

Doug Harper

Madole Professor of Physics
Department of Physics and Astronomy
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Education

- Doctorate of Philosophy in Physics, Vanderbilt University 1991
- Masters of Science in Physics, Vanderbilt University 1989
- Bachelors of Science in Physics and Mathematics, Western Kentucky University 1986

Professional Experience

Professor of Physics July 2003 – present
Western Kentucky University

Associate Professor of Physics July 1996 – June 2003
Western Kentucky University

Assistant Professor of Physics August 1991 – June 1996
Western Kentucky University

Graduate Research Assistant June 1987 – June 1991
*Surface Physics Group led by Professor Norman Tolk
Department of Physics and Astronomy, Vanderbilt University*

- Ph.D. Dissertation: "The Polarization of Balmer-Alpha Radiation Emitted by Beam-Tilted-Foil Excited Hydrogen Atoms"

Graduate Teaching Assistant September 1986 – May 1987
Department of Physics and Astronomy, The Ohio State University

Graduate Research Assistant Summer 1986
*Low Temperature Physics Group led by Professor Thomas Lemberger
Department of Physics and Astronomy, The Ohio State University*

Professional Certifications

Certified LabVIEW Architect July 2016 – Present
National Instruments, Austin, TX.

Software Applications

Physics Lab Assistant 2016
National Instruments LabVIEW Tool Network
<http://sine.ni.com/nips/cds/view/p/lang/en/nid/214008>

Virtual Physics 2016
National Instruments LabVIEW Tools Network
<http://sine.ni.com/nips/cds/view/p/lang/en/nid/214009>

Proposals Funded

NSF/EPSCoR 1992 Research Enhancement Grant Program, "Processes Leading to the Emission of Excited Atoms from Surfaces," May 1, 1992 - April 30, 1993, \$15,000.

NSF/EPSCoR 1993 Research Enhancement Grant Program, "Electron Stimulated Desorption from Surfaces," May 1, 1993 - April 30, 1994, \$15,000.

Kentucky Space Grant Consortium Undergraduate Fellowship, "Undergraduate Fellowship to Investigate Particle-Surface Interactions in Space," August 1, 1993 - June 30, 1994, \$3,000.

NSF/EPSCoR 1994 Research Enhancement Grant Program, "Electron Stimulated Desorption of Excited- and Ground-State Atoms and Molecules from Surfaces," May 1, 1994 - April 30, 1995, \$12,000.

Kentucky Space Grant Consortium Undergraduate Fellowship, "Renewal of an Undergraduate Fellowship to Investigate Particle-Surface Interactions in Space," August 1, 1994 - June 30, 1995, \$3,000.

NSF Research at Undergraduate Institutions, "RUI: Upgrade of an XRF Spectrometer," J.T. Riley (PI), W.P. Pan, D.L. Harper, and L.T. Pesterfield, December 1993 - May 1996, \$25,310.

LECO Corporation, "Surface Analysis Applications and Research with a Glow Discharge Spectrometer," J.T. Riley, W.P. Pan, and D.L. Harper, September 1, 1994 - August 31, 1996, \$101,900

NSF Instrumentation and Laboratory Improvement, "Multi-disciplinary Incorporation of Scanning Electron Microscopy into the Undergraduate Biological and Physical Sciences Program", H. Owen (PI), D.W. Kuehn, D.L. Harper, C. Groves, W.P. Pan, and J.T. Riley, August 16, 1994 - January 15, 1996, \$66,000.

LECO Corporation, "Utilization of Optical Microscopy/Image Analysis in Multidisciplinary Research Projects," W.P. Pan(PI), J.T. Riley, D.L. Harper and C. Lee, October 1994 - September 1995, \$20,900.

Kentucky NASA/EPSCoR Research Enhancement Grant Program, "A Study of Contaminant Concentration versus Depth on LDEF Samples using Glow-Discharge-Optical Emission Spectroscopy," June 1, 1995 - June 30, 1996, \$24,971.

LECO Corporation, "Development of a Surface Analysis Sample Preparation Laboratory," D.L. Harper (PI), J.T. Riley, W.P. Pan, and C. Lee, August 15, 1995 - August 15, 1997, \$24,715.

