

Assistant Professor of Computing & Information Studies (CIS) (July 2022 - present)
Washington & Jefferson College, Washington, PA 15301

Fall 2022

- ~ CIS 105: Game Design and Development
- ~ CIS 112: Database Concepts
- ~ CIS 115: Information Technology and Society

Spring 2023

- ~ CIS 112 (01): Database Concepts
- ~ CIS 112 (02): Database Concepts
- ~ CIS 275: Web Design and Development

Fall 2023

- ~ CIS 105: Game Design and Development
- ~ CIS 112: Database Concepts
- ~ CIS 343: Advanced Data Analysis – Simulations

Spring 2024

- ~ CIS 112: Database Concepts
- ~ CIS 241: Introduction to Data Science

Fall 2024

- ~ CIS 105: Game Design and Development
- ~ CIS 275: Web and Mobile Development
- ~ CIS 343: Advanced Data Analysis – Simulations

Spring 2025 (scheduled)

- ~ CIS 112: Database Concepts
- ~ CIS 241: Introduction to Data Science
- ~ CIS 275: Web Design and Development

Courtesy research appointment: Adjunct Professor of Physics (November 2024 - present)
Carnegie Mellon University, Pittsburgh, PA 15213

EDUCATION

Ph.D. / M.S. in Physics, Carnegie Mellon University, Pittsburgh, PA 15213 (August 2022 / May 2019)

- ~ Thesis: [Characterizing \$\nu\$ and \$n\$ fluxes at the Spallation Neutron Source for the COHERENT experiment](#)
- ~ Honors: [Hugh Young Graduate Student Teaching Award](#), J. Michael McQuade Graduate Research Fellowship

B.A., Physics & Mathematics, Washington & Jefferson College, Washington, PA 15301 (May 2017)

- ~ Honors: *Summa Cum Laude*, Φ BK, $\Sigma\Pi\Sigma$, IIME, George Winchester Prize, Clyde Shepherd Atchison Prize

RESEARCH INTERESTS & MENTORING STUDENT PROJECTS

Data for Good for Education (D4G4ED)

June 2023 - present

Designing and documenting coursework and curricula to support student service-learning experiences in data science

- ~ Organizing annual workshops for data science educators (or any educator discussing data in courses) at liberal arts colleges, community colleges, faith-based institutions, and major research universities to develop shared resources and best practices for incorporating Data For Good in courses and scaffolding it throughout curricula

Low-energy neutrino interactions (COHERENT collaboration)

August 2017 - present

Producing precision measurements of neutrino interactions at Oak Ridge National Laboratory's Spallation Neutron Source

- ~ Modeling the neutrino production at the Spallation Neutron Source using a Geant4 simulation
 - Samuel Tello (CMU '26): updating the Second Target Station geometric model (May 2024 - present)
 - Margot Mahoney (CMU '24): predicting $\bar{\nu}_e$ production from target decay (May 2022 - January 2023)

RESEARCH INTERESTS & MENTORING STUDENT PROJECTS (CONT.)

- ≈ Monitoring the rate and energy of background neutrons coincident with neutrino signal using MARS
 - Hexiang Huang (CMU Ph.D. student): analyzing production run data (August 2024 - present)
 - Cassandra Yang (CMU '27): monitoring ambient 511-keV γ backgrounds (September 2024 - present)
 - Sean Adamski (W&J '24): validating simulation against new ^{60}Co calibrations (January - December 2023)
 - Jacques Moye (CMU '25): searching for 511-keV γ background in stored waveforms (May - December 2023)
- ≈ Contributed to design and commissioning studies for a D_2O detector to normalize neutrino flux
 - Eli Ward (UTK Ph.D. student): constructing analyses of production run data (June 2024 - present)
 - Igor Bernardi (UTK Ph.D. student): comparing simulations to commissioning data (June 2023 - present)

GRANT FUNDING

- ≈ CCL-US STEM Student Research Grant (submitted Spring 2023; funded June - December 2023)
 - Summer 2023 stipend and conference travel for Sean Adamski (W&J '24)
 - Travel to and accommodations at Oak Ridge National Laboratory to collect calibration data
- ≈ [DOE Office of Science Graduate Student Research Award](#) (Solicited 2021-1; funded January - July 2021)
 - Project title: Investigating neutrino and neutron fluxes at the Spallation Neutron Source
 - Collaborating DOE Scientist: Jason Newby, Oak Ridge National Laboratory

