

Gail S. Welsh

Curriculum Vitae

November 2016

Department of Physics
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Education

1994	PhD	Penn State University	Physics (theoretical/computational condensed matter)
1991	MS	Penn State University	Physics (experimental biophysics)
1988	AB	Oberlin College	Physics

Professional Experience

2001-present Associate Professor of Physics, Salisbury University
2002-2008 Chair of the Physics Department, Salisbury University
1994-2001 Assistant Professor of Physics, Salisbury State University
Courses taught at Salisbury University (1994-present):
Physical Science for elementary education majors,
1st, 2nd, and 3rd semester Introductory Physics for physics and engineering majors (calculus-based),
1st and 2nd semester Introductory Physics (algebra-based),
Modern Physics,
Upper-level courses: Computational Physics, Electricity and Magnetism, Semiconductor Physics, Quantum Mechanics, Mathematical Physics, Digital Electronics, Analog Electronics, Senior Laboratory, and Senior Seminar.
Introductory Physics and Integrated Science for non-science majors,
Physics for Middle School Teachers,
Concepts in Physics course for 1st semester physics and engineering majors.

1994 Lecturer, Physics Department, Penn State University:
3rd semester introductory physics for engineers.

1988-1994 Laboratory curriculum development, Penn State University:
Development and teaching of new lab sequence for 1st semester introductory physics for engineers.
Recitation teaching assistant, Penn State University:
1st, 3rd, and 4th semester introductory physics for engineers.
Laboratory teaching assistant, Penn State University:
1st semester introductory physics for biologists,
2nd semester introductory physics for engineers,
Experimental physics for junior and senior physics majors.
Research assistant, Penn State University:
Thesis research in condensed matter theory, advisor Dr. Annett.

Professional Organization Memberships

American Association of Physics Teachers, National Science Teachers Association,
American Physical Society, Sigma Xi Scientific Research Society

Grant Awards and Grant Participation

- 2014 – present Co-PI on Physics Teacher Education Coalition (PhysTEC) Recruiting Grant (three year grant for \$29,889)
- 2010-2011 Curriculum coordination for an NSF STEP grant
- 2005-2007 Co-principal investigator with Joseph Howard, Student Balloon and Engineering Flight Payloads project sponsored through Wallops Island. (first year \$7000, second year \$8000)
- Spring 2000 MHEC Math/Science/Technology Grant, collaboration between the Education Department, Professional Development Schools, and Physics and Math departments. With Norman Frances (East Salisbury School science teacher), developed inquiry-based integrated physical science lesson and presented it to the student teachers' seminar class.
- 2003-2004 MHEC Science ADEPT grant. Curriculum development: Physics course for In-Service Middle School science teachers, taught course in Spring 2005.

Publications

Gail S. Welsh, Starlin D. Weaver, and Matthew A. Bailey, *Salisbury University PhysTEC Recruiting Grant Project*, American Physical Society Forum on Education Newsletter, (Fall 2015).

Gail S. Welsh, *Magnetic Therapy in Physics?*, *The Physics Teacher* **38**, 181 (2000).

Gail S. Welsh and James F. Annett, *Conjugate-gradient Calculations of Adatom Interactions*, *Physical Review B* **49**, 13921 (1994).

Neil D. Shrimpton, Gail S. Welsh, and Jinsuk Song, *The Uniaxial Phase of Alkali Metals on the FCC(100) Metal Surfaces*, *Physical Review B* **45**, 1403 (1992).

Student Publication

Louise D. Coltharp, *Effect of Starting Location on Clusters Formed by Diffusion-Limited Aggregation*, NCUR 2016 Proceedings (2016).

Selected Presentations

Starlin Weaver and Gail Welsh, *PhysTEC Recruiting Grant at Salisbury University*, invited targeted poster presentation, PhysTEC Conference, Baltimore, MD (March 2016).

Gail Welsh, invited speaker on panel at “Spotlight on Women in STEM” sponsored by the Salisbury University Scientista Foundation Chapter (May 2015).

David Rieck and Gail Welsh, *Process-Oriented Guided-Inquiry Learning in Physical Science*, joint presentation at the Teaching and Learning Conference (TLC), Salisbury University (January 2011).

Seth Friese, Anita Brown, and Gail Welsh, *Using Performance-Based Contract Grading to Increase Student Success*, joint presentation at the TLC, Salisbury University (January 2011).

Gail Welsh and David Rieck, *Lecture Activities for Engaging Elementary Education Majors in Physical Science*, paper presented by Gail Welsh at the American Association of Physics Teachers Summer Meeting, Salt Lake City, UT (August 2005).

Gail Welsh, invited speaker on panel at the 3rd annual “Pioneering Women of the Eastern Shore” at Wallops Island sponsored by the Women of Wallops Federal Women’s Program (October 2005).

Gail Welsh and Joseph Howard, *Integrated Inquiry-Based Lecture and Laboratory*, paper presented at the American Association of Physics Teachers Summer Meeting, Rochester, NY (July 2001).

Gail Welsh, *Writing to Learn Physics*, workshop presented to Washington High School faculty, Princess Anne, MD (June 2000).

Linda Bush and Gail Welsh, *Guiding Undergraduates Toward Better Communication in Science*, workshop presented at the Communicating Science Conference, Hamilton College (October 1998).

Gail S. Welsh and Charles R. McKenzie, *A Non-Traditional Approach Keeps Students Excited About Physics*, paper presented at the American Association of Physics Teachers Summer Meeting, University of Nebraska-Lincoln (August 1998).