NSF Instrumentation and Laboratory Improvement Program, "Transferable-Skills-Based University Physics Laboratories," D.L. Humphrey (PI), D.L. Harper, G. Vourvopoulos, August 15, 1998 - December 31, 2000, \$26,226.

American Institute of Physics: Sigma Pi Sigma Undergraduate Research Award, "Investigation of transport properties of high Tc superconductors," (student-authored proposal) **Angela Adams, Gavi Begtrup, Kenneth Purcell**, and Doug Harper, January 1, 2001 - December 31, 2001, \$2000.

Kentucky Space Grant Consortium, "Materials characterization of high Tc superconductors," June 1, 2001 - June 30, 2002, \$9553.

Kentucky Space Grant Consortium, Undergraduate Research Scholarship for Angela Adams, "Investigation of transport properties of high Tc superconducting materials," August 20, 2001 - May 15, 2002, \$3,000.

Kentucky Space Grant Consortium, Undergraduate Research Scholarship for Kenneth Purcell, "Investigation into the effects of radiation damage on the transport properties of high Tc superconducting materials," August 20, 2001 - May 15, 2002, \$3,000.

Kentucky Space Grant Consortium, Undergraduate Research Scholarship for Wes Ryle, "Study of particle bombardment of surface in space," August 20, 2001 - May 15, 2002, \$3,000.

EWA/DOD, "Fortitude II/CCPMP" Doug Harper (PI), Stacy Wilson (Co-PI), August 2008-August 2009, \$548,292.99.

National Science Foundation, "CCLI: Multidisciplinary Instructional Transformation in Science and Math Courses Supporting Teacher Preparation and Institutional Change," Scott Bonham (PI), Stuart Burris (Co-PI), Margaret Crowder (Co-PI), Doug Harper (Senior Personnel), January 2010-December 2012, \$199,867.

WKU Proposals Funded

WKU 1992 Summer Fellowship, "Electron-Exchange Processes at Surfaces," Summer 1992, \$4,000.

WKU Faculty Research Grant, "Stimulated Desorption of Excited Atoms from Surfaces," December 1992, \$1,000.

WKU President's Unrestricted Development Fund, "Presentation of Computer-Based Demonstrations in the Physics and Astronomy Classroom," January 1993, \$1887.

WKU 1993 Summer Fellowship, "Stimulated Desorption of Excited Atoms from Surfaces," Summer 1993, \$4,000.

WKU 2001 Action Agenda Fund, "Guided Discovery Learning in Introductory Physics Courses," Dr. Scott Bonham and Dr. Doug Harper, 2001-02 AY, \$10,800.

WKU 2005 Action Agenda Fund, Teacher Quality Initiative, "Western Kentucky Physics Teachers Alliance", Dr. Richard Gelderman, Dr. Keith Andrew, and Dr. Doug Harper, \$800.

Publications

"The Influence of Adsorbates on Proton Neutralization at Surfaces in a Transmission Geometry," D.L. Harper, R.G. Albridge, D.P. Russell, P.M. Savundararaj, and N.H. Tolk, *Proceedings, Third Annual Air Force Office of Scientific Research Workshop on Surface Reactions in the Space Environment*, (Northwestern University, Evanston, IL, 1989).

"Dependence of Alignment and Orientation Induced by Grazing-Incidence and Beam-Foil Electron-Exchange Interactions on Surface Electronic Structure," D.P. Russell, R.G. Albridge, A.V. Barnes, D.L. Harper, P. Nordlander, P.M. Savundararaj, N.H. Tolk, and J.C. Tully, *Surface Science*, 211 (1989) 198-206.

"Surface Adsorbates and Ion-Surface Interactions at Grazing Incidence," P.M. Savundararaj, R.G. Albridge, D.L. Harper, D.P. Russell, and N.H. Tolk, *Nuclear Instruments and Methods*, B40/41 (1989) 262-65.

"Interactions of Hydrogen with Magnetic and Non-Magnetic Surfaces," D.L. Harper, R.G. Albridge, A.V. Barnes, P.M. Savundararaj, M. Hammond, J. Kirshner, and D.P. Russell, *proceedings of the Eighth International Workshop on Inelastic Ion Surface Collisions*, Wr. Neustadt, Austria, September 1990, *Nuclear Instruments and Methods*, B58 (1991) 512-18.

