PETER WOJCIK, PH.D.

Instructor
Central Washington University
University of Idaho

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EDUCATION

Dec 2020 **University of Idaho**
Ph.D. Physics

Aug 2012 **Oregon State University**
M.S. Physics

Jun 2009 **Central Washington University**
B.S. Physics

EXPERIENCE

Mar 2024 - Present **Lecturer**
Central Washington University

Dec 2020 - Present **Instructor**
Independent Study in Idaho
University of Idaho

Jan 2022 - May 2022 **Instructor**
Southeast Missouri State University

Jan 2021 - May 2021
Aug 2017 - Dec 2017 **Instructor**
University of Idaho

COURSES

PHYS 110: Math for Introductory Physics
Central Washington University

PHYS 1111/1112: General Physics with Algebra I/II
University of Idaho • Independent Study in Idaho

PHYS 111: General Physics with Algebra I
University of Idaho

PHYS 112/113: General Physics with Algebra II/III
Central Washington University

PHYS 183: General Physics with Calculus III
Central Washington University

PH 341: Optics
Southeast Missouri State University

PHYS 341: Electromagnetic Fields I
University of Idaho

RESEARCH

McIlroy Research Group
University of Idaho

Research Areas: Nanoelectronic Device Fabrication, Electrical and Opto-electronic Characterization of Nanoelectronic Devices and Thin-films

Optoelectronic Properties of Single ZnO-Coated Nanocoils

Polycrystalline ZnO was coated onto silica nanocoils using atomic layer deposition and an electronic device consisting of a single ZnO-coated silica nanocoil was fabricated and used to investigate the photocurrent response of the ZnO layer using near-ultraviolet (405 nm) and sub-bandgap (532 and 633 nm) excitation. I was responsible for the the silica nanocoil growth, fabrication of the single ZnO-coated silica nanocoil device, electronic and optoelectronic characterization, acquisition of the scanning electron microscopy images, and the analyses of the data.

Publication: https://iopscience.iop.org/article/10.1088/1361-6528/abbcec

Structural and Electrical Properties of Single Carbon-Coated Nanocoils

A single GUITAR-coated silica nanocoil electronic device was fabricated and used to characterize GUITAR's electrical properties. Raman spectroscopic analyses of GUITAR and the measurements of the electrial resistivity and temperature coefficient of resistivity of 11 single GUITAR-coated silica nanocoil electronic devices indicated that GUITAR is a form of nanocrystalline graphite. I was responsible for the silica nanocoil growth, GUITAR deposition, the fabrication of the GUITAR-coated silica nanocoil device, electrical characterization, and the analyses of all electronic and Raman spectroscopic data.

Publication: https://www.mdpi.com/1996-1944/12/22/3794

Growth Characterization of Silica Nanocoils

A combination of scanning and transmission electron microscopy was used to characterize the individual stages of silica nanocoil growth to explore and understand the preliminary stages of the growth process and subsequent helical morphology. I performed all experiments, aquired all scanning electron microscopy images, and analyzed the experimental data.

Publication: https://iopscience.iop.org/article/10.1088/2053-1591/aa54dc

Minot Research Group
Oregon State University

Research Areas: Nanoelectronic Device Fabrication and Characterization

I designed and fabricated a graphene field-effect transistor (GFET) that was utilized as a biological sensor. I used a combination of atomic force microscopy, scanning electron microscopy, and Raman spectroscopy to characterize the surface properties of the graphene sheet and subsequently modified the annealing and device fabrication processes to create a GFET with optimal sensing characteristics.

Publication: https://iopscience.iop.org/article/10.1088/0957-4484/24/35/355502

TEACHING

I have over ten years of experience teaching undergraduate physics. My combined experience with asynchronous and synchronous online instruction, as well as in-person courses, has given me first-hand insight into the distinct challenges students face in each learning environment.

I use evidence-based practices to design course materials and implement assessments that measure students' conceptual understanding of fundamental physics concepts. Results from these assessments consistently demonstrate significant improvements in student learning with an overall average effect size of 1.37.

