

Robert William Arts, M.S., Ph.D.
P.O. Box 4352
Pikeville, KY 41502-4352
(606) 437-0103
E-mail: rarts@pc.edu
Internet: <http://campus.pc.edu/~rarts>

OBJECTIVE

To promote science education, heighten science awareness, and facilitate an interest in the sciences through innovative, interactive techniques while utilizing highly developed scientific and communication skills.

EDUCATION

Capella University, Minneapolis, MN

Ph.D. in Education, August 2005

Emphasis: Professional Studies in Education

Ph.D. Dissertation: "A Comparison of In-service Elementary Teachers' Conceptions of Selected Standards-Based Force and Motion Concepts Before and After Instruction"

University of Kentucky, Lexington, KY

Master of Science in Physics, August 1994

Master's Thesis: "Laser Raman Spectroscopy of Hydrogen Adsorbed on p-Si(111)"

Ohio University, Athens, OH

Bachelor of Science in Physics, June 1991

Minor: Mathematics

EXPERIENCE

Pikeville College, Pikeville, KY

Professor of Education & Physics, 2007 - Present

Associate Professor of Education & Physics, 2006 - 2007

Associate Professor of Physics, 2000 - 2006

Assistant Professor of Physics, 1995 - 2000

Physics Instructor, 1994 - 1995

Lecture courses taught: Science in the Elementary School and the Middle School, Introduction to Physics, General Physics, Engineering Physics, Modern Physics, Introduction to Astronomy and Astrophysics, Introduction to Physics and Astronomy, and Introduction to Earth Science and Chemistry.

Laboratories taught: Introduction to Physics, General Physics, Engineering Physics, Introduction to Astronomy and Astrophysics, and Introduction to Earth Science and Chemistry.

Special topics course taught: MCAT Review and Problems, Computer Simulations in Physics, Amusement Park Physics, Complexity Theory, Medical Physics, An Introduction to String Theory, and Introduction to Robotics.

Seminar classes taught: Black Holes and Time Travel, Chaos Theory, and The Science in Science Fiction.

I made "Introduction to Astronomy and Astrophysics" the first Pikeville College course to be completely web-enhanced. All course materials are available online. Online resources include: course syllabi, sample tests, discussion boards, grade book, lecture notes, images, animations, Internet links, and homework assignments. Current sections of the course are offered using video projection in a classroom lecture setting. Participants are shown real-time animations of concepts and links to current course information. Lecture notes are updated as new advances / discoveries are reported. In addition, in the summer of 2007, "Introduction to Astronomy and Astrophysics" lecture and laboratory was the first Pikeville College laboratory science course to be offered online via WebCT.

Pikeville College, Pikeville, KY

Director, Math/Science Resource Center, 1994 - 2006

The Center provides outreach support to the county and surrounding school systems in an attempt to further science and mathematics education in the region. As director, I am responsible for outreach activities including educational workshops (student and teachers versions), visiting lectureships, science tours, physics petting zoos, math & science Olympics, and science & math camps. I have not only expanded our offerings to many additional surrounding counties, as well as two additional states, but have personally conducted science and mathematics programs with more than 30,000 public school students and more than 1,000 public school teachers. These programs are usually hands-on, inquiry-based projects designed to increase literacy about science and mathematics.

Big Sandy Community and Technical College, Prestonsburg, KY

Adjunct Professor of Astronomy, Spring 2006 - Present

Morehead State University, Morehead, KY

Adjunct Professor of Astronomy, Spring 2006 - Present

I was responsible for the development and instruction of a survey course for non-science majors related to stars, galaxies, and the universe. The lecture course included online resources such as course syllabi, sample tests, grade book, lecture notes, images, animations, Internet links, and homework assignments. Learners are shown real-time animations of concepts and links to current course information. Lecture notes are updated as new advances / discoveries are reported. The lecture included observation sessions and access to the planetarium.

Pike County Board of Education, Pikeville, KY

Project-Based Learning Program Director, 2006

I provided introduction to the project-based learning environment for local educators and professionals. This was a start-up venture between the Pike County school system and area professionals in the sciences. The program offered after-school, project-based learning environments for local school children. These projects were supervised by participating educators and involved local science professionals as resource agents. The goal was to increase science literacy and awareness by allowing small groups of students the opportunity to research areas within science that are of critical importance to them and to their community. As director of the program, my responsibilities included developing materials for the supervising teachers, running training sessions for both the teachers and professional partners, conducting site visits during the extent of the program, and acting as a guide and a resource for both the supervising teachers and the professional partners.

KAPLAN Educational Testing Services, Pikeville, KY

Physics Review Instructor, 1999 - 2003

I provided introductory and physics review for those students wishing to prepare to take the MCAT examination. I taught a three-hour introduction to the KAPLAN process and a nine-hour review of the complete general physics curriculum, with emphasis on problem solving techniques and strategies.

