

VITA: Karen A. Williams, Ph. D., Professor of Physics
For Professional Activities June 2003 -Dec. 2008
East Central University, Physics Dept., 1100 E. 14th St., PMB D-5, Ada, OK 74820
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EDUCATION: May 1998: Ph.D. in Physics Education, The University of Oklahoma.
Jan. 1988: M.S. in Physics, University of Arkansas
May 1985: B.S. in Physics & Math with Honors, AR Tech University

RESEARCH INTERESTS: Photothermal Deflection Spectroscopy, Laser Tweezers,
Physics Education, Ultrasound heat transfer

COURSES TAUGHT AT ECU: PHYS 1114/1214 General Physics I and II (and labs)
PHYS 3013 Modern Physics (SL)
PHYS 3411 Junior Physics Lab
PHYS 3813 Optics (SL)
PHYS 4313 Intro. to Nuclear Physics
PHYS 3222 Medical Physics (*new*)
PHYS 4222 X-ray and Nuclear Physics Laboratory (*new*)
PHYS 3611 Ultrasound Physics Lab (*new*)
PHYS 2881 Sp. Studies-Optics for Optometrists (*new*)
PHYS 2881 SP-Studies Physics of Star Trek (*new*)

NATIONAL SERVICE

Society of Physics Students (SPS):

President of SPS National Council (4 Councils June 2001-2005)
-Chair-Executive Committee Society of Physics Students
-Chair of Long Range Plan Comm.
-SPS Leadership Scholarship Committee
-SPS Awards Committee I
-SPS Nominating Committee Chair
National SPS Councillor for Zone 12 (Re-elected June 2007-2010).

Sigma Pi Sigma (National Physics Honor Society)

Planning Committee for Sigma Pi Sigma Quadrennial Congress at Fermilab 2006-2008.
Voting Member at Congress for ECU

American Institute of Physics (AIP): (2001-2005)

Governing Board Education Division AIP
Advisory Committee on Physics Education

REGIONAL SERVICE

American Association of Physics Teachers AR-OK-KS Section

Past President 2003-2004
President 2002-2003

Oklahoma Academy of Science

Section Chair Physical Science (Nov. 06-07) on OAS Exec. Committee
Section Vice-Chair Physical Science (Nov. 05-06, Nov. 07-08)
Judge for Jr. OK Academy of Science Regional and State Meet (2005-2008).

OK State Science & Engineering Fair

Special Awards Director (1991- 2004)

SouthCentral Girls Collaborative Engaging Girls in STEM

Board member (2005-on), Mini-Grant evaluator for OK

ECU SERVICE

NCATE Program Director - Physics
Teacher Education Comm.
Student Conduct Comm.
Student Achievement Comm.
ECU Branding Comm.
Tenure Review Comm. (Rutledge, Myers, Crittall, etc)
Tenure Comm. (Newcomber, Miller, etc)
ECU Centennial Comm. - Student & Campus Activities
Advisor for: Society of Physics Students
 Sigma Pi Sigma (honor society), and
 ECU Student Chapter of NSTA
Student Welfare Comm.
Dismissal of Tenured Faculty Comm.
Physics Program Review Comm.

PROFESSIONAL MEMBERSHIPS

American Association of Physicists in Medicine (AAPM)
American Association of Physics Teachers (AAPT)
National Science Teachers Association (NSTA)
OK Academy of Science (OAS)
Oklahoma Science Teachers Assoc. (OSTA)
Society of Physics Students (SPS)
Sigma Pi Sigma ($\Sigma\Pi\Sigma$)

PUBLICATIONS (11)

