

# Kiera McCormick — CV

Johns Hopkins University

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## RESEARCH INTERESTS

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My research and work focus on the development of Large Language Models for higher scientific research, human and AI comparison and cooperation on Natural Language Processing tasks, advancing open-source science, prompt engineering, evaluating human-computer interactions, question-answer chatbot applications, and more. I am also interested in exploring the possibilities of machine learning for interdisciplinary fields, and machine translation.

## EDUCATION

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**Johns Hopkins University**

**Baltimore, MD**

*Masters of Science in Engineering in Computer Science*

Starting August 2025

- **Concentration:** Human Language Technology

**Loyola University Maryland**

**Baltimore, MD**

*Bachelor of Science in Engineering*

Graduated May 2025

- **Concentrations:** Electrical and Computer Engineering
- **Minor:** Mathematics
- **GPA:** 3.745
- **Dean's List Honors:** Fall 2021, Spring 2022, Fall 2022, Spring 2023, Fall 2023, Spring 2024, Fall 2024, Spring 2025
- **Relevant Coursework:** Physics I & II, Linear Circuit Analysis, Statics, Calculus I, II, III, Electronics, Digital Logic, Quantum Computing, Signals and Systems, Ordinary Differential Equations, Programming Tools, Object-Oriented Engineering Design, Probability and Statistics, FPGA Design, Communications, Linear Algebra, Electromagnetics, Microprocessor-Based Systems, Advanced Linear Algebra, Quantum Computing II, Power Systems, Engineering Systems Analysis

**Danish Institute for Study Abroad**

**Copenhagen, DK**

*Core Course: Holocaust and Genocide*

*Spring 2024*

## PROJECTS

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### Quantum Computer Simulator

Spring 2022

- Engineered a Quantum Computer simulator in Python, leveraging object-oriented programming principles in a semester-long collaborative project.

### Solar Panel Mars Rover

Fall 2023

- Collaborated in a four-person team to design and construct an autonomous Mars Rover prototype with innovative solar recharging capabilities.
- Spearheaded the development of the rover's motion control system using Arduino programming, optimizing mobility and navigation.
- Engineered a power conversion system to efficiently utilize solar energy for autonomous recharging.
- Implemented an advanced sun-tracking algorithm for the solar panel, maximizing energy collection in variable conditions.

### Hotspot Homing Robot

September 2024 – May 2025

- Developed an autonomous mobile robot designed to detect and localize rogue access points in office environments, sponsored and mentored by members of the Applied Signal Technology sector at Raytheon.
- Integrated wireless signal processing and detection techniques with navigation systems, such as Simultaneous Localization and Mapping, to create a comprehensive security solution.
- Collaborated with an interdisciplinary team to design a user-friendly interface for real-time threat visualization and reporting.

## RESEARCH AND WORK EXPERIENCE

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### Center for Astrophysics | Harvard & Smithsonian

Cambridge, MA

*AstroAI Summer Intern*

January 2025 – Present

- Utilizing prompt engineering to get the most discriminative physical information about astrophysical events identifiers listed in the Chandra Source Catalog and SIMBAD.
- Evaluating how physical information is encoded in LLM-generated summaries.
- Conducting astronomer validation of LLM-generated summaries through a standard protocol and web interface.

### Space Telescope Science Institute and Johns Hopkins University

Baltimore, MD

*Summer Astronomy Space Program and the Annual Jelinek Memorial Summer Workshop*

May 2024 – August 2024

- Examined the application of Artificial Intelligence and machine learning, particularly Large Language Models (LLMs), in astronomy research. Assessed the potential of LLMs to enhance research efficiency and reliability.
- Designed and implemented LLM-powered chatbots for deployment on Slack, specializing in prompt engineering, conducting comparisons between open and closed-source models, integrating information retrieval pipelines, and creating evaluation benchmark datasets.

### **Omega Technical Services at Los Alamos National Laboratory**

**Los Alamos, NM**

*Engineering Intern*

May 2023 – August 2023

- Collaborated with the industrial engineering team at the Los Alamos National Laboratory, focusing on task scheduling optimization through databases and automation. Transformed a previously manual task of job scheduling to an automated system.
- Utilized database coding and conducted data analysis using tools such as MicroStrategy, Excel, SQL, Python, VBA, and Confluence, contributing to the creation of metrics and dashboards for effective data visualization.
- Worked towards automating an extract, transform, load (ETL) pipeline through MariaDB, MS Task Scheduler, and Alteryx.

