Curt W. Foltz foltzc@marshall.edu (304) 208-2473

Dep’t of Physics / Sci.252 Marshall University Huntington, WV 25701

Education:

PhD '91 May, The Catholic University of America, Experimental Nuclear Physics
thesis: *Investigation of 36Ar and 38Ar Nuclei via Inelastic Electron Scattering*

M.S. '85 May, The Catholic University of America, Experimental Physics

 '81 fall coursework in Secondary Ed (Math, Phys, Chem) at Edinboro State University (PA)
'80-81 graduate coursework in Physics & Math at Ohio State University

B.S. '80 May, The Pennsylvania State University, Physics
thesis: *Molecular Dynamics Investigation of Retinene Photoabsorption*

Post-Secondary Academic Employment:

'08 Aug - present: Assistant Prof.
Department of Physics, Marshall University, Huntington WV
(Teaching Physical Science Studio, College Physics I & II and Labs, University Physics I & II, History & Philosophy of Science, Modern Physics and Lab, Jr/Sr. Electronics and Lab)

'02 Aug – '08 Jun: Assistant Prof.
Physics Department, Clarion University of Pennsylvania, Clarion PA
(Teaching Physical Science, College Physics, Univ.Physics, Electronics, Optics, Advanced Labs)

'01 Aug – '02 May: Visiting Assistant Prof.
Physics Department, Illinois Wesleyan University, Bloomington IL
(Teaching College Physics I & II and their Labs, University Physics Labs, Jr/Sr Optics)

'00 Aug - '01 Jul: Visiting Assistant Prof.
Department of Geology & Physics, Lock Haven University, Lock Haven PA
(Teaching College Physics I & II and Labs, Engineering Statics & Dynamics)

'97 Jul - '00 Jul present: Lecturer - Lecture Support
Department of Physics & Astro, Univ.of Massachusetts-Amherst, Amherst MA
(lecture demonstrations: equipment assembly, repair, design & construction; software writing: exam & classwork grading & analysis, teaching evaluation analysis; pedagogy; teach; outreach)

'95 Aug - '97 Jun: Lecturer - Academic Staff
Department of Physics & Astro, Univ.Wisconsin - Oshkosh, Oshkosh WI
(Teaching Electronics, Engineering Statics&Dynamics, Phys.Sci./Elem.Ed, Astro & Labs)

'93 Aug - '95 Aug: Visiting Assistant Prof.
Physics Department, St. Lawrence University, Canton NY
(Teaching CollegePhys & Labs, Math.Phys, Senior Projects, Adv.Lab, Astro & Lab)

'92 Aug - '93 Aug: Visiting Assistant Prof.
Physics Department, Western Maryland College, Westminster MD
(Teaching Advanced Mechanics, E&M.II, Electronics, Univ.Phys & Lab, Astro&Lab)

'91 Aug - '92 Aug: Assistant Prof
Dep't of Physics & Physical Science, Univ.Nebraska at Kearney, Kearney NE
(Teaching Coll.Phys & Labs, Astro & Lab, Phys.Sci; Directed observatory & planetarium)

'84 Nov - '90 Dec: Research Assistant
Experimental Nuclear Group, Physics Dep't, Catholic Univ., Washington DC
(electron scattering experiments; design, produce, install, data collect & analyze, report)

'82 Jan - '85 May: Teaching Assistant
Physics Department, Catholic University, Washington DC
(Teaching Univ.Physics recitations & labs, Jr/Sr. Electronics & Lab, Intro Astronomy Labs)

Teaching Experience (through 2022 Fall):

Advanced Classical Physics: course, **2** sections (for Sr.Physics majors)
Lagrangian, Hamiltonian, Poisson; inertia, stress, strain, field tensors in flow; antennas & waveguides.

Advanced Experimentation: course, **6** sections (for Jr./Sr. Physics majors)
design, optimize & interpret experiments with multiple parameters. High Vac., Low Temp., Optical, electronic, & interfacing techniques. Proposal-writing, in-progress poster, timed paper, article.

Intermediate Optics: course, **3** sections; lab, **3** sections (for Jr/Sr. Physics majors)
lens aberrations; photometry; polarization; interference & interferometry; spectrometry & lasing

Intermediate Experimentation: course, **5** sections (for So./Jr. Physics majors)
 standard statistical, computational, mechanical, optical, electronic and vacuum techniques.

Math Methods of Physics: course, **2** sections (for Jr.Physics majors)
 Vectors & fields; grad, div, curl; Stokes, Gauss, Green theorems. Complex functions; transforms of Fourier & Laplace. Differential eq'ns; approx. sol’ns & bases. Random & stochastic models.