["Observation of beam-induced changes in the polarization of Balmer- \$\alpha\$ radiation emitted following beam-tilted-foil transmission,"](#) Douglas L. Harper, Royal G. Albridge, Norman H. Tolk, Wang Qi, David D. Allred and Larry V. Knight, *Physical Review A*, 52(6) (1995) 4631-9.

"Acoustic Leak Detection System for Railroad Transportation Security," P. C. Womble, J. Spadaro, M. A. Harrison, A. Barzilov, D. Harper, L. Hopper, E. Houchins, B. Lemoff, R. Martin, C. McGrath, R. Moore, I. Novikov, J. Paschal, and S. Rogers, *2007 SPIE Defense and Security Symposium: Technologies for Homeland Security and Law Enforcement*, April 2007.

"A Pressured Tank Car Inspection System for Railroad Transportation Security," P. C. Womble, J. Spadaro, M. A. Harrison, A. Barzilov, D. Harper, B. Lemoff, R. Martin, I. Novikov, J. Paschal, L. Hopper, C. Davenport, and J. Lodmell, *Proceedings of the IEEE Conference on Technologies for Homeland Security: Enhancing Critical Infrastructure Dependability*, Boston, MA, May 2007.

"Wireless Orthogonal Sensor Networks for Homeland Security," K. Moss, A. Barzilov, J. Board, D. Harper, L. Hopper, J. Paschal, and P. Womble, *Proceedings of the IEEE Conference on Technologies for Homeland Security: Enhancing Critical Infrastructure Dependability*, Boston, MA, May 2007.

"Physical Touch Aspects of the Touch Interface for Flight Deck Applications," T. Robinson, G. Grabski, J. Green, M. Jacobson, C. Byrne, D. Harper, *Symposium of the Society of Information Displays*, San Diego CA, June 2014.

Conference Presentations

"Investigation of Particle-Solid Interactions via Ion- and Neutral-Beam Bombardment," Southeastern Section of the American Physical Society, November 1987, Nashville, TN.

"Dependence of Alignment and Orientation Induced by Beam-Tilted-Foil Interactions on Surface Electronic Structure," March Meeting of American Physical Society, March 1988, New Orleans, LA.

"Anisotropic Neutralization by Thin-Foil Transmission," Third Annual AFOSR Workshop on Surface Reactions in the Space Environment, October 1988, Vanderbilt University, Nashville, TN.

"Anisotropic Neutralization by Thin-Foil Transmission," Fourteenth International Conference on the Physics of Electronic and Atomic Collisions, July 1989, New York, NY.

"The Influence of Adsorbates on Proton Neutralization at Surfaces in a Transmission Geometry," Fourth Annual AFOSR Workshop on Surface Reactions in the Space Environment, September 1989, Northwestern University, Chicago, IL.

"Grazing-Incidence Scattering and Beam-Tilted-Foil Transmission of Protons," Eleventh International Conference on the Application of Accelerators in Research and Industry, November 1990, Denton, TX.

"Study of the Electron-Exchange Subsequent to the Beam-Tilted-Foil Transmission of Protons," Southeastern Section Meeting of the American Physical Society, November 1990, Atlanta, GA.

"The Beam-Fluence Dependence of the Polarization of Balmer- α Radiation Emitted Following the Transmission of Protons Through Tilted Carbon Foils," March Meeting of the American Physical Society, March 1991, Cincinnati, OH.

["Evolution of Beam-Tilted-Foil Excited Hydrogen Atoms through Electric Fields,"](#) Seventy-Seventh Annual Meeting of the Kentucky Academy of Science, November 1991, Owensboro, KY.

"Data Acquisition and Experiment Control in the Solid State Laboratory using LabVIEW for Macintosh," Douglas L. Harper, Islamshah Amlani, poster presented at the WKU Open House for Faculty Research, April 1-2, 1993.

"Electron Stimulated Desorption of Atoms and Molecules from Surfaces," poster presented at the First Annual Kentucky EPSCoR Conference, Douglas L. Harper, Islamshah Amlani, and Erik Goodwyn, Lexington, KY, May 8, 1995.

"Calibration of a Glow-Discharge-Atomic Emission Spectrometer for Quantitative Depth Profile and Bulk Analyses," John T. Riley, Douglas L. Harper, Joseph M. Riley, Q. Cao, Janet Adair, and Dave Jedrejic, 1996 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, IL, March 3-8, 1996.