I have experience with all duties related to teaching in-person, and asynchronous and synchronous online physics courses, including scheduling, lecture preparation and delivery, development of homework, exams, and solutions, grading, troubleshooting laboratory equipment, and mentoring students through complex subject material.

CERTIFICATES

Aug 2012 **Professional Science Master's Certificate**
Oregon State University

The Professional Science Master's (PSM) Certificate bridges the gap between academia and the workplace with a curriculum that includes courses in finance, accounting, ethics, communications, and business management. The interdisciplinary approach to the PSM program provides students with professional training in scientific and business disciplines that are not included in traditional science master's or doctoral programs.

SKILLS

Device and Materials Characterization

Scanning Electron Microscopy | Atomic Force Microscopy | Optical Microscopy | Raman Spectroscopy | Electronic and Optoelectronic Device Characterization

Device Fabrication

Cleanroom Operations | Metal Deposition | Sputtering | Thermal Evaporation | Chemical Vapor Deposition Processes | Mask Design | Photolithography | Plasma Etching | High Vacuum Equipment

Computer

Windows | Mac | Linux | Perl | C Programming | Fortran | Canvas | Blackboard Learn | Microsoft Office | Mathematica | Adobe InDesign | Adobe Photoshop | Adobe Illustrator | Computer Aided Design (CAD)

Soft

Verbal Communication | Public Speaking | Organization | Analytical Reasoning | Creativity | Leadership | Problem Solving

PUBLICATIONS

Peter M Wojcik, Lyndon D Bastatas, Negar Rajabi, Pavel V Bakharev, and David N McIlroy. The effects of sub-bandgap transitions and the defect density of states on the photocurrent response of a single ZnO-coated silica nanospring. *Nanotechnology*, **2021**, *32*, 035202.

Peter M Wojcik, Negar Rajabi, Haoyu Zhu, David Estrada, Paul H Davis, Twinkle Pandhi, I Francis Cheng, and David N McIlroy. Utilizing a single silica nanospring as an insulating support to characterize the electrical transport and morphology of nanocrystalline graphite. *Materials*, **2019**, *12*, 3794.

Negar Rajabi, **Peter M Wojcik**, Lokendra R Khanal, You Qiang, and David N McIlroy. A comparison of the morphological and electrical properties of sol-gel dip coating and atomic layer deposition of ZnO on 3D nanospring mats. *Materials Research Express*, **2019**, *6*, 035902.

Peter M Wojcik, Pavel V Bakharev, Giancarlo Corti, and David N McIlroy. Nucleation, evolution, and growth dynamics of amorphous silica nanosprings. *Materials Research Express*, **2017**, *4*, 015004.

Dinesh Thapa, Jesse Huso, Kevin Miklos, **Peter M Wojcik**, David N McIlroy, John L Morrison, Caleb Corolewski, Matthew D McCluskey, Thomas J Williams, M Grant Norton, Leah Bergman. UV-luminescent MgZnO semiconductor alloys: nanostructure and optical properties. *Journal of Materials Science: Materials in Electronics*, **2017**, *28*, 25112520.

Isaiah O Gyan, **Peter M Wojcik**, D Eric Aston, David N McIlroy, I Francis Cheng. A Study of the Electrochemical Properties of a New Graphitic Material: GUITAR. *Chem-ElectroChem*, **2015**, *2*, 700706.

Grant Saltzgaber, **Peter M Wojcik**, Tal Sharf, Matthew R Leyden, Jenna L Wardini, Christopher A Heist, Adeniyi A Adenuga, Vincent T Remcho, and Ethan D Minot. Scalable Graphene Field-Effect Sensors for Specific Protein Detection. *Nanotechnology*, **2013**, *24*, 355502.

HONORS

American Association of Physics Teachers

Graduate Teaching Assistant Award
University of Idaho Department of Physics

Sigma Pi Sigma National Physics Honor Society

Alpha Sigma Lambda Honor Society

Omicron Delta Kappa National Leadership Honor Society

David R. Lammlein Scholarship Recipient
Society of Exploration Geophysicists