Electronics: course, **11** sections; lab, **15** sections (mostly Physics majors)
DC, AC, LCR; diodes, transistors, FET’s, *etc* (incl.tubes); feedback, op amps, oscillators, *etc*.;
sensors & transducers, active filters; ADC & DAC; logic gates, latches, registers; adders, ALU

Modern Physics: course, **1** section; lab, **2** section (mostly physics majors)
intro Relativity, photons & matter waves, 1-d quantum; atoms, solid state, distributions, nuclei

History & Philosophy of Science: course, **11** sections; including the lab
for Secondary & Middle School Science Education majors

University Physics I: course, **7** sections; discussion, **5** sections; lab, **14** sections
new labs for PC’s: constant a, impulse-momentum, Brownian motion, gas PVT, etc.

University Physics II: course, **11** sections; discussion, **7** sections; lab, **6** sections

College Physics I: course, **20** sections; lab, **34** sections … mechanics, thermo, waves
(for Bioscience majors and health fields) with vector trig and atomic-level thermal explanations

College Physics II: course, **29** sections; lab, **46** sections
E&M, Optics, atoms, nuclei. new labs for capacitors, ion conduction, diffusion, EKG, beta rays, etc.

Engineering Vector Statics: course, **4** sections
usually with spreadsheet computations as well (sometimes Maple or MathCad)

Engineering Vector Dynamics: course, **3** sections
with and without feedback-controlled forces (e.g, from processors with delay)

College Physics of Energy & Environment: course, **1** section – I created this course
physics, technology, implementation issues of Energy Alternatives and Environmental Impact

Intro Astronomy: course, **9** sections; lab, **18** sections (diverse clientele)
1-semester survey, mostly for Gen.Ed, but Physical Science majors should get a solid foundation.

Intro Solar System Astronomy: course, **6** sections; (diverse clientele)
half of a 2-semester sequence; formation, development, and properties of planets

Stellar Astronomy: course, **4** sections; (diverse clientele)
half of 2-semester sequence; formation, development, properties of stars, galaxies, and cosmology

Conceptual 20th Century Physics: course, **1** section – I created this course.
Modern Physics underlies the technology for medicine, cell phones, and new energy sources.

Physical Science, Phys&Astro: course+labs, **29** sections (inquiry-based, for Elementary Ed.majors)
1-semester survey of Physics, Astronomy, Technology ; process-oriented, explicit pedagogy

Physical Science, Chem&Geo: course+labs, **13** sections (inquiry-based, for Elementary Ed.majors)
1-semester survey of Chemistry, Geology, Earth Science ; process-oriented, explicit pedagogy

Scholarship, Projects, and Research Activities:

prelim data: ***Static B-fields Influence Light’s Propagation Through Vacuum*** (for Am.J.Phys?)
prelim result : ½ Tesla makes n–1 ~ 3e–9 … Fabry-Perot resonator done … needs magnet-table

in progress: ***Using Bremstrahlung to measure GeV Electron Beam Energy*** (for Rev.Sci.Instr?)
external Brems spectrum can estimate CEBAF beam energy while providing trigger signal

repairing: ***Mass Measurement and Separation of Excited 34Co from 34Co After Gamma-Decay***
magnetic bottle/atom fountain with surround to catch recoiling nuclei after the gamma emission

designing: ***A New Relativity Experiment for the Modern Lab*** (for Am.J.Phys?)
radioactive betas are sorted by momentum, filtered by velocity, and have their Energy measured

back burner: ***Galactic Disk Mass Density Function ρ(z) from Star Velocity Axial Component vz(z)***
data-base consistency check => includes incorrect distances! … other databases?

back burner: ***Particle Deflection and Time Delay for Various Classical Dynamics Potentials***
exact result *cf* impulse approx: for positive, zero, imaginary mass ; in –r –n, e –b r /r, ln(r) potentials

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'08 Apr: ***Resonant Modes & Energy Gradients in SonoLuminescence*** (Advisor)
Charles Baran’s student project, poster presented at Undergrad Research Conf., Clarion, PA

'07 Apr: ***Efficiency of Heat Exchanger in a Solar Water Pasteurizer*** (Advisor)
Anthony Kline’s student project, poster presented at Undergrad Research Conf., Clarion, PA

'07 Mar: ***Temperature Profiles and Air Flow Through a Large Wood-Fired Kiln*** (Advisor)
Jason Lewis’ student project, presented at W.PA section AAPT Spring 2007 meeting.