["Depth Profile and Bulk Analysis Using a Dual Source, Glow Discharge-Atomic Emission Spectrometer,"](#) Douglas L. Harper, John T. Riley, Janet Adair, and Dave Jedrejic, 1996 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, IL, March 3-8, 1996.

["Use of Glow Discharge-Atomic Emission Spectroscopy for Quality Control,"](#) Douglas L. Harper, John T. Riley, Janet Adair and Dave Jedrejic, poster presented at the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, IL, March 3-8, 1996.

"A Study of Contaminant Concentration Versus Depth in LDEF Samples Using Glow Discharge-Atomic Emission Spectroscopy," Douglas L. Harper, Janet Adair, and Dave Jedrejic, Second Annual Kentucky EPSCoR Conference, Louisville, KY May 6, 1996.

["Depth-Profile Analysis of Space-Exposed Materials using Glow Discharge-Atomic Emission Spectroscopy,"](#) Douglas L. Harper, Dave Jedrejic, and John T. Riley, 1997 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Atlanta, GA, March 20, 1997.

"Glow Discharge-Atomic Emission Spectrometric Analysis of Pressed Pellets of Various Ashes," John T. Riley, Xiao Liu Chi, Keith Miller, and Douglas L. Harper, 1997 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Atlanta, GA, March 20, 1997.

["Virtual Physics: Numerical Integration of Newton's Second Law Made Easy,"](#) Doug Harper and Richard Hackney, Winter 2001 AAPT Meeting, San Diego, CA, January 6-11, 2001.

["Transferable-Skills-Based University Physics Laboratories,"](#) Doug Harper and Doug Humphrey, Winter 2001 AAPT Meeting, San Diego, CA, January 6-11, 2001.

["Virtual Physics: Numerical integration of Newton's second law made easy,"](#) Doug Harper, KCVU Conference on Building a Scholarly Structure for Teaching and Learning, Bowling Green, KY, May 20-22, 2001.

["Evaluation of a Multiple Goal Revision of a Physics Laboratory,"](#) Scott Bonham, Doug Harper, Lance Pauley, Physics Education Research Conference 2012, Philadelphia, PA, August 1-2, 2012.

["Addressing Quantitative, Conceptual and Writing Goals in an Introductory Laboratory,"](#) Scott Bonham, Doug Harper, 80th Annual Meeting of the Southeastern Section of the American Physical Society, Bowling Green, KY, November 20-23, 2013.

["Development of a flexible and scalable software tool for use by students in University Physics Laboratories,"](#) Doug Harper, Scott Bonham, 80th Annual Meeting of the Southeastern Section of the American Physical Society, Bowling Green, KY, November 20-23, 2013. [PPTX PDF](#)

["A Scaffolded Use of LabVIEW in the Physics and Engineering Curriculum"](#), Doug Harper, NI Week 2016, Austin, TX, August 1-4, 2016. [PPSX PDF](#)

"Data Acquisition Using LabVIEW", workshop presented at The Third Conference on Laboratory Instruction Beyond the First Year (BFY III), Loyola University Maryland, Baltimore, MD, July 25-27, 2018. [PPTX PDF](#)

Seminar Presentations

"Use of a Computer in Physics and Astronomy Classroom Demonstrations: Making Waves with a Macintosh," Douglas L. Harper, WKU Department of Physics and Astronomy Seminar, October 11, 1993.

"Surface and Depth Profile Analysis Using Glow Discharge-Atomic Emission Spectroscopy," Douglas L. Harper, invited seminar presented to the *Center for Molecular and Atomic Studies at Surfaces* at Vanderbilt University, September 6, 1995.

"Depth Profile and Bulk Analysis Using Glow Discharge-Atomic Emission Spectroscopy," Douglas L. Harper, Janet Adair, Dave Jedrejic, and John T. Riley, presented at the First Annual Meeting of the WKU Materials Characterization Center Advisory Committee Meeting, WKU, November 13, 1995.

"Surface and Depth Profile Analysis Using Glow Discharge-Atomic Emission Spectroscopy," Douglas L. Harper, invited seminar presented to the Departments of Chemistry and Physics at Austin Peay State University, March 14, 1996.

