

# Adam Lastowka

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## Education

**Florida Institute of Technology**  
*Physics, Bachelor of Science*

Summa Cum Laude, April 2024  
GPA: 3.96

## Experience

**Florida Institute of Technology High Energy Physics Group**  
*Research Assistant*

Fall 2021 – Spring 2024  
Melbourne, FL

- Created a machine learning model to reconstruct the momenta of top quark pairs in the Large Hadron Collider (LHC) and characterize their quantum entanglement.
- Developed software to automate and improve gas electron multiplier detector DAQ and QC tests, characterized detector responses using X-Ray and radioisotope sources, and assisted in the design of a novel cylindrical micro-pattern gaseous detectors.

**Additional Research (Florida Tech)**  
*Research with various professors*

Fall 2021 – Present  
Melbourne, FL

- Writing numerical simulations to classify the orbits of rogue black holes for Florida Tech's galactic astrodynamics research group.
- Designed a data processing/deconvolution pipeline to characterize azimuthal muon flux using a pair of scintillating detectors.
- Studied the nuclear decay network and developed a new way to visualize the nuclear chart (all atoms and their isotopes); paper coming soon.
- Wrote and tested an approximate fast(er) Fourier transform algorithm for AVR microcontrollers in C.

**Temple University**  
*Research Assistant*

Summer 2022

- Worked with a team collaborating with Brookhaven National Laboratories to simulate and design a central particle tracker for the future Electron Ion Collider. Investigated detector configurations with simulations in Python and C++.

**University of Pennsylvania Complex Systems Group**  
*Research Assistant*

2014, 2017

- Developed a mathematical metric for impact score in the human musculo-skeletal network as a part of a neuroscience research project (2014) ([doi.org/10.1371/journal.pbio.2002811](https://doi.org/10.1371/journal.pbio.2002811))
- Used MATLAB and Python to analyze the evolution of semantic networks across scientific papers (2017).

**Open Connections**  
*Course Facilitator / Instructor*

A.Y. 2018

- Co-instructed a course in 3D modelling and FDM 3D printing to high school students. Additionally taught courses in drawing and animation.

# Skills and Interests

**Programming Languages:** Python, Java, C++, MATLAB, JavaScript, Shell

**Software/Systems:** Git, Linux, Autodesk Inventor, AutoCAD, Blender, Microsoft Office, etc.

**Hardware:** Electronics (oscilloscope, signal gen., HV DC power, etc.), Analog filters, Soldering, Microcontrollers, Radiation & X-rays, Detectors, Clean room etiquette, Laser cutters, 3D printers, Woodworking/metalworking

**Soft Skills:** Public speaking, Project management, Adaptability and enthusiasm, Technical communication, Presentation skills, Data visualization, Graphic design, Jazz piano & digital synthesizers

**Areas of Interest:** Image processing, Inverse problems, Chaotic systems, PDEs, Control Systems, Machine Learning, Tomography, simulations, Interdisciplinary projects, Getting usable results from unruly data / equipment

# Awards & Positions

- **Florida Tech**, *Outstanding Student Award in Physics* (A.Y. 2023-24)
- **Florida Tech**, *Distinguished Student Scholar* (Spring 2023 & 2024)
- **Florida Tech**, *Dean's List* (all semesters)
- **Phi Kappa Phi** (Honor Society)
- **Sigma Pi Sigma** (Physics Honor Society)
- **Florida Tech Astrobiological Research & Education Society**, *Future Astronaut Corps Member* (A.Y. 2023-24)

# Independent Work

## JWST Photo Bot (@JWSTPhotoBot)

Winter – Summer 2023

*An open-source bot to automatically query, tone-map, and upload new JWST photos to Twitter*

- I designed this bot to make 'raw' JWST photos more easily accessible to the public. It quickly gained thousands of followers. The bot is currently on indefinite hiatus due to high operating costs.
- Tools & Technologies used: AstroPy, PIL, Barbara A. Mikulski Archive for Space Telescopes (MAST)

## Personal Website (www.adamlastowka.com)

Winter 2021 – Present

*Articles on technical topics & a repository for my creative work*

- A responsive static website featuring technical / educational articles on projects
- Tools & Technologies used: HTML/CSS, JavaScript, MetalSmith, GitHub Pages

## Quadcopter

A.Y. 2018

*A quadcopter designed 'from scratch' (i.e. a custom-built chassis and stabilization system)*

- Collaborating with a small team, I built a Wi-Fi-enabled quadcopter with software-based attitude controls running in Python.
- Tools & Technologies used: Raspberry Pi, Python, various electronics

## Computer Graphics

*Skilled computer graphics programmer with intimate knowledge of color spaces & shaders*

Ongoing

- Created a real-time volumetric visualization of the atomic orbitals (Hydrogen-like atom eigenfunctions) with tailored Laguerre polynomial calculations.
- Created a 3D graphics engine in C++/OpenGL featuring a deferred rendering pipeline, soft shadows, ambient occlusion, and more.

## Assorted Programming Projects

Ongoing

*Diverse experience with computational methods & programming topics*

- Many programs in various languages: perceptual hashing, N-body simulations, neural networks, PDE solvers, motion tracking, demoscenes, cellular automata, etc.