- Williams, K. A. (2005). What I See as SPS President-With Great Power Comes Great Responsibility, *The SPS Observer*, an American Institute of Physics Publication, 37(1), p. 5.
- Williams, K. A. (2005). ECU Physics website: <http://www.ecok.edu/academics/schools/ms/cp/default.asp>
- Williams, K., Rutledge, C.T., & Pfeffer, F. (2006). *A Laboratory Manual for General Physical Science*, 4th Ed., Pearson Custom Publishing.
- Weems, B. & Williams, K. (2006). *General Physics Laboratory Manual PHYS 1114/1214, 2115/2225*, 3rd Ed., Pearson Custom Publishing.
- Williams, K. (2006). *PHYS 4222 X-ray and Nuclear Physics Laboratory Manual*, Campus Custom Publishing.
- Williams, K. (2007). *Junior Physics Laboratory Manual*, 2nd Ed., local area press.
- Williams, K. (2007) *Ultrasound Lab*, ECU Printing Services.
- Williams, Karen (2008). *PHYS 3611 Ultrasound Physics Laboratory Manual*, 2nd Ed. , ECU printing services. ISBN 2818560199366 9000
- *Write and distribute electronic alumni (physics) newsletter *The Tiger Charges* 3x a year.
- *Filmed, edited, duplicated DVD *An Afternoon with a Medical Physicist*, (7/20/06-11/20/06)
- *Author of *The College of Health and Sciences Newsletter* (biannually). Published Oct. 21, 2008.

PAPERS PRESENTED (40 from Fall 2003-Dec. 2008: 30 oral (5 invited), 10 poster)

- Williams, K. (2003). *Standing on the Shoulders of the Women Giants?* paper at American Association of Physics Teachers National Summer Meeting in Madison, WI 8/6/03.
- Williams, K. (2003). *Outstanding SPS Chapter Advisor Award- Jerome Long* invited paper at Society of Physics Students National Council Meeting, Washington, DC, Sept. 25, 2003.
- Williams, K. (2003). *SPS and Sigma Pi Sigma Means More than the Pin* invited paper at Society of Physics Students Zone 12 Fall Meeting, Southern Nazarene University, Bethany OK, Oct.11, 2003.
- Williams, K. (2003). *Building Einstein with Dominoes* at the Society of Physics Students Zone 12 Fall Meeting, Southern Nazarene University, Bethany OK, 10/10-11/03.
- Standeford, Levi, & Williams, K. (2003) *Study 1: Gamma Spectroscopic Determination of Amount of Potassium in Potassium Chloride and Two Different Miracle Grow Fertilizers and Study 2: Uptake of Radioactive Tracer in Plants with Tumors* poster presented at 8th Annual Research Symposium OK L.Stokes Alliance for Minority Participation in STEM at OSU, Noble Research Center, Stillwater, OK, 9/30/03.
- Williams, K. (2003). *SPS Annual Report and Ties to Member Organizations* at American Institute of Physics Governing Bd., 8/26/03, CA.
- Williams, K. (2003). *Standing on the Shoulders of the Women Giants*, AR-OK-KS/Neb Section of the Amer. Assoc. of Physics Teachers Fall Meeting, Manhattan, Kansas, 11/8/03.
- Williams, K. (2004). *SPS Activities at ECU* poster paper at American Assoc. of Physics Teachers Winter Meeting, Miami, FL, 1/25/04.
- Williams, K. (2004). *Outstanding SPS Chapter Advisor Award- Jerome Long* invited speaker in ceremonial session at American Assoc. of Physics Teachers Winter Meeting, Miami, FL, Jan. 26, 2004.
- Williams, K. and Rutledge, C. (2004). *The Women and Minorities Succeed in Physics at ECU*, paper at American Assoc. of Physics Teachers Winter Meeting, Miami, FL, Jan. 28, 2004.
- Williams, K. (2004). *Standing on the Shoulders of the Women Giants*, Prime Timers of Ada, Ada, OK. 2/17/04.
- Williams, K. (2004). *Rainbow Glasses with Flash Effect* paper at American Association of Physics Teachers Summer Meeting, High School Share-a-thon Session, California State University, Sacramento, CA, 8/1/04.
- Williams, K. (2004). *SPS Across the U.S. Celebrates World Year of Physics* paper at American Association of Physics Teachers Summer Meeting, California State University, Sacramento, CA, 8/1/04.
- Standeford, L (presenter), & Williams, K. (2004). *Uptake of Radioactive Tracer in Plants with Tumors* paper at 10th Annual OK L.Stokes Alliance for Minority Participation in STEM Research Symposium, Sept. 25, 2004, Noble Research Center, Stillwater, OK.
- Williams, K. (2004). *Qualitative Examination of Prelab Questions in Intro Lab.* paper at 2004 AR-OK-KS Section of the American Association of Physics Teachers Meeting, Oct. 9, 2004, UALR, Little Rock, AR.
- Williams, K. (2004). *Outstanding SPS Chapter Advisor Award- Earl Blodgett*, invited speaker at Society of Physics Students National Council Meeting, Univ. of NM, Albuquerque, NM, Oct. 14, 2004.
- Williams, K. (2004). *Moderator of 2005 World Year of Physics Session*, 2004 Sigma Pi Sigma Congress: Heritage and Promise, University of New Mexico, Albuquerque, NM, Oct. 15, 2004.
- Williams, K. (2004). *Using Photothermal Deflection Spectroscopy to Measure Laser Beam Profiles* poster paper at 2004 Sigma Pi Sigma Congress, Univ. of New Mexico, Albuquerque, NM, Oct. 16, 2004.
- Williams, K. (2004). *SPS Annual Report* to American Institute of Physics Governing Board, Yorktown Heights, NY. Oct. 24, 2004.

