

## Allison Liu

Motivated student seeking to provide programming and analysis experience to scientific applications.

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### WORK EXPERIENCE

**Laboratory for Atmospheric and Space Physics (LASP) - University of Colorado Boulder**

**Student Research Assistant, February 2021 - Present**

- Building, training, and optimizing a generative adversarial network to create a machine-learning ready dataset for solar flare prediction. Using historic and current magnetogram data—Data pre-processing and exploration, feature engineering, and statistical analysis of results.

**Kapteyn-Murnane Group, JILA - University of Colorado Boulder**

**Student Research Assistant, June 2017 - August 2020**

- Designed and built a commercial-quality M<sup>2</sup> laser diagnostic device in MATLAB. I interfaced multiple pieces of scientific equipment and created a graphical user interface to collect and analyze data. Later implemented a modified phase-retrieval algorithm to fully characterize a laser beam.
- Interfaced a novel laser system with an existing chemical engineering experiment.

### EDUCATION

**B.S. Applied Math, Computer Science Minor**

**University of Colorado Boulder, Expected Graduation May 2022**

- **GPA: 3.707/4.000**
- Relevant Coursework: Computer Science- Data Structures, Algorithms, Artificial Intelligence, Machine Learning, Software Development, Database Systems  
Math- Calculus, Probability, Linear Algebra, Numerical Analysis, Statistics, Chaos/Dynamical Systems  
**Current: Applied Deep Learning, Dynamic Models in Biology, Complex Analysis**
- Awards and Honors: Engineering Honors Program, BOLD Scholar, College of Engineering Dean's List
- Clubs and Organizations: Society of Women Engineers (SWE), CU Women's Ultimate Frisbee

### PUBLICATIONS

- L. Rego, K. Dorney, N. Brooks, Q. Nguyen, C. T. Liao, J. San Román, D. Couch, **A. Liu**, E. Pisanty, M. Lewenstein, L. Plaja, H. C. Kapteyn, M. M. Murnane, & C. Hernández-García. *Generation of extreme-ultraviolet beams with time-varying orbital angular momentum*. Science 364, 6447 (2019). DOI: 10.1126/science.aaw9486
- D. Couch, Q. Nguyen, **A. Liu**, D. Hickstein, H. Kapteyn, M. Murnane, & N. Labbe. *Detection of the Keto-Enol Tautomerization in Acetaldehyde, Acetone, Cyclohexanone, and Methyl Vinyl Ketone with a Novel VUV Light Source*. Proc. Combust. Inst. 38 (2021). DOI: 10.1010/j.proci.2020.06.139

### VOLUNTEERING

**Machine Learning STEM Camp, May 2021 – July 2021**

- Developed and taught machine learning curriculum to high school students for a STEM summer camp

**Partnerships for Informal Education in the Community (PISEC), February 2020 – May 2020**

- Volunteered weekly as a mentor for STEM students of underrepresented minorities outside of Boulder

### ADDITIONAL SKILLS AND INTERESTS

- Technical Languages: Python, MATLAB, C++, SQL, HTML, CSS
- Tools and Technologies: Mathematica, Unix/Linux, Git, Latex, Bash Shell
- CPR and First-Aid Certification
- Climbing gym routesetter at University of Colorado Boulder (September 2020-Present)