Kevin J. Conley

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CURRICULUM VITAE

EDUCATION

PhD, Physics, Wake Forest University 2008
Advisor: Natalie A. W. Holzwarth
MS, Physics, Michigan State University 1993
Advisor: **David Tománek**
BS, Professional Physics, University of Oklahoma 1990
J. Clarence Kartcher Merit Scholarship, 1988-1990

EXPERIENCE

Program Coordinator, Nanotechnology Education 2007+
Forsyth Technical Community College
Student, Faculty, and Staff-chosen Reynolds Excellence in Teaching Award (2007)
Instructor of Physical Science 1994-2006
Forsyth Technical Community College
Developed undergraduate physics and high-school level mathematics courses
Natural Science Instructor 1995
North Carolina Governor's School West
Numerically simulated stellar C-N-O fusion cycle with elite high school students
Research Assistant 1993
Michigan State University, advised by David Tománek
Conducted semiclassical and quantum calculations of Fullerene dynamics and structure
Teaching Assistant 1991-1992
Michigan State University, Lyman Briggs School of Science
Taught electronics and mechanics laboratory for pre-med students
Research Fellow 1990-1991
Technical University of Berlin, advised by Eckerhard Schöll
Developed Monte Carlo simulations of chaotic electron transport in semiconductors
Research Assistant 1990
University of Oklahoma, advised by Michael A. Morrison
Calculated quantum-mechanical hyperfine scattering cross-sections of NH_3 with H_2
Teaching Assistant 1989-1990
University of Oklahoma
Taught mechanics laboratory for non-science majors
Research Fellow 1989
Rice University, advised by **Richard Smalley** [Nobel Prize in Chemistry 1996]
Numerically simulated ion cyclotron-resonance chamber designs for C_{60} confinement

FUNDING

Authored and awarded $136,343 from the North Carolina BioNetwork for the development of a Biological Atomic-Force Microscopy course to benefit the Biotechnology and Nano-technology Associate in Applied Science [AAS] degree programs at Forsyth Tech, 2008

Authored and awarded $500,000 from the Wachovia Corporation to establish an Atomic Force Microscopy [AFM] Laboratory for the Associate of Applied Science in Nanotechnology Degree Program at Forsyth Technical Community College, 2005

Awarded $6,000 scholarship from the University of Oklahoma's Department of International Programs and Department of Physics and Astronomy for study abroad to take courses and do research in the physics department at the Technical University of Berlin, 1990

Awarded $1,000 annual J. Clarence Kartcher Merit Scholarship from the University of Oklahoma's Department of Physics and Astronomy, 1988-1990

PROGRAM DEVELOPMENT

Authored the State Standard for the Associate of Applied Science in Nanotechnology Degree Program for the North Carolina Community College System, 2004

- comprehensive Program Competencies
- four-semester Curriculum Model
- eight new Course Descriptions
- supplementary Course Requirements in Engineering Technology

Established partnership with David Carroll, Director of the Wake Forest University Center for Nanotechnology and Molecular Materials, for access to laboratory resources, 2004

- electron microscopy
- nanofluid fabrication
- thin film fabrication

Conduct outreach for Forsyth Technical Community College's Nanotechnology Program

- middle school, high school, and college students
- faculty, staff, and board of trustees
- North Carolina State Community College System
- Biology, Chemistry, Physics, and Engineering audiences
- international, national, and local business groups and leaders

Set budgets, purchase equipment, and manage AFM and fluorescence microscopy laboratory

Hire and supervise adjunct faculty to teach safety and laboratory courses in nanotechnology

Advise other colleges on the development of AAS in Nanotechnology Degree Programs

Attend local, regional, and national conferences on nanotechnology

Maintain mutually beneficial relationships with key professionals in local industry and academia

Place students in mandatory 160-hour Cooperative Education positions with local companies

COURSE DEVELOPMENT

NAN 251 Biological Atomic-Force Microscopy (2008)
Studies of biological systems including cells, organelles, DNA, proteins, and synthetic biostructures with liquid AFMs and epifluorescence optical microscopes

NAN 243 Atomic-Force Microscopy (2008)
Studies of nanostructures, polymers, and solid-state materials with conducting SPM, nonconducting topology AFM, and force-probing AFM

NAN 112 Fundamentals of Nanoscience (2006-2007)
Incorporated elements of organic chemistry, cell biology, and modern physics

NAN 111 Introduction to Nanotechnology (2005-2006)
Developed distance-learning "Discussion Board Management by Students"

PHY 110 Conceptual Physics (2003-2006)
Developed hybrid distance-learning website delivery with in-class laboratory

PHY 132 Electricity & Magnetism (2000)
Developed "Circuits and Schematics" workshop curriculum

PHY 151 and 152 College Physics with Trigonometry (1996-1998)
Adapted Priscilla Laws' [Dickinson College] "Workshop Physics" curriculum for local use

PHY 251 and 252 General Physics I and II with Calculus (1995-1997)
Incorporated lessons from Short Course Chautauqua on "Insights into Introductory Physics Teaching" led by Arnold Arons [University of Washington]