- Williams, K. (2005). *American Institute of Physics Outstanding SPS Chapter Advisor Award for 2005* invited speaker for Ceremonial Session of Amer. Assoc. of Physics Teachers National Meeting in Albuquerque, NM, 1/10/05.
- Williams, K. (2005). *What Does the SPS President Do Anyway?* poster presentation at American Assoc. of Physics Teachers National Meeting in Albuquerque, NM, 1/9/05.
- Williams, K. (2005). *Qualitative Examination of Prelab Questions in Intro Physics Lab*, oral presentation at American Association of Physics Teachers National Meeting in Albuquerque, NM, 1/10/05.
- Williams, K. (2005). *Lessons Learned from the Past Aid in Research* oral presentation at American Assoc. of Physics Teacher's National Meeting in Salt Lake City, UT, 8/10/05.
- Williams, K. (2005). *Civic Engagement in Physics Classes* oral presentation at AR-OK-KS Section of the American Association of Physics Teachers Section Meeting in OKC, OK at OK City Community College, 10/8/05.
- Williams, K. (2005). *Visual Representations Aid Teaching Electromagnetism to College Students* oral presentation at OK Academy of Science Fall Technical Meeting, OK City University, OKC, OK, 11/5/05.
- Williams, K. (2006). *Science Fiction and Science: A Scientist's Perspective* oral presentation at ECU Science Fiction Fest, East Central University Library, Ada, OK 1/26/06.
- Williams, K. & Jacome, V. (2006). *An Introductory Investigation Using an Ultrasonic Echoscope*, poster at AR-OK-KS Section of the American Assoc. of Physics Teachers, Fall Meeting, Emporia State, 10/28/06.
- Williams, K. & Jacome, V. (2006). *An Introductory Investigation Using an Ultrasonic Echoscope*, oral presentation at OK Academy of Science Technical Meeting at Rogers State University, 11/3/06.
- Williams, K. (2006). *Painless Post-Graduation Assessment of the Major*, oral presentation at AR-OK-KS Section of the American Assoc. of Physics Teachers, Fall Meeting, Emporia State, KS 10/28/06.
- Williams, K. & Jacome, V. (2007). *An Introductory Investigation Using an Ultrasonic Echoscope*, poster at OK Research Day at UCO, 4/6/07.
- Williams, K. (2007). *Using Simulations in College Physics II and Modern Physics*, oral paper at American Association of Physics Teacher's Summer Meeting, Greensboro, NC on 7/30/07.
- Williams, K. (2007). *Advanced Labs at ECU-More than Experiments*, oral paper at American Association of Physics Teacher's Summer Meeting, Greensboro, NC on 8/1/07.
- Williams, K. & Marek, E. (2007). *Piaget and Ausubel: A Contemporary Investigation*, poster at Physics Education Research Conference, Greensboro, NC, 8/1/07.
- Williams, K. (2007). *Service Learning in Modern Physics and Optics at ECU*, oral paper at Arkansas-Oklahoma-Kansas Section of the American Assoc. of Physics Teacher's Meeting, University of Central Arkansas, Conway, AR, 10/20/07.
- Williams, K. (2007). *Assessment of Physics Major at ECU: Part II-Stakeholders*, poster at AR-OK-KS Section of the American Association of Physics Teacher's Meeting, University of Central Arkansas, Conway, AR, 10/20/07.
- Williams, K. (2007). *The Utilization of Ultrasonic Waves to Measure Properties of Light and Matter*, oral paper at Oklahoma Academy of Sciences Fall Technical Meeting, Tulsa Community College SE Campus, 11/2/07.
- DiMambro, R. & Williams, K. (2008). *Undergraduate Optical Tweezers*, poster at L.S. Stokes 14th Annual Research Symposium (9/20/08).
- Williams, K. (2008). *Terrestrial Gamma Radiation and Weather*, oral paper at OK Academy of Science Fall Technical Meeting, at SNU, 10/31/08.
- Williams, K. (2008). *Science Ethics Education*, oral paper at AR-OK-KS Section of AAPT Meeting at Rose State University, MWC, OK, 11/1/08.
- Williams, K. (2008). *Science Ethics Workshop-Result from 2004 Congress*, poster at Sigma Pi Sigma Quadrennial Congress, Fermilab, IL, 11/8/08.

