
Ph.D. Physical Chemistry, University of Colorado**B.S.** Chemistry and **B.A.** French, University of Colorado

Objective

To work in a scientific, technical, engineering, and mathematical career

Skills

solve problems, assemble and interpret data, analyze and order complex systems, make mathematical models of physical and chemical processes, design data tables and graphics, write scientific and technical reports, prepare and give presentations

Professional Associations

American Physical Society (APS) and American Vacuum Society (AVS), and on LinkedIn

Postdoctoral–Visiting Assistant Professor of Physical Chemistry**2008 – 2013**

Creighton University (2011 – 2013), Department of Chemistry, 2500 California Plaza, Omaha, Nebraska, 68178

Lewis University (2010 – 2011), Department of Chemistry, One University Parkway, Romeoville, Illinois 60446

Linfield College (2008 – 2010), Department of Chemistry, 900 South Baker Street, McMinnville, Oregon 97128

Objective: to gain a broader and deeper foundation in the fundamental principles of physics and chemistry by teaching
Lectured on chemical kinetics and equilibrium, chemical and statistical thermodynamics, quantum mechanics, spectroscopy
Lectured on atomic layer deposition, thin films, solid–state materials, and surface and vacuum science
Lectured on metrology, scientific method and measurement, and basic electronics and optics of chemical instruments
Lectured on differential, integral, multivariable, and vector calculus; linear algebra; differential equations; and statistics
Developed and taught *Physical Chemistry*, *Instrumental Analysis*, *General Chemistry*, and corresponding *Laboratory* courses
Developed and taught *Science, Technology, and Society* course on the history, philosophy, and ethics of science
Developed and taught *Writing in Chemistry* and mentored students in preparing journal articles, posters, and presentations
Developed plans and materials for American Chemical Society (ACS) accreditation of the Chemistry Major

Postdoctoral Research Associate**2008**

Kansas State University, Department of Chemistry, 111 Willard Hall, Manhattan, Kansas 66506

Fabricated carbon nanofiber nanoelectrode arrays for oligonucleotide electrochemical biosensors

Optimized PECVD, thermal CVD, and sputtering systems for carbon nanofiber array growth and SiO₂ thin film deposition

Operated fluorescence microscope and potentiostat for optical–electrochemical analysis of sensors

Graduate Research Assistant**2002 – 2007**

University of Colorado, Department of Chemistry and Biochemistry, UCB 215, Boulder, Colorado 80309

Devised doctoral thesis on the mechanism for Atomic Layer Deposition (ALD) thin film nucleation and growth on polymers

Fabricated Al₂O₃ and TiN thin film nucleation layers on low-*k* polymer dielectric materials for integrated circuits

Fabricated W thin film on Co nanoparticles for industrial hard–metal and on carbon nanotubes for tunable electronics

Fabricated Al₂O₃ and W thin films on polymer substrates for diffusion barriers and flexible OLED displays

Performed extensive background research and presented seminars on:

nanostructured and solid–state materials; surface and vacuum science; thin film fabrication and characterization;

chemical process kinetics and engineering; and semiconductor, sensor, photovoltaic, and energy storage devices

Constructed an electronically automated ALD vacuum system for thin film growth

Maintained vacuum pumps, valves, flow meters, electronics, and pressure and temperature monitoring devices

Optimized reactor processes and ALD chemistry of Al₂O₃ and W thin films on flat substrates, polymers, and particles

Performed *in situ* experimental analysis of thin film growth with: quartz crystal microbalance, QMS, and FTIR

Performed *ex situ* analysis of thin film structural, electrical, thermal, and optical properties with:

profilometer, ellipsometer, four–point and mercury probes, AFM, TEM, XRD, XPS, SEM, and AES instruments

Programmed with Labview, prepared professional talks, managed research laboratory supplies and accounts

Rocky Mountain AVS Poster: *W ALD on Co Nanoparticles*, Golden, Colorado, August 2005

Rocky Mountain AVS Poster: *Al₂O₃ ALD on Polymers*, Golden, Colorado, August 2004

American Vacuum Society Talk: *TiN ALD on low-*k* dielectric*, Denver, Colorado, November 2002

Lecturer and Instructor**2007**

University of Colorado, Department of Chemistry and Biochemistry, UCB 215, Boulder, Colorado 80309

