

DUNCAN WILKIE

PERSONAL INFORMATION

Born Arkansas, 3 July 2002

email **Personal** · **Work**

"The aim of theory really is, to a great extent, that of systematically organizing past experience in such a way that the next generation, our students and their students and so on, will be able to absorb the essential aspects in as painless a way as possible..." — Sir Michael Atiyah

EDUCATION

2019–2023 **BS Physics, BS Mathematics** · **3.76 GPA**

*Louisiana State
University*

Dual degrees, *cum laude*. 15 hours of graduate-level math. Thesis: PyPHITS: A Python Porcelain for JAEA's PHITS.

RESEARCH PROJECTS AND WORK EXPERIENCE

June 2024— **Associate Software Engineer, Algorithm
Development and Optimization, MBTE**

*Northrop-
Grumman Systems
Corporation*

Developing industry-leading processes, procedures, and statistical methods for the requisition, integration, and validation of digital-twin models for naval aviation systems. Using digital-twin models and design of experiments techniques to significantly reduce flight test span.
Supervisor: Josue "Josh" TOBAR · Josue.Tobar@ngc.com

Spring 2023 **Heegaard Floer Homology of 1-1 Knots**

LSU Math 4997

Worked with a professor and graduate student on the mathematical study of a particularly powerful knot invariant. Automated the drawing of the diagrams used to compute this invariant, which were otherwise very time consuming, and did exploratory application of Prolog's Popper, an inductive logic programming framework, to automatically generate combinatorial conjectures from data.
Advisor: Jeffery CHANCELLOR · jeff@spartanphysics.com

*Oct 2022—
May 2023* **Research Commercialization**

Atlantis Industries

Hired as software engineer and research scientist by advisor's startup, among its first employees, to commercialize technologies developed in academia, on a grant from US Space Command.
Advisor: Jeffery CHANCELLOR · jeff@spartanphysics.com

*Nov 2021—
May 2023* **PHITS Usability Improvements**

SpaRTAN Physics

Designed and implemented a Python interface to the card-input Monte Carlo radiation transport code system the research group was using (and graduate students struggling with). This opened many further opportunities for integrating highly-validated transport simulations in larger HPC pipelines, especially the inverse design, medium-energy nuclear physics phenomenology, and computational phantom evaluation workloads that compose the lab's primary scientific output. Also developed an Emacs major mode for the input format and a POSIX-friendly invocation script. Advisor: Jeffery CHANCELLOR · jeff@spartanphysics.com

SpaRTAN Physics *Summer 2021* **Spaceflight Radiation Detector Development**

Primary software developer of an iOS-based interface for ADVACAM's MiniPIX detectors, doing 100% of the Swift app development and much of the embedded C implementation of Apple's proprietary iAP2 protocol. The product was intended to fly on SpaceX's Inspiration 4 mission, and is currently used in space medical physics research. Advisor: Jeffery CHANCELLOR · jeff@spartanphysics.com

J. B. Hunt
Transport Services *Summer 2020* **Data Science Intern**

Modernized the data pipelining, improved correctness and performance, and ported to Python an old SPSS model that estimated repair time of tractors from basic data (e.g. mileage, repair location). This model fed ERP software that repair centers used to schedule jobs, and had major implications for shop downtime. Worked with database systems, most of the features of scikit-learn, SPSS, Databricks, and the Azure DevOps platform.

PRESENTATIONS

LaSPACE Council Meeting *October 2021* **Embedded Development for Spaceflight Radiation Detectors**

Showcase of the summer 2021 research described above at a statewide poster session for undergraduate and graduate students funded through NASA EPSCoR.
Authors: Duncan Wilkie, Jacob Miller, Jared Taylor, Jeffery Chancellor

TEACHING

AY 2018 · High/elementary school math and ACT prep tutoring job.

Aug 2019—May 2023 · Informal homework help for other physics majors.

Fall 2020 · Engineering physics recitation leader.

Apr 2022— · Online, informal tutoring.

AWARDS AND SCHOLARSHIPS

2019–2023 · LSU Ann and Clarence P. Cazalot Jr College of Science Honors Scholar

2019–2023 · LSU President's Future Leader in Research

AY 2021 · NASA EPSCoR Louisiana Space Grant Consortium Undergraduate Research Assistantship

2022 · LSU Goldwater Fellowship Nominee

March 17, 2025