"Surface Analysis Using an Atomic Sandblaster: Glow Discharge-Atomic Emission Spectroscopy," Douglas L. Harper, WKU Department of Physics and Astronomy Seminar, November 18, 1996.

["Glow Discharge OES for Quality Control and Research,"](#) invited seminar presented at LECO exhibit, 1997 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Atlanta, GA, March 18, 1997.

"Glow Discharge OES Analysis of Pressed Pellets of Various Ashes," invited seminar presented at the First Annual GD-OES User's Group Meeting, Leco Technical Center, St. Joseph, MI, November 11-12, 1997.

["Introduction to Measurement and Automation using LabVIEW Virtual Instruments,"](#) Doug Harper and Doug Humphrey, workshop presented to members of local industry, Bowling Green, KY, March 31, 2000.

["Virtual Physics: Numerical Integration of Newton's Second Law Made Easy,"](#) Doug Harper, WKU Department of Physics and Astronomy Seminar, December 4, 2000.

["Teaching Physics Interactively"](#), Doug Harper, WKU Department of Physics and Astronomy interactive engagement classroom open house, November 27, 2001.

"Surface and Depth Profile Analysis Using Glow Discharge-Atomic Emission Spectroscopy," Douglas L. Harper, invited seminar presented to the Department of Chemistry at Murray State University, April 7, 2003.

"Computerized Experiment Control and Data Collection using LabVIEW", WKU Workshop presented for the Faculty Center for Excellence in Teaching, March 4, 2004.

"Advanced Computerized Experiment Control and Data Collection using LabVIEW", WKU Workshop presented for the Faculty Center for Excellence in Teaching, March 11, 2004.

"[LabVIEW @ WKU](#)", seminar presented to the WKU Chapter of IEEE, March 21, 2017.

Presentations by WKU Students co-authored by Doug Harper (student authors in bold)

"[Sputtering of Copper from Sparsely Coated Silicon](#)," **Islamshah Amlani**, Douglas L. Harper, James H. Arps and Robert A. Weller, Seventy-Eighth Annual Meeting of the Kentucky Academy of Science, Ashland, KY, October 31, 1992.

"PHOTON - A Program For Monte-Carlo Simulation of Diffraction Patterns as a Sequence of Photon Events," **M. Pentecost**, R. Hackney, K. Hackney, D. Bryant, and D. Harper, Seventy-Eighth Annual Meeting of the Kentucky Academy of Science, Ashland, KY, October 31, 1992.

"Sputtering of Copper from Sparsely Coated Silicon," **Islamshah Amlani** and Douglas L. Harper, Twenty-Third Annual Sigma-Xi Research Conference, WKU, April 1, 1993.

"[Data Acquisition and Experiment Control in the Surface Physics Laboratory at Western Kentucky University](#)," **Islamshah Amlani, Todd Stinson**, and Douglas Harper, presented at the Seventy-Ninth Annual Meeting of the Kentucky Academy of Science, Georgetown, KY, October 23, 1993.

"Electron-Stimulated Desorption from Alkali-Halides," **Islamshah Amlani**, Presentation of Honors Thesis, Western Kentucky University, May 4, 1994.

"Computerization of a Classic Hall-Effect Experiment," **Erik Goodwyn** and Douglas L. Harper, Twenty-Fourth Annual Sigma-Xi Research Conference, WKU, April 15, 1995.

"Selection and Analysis of Samples for Calibration of a Glow Discharge-Atomic Emission Spectrometer," **Joseph M. Riley, Jr., Carolyn Cao, Matthew B. Renfrow**, John T. Riley, Douglas L. Harper, **Janet Adair**, and **Dave Jedrejic**, Annual Meeting of the Kentucky Academy of Science, Bowling Green, KY, November 17, 1995.

"[Surface and Depth Profile Analysis of Raw Steel Samples Using Glow Discharge-Atomic Emission Spectroscopy](#)," **Janet Adair, Dave Jedrejic**, Douglas L. Harper, John T. Riley, **Joseph M. Riley, Jr., Carolyn Cao**, Annual Meeting of the Kentucky Academy of Science, Bowling Green, KY, November 17, 1995.

"[Calibration of a Glow Discharge-Atomic Emission Spectrometer for Quantitative Depth Profile Analysis](#)," **Dave Jedrejic, Janet Adair**, Douglas L. Harper, and John T. Riley, Twenty-Sixth Annual Sigma-Xi Research Conference, WKU, March 30, 1996.