SERVICE & LEADERSHIP

In support of Washington & Jefferson College

- ≈ Serving as the pre-tenure faculty representative on the Strategic Planning Committee (September 2024 - present)
- ≈ Faculty Mentor for the Women's Field Hockey team (May 2024 - present)
- ≈ Invited panelist for a closed discussion with new faculty during in-person orientation (August 2024)
- ≈ Drove the Society of Physics Students to Edinboro, PA to view the total solar eclipse (April 8, 2024)
- ≈ Co-coordinated the development of an interdisciplinary Data Science minor and CIS major emphasis (AY 23-24)
- ≈ Board Member of the Elizabeth Forward Alumni and Friends Association (EFAFA) (January 2023 - present)
 - Developing relationships within the Elizabeth Forward High School Guidance Office
 - Serving as the primary point of contact for high school seniors applying for EFAFA scholarships
 - Working with W&J admissions staff to support recruitment and retention of Elizabeth Forward students

In support of the Computing & Information Studies Department

- ≈ Co-hosting Data Science Seminars for faculty and staff with interest in data (September 2024 - present)
- ≈ Hosting annual CIS Student Games Exhibits for the W&J community (and prospectives) (August 2022 - present)
- ≈ Designed a 300-level course on simulation design and collaborative development (CIS 343, approved Dec. 2023)
- ≈ Advising students pursuing a CIS major [currently: 7, historical total: 11] (Fall 2023 - present)
- ≈ Purchasing and organizing office supplies and electronics which support our pedagogies (Spring 2023 - present)
- ≈ Staffing major / minor exploration events for undecided and prospective students (August 2022 - present)

SERVICE & LEADERSHIP (CONT.)

In support of my research communities

- ~ Nominated: 3-year term on initial [APS DPF Coordinating Panel for Software and Computing](#) (November 2024)
- ~ Reviewing dissertation work as part of thesis committees for the following Ph.D. candidates:
 - Byron Daniel, Carnegie Mellon University (May 2024 - present, expected defense May 2025)
 - Gen Li, Carnegie Mellon University (May 2024 - present, expected defense 2027+)
- ~ Computing & Software Coordinator for the COHERENT collaboration (June 2023 - present)
 - Ensuring proper data management, version control, and documentation for 30+ institutions
 - Monitoring shared grid computing resources, advising on efficient software development
 - Creating software containers to ease onboarding struggles for undergraduate researchers
- ~ Data Coordinator for the COHERENT collaboration (June 2020 - September 2022)
 - Maintaining accurate logs of data locations and backups across all subsystems and archival platforms
 - Routinely performing data archival, working with ORNL staff to procure storage drives as needed
 - Role merged with Computing & Software Coordinator in June 2024 (see data management above)
- ~ Graduate student member of COHERENT's Diversity and Inclusion Committee (July 2020 - August 2022)
- ~ Student member for the founding year of CMU's Physics Graduate Program Committee (August 2021 - 2022)
- ~ Junior Member Representative to the COHERENT Collaboration Board (January 2020 - January 2021)
- ~ Support for American Physical Society's Conferences for Undergraduate Women in Physics
 - Contributed to the national application review and chaired student talk session at virtual CUWiP 2021
 - [Led the logistical organization of and coordination of volunteers for PghCUWiP in 2020](#)
 - Assisted with networking events as a graduate student in 2019 (TCNJ) and 2021 (virtual)

RECENT COMMUNITY ENGAGEMENT

- ~ Organizer: [Workshop on Data for Good for Education](#)
Academic Data Science Alliance Annual Meeting, University of Michigan, Ann Arbor, MI (28 October 2024)
- ~ Contributed: COHERENT 101 – Software and Computing (Resources and Best Practices)
COHERENT Collaboration Meeting, Oak Ridge National Laboratory, TN (30 May 2024)
- ~ Invited: Dynamic Systems – Particles and People
W&J's Society of Physics Students' Accessible Research Colloquium, Washington, PA (8 February 2024)
- ~ Poster (*presented by Jacques Moyer*): MARS Neutron Measurements for COHERENT
Joint Meeting of the American Physical Society's Division of Nuclear Physics Annual Meeting and the Physical Society of Japan, Hilton Waikoloa Village, Island of Hawai'i (29 November 2023)
- ~ Poster (*presented by Sean Adamski*): Validating the simulation of a neutron spectrometer
Consortium for Computing Sciences in Colleges – Eastern Regional Meeting (CCSC-Eastern)
Bay Atlantic University, Washington DC (20 October 2023)
- ~ Invited: [Impact of low-energy pion-production measurements on COHERENT](#)
NA61++/SHINE: Physics opportunities from ions to pions [virtual], Geneva, Switzerland (15 December 2022)
- ~ Defense: Characterizing neutrino and neutron fluxes for the COHERENT experiment
Public Thesis Defense, Carnegie Mellon University, Pittsburgh, PA (12 August 2022)
- ~ Poster (*presented by Diana Parno*): [Neutrino-flux model for COHERENT](#)
XXX International Conference on Neutrino Physics and Astrophysics, Seoul, Korea (21 June 2022)