CREATIVE ENDEAVORS

Heel over Heels, photo submitted to Sigma Pi Sigma Quadrennial Congress Art Contest, at Fermilab, IL, 11/8/08, won Honorable Mention.

WORKSHOPS COMPLETED (30)

Workshops at American Association of Physics Teachers National Meeting, Madison, WI,
8/3/03: *New Model Course in Applied Quantum Mechanics*
Physics on the Road I

What We Hear Versus What They Say- A Diversity Workshop at Society of Physics Students
National Council Meeting, American Center for Physics, College Park, MD, 9/26/03.

Reaching Graduate Schools at Eighth Annual Research Symposium Oklahoma Louis Stokes
Alliance for Minority Participation in Science, Mathematics, Engineering and
Technology at OSU, Noble Research Center, Stillwater, OK, 9/30,03.

Cultivating New Scientists Through Undergraduate Research at American Institute of Physics
Academic-Industrial Workshop in San Jose, CA, 10/26/03.

Industrial Physics Forum: Physics in the Life Sciences, American Institute of Physics Corporate
Associates Forum, San Jose, CA and Agilent, Palo Alto, CA, Oct. 26-28, 2003.

Humanized Physics Project at AR-OK-KS/Neb. Section of the American Association of Physics
Teachers Meeting, Kansas State University, 11/8/03.

Cultivating New Scientists Through Undergraduate Research an American Institute of Physics
workshop at the Industrial Physics Forum, San Jose, CA, Oct. 26, 2004.

LAA Physics: Mechanics Tutorials in Online Integrated, and Highly Interactive Laboratory
Workshop at AAPT Winter Meeting in Miami, FL, Jan. 25, 2004.

Advanced and Intermediate Instructional Laboratories, Aug.1, 2004 at California State
University, Sacramento, CA. AAPT Workshop at the 2004 Summer Meeting

Investigate Learning in Your Classroom with TI-Navigator at the AR-OK-KS Section of the
AAPT meeting at UALR, Little Rock, AR. Oct. 8, 2004.

Completed and Planned workshops at the Sigma Pi Sigma 2004 Congress: Heritage and
Promise, University of New Mexico, Albuquerque, NM, Oct. 15-16, 2004:

Ethics in Physics I: Career Choices and Weapons Research

Ethics in Physics II: Professional Integrity in Research & Authorship

Ethics in Physics III: Our Collective Role in Achieving Diversity

Ethics in Physics IV: Tenure and Academic Freedom

Engineering Education & Student Performance-Based Review, an American Institute of
Physics/Industrial Physics Forum Workshop, Yorktown Heights, NY, Oct. 24, 2004, pm.
(Participant/table leader).