TEACHING PRESENTATIONS

"The Nanotechnology Degree Program at Forsyth Technical Community College"
[Invited] Global National Science and Engineering Education Conference on Nanotechnology, Washington DC, 2008

BioNetwork BioLink Conference, Community College 2007

[Invited] Two Year College Chemistry Consortium, Wake Technical Community College, Raleigh, NC, 2007

North Carolina Section-AAPT Spring Meeting, Raleigh, NC, 2006

[Invited] BioNetwork BioLink Conference, Central Carolina Community College, Sanford, NC 2006

North Carolina Section-AAPT Fall Meeting, Duke University, Durham, NC, 2005

"Demonstrating the Essential Equations of Waves for PHY133 Light and Sound"
NCS-AAPT Fall Meeting, Forsyth Tech Community College, Winston-Salem, NC, 1997

"Workshop Physics at Forsyth Technical Community College: Technology, Pedagogy, and Evaluation" [Invited] with fellow instructors Mary Avery and Robert Tyndall, National Institute for Staff and Organizational Development, Austin, TX, 1996

OUTREACH

Lectures and demonstrations for NanoDays with SciWorks Science Museum, Winston-Salem, NC, in preparation for 2009

Forsyth Tech "Physics at the Dixie Classic Fair", 1996-2008

Nanotech Students present live AFM demonstration at the Appalachian Regional Microscopy Conference, Appalachian State University, Boone, NC 2008

Nanotech Students staff a booth at the Third Annual North Carolina Nanotech Conference, Salem College, Winston-Salem, NC 2008

"The Nanotechnology Degree Program at Forsyth Technical Community College"

- Elkin Middle and High Schools, Elkin, NC, 2008
- West Forsyth High School, Winston-Salem, NC 2008
- Lewisville Rotary Club, Lewisville, NC 2008
- Camp Flat World (inspired by the writing of Thomas Friedman), Greensboro, NC 2008
- Winston-Salem Engineers' Society, Winston-Salem, NC 2008
- North Carolina Annual Nanotechnology Conference, Greensboro, NC, 2007-2008
- Triad BioSummer Program at Atkins High School, Winston-Salem, NC 2006-2008
- Monthly visits of local 8-12 graders to Forsyth Tech, 2005-2008
- North Carolina State Legislature, Raleigh, NC 2007
- Lee A. Chaden, CEO, Hanes Brands, Winston-Salem, NC, 2006
- Forsyth Tech Foundation, 2006
- Chris Price, Director, Piedmont Triad Research Park, Winston-Salem, NC, 2005
- Ledford High School, Ledford, NC 2005
- IEEE, Winston-Salem, NC, 2004

The Small Times, the premier magazine covering international nanotechnology, publishes a five-paragraph overview of Forsyth Tech's nanotechnology program in article: "Community colleges are critical", May 2007.
http://www.smalltimes.com/display_article/292544/109/ARTCL/none/none/Community-colleges-are-critical/

Winston Salem Sunday Journal publishes as their feature article in their Sunday Business section: "Building Jobs: Forsyth Tech is working to get students ready to be a part of the nanotechnology work force", April 1, 2007.

Winston Salem Journal publishes article: "Wachovia supports new FTCC program – It gives $500,000 for nanotechnology", February 27, 2007.

The North Carolina Board of Science and Technology posts a feature article: "On the cutting edge: Community college training for the nanotechnology workforce", October 6, 2006.
http://www.ncnanotechnology.com/public/nanotechnology/Forsyth-Tech.asp

"Celebrating a Century of Physics and Society"
North Carolina Section-AAPT Spring Meeting, Raleigh, NC, 2000

"A Philosophical Society Grows in Dixie"
with James Fortuna [philosophy], Allen Pinnix [history], and Nathaniel Gough [English], National Conference for the Humanities and the Arts Winston-Salem, NC, 1998

"Runaway Change: Albert Bartlett's Ideas on Exponential Growth and Non-Sustainability"
Forsyth Tech Philosophical Society, 1998

ACADEMIC SERVICE

Participant, BioMed Atomic-Force Microscopy Conference, Monterey CA, 2008

Participant, Southern Growth Policies Board Nano Network Summit, Raleigh, NC, 2008

Participant, Nano Science and Technology Institute Conference, Boston, MA 2008

Participant, Summit on Southern Nano Network, Oak Ridge National Laboratories, TN 2006

Participant, Forsyth Tech President's Strategic Planning Retreat, Technology Committee, 2005

Lecture Series Organizer, "Celebrating a Century of Physics and Society" – inspired by the APS Centennial Posters – a six-part monthly series showcasing the music, history, science, and food of Nobel Laureates and their home countries, made possible by the talents of faculty, staff, and students, and attended by 300 Forsyth Tech students, 1999

Faculty Co-Sponsor, Forsyth Tech Philosophical Society, 1996-1998

President, Forsyth Tech Faculty Senate, 1996-1997

Interpreter, "Impression 5 Science Center", Lansing, MI, 1994

Founding Member, Michigan State University's "Science Theatre" Outreach Program
East Lansing, MI, 1991-1992