Gail S. Welsh, *Teaching Techniques*, workshop presented for new faculty members at Salisbury State University (August 1997 and 1998).

Gail S. Welsh and C. Richard McKenzie, *Collaborative Learning Through Collaborative Teaching*, paper presented at Rethinking Key Issues in College Learning, Elon College (September 1997).

Gail S. Welsh, *Transforming Preconceptions into Physics: A Writing-to-Learn Activity*, workshop presented at the Writing Across the Curriculum Conference, Salisbury State University (September 1997).

C. Richard McKenzie and Gail S. Welsh, *Major Concepts in Physics: A Non-Traditional Approach*, paper presented at the Faculty Seminar Series, Henson School of Science, Salisbury State University (April 1997).

Gail S. Welsh, *Understanding Surface Defect Interactions*, paper presented at the Faculty Seminar Series, Henson School of Science, Salisbury State University (November 1994).

Other Professional and Service Activities

2014-present	University Academic Assessment Committee, member
2014-present	Salisbury University Scientista Chapter, student organization advisor
2008-present	Henson School of Science Curriculum Committee, member; Chair 2009-2010 and 2014-2015
2012-2013	Assessment of General Education Science Learning Goals
2011-2013	University Promotions Committee, member
2011-2013	Continuing Accreditation Team for the Professional Education Unit, member
2008-2011	Faculty Senate, member
2006-2007	Search Committee for Dean of Henson School, Chair
2001-2008	Commencement Committee, Co-Head Faculty Marshal
2002-2012	Secondary Education/ K-12 Committee and Teacher Education Council, member
2003-2006	Continuing Accreditation Team for the Professional Education Unit, member
2001-2004	Secondary Education Associate of Arts in Teaching (Maryland Partnership for Teaching and Learning K-16), Faculty Disciplinary (Physics) Committee, member and Co-Chair
2001-2002	Developed Physics Secondary Education Track, Salisbury University.

1997-2000 General Education Task Force, Salisbury State University, member.
 1999-2002 University Curriculum Committee, Salisbury State University, member.
 1995-2002 Henson School of Science Curriculum Committee, member and Chair.
 1995-1998 Salisbury State University-University of Maryland Eastern Shore Collaborative
 New Faculty Initiative, Co-coordinator.

Workshops and Tutorials Attended

March 2016 Physics Teacher Education Coalition Conference & PI meeting, Baltimore, MD.
 March 2015 Physics Teacher Education Coalition Conference & PI meeting, Seattle, WA.
 May 2011 Physics Teacher Education Coalition Conference, Austin, TX.
 August 2009 *Critical Thinking & the Art of Instruction*, one-day workshop, Salisbury University
 August 2005 *Research-based Alternatives to Problem Solving*, American Association of Physics
 Teachers (AAPT) Summer Meeting, Salt Lake City, UT.
 April 2005 *Professional Skills Development Workshop*, American Physical Society and the
 Committee for the Status of Women Physicists, Tampa, FL.
 May 2003 *Increasing the Retention of Under-Represented Groups – And the Learning of All
 Groups – In Science, Mathematics, Engineering and Technology Courses*, NSF
 National Chautauqua Workshop Program, University of Dayton, Dayton, OH.
 June 2003 Chair's Conference, ACE, Alexandria, VA.
 Spring 2002 *Classroom Assessment*, EDUC 532 course, Dr. Starlin Weaver, Salisbury
 University.
 January 2002 *Courage to Teach*, week-long retreat, College Park, MD.
 January 2001 *Problem-Based Learning*, one-day workshop, WorWic Community College.
 June 2000 *Process Workshops – A New Model for the Science Classroom*, NSF National
 Chautauqua Workshop Program, SUNY Stony Brook, Stony Brook, NY.
 Spring 2000 *Writing in the Disciplines Faculty Seminar*, Salisbury State University.
 August 1998 *Group Problem Solving with Interdisciplinary Emphasis*, American Association of
 Physics Teachers (AAPT) Summer Meeting, Lincoln, NE.
 May 1998 *Changing Science Courses to Promote Critical Thinking*, NSF National
 Chautauqua Workshop Program, Temple University, Philadelphia, PA.
 1996-1997 *Writing Across the Curriculum Faculty Seminar*, Salisbury State University.
 January 1995 *A New Approach to Introductory Electricity and Magnetism and The CASTLE
 Project: Electricity for the Right Side of the Brain*, AAPT Winter Meeting,
 Orlando, FL.

Selected Senior and Summer Student Research Projects

2014-2016 Computer Simulation of Diffusion-Limited Aggregation (one student, Summer
 2014 in the Summer Bridges for SUCCESS program, co-mentor Jeffrey Emmert;
 Fall 2014 – Fall 2015 independent study; Spring 2016 senior research project)
 2012 Computer Modeling of Adsorbate Configurations (two students, Guerrieri
 Undergraduate Summer Research and Fall 2012 senior research project, co-mentor
 Jeffrey Emmert)
 Spring 2006 Silicon Adsorbates (one student, senior research project)
 Spring 2003 Alkali Metal Adsorption (three students, senior research project)

Sabbatical Projects

Spring 2016 Diffusion-Limited Aggregation: modeling and electrodeposition experiments.
 Spring 2002 Portfolio and other assessment techniques applied to Modern Physics course.