Assisted in teaching *Honors General Chemistry* lectures and demonstrations, and taught laboratories

Front Range Community College, 3645 West 112th Avenue, Westminster, Colorado 80031

Taught *General Chemistry* lectures and laboratories

NSF GK–12 Teaching Fellow	2003 – 2004
University of Colorado, Department of Chemistry and Biochemistry, UCB 215, Boulder, Colorado 80309 Collaborated with local high school science teachers on chemistry laboratory experiments	
Graduate Teaching Assistant and Laboratory Instructor	2002 – 2003
University of Colorado, Department of Chemistry and Biochemistry, UCB 215, Boulder, Colorado 80309 Taught <i>General Chemistry</i> , <i>Physical Chemistry</i> , and <i>Engineering General Chemistry</i> laboratories	
NSF REU Summer Undergraduate Research Assistant	2000
Grenoble Institute of Technology (INPG), 46, avenue Félix Viallet, 38031 Grenoble Cedex 1, France Fabricated optical waveguides in clean-room by physical vapor deposition of metals on chalcogenide glass Measured waveguide performance using lasers and optical bench equipment in optoelectronics laboratory	
Librarian	1999 – 2007
University of Colorado, Norlin Library, Boulder, Colorado 80309 Maintained book circulation and directed book stack and shelving operations	
Elementary School English Instructor	1998 – 1999
Ecole Elementaire du Centre, 20 rue de Beauvais, 60300 Senlis, France Taught English in eight 5 th Grade classes in four local public elementary schools Mastered French language fluency in reading, writing, and conversation	
Elementary Science Experiment Module Builder	1997 – 1998
University of Alabama Huntsville, HASP Science Partnership, Huntsville, Alabama 35899 Refurbished and trained teachers to use elementary science experiment modules in local public schools	
Physics Laboratory Assistant	1996
Louisiana School for Math, Science, and the Arts, 715 University Parkway, Natchitoches, Louisiana 71457 Taught mechanics laboratory and assisted with lecture for summer high school <i>Physics</i> course	
Diploma	1995
Alabama School of Mathematics and Science, 1255 Dauphin Street, Mobile, Alabama 36604 ACT Scores: Scientific Reasoning: 33, Mathematics: 33, Reading: 31, English: 29; Composite: 32 (99%ile) SAT Scores: Mathematics: 700 (93%ile), Verbal: 540 (64%ile); Composite: 1240	
Awards	1995
Eagle Scout, Boy Scouts of America	

Publications

- A. S. Cavanagh, C. A. Wilson, A. W. Weimer and S. M. George, Atomic layer deposition on gram quantities of multi-walled carbon nanotubes, *Nanotechnology* 20 (2009) 255602
- C. A. Wilson, D. N. Goldstein, J. A. McCormick, A. W. Weimer and S. M. George, Tungsten Atomic Layer Deposition on Cobalt Nanoparticles, *J. Vac. Sci. Technol. A* 26(3), May/June 2008, p430–437.
- C. A. Wilson, J. A. McCormick, A. S. Cavanagh, D. N. Goldstein, A. W. Weimer and S. M. George, Tungsten Atomic Layer Deposition on Polymers, *Thin Solid Films*, Volume 516, Issue 18, 31 July 2008, p6175–6185.
- C. A. Wilson, Al₂O₃ and W Atomic Layer Deposition on Polymers and Nanoparticles, *Thesis*, University of Colorado at Boulder, May 2007, p1–78.
- C. A. Wilson, R. K. Grubbs, and S. M. George, Nucleation and Growth during Al₂O₃ Atomic Layer Deposition on Polymers, *Chemistry of Materials*, Nov 2005, Vol. 17 Issue 23, p5625–5634.
- J. W. Elam, C. A. Wilson, M. Schuisky, Z. A. Sechrist, and S. M. George, Improved nucleation of TiN atomic layer deposition films on SiLK low-κ polymer dielectric using Al₂O₃ atomic layer deposition adhesion layer, *J. Vac. Sci. Technol. B* 21(3), May/June 2003.
- S. M. George, J. D. Ferguson, A. W. Weimer and C. A. Wilson, Method for the Deposition of an Inorganic Film on an Organic Polymer, U. S. Patent Application 20040194691, PCT International Publication Number WO 03/008110 A1.