Richard Bland College, Petersburg, VA

Adjunct Professor of Physics, Summers, 1998 & 1999

I developed and taught a teacher re-certification course designed for teaching science with a "hands-on" approach at the elementary, middle and high school levels. I incorporated the National Science Standards and the Virginia Standards of Learning into the specific content area demonstrations that were developed throughout the course. Participants developed and constructed demonstration activities, improved their confidence and skills in teaching physics, and became better equipped to incorporate science standards into their daily curriculum.

PROFESSIONAL DEVELOPMENT

National Radio Astronomy Observatory, Green Bank, WV

Chautauqua short course entitled "A Radio View of the Universe and the New Green Bank Telescope." Certificate awarded May 2000.

National Radio Astronomy Observatory, Green Bank, WV

Chautauqua short course entitled "Teaching Introduction to Astronomy." Certificate awarded May 1998.

Millersville University, Millersville, PA

"Teaching Introductory Physics Using Interactive Teaching Methods and Computers" held at Dickinson College, July 1997. Graduate credit awarded July 1997

University of Dayton, Dayton, OH

Chautauqua short course entitled "Multimedia Laboratory & Classroom Simulations: Instructional tools for the Sciences." Certificate awarded June 1997.

James Madison University, Harrisonburg, VA

"Physics Demonstrations Using Simple Apparatus" held at the Virginia Military Institute. Graduate credit awarded July 1996.

University of Dayton, Dayton, OH

Chautauqua short course entitled "Inexpensive Interfacing of Undergraduate Laboratory Experiments." Certificate awarded May 1996.

Big Sandy Telecommuting Services, Inc., Pikeville, KY

144 hour Novell 3.1x Certified Netware Engineer (CNE) training. Certificate awarded December 1995.

COMPUTER SKILLS

- Accustomed to using IBM-PC (MS-DOS and Windows), Apple Macintosh, and similar computing hardware
- Competent in word processing, communications, spreadsheets, databases and a variety of other application software
- Familiar with BASIC, True BASIC, FORTRAN, and Turbo Pascal languages
- Proficient in HTML and Web authoring
- Experienced in JAVA and CGI (Perl)

AFFILIATIONS

American Association of Physics Teachers
Member, 1997 - Present

Appalachian Mathematics and Science Partnership
Science Advisory Council, 2003 - 2004
Science Course Development Group (Elementary, Middle, and High School),
2003 - 2005
Elementary Institute Instructor, 2003
Middle School Institute Instructor, 2004, 2005 & 2006
Coordinator, Physical Science Development Group, 2006
Letcher County PEP Grant Member, 2006

Association for Science Teacher Education, Mid-Atlantic Region
Member, 2005 - Present

Challenger Learning Center of Kentucky
Board of Directors, 2002 - 2007

East Kentucky Science Center
Board of Directors (Founding Member), 1996 - Present
Planetarium Technician, 2004 - Present

Kentucky Academy of Sciences
Member, 2002 - Present

Kentucky Association of Physics Teachers
Member, 1995 - Present

Kentucky Department of Education, Region 8 Service Center
Advisory Board, 1995 - 2000; Chair 1999 - 2000

National Association for Research in Science Teaching
Member, 2005 - Present

National Association of Rocketry
Senior Member, 2003 - 2006

National Energy Education Development Project, Kentucky Chapter
Board of Directors, 1995 - 1998

National Science Teachers Association
Member, 1996 - Present
Pikeville College Student Chapter, Founder and Faculty Advisor, 2003 - Present

Pike County Chamber of Commerce
Member, 1997-1999

Pike County Student Technology and Leadership Program
Advisory Board, 1998 - 1999

Server-Client Technology in Physics Teaching at Berea College
Team Member, 1997 - 1999

Sigma Zeta, Beta Xi chapter, National Science and Mathematics Honor Society,
Founding Chapter Member, 1999 - Present

Society of College Science Teachers
Member, 1996 - Present

PROFESSIONAL ACTIVITIES

AEL Math and Science Regional Cadre
Team Leader, 2001 - 2003

Bayer/NSF Awards Program
Semifinalist Judge, 2002

Crawford Engineering
Physics Consultant, 1997 - 1998

Eastern Kentucky Goals 2000 Development Project
Higher Education Consultant, 1996 - 1999
Science Camp Consultant and Co-coordinator, 1998 -1999

East Kentucky Regional Gear-Up Program
Physics Consultant, 2001 - Present
Program Presenter, 2003 - Present

Intel International Science and Engineering Fair
Grand Awards Judge, 2002, 2003 & 2006