TECHNICAL SKILLS

- ≈ Programming:
 - Developer: python, Mathematica, C++, Geant4, ROOT, PostgreSQL, GameMaker
 - User: SQLite, coda, Arduino, LabVIEW, MATLAB, Grafana, Docker, Apptainer
 - Techniques: large-scale data analysis, data visualization, data modeling and simulation, database design and management, basic instrument interfacing, data acquisition, containerization, playcentric game design
- ≈ Electronics: basic circuit construction, photomultiplier tube alterations, high voltage, data acquisition
- ≈ Other: basic glassblowing, basic machine shop experience

PUBLICATIONS

- ≈ [Accessing new physics with an undoped, cryogenic CsI CEvNS detector for COHERENT at the SNS](#)
COHERENT collaboration, Phys. Rev. D **109**, 092005 – 10 May 2024.
- ≈ [Measurement of Electron-Neutrino Charged-Current Cross Sections on \$^{127}\text{I}\$ with the COHERENT NaI \$\nu\text{E}\$ Detector](#), COHERENT collaboration, Phys. Rev. Lett. **131**, 221801 – 29 November 2023.
- ≈ [Measurement of \$^{nat}\text{Pb}\(\nu_e, Xn\)\$ production with a stopped-pion neutrino source](#)
COHERENT collaboration, Phys. Rev. D **108**, 072001 – 3 October 2023.
- ≈ [First Probe of Sub-GeV Dark Matter Beyond the Cosmological Expectation with the COHERENT CsI Detector at the SNS](#), COHERENT collaboration, Phys. Rev. Lett. **130**, 051803 – 3 February 2023.
- ≈ [Measurement of scintillation response of CsI\[Na\] to low-energy nuclear recoils by COHERENT](#)
COHERENT collaboration, JINST **17** P10034 – 21 October 2022.
- ≈ [COHERENT constraint on leptophobic dark matter using CsI data](#)
COHERENT collaboration, Phys. Rev. D **106** 052004 – 14 September 2022.
- ≈ [Measurement of the Coherent Elastic Neutrino-Nucleus Scattering Cross Section on CsI by COHERENT](#)
COHERENT collaboration (*Led internal peer review*), Phys. Rev. Lett. **129** 081801 – 17 August 2022.
- ≈ [Simulating the neutrino flux from the Spallation Neutron Source for the COHERENT experiment](#)
COHERENT collaboration (*Corresponding author*), Phys. Rev. D **106** 032003 – 2 August 2022.
- ≈ [Monitoring the SNS basement neutron background with the MARS detector](#)
COHERENT collaboration (*Working group contributor*), JINST **17** P03021 – 22 March 2022.
- ≈ [A D₂O detector for flux normalization of a pion decay-at-rest neutrino source](#)
COHERENT collaboration (*Working group contributor*), JINST **16** P08048 – 16 August 2021.
- ≈ [First Detection of Coherent Elastic Neutrino-Nucleus Scattering on Argon](#)
COHERENT collaboration, Phys. Rev. Lett. **126** 012002 – 7 January 2021.
- ≈ [Sensitivity of the COHERENT Experiment to Accelerator-Produced Dark Matter](#)
COHERENT collaboration, Phys. Rev. D **102** 052007 – 29 September 2020.
- ≈ [First constraint on coherent elastic neutrino-nucleus scattering in argon](#)
COHERENT collaboration, Phys. Rev. D. **100** 115020 – 9 December 2019.

PREPRINTS & WHITE PAPERS

- ≈ [First detection of coherent elastic neutrino-nucleus scattering on germanium](#)
COHERENT collaboration, arXiv:2406.13806 [hep-ex]
- ≈ [The COHERENT Experimental Program](#)
COHERENT collaboration, arXiv:2204.04575 [hep-ex]
- ≈ [COHERENT 2018 at the Spallation Neutron Source](#)
COHERENT collaboration, 2018 white paper. arXiv:1803.09183v2 [physics.ins-det]