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Berkeley SETI Research Center
Summer Research Internships

Dear Sir or Ma'am,

I am writing this cover letter to express my interest in the Summer Research Internship at Berkeley SETI Research Center. Berkeley and SETI have a reputation for research excellence in astronomy fields, and the opportunity to learn science from such venerable institutions is the motivating factor for my application.

I am very interested in extra-solar planet research. I am currently conducting a research project at the University of Texas at Austin in collaboration with Dr. Adam Kraus on measuring the allowed orbits of several directly-imaged wide planetary mass companions (PMCs) to young low-mass stars. Wide PMCs exist in a parameter space that is not well accounted for by planet formation models. Using observation to constrain orbital parameters for this class of objects can present clues to their possible formation pathways. This project has required me to develop my own image processing pipeline, an MCMC-based precision astrometry algorithm, and a rejection-sampling orbital parameter fitting pipeline (all developed in Python; some of my algorithms run on the Texas Advanced Computer Center supercomputers). I have also learned much about the physics of Keplerian orbits, and traveled to Keck Observatory in Hawaii to collect more data for my project. I expect to publish my results in early 2018.

Additionally, in summer of 2016, I participated in an REU at Northern Arizona University and Lowell Observatory in the field of planetary science. I performed a laboratory astrophysics project measuring the freezing point of various permutations of ternary methane-ethane-nitrogen mixtures, which may match the compositions of the lakes on Titan. The ability of the lakes to form ice will affect how they interact with the Titan atmosphere, and our work will inform climate models of the system. During this project I gained familiarity with Python and Jupyter notebooks and dipped my toe into Fortran. My work will be a part of an upcoming publication from the lab.

Exoplanet science is most certainly where my interests lie. For this reason, I feel that SETI and Berkeley are an ideal choice for a valuable and exciting summer research internship for 2018. I am intrigued that the program focuses so heavily on programming projects, as I am keen to continue to develop my scientific programming skills. I am also excited by the opportunity to learn to operate the Green Bank and Parkes radio telescopes. I love observational astronomy and intend to pursue it as a career, but to date I have only experience operating optical and infrared telescopes and cameras. I would love the chance to learn how radio astronomy is conducted. I have experience operating large and complex machinery, and relish the chance to add a new skill.

I also feel that I have a lot to offer your program. I am a US Navy veteran and a returning student seeking a second bachelor's degree in astronomy. As such, I have a unique set of skills and experiences that would bring experiential diversity to your program. I am a serious and driven student seeking as many valuable experiences as possible that will fully equip me for a career as an observational astronomer in the exoplanet field. I would be thrilled to work on any project in your program related to exoplanetary system or star formation, that makes use of observational data and involves scientific programing.

Thank you for your time and consideration. I look forward to hearing from you.

Sincerely,

Logan Pearce