KAA District Governor's Cup Academic Competition
Officiating Judge, 1997 - 1998

Kentucky Science Support Network
Science Mentor, 2003 - Present

Mad Scientist Network
Science Mentor, 2001 - Present

National Public Radio
Science Mentor, 1997

NSF Global Science and Technology Week
"Ask a Scientist or Engineer" Mentor, 2002

Phelps Elementary Outdoor Classroom Project
Grant Advisor, 1997 - 1998

Region 8 Service Center Education Round Table
Panel Speaker, 1997

Region 8 Middle School Summer Science Academy
Consultant and On-site Coordinator, 2001
Consultant, Summer Science Academy - Elementary Emphasis, 1999

Regional Science Olympiad
Event Coordinator, 1997 - 2006.
Co-Director, 2007 - Present

State Science Olympiad
Event Coordinator, 1996 – 2001

University of Louisville
Science Assessment & Scoring Rubrics Reviewer, 2004 - 2005

PUBLICATIONS

Arts, R. (2007). "Traditional versus Guided Inquiry Instruction in the Undergraduate Physics Laboratory." *Society of College Science Teachers Quarterly*, Issue XXXXI, No.2, Summer 2007.

Arts, R. (2005). *A Comparison of In-service Elementary Teachers' Conceptions of Selected Standards-Based Force and Motion Concepts Before and After Instruction* (Doctoral dissertation, Capella University, 2005). UMI.

Arts, R. (2005). Chapter problem set editor/reviewer. For J. Walker, *Physics*, 3rd ed. Upper Saddle River, NJ: Prentice Hall.

Arts, R. (2005). *Introduction to astronomy and astrophysics: Laboratory activities manual*. Pikeville, KY: Author.

Arts, R. (2004). Laboratory activity writer and field tester. In M. Wyssession, D. Frank, & S. Yancopoulos, *Laboratory manual: Physical science concepts in action with earth and space science*. Upper Saddle River, NJ: Prentice Hall.

Arts, R. (2004). Laboratory activity writer. In M. Wyssession, D. Frank, & S. Yancopoulos, *Physical science concepts in action with earth and space science*. Upper Saddle River, NJ: Prentice Hall.

Arts, R. (2002). *Laboratory physics, part II* (5th ed.). Pikeville, KY: Author.

Arts, R. (2001). *Laboratory physics, part I* (4th ed.). Pikeville, KY: Author.

Arts, R. (2001). *Laboratory astronomy and astrophysics* (1st ed.). Pikeville, KY: Author.

Arts, R. & Parsons, J. (2000). *Laboratory physics: Instructor's edition, part II* (Rev. ed.). Pikeville, KY: Author.

Arts, R. & Parsons, J. (2000). *Laboratory physics: Instructor's edition, part I* (Rev. ed.). Pikeville, KY: Author.

Arts, R. (1997). *Film canister rocket*. U.S. Copyright No. VAu-411-794.

Arts, R. (1997). Workshop physics for the pre-medical student: The impact forces on the human foot. *Proceedings of the Teaching Introductory Physics Using Interactive Teaching Methods and Computers Workshop*. Carlisle, PA: Dickinson College.

Arts, R. (1993). Laboratory 19: The oscilloscope and the series RC circuit. In B. D. Kern, *Laboratory manual for general physics: Part two*. Dubuque, IA: Kendall/Hunt.

PRESENTATIONS GIVEN

"Traditional versus Guided Inquiry Instruction in the Undergraduate Physics Laboratory." Society of College Science Teachers/NSTA National Meeting, St. Louis, MO, March-April, 2007. Mid-Atlantic Region Annual Conference of the Association for Science Teacher Education, Ansted, WV, September 2007.

"The Pros and Cons of an Extracurricular Project Based Learning Program: Perceptions of Students, Teachers & Professionals." Mid-Atlantic Region Annual Conference of the Association for Science Teacher Education, Marion, VA, October 2006.

"A Comparison of In-service Elementary Teachers' Conceptions of Selected Standards-Based Force and Motion Concepts Before and After Instruction." Mid-Atlantic Region Annual Conference of the Association for Science Teacher Education, Breaks Interstate Park, KY/VA, October 2005. National Association for Research in Science Teaching Conference, San Francisco, CA, April 2006.

"Online Homework: A Comparison and Overview." Appalachian College Association Technology Summit IV, Johnson City, TN, October 2001.

"The CGI Script." Appalachian College Association Technology Summit III, Knoxville, TN, October 2000.

"Data Acquisition for the Sciences." Science Strand Meeting at the Appalachian College Association Technology Summit III, Knoxville, TN, October 2000.

