwaukee, 1996

Professional Service

NSF BEST Energy ATE Center National Visiting Committee member 2019 - present
NSF MentorUp program, Mentor to institutions pursuing NSF funding, 2018- present
NSF Bioenergy ATE Center National Visiting Committee member 2015 - present
NSF MentorLinks program, Mentor to institutions new to NSF, 2011- present
DOE Solar Challenge Prize Reviewer, 2020
AWEA National Kid Wind Challenge Judge, 2018
Wisconsin Solar Olympics Judge, 2018
AACC Community College Innovation Challenge Judge, 2016
NSF Path Tech Life Study of Factors Impacting Student Success, 2015-2017
NSF Advanced Technological Education PI Meeting Planning Committee, 2015 and 2017
Carnegie Foundation for Advancement of Teaching, reviewer, 2011-2016
DOE Solar Energy Technology Office Portfolio Reviewer, 2018
DOE Interdisciplinary Teaching about the Earth for a Sustainable Future, Reviewer, 2017
NSF STEP Curriculum Reviewer for content in Renewable Energy, 2017
US Department of Energy, grant proposal reviewer, 2015–present
National Science Foundation, grant proposal reviewer, 2005-present
Solid State Ionics, manuscript reviewer, 2011-present
Journal of Physical Chemistry, manuscript reviewer, 2010–present
Journal of Chemical Education, manuscript reviewer, 2010-present
Electrochimica Acta, manuscript reviewer, 2008-present
Energy and Fuels, manuscript reviewer, 2008-present
Journal of the Electrochemical Society, manuscript reviewer, 2006-present
Journal of Power Sources, manuscript reviewer, 2005-present

Volunteer Experience

Clean Lakes Alliance, Lake Monitoring Steward, Madison, WI 2015-present
Future Truck Hybrid Competition Team, Electrical Group, UW-Madison 2002-2003
Conservation Committee, Village of Shorewood, WI 1997-1999

Professional Societies

American Chemical Society
The Electrochemical Society
American Society for Engineering Education
Association of Energy Engineers
Solar Energy International
Midwest Renewable Energy Association – Lifetime Member
Royal Institution of Great Britain–Faraday Member

Honors and Awards

Phi Theta Kappa Faculty Mentor Award, 2017
Madison College Excellence in Teaching Award nominee, 2016
American Society for Engineering Education Best Paper Award, 2016
Phi Theta Kappa Distinguished Teacher of the Year nominee, 2016
Wisconsin Higher Education Energy Educator of the Year Award, 2015
Phi Theta Kappa Golden Apple Faculty Award, 2013
Wall of Fame Distinguished Alumni, Menomonee Falls High School, 2011
40 Under 40 Innovators to Watch, In Business, 2011
Professor of the Year, Carnegie Foundation for Advancement of Teaching, 2010
Assoc of Community College Trustees Faculty Member Award nominee, 2007
Tau Beta Pi Engineering Honor Society, 2003
Outstanding Faculty Member, Menomonee Falls High School, 2002

Phi Kappa Phi National Honor Society, 2002
Graduate School Fellowship, UW-Milwaukee, 1997
Graduated with Distinction, UW-Madison, 1995
Golden Key National Honor Society, 1992
Outstanding Tutor Award, 1992

Student Mentoring and Career Development

Undergraduate students mentored in academic research	26
Undergraduate honors students mentored	8
Undergraduate honors student competition winners	4
Undergraduate student travel awards	20
Undergraduate student publications	10
Undergraduate students placed in National Laboratory internships	5
Undergraduate students mentored as tutors or Supplementary Instructors	19
Graduate students mentored as teachers & future faculty members	13
Graduate students earning certificate in STEM teaching and learning	6

Collaborators on Extramurally Funded Projects & Other Affiliations

Geoff Bradshaw, Center for International Education, Madison Area Technical College
Joel Shoemaker, Electrical Apprenticeship Program Director, Madison Area Technical College
Don Gillian Daniel, UW-Madison Center for Integrating Research Teaching and Learning
William Beckman and Sanford Klein, UW-Madison Solar Energy Lab
Kathleen Alfano and Gabrielle Temple, National Science Foundation and College of the Canyons
Roger Ebbage and Josh Manders, Northwest Water and Energy Institute, Lane Community College
Kevin Cooper and Ben Reid, Regional Center for Nuclear Energy Technology, Indian R. State College
James Auld and Roger Whan, Florida Power and Light and Next Era Energy
Lewis Rothberg, Center for Photo-Induced Charge Transfer, University of Rochester, NY
Theri Parker, Mick Sagrillo, and Nick Hylla Midwest Renewable Energy Association
Johnny Weiss, Kris Sutton, and Kathy Swartz, Solar Energy International
Paul Dearlove and Dick Lathrop, Clean Lakes Alliance, Madison, WI
Roger Rowell and Mark Knaebe, US Forest Products Laboratory
Edgar Armacanqui, Research and Development, Rayovac Inc.
Jennie Lane, Jamie Mollica, and Sara Windjue, WI K-12 Energy Education Program
Linda Lung and Marcus Giron, Office of Education Programs, National Renewable Energy Laboratory
Christopher Johnson and Michael Thackeray, Battery Technology, Argonne National Laboratory
Tony Hartman, Great Lakes Ag Energy LLC, and Legacy Solar Co-Op
Walter Zeltner, Microporous Oxides Science and Technology LLC and UR-Water LLC
Marc Anderson, Environmental Chemistry and Technology, University of Wisconsin-Madison