Learn Anytime Anywhere Physics: Energy, Circular Motion and Momentum Interactive &
Online Tutorials at American Assoc. of Physics Teachers National Mtg. in Albuquerque,
NM 1/8/05.

The SENCER Project & Civic Engagement in the Physics Curriculum at American Assoc. of
Physics Teachers National Mtg. in Albuquerque, NM 1/8/05.

VPython: 3D Programming at American Assoc. of Physics Teachers National Meeting in Salt
Lake City, Utah, 8/6/05.

Hands-On Introduction to LabView Graphical Development Environment Seminar in OKC, OK,
9/6/05.

Heartland BEST (Boosting Engineering, Science & Technology) Robotics Workshop at AR-OK-
KS Section of the American Association of Physics Teachers Section Meeting at OK
City Community College, OKC, OK, 8/7/05.

The NCATE Program Review Process and Breakout Session at OACTE (OK Assoc. of
Colleges for Teacher Education) at U. of OK Center for Continuing Education. 11/4/05.

Workshops at American Assoc. of Physics Teacher's Summer Meeting, Greensboro, NC

7/28/07 (8am-12pm) *Reaching, Teaching, and Keeping Under-represented Minorities*

7/29/07 (8am-12 pm) *P-CSI-Greensboro: The Role of Physics in Forensic Science*

7/29/07 (1-5 pm) *Implementing the Learning Assistant Model*
7/31/07 1:30-3:30 pm *Teaching Relativity in Week One/MacScope*, Commercial
Physics Learning in the Context of Scaffolded Diagnostic Tasks at Physics Education Research
Conference: Cognitive Science and Physics Education Research Greensboro, NC-8/2/07
Mathematica Workshop at ECU, 10/14/08
Workshop Group Leader at Sigma Pi Sigma Quadrennial Congress (11/8/08) @ Fermilab
Scientific Citizenship Workshops:
II: *Energy Efficiency: Benchmarks and the Citizen's Response*
III: *Mediating Public Perception, A View From Behind the Camera*
IV: *From Researcher to Representative, Learning to Listen to Community*

WORKSHOPS CONDUCTED

Mars Pathfinder Landings taught to 200 SEES students at American Assoc. of Physics Teachers
National Meeting Miami Beach, FL (1/28/04)
Telephone Dialer
AR-OK-KS Section of AAPT Meeting at University of Central Arkansas (10/20/07)
AR-OK-KS Section of AAPT Meeting at Rose State University (10/31/08)
Science Ethics Workshop, ECU Jan. 22, 2008.
Science Ethics Workshop, OK State University, L.S. Stokes Alliance for Minority Participation
in STEM, Feb. 15, 2008.

STUDENT RESEARCH DIRECTED

Levi Standeford: Summer '03 research ECAMP (Gamma spectroscopy)
Levi Standeford: Summer '04 research ECAMP (Plant tumor inoculation & imaging)
Erik Gonzales: Summer '05 mentor (Solar cells efficiency)
Sabina Koukourinkova-Duncan: Fall '05 honors (superconductivity measurements)
Victor Jacome Research: Summer '06 Univ. Studies-Ultrasound imaging
Andrew McCann: Summer '06/Fall '06 Surestep research (Labview programming)
Lindsey Forester: Summer '06 Surestep Research (Labview programming)-quit early.
Chris Barnett: Spring '06 Surestep Research (Labview Xray Diffraction Interfacing)
Rocco DiMambro: Spring '08/Summer'08 Honors thesis research (Optical Tweezers) (*ongoing*)

EVIDENCE OF EXCELLENCE or HONORS

Nominated to Who's Who Among America's Teachers in 2004.
Inducted OK Science & Engineering Fair Hall of Fame 2005
External Evaluator for Ohio Physical Science Curriculum 2005
Awarded ECU Dean's Travel Award April 2007
Awarded ECU Exceptional Merit 2007 (for Scholarship)
Awarded Worth Seagondollar Service Award at Sigma Pi Sigma Quadrennial Congress at
Fermilab, IL, 11/8/08

WEBSITES

Dept: http://www.ecok.edu/colleges/health_sciences/physics/default.asp
Faculty Personal: <http://homepage.mac.com/kwillims/>