"Depth Profile Analysis Applications Using a Glow Discharge-Atomic Emission Spectrometer" **Janet Adair, Dave Jedrejic**, Douglas L. Harper, and John T. Riley, Twenty-Sixth Annual Sigma-Xi Research Conference, WKU, March 30, 1996.

"Development of Calibration Standards for a Glow Discharge-Atomic Emission Spectrometer," **Matthew B. Renfrow, Joseph M. Riley, Jr., Charley Chi, Janet Adair**, John T. Riley, and Douglas L. Harper, Twenty-Sixth Annual Sigma-Xi Research Conference, WKU, March 30, 1996.

"Preliminary Analysis of Space-Exposed Samples using Glow Discharge-Atomic Emission Spectroscopy," **David Jedrejic**, Douglas L. Harper, Twenty-Seventh Annual Sigma-Xi Research Conference, WKU, April 12, 1997.

"Comparison of X-Ray Fluorescence Spectrometry and Glow-Discharge Atomic-Emission Spectroscopy," **Joshua James, Matt Richey**, Li Dong, Doug Harper and John Riley, Eleventh Annual Argonne Symposium for Undergraduates in Science Engineering and Mathematics, Argonne National Laboratory, November 3-4, 2000.

["Creation of a system to measure the transport properties of superconducting materials,"](#) **Kenneth Purcell** (received Outstanding Presentation Award), **Angela Adams, Gavi Begtrup, Wes Ryle** and Doug Harper, 2001 Sigma Xi Student Research Conference, WKU, March 31, 2001.

["Development of a system to measure the critical temperature of high Tc superconductors,"](#) **Angela Adams** (received Outstanding Presentation Award in Physical Sciences Division), **Kenneth Purcell**, and Doug Harper, 2002 Sigma Xi Student Research Conference, WKU, April 6, 2002.

["Investigation of the formation of high Tc superconducting balls in the presence of an electric field,"](#) **Wes Ryle, Angela Adams, Kenneth Purcell**, George Levin and Doug Harper, 2002 Sigma Xi Student Research Conference, WKU, April 6, 2002.

["Investigation of the formation of high Tc superconducting balls in the presence of an electric field,"](#) **Wes Ryle**, George Levin and Doug Harper, poster, NASA R&D and Emerging Opportunities Conference, Louisville, KY, October 22, 2002.

"Beam Line Optics for 2.5 MeV Van de Graaff Particle Accelerator," **Timothy Morgan**, Alexander Barzilov, Phillip Womble, and Doug Harper, poster, Posters at the Capital, January 2006.

"Upgrade of Acquisition and Analysis Software for a Rigaku D-Max B X-Ray Diffractometer", **Ian Rice** and Doug Harper, 2007 WKU Physics and Astronomy Undergraduate Student Research Conference, April 6, 2007.

"Fixed and Dynamic Sensor Networks Using Wireless Technology" **Kyle Moss, J.Paschal, J.Board**, P.Womble, A.Barzilov, D.Harper, I.Novikov, 2007 WKU Physics and Astronomy Undergraduate Student Research Conference, April 6, 2007.

"Fast Multi-Channel Analyzer Based on Free-Running Digital Signal Processing" **Chris McGrath, M.Nichols, J.Board**, J.Paschal, P.Womble, A.Barzilov, I.Novikov, D.Harper, 2007 WKU Physics and Astronomy Undergraduate Student Research Conference, April 6, 2007.

"The Development of Devices to Detect Low Frequency Magnetic Fields", **Brian Cooper**, Phillip Womble*, Douglas Harper, Jon Paschal, Joseph Howard, **Jason Smith, Christopher McGrath**, Seventeenth Annual Argonne Symposium for Undergraduates in Science, Engineering, and Mathematics, Argonne National Laboratory, November 2-3, 2007.

"Modeling Results for Environmental Acoustic Pressure Obstructions", **Jason A. Smith**, Phillip C. Womble*, Doug Harper, Joseph Howard, **Brian N. Cooper, Chris McGrath, James Phelps**, Seventeenth Annual Argonne Symposium for Undergraduates in Science, Engineering, and Mathematics, Argonne National Laboratory, November 2-3, 2007.