"Teaching Introductory Astronomy using HTML and the Internet." Technology in Teaching Conference, Berea, KY November 1998. Appalachian College Association Technology Summit, Knoxville, TN, October 1999. Kentucky Association of Physics Teachers meeting, Lexington, KY, April 2000. Poster Session of the Technology Interchange at the ACA Technology Summit III, October 2000.

"Inexpensive Computer Interfacing for the Sciences." Appalachian College Association Technology Summit, Knoxville, TN, October 1998. Technology in Teaching Conference, Berea, KY November 1998.

"Math and Science Resources for your Classroom." Pike County Schools Regional Title I Conference, Pikeville, KY, December 1997 and November 1998.

"Technology in Math and Science Instruction." East Region Association Technology Conference and Region 8 Technology Showcase, Shelby Valley, KY, January 1998.

"The Laser Spirograph." Kentucky Association of Physics Teachers meeting, Bardstown, KY, March 1997.

WORKSHOPS PRESENTED

- "Fun with Forensic Science." Pike County Schools Summer Program for Teachers, June 2007.
- "Hands-On Science Olympic Events & Outreach Opportunities For Your Classroom." Pike County Schools Professional Development Conference, August 2007.
- "Logger Pro and the Basics of Real-time Data Acquisition." Letcher County Central High School Professional Development Workshop, Whitesburg, KY, December 2006.
- "Science Magic." Pike County Schools Regional Title I Conference, Pikeville, KY, December 2006.
- "Fun with Color." Pike County Schools Regional Title I Conference, Pikeville, KY, December 2005.
- "Phascinating Fizzix." Jenkins High School Professional Development Workshop, Jenkins, KY, March 2005.
- "Fun with Electricity and Magnetism." Pike County Schools Regional Title I Conference, Pikeville, KY, December 2004.
- "The Nuts and Bolts of the Physics Petting Zoo." Eastern Kentucky Physics Alliance, Pikeville, Kentucky, November 2004
- "Introduction to Holography." Eastern Kentucky Physics Alliance, Pikeville, KY, April 2004.
- "The Madagascar Hissing Cockroach." Eastern Kentucky Physics Alliance, Pikeville, KY, April 2003.
- "Teaching Physics with Toys." Eastern Kentucky Physics Alliance, Pikeville, KY, November 2000.
- "The Wonders of Air Pressure." Eastern Kentucky Physics Alliance, Pikeville, KY, March 2000.
- "Hands-On Astronomy Activities." Eastern Kentucky Physics Alliance, Pikeville, KY, November 1999.
- "Hands-On Demonstration Activities." Pike County Schools Regional Title I Conference, Pikeville, KY, December 1999 and November 2000.
- "Hands-On Science Activities." Kentucky Educational Development Corporation (KEDC) summer workshop series. Hosted at Pikeville College, Pikeville, KY, July 1999.
- "Physical and Environmental Science Activities." Johnson County Middle School, July 1998.
- "Hands-On Science Activities." Lookout Elementary, April 1998.
- "Electricity & Magnetism." Eastern Kentucky Physics Alliance, Pikeville, KY, November 1997.
- "The Optical Telescope and Physics Demonstrations." Kentucky Association of Physics Teachers / Partnership for Reform Initiatives in Science and Mathematics, Eastern Kentucky Physics Alliance, November 1996 & April 1997.

“The Stomp Rocket and the Hot Air Balloon.” Kentucky Association of Physics Teachers meeting, Bardstown, KY, March 1997.

“The Calculator-Based Laboratory.” Eisenhower Math/Science Consortium at the Appalachian Education Laboratories (Eastern Kentucky hosted workshops), October - November, 1996.

“Projectile Motion.” Kentucky Association of Physics Teachers / Partnership for Reform Initiatives in Science and Mathematics, Eastern Kentucky Physics Alliance, June 1996.

AWARDS

“Best Science Presentation.” Appalachian College Association Technology Summit, Knoxville, TN, October 1998.

“Best Presentation.” Technology in Teaching Conference, Berea, KY, November 1998.

“Highest Speaker Evaluations.” Pike County Schools Regional Title I Conference, Pikeville, KY, December 1997.

REFERENCES

Dr. Wallace Campbell, Dean of the College
Pikeville College
147 Sycamore Street
Pikeville, KY 41501
(606) 218-5219
campbell@pc.edu

Dr. John Christopher, Professor of Physics
University of Kentucky
Department of Physics and Astronomy
171 Chemistry-Physics Building
Lexington, KY 40506-0055
(859) 257-5660
jchris@uky.edu

Dr. Thomas R. Hess, Associate Professor of Chemistry
Chair of the Division of Science and Mathematics
Pikeville College
147 Sycamore Street
Pikeville, KY 41501
(606) 218-5475
thess@pc.edu