ISAAC MCMAHON

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EDUCATION

Carnegie Mellon University | Pittsburgh, PA | Bachelor of Science in Physics, Astrophysics Track Grad. May 2021
GPA 3.84 | Dean's List (F17 F18 S19 S20 Honors, S18 F19)

EXPERIENCE

Incompleteness in Photometric Redshift Estimation (May 2020 - Present)
McWilliams Center for Cosmology | Carnegie Mellon University

- Used machine learning to parse photometric data in order to classify galaxies by redshift and color
- Utilized Kohonen Self-Organizing Maps to reduce the galaxy dataset to a two-dimensional map in order to identify distinct populations of galaxies and the effect of incompleteness on their distribution
- Results accepted for presentation at the 237th AAS Meeting in January 2021.

Simulating Instrument Response to Electrons in EPI-Hi (Summer 2019)
Space Radiation Lab | California Institute of Technology

- Utilized GEANT4 simulations to model interactions between incident particles from the sun and instruments in EPI-Hi, an experiment on the Parker Solar Probe
- Using simulated electron response data, developed a method to approximate incident electron energy spectrums based on electron event data taken by EPI-Hi
- Applied this approximation method to real data taken by the Parker Solar Probe from an electron event early in 2019, results in co-authored pre-published paper being submitted to Astronomy & Astrophysics Journal.

Cold Atom Sources (Summer 2018)
Air Force Research Lab | Kirtland Air Force Base, Albuquerque, NM

- Designed and built a glass vacuum chamber for trapping atoms with a magneto-optical trap on a two-person team, to improve on previous military applications in atomic clocks, accelerometers, and other devices, Patent Pending
- Fabricated experimental chamber by cutting and milling glass, laser cutting and soldering chips, and assembling, then placed experimental chamber under vacuum and started an experiment to verify the ability of the chamber to control Rubidium atom flow into its laser beam cross-section

Office Assistant (August 2017 – Present)
Carnegie Mellon University Computer Science Department | Pittsburgh, PA

- Host employers who hold events on campus, communicating with organizers to bring industry expertise to students
- Archive and digitize old files, organize storage spaces, and manage resources lent to student groups

SKILLS

Programming: Python, Mathematica, C++, IDL, LaTeX
Fabrication: 3D Printing (Proficient), CNC Milling (Familiar)
Software: Solidworks, FreeCAD (Familiar); Microsoft Office (Proficient)
Languages: English, Chinese (Fluent); Ancient Greek, Latin, Hebrew (Familiar)

ACTIVITIES

Physics II for Engineers – Undergraduate Teacher's Assistant (F19, S20, F20)

- Teach recitation, grade assignments, and provide office hours for students

Association for Computing Machinery – Officer & Treasurer (S19, F19, S20, F20)

- Organize school-wide hackathons and coding challenges aimed at helping younger undergraduates polish skills and establish projects for their portfolios