

Joshua T. Peterson

Curriculum Vitae

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OBJECTIVE

To guide research projects regarding sustainable alternative forms of energy

To make the concepts of physics accessible to all levels of students through my professional and approachable teaching style.

EDUCATION

Ph.D., Physics

Auburn University

Dissertation Title: "Field Mapping on the Compact Toroidal Hybrid"

Aug 2008

Auburn, AL

B.S., Physics

University of Wisconsin, Stevens Point

May 2000

Stevens Point, WI

B.S., Mathematics

University of Wisconsin, Stevens Point

May 2001

Stevens Point, WI

RESEARCH EXPERIENCE

Associate Researcher

SRML University of Oregon

Aug 2012 to Present

Eugene, OR

- Developed a user friendly data file format to archive and display solar data
- Wrote Mathematica post processing code for viewing and analysis of data
- Measured and analyzed the spectral nature of incoming solar radiation
- Quantified the uncertainties of spectroradiometers
- Performed calibration data analysis on all instruments since year 2000
- Routinely participates in public outreach events promoting the SRML
- Tested and troubleshot issues for a cell phone app for which measured the amount of shaded skyline available to a site
- Performed routine maintenance of equipment
- Supervised undergraduate student employees
- Participated in the NPC calibration intercomparison (Boulder, CO)

Post-Doctoral Researcher

Presbyterian College

Jan 2010 to May 2011

Clinton, SC

- Created MATLAB software which allows viewing the INTERMAGNET magnetic field measurements as a contour plot
- Utilized the contour plot to track magnetic storms
- Developed software to analyze NASA's Polar satellite data of the aurora borealis
- Determined the roughness exponent of the aurora for 10 years of Polar satellite data
- Worked with students in designing and building a prototype solar panel for the Presbyterian College electric car
- Determined the optimal size of window awnings to for the Presbyterian College green house.

Research Assistant

Auburn University

Oct 2001 to Aug 2008

Auburn, AL

- Expertise in constructing the stellarator fusion device CTH
- Planned, executed and analyzed experiments measuring the vacuum magnetic field structure of CTH
- Quantitatively compared the experimental field mapping results with those of simulation
- Produced a detailed model for the electromagnetic coils of CTH
- Assisted in developing the optimization code used in the simulation of the CTH coils
- Effectively measured the magnetic islands present on CTH
- Determined the error field responsible for creating the magnetic islands
- Minimized the size of the island by creating a correction magnetic field

LABORATORY SKILLS

- Experience in maintaining a solar research monitoring facility
- Expertise in undergraduate teaching laboratory equipment
- Skill in constructing a stellarator fusion device
- Proficient with machine shop equipment
- Familiarity with high vacuum systems
- Experience in electrical hardware diagnostics

COMPUTER PROGRAMS and LANGUAGES

- Mathematica
- Excel
- Logger Pro
- Data base management techniques
- Loggernet (Cambell Scientific)
- MATLAB
- Fortran
- LabView

TEACHING EXPERIENCE

Adjunct Instructor/ Instructor

University of Oregon

Jan 2013 to May 2016

Eugene, OR

- Laboratory Instructor – Guided and taught introductory laboratory physics course
 - Updated and modified existing labs to maximize student learning outcomes
 - Developed new lab experiments using current best practices in physics education
 - Coordinated 9 lab sections
 - Managed 8 GTFs
 - Led GTF lab training orientation session (Aug 2014, 2015)
 - Collaborated with lab instructors teaching other lab courses
 - Communicated with lecture instructors to ensure compatibility of two courses
 - Supervised undergraduate student lab assistants
 - Performed systematic cleaning and organization of lab space and equipment

- Energy and the Environment –Effectively conveyed to the students the underlying principles behind humanities energy use and climate change.

Visiting Assistant Professor
Whitman College

Aug 2011 to May 2012
Walla Walla, WA

- Upper level – Developed and delivered upper level lecture series on electricity and magnetism
- Introductory level – Developed and delivered introductory lecture and laboratory series on Newtonian mechanics, electricity, magnetism, and optics
- Advising –Supervised students working on an optimized window awning algorithm, finding the dimensions of a window awning to minimize the unwanted summer sun and maximize the beneficial winter sun.
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Adjunct Instructor
Presbyterian College

Aug 2009 to May 2011
Clinton, SC

- Lecture and Laboratory – Developed and delivered introductory lecture series on Newtonian mechanics, thermodynamics, and electricity and magnetism

Graduate Teaching Assistant
Auburn University

Aug 2001 to May 2003
Auburn, AL

- Lab teaching assistant and recitation leader for introductory physics course

Private Physics Tutor

1999 to 2009

- Private instruction for students needing extra help with their physics coursework

STUDENT ENGAGEMENT

- Committed to student learning and development
- Dedicated to developing curriculum that engages and best instructs students
- Receive excellent student teacher evaluations (average score of $4.45 \pm .26$ on a 5 point scale, sample size = 151 students, 2 year period, 78% response rate)
- Spend 15+ hours in-class every week working directly with students.
- Offer ample office hours (4 hours in addition to in-class hours). Typically instruct 20 -30 students a week during office hours
- Have a positive rapport with students. Typically writing 5-10 letters of recommendation a year for students applying for graduate school or professional opportunities.

PUBLICATIONS

“Developing a spectroradiometer data uncertainty methodology” Josh Peterson, Frank Vignola, Aron Habte, et al. *Solar Energy* 149 (2017)

“Spectroradiometer Intercomparison and Impact on Characterizing Photovoltaic Device Performance” Aron Habte, Afshin Andreas, Josh Peterson, et al. *Solar 2014 Conference.*, American Solar Energy Society; San Francisco, CA, July 2014 (2014)

“PV Module Performance After 30 Years Without Washing” Frank Vignola, Josh Peterson, Rich Kessler, et al. *InterSolar North America*, San Francisco, CA, (2014)

“Effects if Changing Spectral Radiation Distribution on the Performance of Photodiode Pyranometers” Frank Vignola, Zachary Derocher, Josh Peterson, et al. *Photovoltaic Specialist Conference (PVSC)*, 2014 IEEE 40th (2014)

- “New Data Set for Validating PV Module Performance Models” Bill Marion, Frank Vignola, Josh Peterson, et al. IEEE PVSC, Denver, CO, June 2014 (2014)
- “Complex Analysis of Polar Auroras for 1996”, J. Wanliss and J. Peterson, AGU Monograph on Complexity and Extreme Events in Geosciences, (ed.) Daniel Baker (2012)
- “Vacuum magnetic field mapping experiments for validated determination of the helical field coil location in stellarators”, J. Peterson, J. Hanson, G. Hartwell, and S. Knowlton, Physics of Plasmas 17, 032505 (2010)
- “Field Mapping on the Compact Toroidal Hybrid”, J. Peterson, PhD Dissertation, Auburn, AL (2008)
- “Validation of HF coil location by field mapping on CTH”, J. T. Peterson, G. J. Hartwell, S. F. Knowlton, J. Hanson, Stellarator News, Aug. 2008, Is. 116
- “Initial vacuum magnetic field mapping in the compact toroidal hybrid”, J. T. Peterson, G. J. Hartwell, S. F. Knowlton, J. Hanson, R. F. Kelly, C. Montgomery, Proceedings from the 2006 Innovative Confinement Concepts (ICC) Workshop, Austin, TX , Journal of Fusion Energy, Vol. 26, Num. 1-2 (2007), p. 145-148

REFERENCES

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