["Sample Environment at the Spallation Neutron Source: An Automated Gas Environment System \(AGES\)"](#), **Nathan Campbell, Jacob Baxley, Gordon Gameson**, Doug Harper, Edward Kintzel, Bruce Hill, Louis Santodonato, Twentieth Annual Argonne Symposium for Undergraduates in Science, Engineering, and Mathematics, Argonne National Laboratory, November 13, 2009.

["Sample Environment at the Spallation Neutron Source: An Automated Sample Environment Air Purge System"](#), **Drew Bewley**, Doug Harper, Bruce Hill, Landon Solomon, Mariano Ruiz, Louis Santodonato, 2011 WKU Student Research Conference, Gary Ransdell Hall, WKU Campus, March 26, 2011.

Curriculum Materials

Computer Simulation of Phonon Vibrations on a Monatomic and Diatomic Linear Chain, Solid State Physics, WKU, 1992.

Computer Simulation of Waves on a String, University Physics, WKU 1992.

Laboratory Manual for University Physics I, WKU, Fall 1999.

[Virtual Physics](#): *A LabVIEW Virtual Instrument for Performing Numerical Integration of Newton's Second Law*, Mechanics Courses (Physics 255, 350, 450), WKU, 2000.

Sound Analyzer: A LabVIEW Virtual Instrument for Recording and Analyzing Sounds using a PC Sound Card, University Physics and Acoustics, WKU, 2000.

Consulting and Contract Work

Performed or supervised the analysis of hundreds of samples using the technique of Glow-Discharge Atomic Emission Spectroscopy for the following companies:

- Agilent Technologies, Inc., Wilmington, DE
- Brockhouse Institute for Materials Research, McMaster University, Hamilton, ON Canada
- Caterpillar, Inc., Peoria, IL
- Cummins Engine Co., Columbus, IN
- Crossville Ceramics, Crossville, TN
- DESA International, Bowling Green, KY
- Emerson Motor Technology Center, St. Louis, MO
- Kenmore Research, Ravenna, OH
- Pan-Oston, Glasgow, KY
- Premium Allied Tool, Owensboro, KY
- Quality Heat Technologies Pty. Ltd., Victoria, Australia

Authored and maintained LabVIEW applications for the following projects:

- "Data Acquisition System for a Nitrous Oxide Engine Test Stand," Holley Performance, Bowling Green, KY, August, 2000.
- "Supercharger Production Test Stand," Holley Performance, Bowling Green, KY, 2002-present.
- "Fuel Pump Production Test Stand", Holley Performance, Bowling Green, KY, 2004-present.
- "Carburetor Test Stand", Holley Performance, Bowling Green, KY, 2005-present.

Reviews

Reviewed "Polarization of emission lines from foil-excited atoms: Current density dependent or beam dose dependent?" Yasuyuki Kimura and Keishi Ishii, submitted to NIM B, Beam Interactions with Materials and Atoms, July 1997.

Reviewed *Learning with LabVIEW*, by Robert H. Bishop (Addison Wesley Longman, Inc., 1999).

Reviewed *Eisenhower Grant Proposals*, October 2000.

Reviewed *Six Ideas That Shaped Physics, Unit E: Electric and Magnetic Fields are Unified, Second Edition*, by Thomas Moore (McGraw-Hill, 2002).

Honors

President's Scholar, Western Kentucky University, 1982-86.

H.M. Yarbrough Mathematics Award, Western Kentucky University, 1986

George V. Page Physics Award, Western Kentucky University, 1986.

Ogden College of Science Outstanding Senior Scholarship, Western Kentucky University, 1985-86.

[American Vacuum Society](#) Graduate Fellowship, Vanderbilt University, 1988-90.

Recipient of the Ogden College of Science and Engineering Faculty Award for Teaching, 2004.

Recipient of the Western Kentucky University Faculty Award for Teaching, 2004.

Member of the Ohio County High School Wall of Fame, 2005.

Member of [National Instruments Elite Educators](#), 2014.

Memberships

[AAPT](#) - American Association of Physics Teachers

Phi Eta Sigma - Freshman Honor Society

Pi Mu Epsilon - Mathematics Honor Society

[Sigma Xi](#) - The Scientific Research Society

[Sigma Pi Sigma](#) - Physics Honor Society