### **Loyola University Maryland**

**Baltimore, MD**

*Physics Teaching Assistant and Tutor*

September 2022 – May 2025

- Direct students in weekly Physics problems that align with their ongoing coursework.
- Work for two hours weekly in the Physics lab for students seeking help with specific topics.

### **University of Delaware**

**Newark, DE**

*Junior Physics Intern*

March 2020 – August 2020

- Contributed to an astrophysical research project analyzing the spectral characteristics and luminosity of massive stars. Developed Python scripts using Jupyter Notebook to process and visualize complex stellar data.
- Created data visualizations of spectral lines and magnitude measurements, enhancing the interpretation of stellar properties.

## **PUBLICATIONS**

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Note: \* first authorship.

- [\*Designing an Evaluation Framework for Large Language Models in Astronomy Research\*](#)
  - Wu, J. F., Hyk, A., **McCormick, K.**, Ye, C., et al., 2024, *ICML: AI4Science workshop*, submitted, arXiv:2405.20389.
- *\*Real-World Evaluations of LLMs for Astronomy Research*

- **McCormick, K.**, Hyk, A., Wu, J. F., 2024, *NeurIPS: EvalEval workshop*, submitted.
- [\*\\*From Queries to Criteria: Understanding How Astronomers Evaluate LLMs\*](#)
  - **McCormick, K.**, Hyk, A., Zhong, M., Ciucă, I., et al., 2025, *COLM*, accepted.
- [\*pathfinder: A Semantic Framework for Literature Review and Knowledge Discovery in Astronomy\*](#)
  - Iyer, K. G., Yunus, M., O'Neill, C., Ye, C., Hyk, A., **McCormick, K.**, et al., 2024, *ApJS* 275 38, arXiv:2408.01556.

## CONFERENCES

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Machine Learning conference/workshop paper reviewer for *NeurIPS*

Volunteer at the *AstroAI Workshop*

**Gender Minorities and Women in Physics Summit**

**Johns Hopkins University**

Poster Presentation

September 14, 2024

- Discussed work on the application of Large Language Models in Physics and Astronomy.

**American Astronomical Society 245**

**National Harbor, MD**

iPosters

January 11-16, 2025

- Presented “Evaluating Large Language Models in Astronomy Research” at the Machine Learning Methods session.
- Co-authored “pathfinder: a Semantic Framework for Literature Review and Knowledge Discovery in Astronomy” at the Machine Learning Methods session.

Talks

- Co-authored “Evaluating LLM Tools: Insights from Astronomer Interactions with a RAG-Based Slack Chatbot” at the Technology Developments in Outreach, Education, and Research session.

**AstroAI Workshop**

**Cambridge, MA**

Poster Presentation

July 7-11, 2025

- Presented “Evaluating Large Language Models in Astronomy Research”.

## TECHNICAL SKILLS

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Python, Java, SQL, VBA, C++, Git, MATLAB (certified), Simulink, Raspberry Pis, Arduinos, FPGAs, SolidWorks, LT Spice, Active HDL

Completion of the 2024 Summer School on Human Language Technology at Johns Hopkins University

## EXTRACURRICULAR ACTIVITIES

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**Society of Women Engineers**

*President*

**Baltimore, MD**

February 2023 – May 2025

**Engineering Industrial Advisory Board**

*Class of 2025 Representative*

**Baltimore, MD**

December 2023 – May 2025

**Loyola University Maryland Honors Program**

*Member and Peer Mentor*

**Baltimore, MD**

September 2021 – May 2025

**Haig Scholar**

*Member*

**Baltimore, MD**

February 2024 – May 2025

**Loyola Women's Club Lacrosse Team**

*Academic All-American*

**Baltimore, MD**

September 2022 – May 2025

**Institute of Electrical and Electronics Engineers**

*Member*

**Baltimore, MD**

October 2021 – May 2025