'06 Sep: ***Energy Return Times for Various Solar Panel Configurations in NW PA*** (presentation)
*Life After Cheap Oil* , National Conference, Wilson College, Chambersburg PA

'06 Jul: ***Injecting Relativity Concepts into Physics I & II*** (poster, and discussion breakout leader)
AAPT Topical Conference: *Teaching General Relativity to Undergrads*, Syracuse, NY

'06 Apr: ***Viability of Making BioDiesel Fuel from Waste Cooking Oils in Clarion*** (Advisor)
Brayton Batson’s Student Project, results in Poster at Undergrad Research Conf., Clarion, PA

'06 Mar: ***Involving Students in Energy-Saving Competition among Clarion Dormitories*** (Advisor)
Heather Zielonka’s project, presented at W.PA Section AAPT Meeting, Monroeville PA

'05 Fall: ***A Method to Separate Fox Sedge Seeds from Chaff*** (Advisor)
Mariah Mills’ Student Project, results in Technical Report to Ernst Seeds, Meadville, PA

'05 Apr: ***Toward a Lab Experiment Relevant to Relativity*** (presentation),
Spring 2005 Western PA Section AAPT Meeting, Clarion, PA

'04 Oct: ***Is the Force Concept Inventory Worth Fixing?*** (presentation),
Fall 2004 Western PA Section AAPT Meeting, Edinboro PA

'04 Aug: ***CETP 5th Annual Conference, Workshop on Teacher Preparation*** (participant – organizer)
2-day workshop : constructivist strategies & active learning, Clarion Univ, PA

'03 Nov: ***What are They \*Really\* Thinking on the FCI?*** (poster session presentation),
2003 AAPT Calculus-Based Physics Conference, Arlington VA

'03 Aug: ***CETP 4th Annual Conference, Workshop on Teacher Preparation*** (participant)
2-day workshop : constructivist strategies & active learning, Edinboro Univ, PA

'03 May: ***Using IR Communication Devices for Active Learning*** (presentation)
2-days of workshops, Resources for the Electronic Classroom, West Chester Univ, PA

'03 Apr: ***Penn State Univ. Nanotechnology Short Course*** (participant)
3-day workshop introducing PSU’s Nanotech Center Curriculum, Univ.Park, PA

'02 May: ***Stable or Unstable: Nuclei as Capstone of the Algebra Physics Sequence*** (presentation)
Spring meeting of the Illinois Section of AAPT, at Joliet Jr College, Romeoville IL

'99 Mar: ***Using Pasco’s Science Workshop for Physics Labs*** (1/2 day workshop, co-presenter)
special workshop, Western Mass. Physics Teachers Alliance, at UMass Amherst

'97 Oct: ***Good Science, Bad Science, PseudoScience*** (presentation)
fall meeting, Western Massachusetts Physics Teachers Alliance, at UMass Amherst

'96 Aug: ***Powerful Ideas in Physical Science - Workshop*** (participant)
 2-day workshop: using PIIPS in schools/colleges, with AAPT, at College Park MD

'96 Apr: ***Causality, Non-Locality, and Determinism in Modern Physics*** (presentation)
the U.W.-Oshkosh Philosophy Club; Oshkosh, WI

'96 Mar: ***Undergraduate Teaching Improvement Council Faculty Colleg****e* (participant)
2½-day workshop: critical thinking, context-rich learning, at U.W.-Marinette WI

'95 Jun: ***Diversifying for Undergraduate Research*** (presentation)
HUGS 10th Anniversary Session, at CEBAF (Jefferson Labs); Newport News, VA

'95 Feb: ***Cooperative Learning: Success for All*** (participant)
1½-day workshop: groupwork strategies & techniques, at SUNY Potsdam, NY

'94 Apr: ***Demonstrations in Electricity and Magnetism*** (St.Lawrence Univ. team advisor/coach)
presentations by student teams in competition at SUNY Binghamton, NY

'94 Mar: ***Electroexcitation of Low-multipolarity Magnetic Transitions in 36Ar and 38Ar***Phys.Rev.C **49**, 1359 [includes only one method of distorted-wave corrections]

'93 Nov: ***The Teacher Scholar - the Interaction of Research and Teaching*** (participant)
1½-day: the place of research in undergrad curricula, at Clarkson U, Potsdam NY

'92 May: ***Nebraska Science and Math: Education 2000 Conference*** (task force co-leader)
5-day workshop: developed specific reforms required of pre-service teacher preparation.