Secured departmental funding for eight OU SPS members to attend SPS Texas Section meetings in Lubbock, Houston, San Antonio, and Austin, TX 1988-1990

Founding President, University of Oklahoma Chapter, Society of Physics Students [OU SPS]
Norman, OK, 1988-1990

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UNDERGRADUATE RESEARCH INVOLVEMENT

"Are There One or Three Types of Visual Receptor Cones in the Human Eye? A Study with Fluorescence Microscopy", Aziz Ahmad [AAS Biotech, 2010], Forsyth Technical Community College, 2010

"Comparative Morphology of Recyclable Plastics at the Nanoscale with Atomic-Force Microscopy", Garland Vacanti [AAS Nanotechnology, 2009], Forsyth Technical Community College, 2008

"A Dirac-to-Schrödinger Troullier-Martins Pseudopotential Method Incorporating Spin-Orbit and Relativistic Effects", Marc Bishop and Chris Walburn [BS Chemical Engineering, North Carolina A&T University, 2008] Forsyth Technical Community College, 2005

"An Implementation of the Block-Galerkin Matrix Diagonalization Method"
Aaron Clauset [BS Physics & Computer Science, Haverford College, 2003] REU Student (sponsored by Natalie A. W. Holzwarth), Wake Forest University, 1998

"An Overview of Quantum Mechanics and Chaotic Dynamics"
Drury Fulcher [AAS 1999], Forsyth Technical Community College, presented at the North Carolina Section of the American Association of Physics Teachers [NCS-AAPT], The University of North Carolina Asheville, Asheville, NC, 1998

UNDERGRADUATES MENTORED

Corey Whitt [AAS Nanotechnology, 2008], Research with PureLux nanotech company, 2007

Michael Owens [Nanotechnology], Forsyth Tech CoOp Student of the Year Award (2007) for work with the Wake Forest University Office of Asset and Technology Management

Jessica Kennedy, [Calculus-Based Physics, 2007], North Carolina State University, Biomedical Engineering

Matthew Renn [Conceptual Physics, 2006], St. John's College, New Mexico, Liberal Studies

Linette Poole [Conceptual Physics, 2005], Virginia Commonwealth University, Forensic Science

Valerie Rydberg [Conceptual Physics, 2005], Wake Forest University, MS in Physical Therapy

Chris Walburn [Calculus-Based Physics, AAS 2004], BS in Chemical Engineering, North Carolina A&T University, 2008

Brandon White [Conceptual Physics, 2004], Air Force Academy, Space Programs [BS 2008]

Chad Bell [Calculus-Based Physics, AAS 1999], North Carolina State University, Mathematics [BS 2002], High School Instructor of Mathematics [2004-2007]

Jeffrey Backus [Calculus-Based Physics, AAS 1999], North Carolina State University, Degrees in Computer Science, Mechanical Engineering, and Electrical Engineering [BS 2004]

Monique Wilkins [College Physics, AAS 1998], University of North Carolina-Chapel Hill, Philosophy [BS 2001]

Terry Bennett [Calculus-Based Physics, AAS 1998], Research position with Wake Forest University School of Medicine [2003-present]

Darryl Starnes [Calculus-Based Physics, AAS 1995], North Carolina A&T State University, Nuclear Engineering [BS 2002], Duke Power [1993-present]

RESEARCH PRESENTATIONS

"A Relativistic Implementation of the Projector Augmented-Wave Method"
Electronic Structure '05, Cornell University, Ithaca, NY, 2005
"A Relativistic Implementation of the Projector Augmented-Wave Method"
North Carolina Section – AAPT Fall Meeting, Duke University, Durham, NC 2005
"The Dispersion-Mode Polarization Problem in Circular Fiber-Optic Waveguides"
Wake Forest University Graduate Student Research Day, Winston-Salem, NC 1998
"Vibrational Spectra of Multi-Shelled Fullerenes"
Midwest Theory Conference, Detroit, MI, 1993
"Monte Carlo Calculations of Chaotic Electron Transport in Semiconductors"
Michigan State University Graduate Journal Club, East Lansing, MI, 1993
"Molecular Hyperfine Scattering Cross-Sections of NH_3 with H_2"
APS Division of Atomic, Molecular, and Optical Physics, Monterey, CA, 1990
"Design and Analysis of the 'Boxing Ring' Ion Cyclotron Resonance Cell"
Texas Section of the Society of Physics Students [SPS], San Antonio, TX, 1989

RESEARCH PUBLICATIONS

"A Dirac All-Electron Basis and Spin-Orbit Coupled Projector Implementation of the Projector Augmented Wave Method for Atomic Systems"
Ph.D. thesis, advised by Natalie A. W. Holzwarth, Wake Forest University (2008)
"Foraging Energetics of Great Egrets and Snowy Egrets"
John N. Brzorad, Alan D. Maccarone, and Kevin J. Conley
Journal of Field Ornithology, 75(3):266-280 (2004)
"Vibrational Spectra of Multi-Shelled Fullerenes"
Tibor F. Nagy, Kevin J. Conley, and David Tománek
Physical Review B 50, 12207 (1994)