'91 Oct: ***Discovering and Addressing Misconceptions in General Science***(presentation)Great Plains Planetarium Association, '91 Annual Meeting; Omaha NE

'91 Apr: ***Electroexcitation of Low-multipolarity Transitions in 36Ar and 38Ar***(presentation)American Physical Society, '91 Spring Meeting (Apr. *APS Bulletin*); Washington DC

'91 Feb: ***Investigation of 36Ar and 38Ar via Inelastic Electron Scattering*** (dissertation) University Microfilms Inc. ('91), Ann Arbor MI [compares distorted-wave corrections]

'87 Oct: ***Low-multipolarity Excitations in 36Ar by (e,e')***(presentation)
Nuclear Physics Division of APS, '87 Meeting (Sep. *APS Bulletin*); New Brunswick NJ

'86 Jun: ***In Search of (Dynamical) Skyrmion States***(presentation)Hampton U. Graduate School at CEBAF (transcript in *HUGS Proceedings*); Newport News, VA

'86 Apr: ***High Pressure Gas Target System for High Resolution Experiments***(presentation)1986 Photonuclear Gordon Conference (Abstract in *Proceedings*); New Hampshire

'83 Nov: ***Thin GeLi Detectors for Calorimetry and for Tagging of Electrons and Protons***Catholic University Nuclear Group internal report; copies available on request

'80 Apr: ***Molecular Dynamics Investigation of Retinene Photoabsorption***(presentation)Physics Department Senior Seminar, Penn State Univ.; University Park, PA

'77 Apr: ***A Symmetric Definition of the Derivative and its Anti-derivative***(presentation)
Pennsylvania meeting of the Am. Math Assoc., Carnegie-Mellon; Pittsburgh, PA

Directed Student Projects , unpublished (by year done) :

2019 : using an electron-gun as a plasma generator

2015 : UV from salon tanning-beds and their effect on human tissue

2009 : measured the X-ray spectrum from “scotch tape” as pulled from the roll

2008 : measured the etch/sputter rate of different ions at different voltage and focus

2007 : effectiveness of thermoelectric cooler (Peltier device) at various Temperatures

2007 : setup and control of an old tunable dye laser with a pulsed YAG exciter

2004 : test and calibrate a scanning electron microscope and atomic force microscope

2002 : do AC electric fish frequency-modulate intentionally ?

2001 : giving an abused bell-jar vacuum system new life as a plasma container

2000 : physics concept development in elementary school children

1999 : making large reflection holograms

1998-2000 : physics demonstrations and explanations in elementary schools
 (12-28 students/semester visited 9-26 classrooms in teams of 3-4, on 4 topics)

1997 : comparing conduction bands of amorphous photovoltaics : new *vs*. degraded

1996 : production and containment of a highly-charged plasma of protons

1995 : discerning the Electric Field produced by an individual fish among a school

1995 : turtles’ response to slowly-changing magnetic fields

1995 : measuring the critical temperature and critical field of high-Tc YCBO

1995 : photovoltaic cells as diodes and as current generators

1995 : using a fiber-optic Michelson interferometer as a remote sensor

1994 : photographing stellar spectra with a home-made portable spectrograph

1994 : electrical and optical properties of evaporated thin-film field-effect transistors

1994 : speed distribution of evaporating Sulfur atoms (in vacuum by time-of-flight)

1994 : effect of bias frequency and amplitude on remnant magnetization on audio tape

1993 : Cobalt-60 gamma-decay rate in a strong external magnetic field

1993 : bringing a very old transmission electron microscope back on-line

1993 : building a dc-ac power inverter (for W.Md’s portable telescope)

1992 : combustion efficiency of a race-car engine (in 5-d parameter space)

1992 : semi-automated search for new asteroids with UNK’s 16” Newtonian

1992 : construct & install meteor shower and bolide projector in UNK planetarium

1992 : computer control of UNK’s 16” Newtonian, with automatic star-seek

1991 : Wondering About the Star of Bethlehem (a new planetarium program)

1991 : using a CCD camera for computer imaging with U.N.Kearny’s long refractor

Recent Service to University and Academic Communities:

University: help CoEd around several of their Accreditation visits.
helped CITE with their most recent Accreditation visit.
participate in Commencements.

College: College of Science liaison to College of Education via CSLCITE.
wrote CoS Natural Science category requirements for our new Gen.Ed system.

Department: member on several Department Committees, Chair of a few Committees
responsible for Physics Department Assessment activities, data collection, and analysis
always participate in High School Physics Day (outreach).
usually participate in Green & White Days.
represented Physics to CoS Curriculum Committee when we established our AoE.

Discipline: *Homework Helper* (award level) on the *Physics Forums* international web site.
participate in *Ask A Scientist* national program to strive against pseudo-science.
member of the American Association of Physics Teachers (and its Appalachian Section)
member of the American Physical Society (and Divisions of Astrophysics and Nuclear,
 and forums on Education and History

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Recent References:

Dr. Huong Nguyen 304-696-2756 Dr. Thomas Wilson 304-696-2752

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