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Personal Statement—Berkeley Astrophysics

I’ve always been curious—from an early age I’ve tinkered and experimented and frightened my parents a few too many times (my first ER visit at age five was the result of a coin tasting experiment gone awry) over the years. Despite a few close calls over the years and with the help of an incredible support system of family, friends, professors, and many scholarship/grant donors I have taken that innate curiosity and distilled it into something a little more refined. My dream job is to learn forever—I often remark to friends that if money were no object I’d like to collect degrees like infinity stones—and to that end I am seeking admission into Berkeley’s Astrophysics program to continue my studies about the subject that has transfixed me longest over my lifetime.

My path to writing this essay hasn’t been linear by any means—in high school I thought I wanted to be a heart surgeon—but college calculus classes brought me back to my boyhood dreams of becoming an astronaut (I’d still like to be an astronaut, but recognize that’s pretty unlikely). I thought I might minor in physics as an aside, but once I dipped my toes in that childhood curiosity was awakened anew, and I realized extricating myself would be impossible until that insatiable drive for understanding the workings of the cosmos had been taken to its logical conclusion. As a result of my meanderings I’m a well rounded student—I’ve collected minors in applied mathematics and music along the way—and I am that much more confident that astrophysics is my home. Despite being confident in my love of the subject, I’ve struggled with family and financial hardships as well as crippling self-doubt in my own potential to be a scientist. I’ve been on my own in paying for college, and without the incredibly generous support of Pell grants, scholarships, and a few subsidized loans my undergraduate degree would not have been possible. My family situation has been in a precarious state of uncertainty the last few years, and while things are better now I’ve always had to spend summers close to home working and helping to take care of my siblings instead of gaining research experience, something which greatly heightened my anxiety and sense of imposter syndrome until recently.

As a result of my undergraduate meandering and family situation it took me some time before I was able to become involved in research. REUs were never an option for me due to financial and family constraints and our small department unfortunately only has two professors who actively do astronomy research, both who I was reluctant to approach for most of my undergraduate career for fear of rejection or failing as a researcher. Luckily I finally approached my now-mentor professor last spring about becoming involved with his research on pulsars, and my only regret is that I didn’t realize how cool it was sooner. We’re working to identify accreting X-ray binaries from archival data, and in the process I’ve learned how to process data from orbiting observatories (CHANDRA and XMM-NEWTON), been exposed to Fortran, Perl, and fallen in love with bash shell scripting and my new favorite language (Julia). I’ve even embraced dual-booting my computer with Linux (Mint is my flavor of choice)! My largest individual contribution to this project has been creating a group of scripts that sort through more than 42 million lines of combined observational data to create a massive background map we sample for statistical significance of our detections, but I’ve worked with my mentor to develop other scripts to extract source lightcurves and other data from the telescope archives using HEASOFT and SAS, perform Fourier analyses on these sources, and cross-reference with other sources. I hope to take these observational and computational skills to work at Berkeley—I’m enthralled by nearly every project the department is working on. I’m particularly interested in working with cosmology, extragalactic astronomy, and/or supernovae at Berkeley. Although my skills lean more towards the observational/data processing side currently, I’d love to try to integrate theoretical approaches to my studies as well.

Like most people in astronomy the stars have held me in awe from an early age, but my love for Berkeley has blossomed more recently. I visited this past summer to attend a close high school friend’s graduation, and I instantly fell in love with the atmosphere of the campus (particularly the libraries and Campbell hall!) and the culture—I agree strongly with the area’s political, social, and environmental views (I can’t wait to sustainably shop at Berkeley Bowl!). I was particularly taken aback by the lovely campanile hosted on Berkeley grounds, and if admitted I would love to represent the department in learning to play it (when I visited there was an advertisement posted for a class in which you could play the bells). Teaching and outreach are crucial to a Ph.D. (in addition to inspiring other to join our cause, how are we supposed to get funding if we can’t get people excited about our research?) and I would consider myself close to an astronomy evangelist. Since leaving high school I’ve spent my March-October weekends helping run the largest public observatory in Idaho where I’ve given talks and shared this looking glass into the cosmos with over 20,000 visitors. I’ve spent my summer days working as the STEM lead for our four local YMCAs, where I’ve had the privilege of writing and teaching curriculum to youth of all stripes regardless of socioeconomic status. Online I’ve had the privilege of occasionally writing guest science and astronomy posts for the *StarTalk* blog, shared out to a collective audience of more than 500,000. The past two years I’ve enjoyed teaching lower division labs in physics and astronomy as well as cohosting the department’s drop-in tutoring lab. It’s been incredibly rewarding to help other students succeed and see that reflected in course evaluations and comments to professors. More recently, I read an incredible book entitled “Just Mercy” as part of a service-based honors class, and I was inspired to take my physics evangelism to our local prisons where I now teach an introductory programming class (in Python), assist with GED skills, and inspire interest in physics though demonstrations/labs I take from our department’s stockroom. This has been one of the most rewarding experiences of my life, as I’ve had the privilege of working with men and women who society has largely otherwise discarded and I’ve seen the tangible impacts an outsider’s interest and support can generate in them. I hope to find others interested in expanding the program I’ve put in place here before I leave, and I hope to continue in this kind of service at Berkeley.

Often when I ponder the cosmos I’m awed by the privileged position our little blue marble has been afforded, and even more so the privileged microstate I get to live here. I recognize that it’s incredibly improbable that any citizen of Earth would be born with such an advantage as I’ve been given just by birth. I’m proud of the personal challenges I’ve overcome to be able to write this statement and take the next step forward in my career, but I know that getting to this place would not have been possible without the incredible support system I’ve relied on. To that end, I’m passionate about paying it forward and using the privileges I have not to subjugate but to raise and extend a chorus of voices in all that I do, such that collectively we can best maintain this most unlikely low-entropy bubble of space-time we call Earth as long as possible. I hope to join the diverse and boundary-breaking team at Berkeley in exploring the universe as cooperatively as possible. As a more famous Kirk once remarked, space is “the final frontier”—my greatest hope is to help uncover some tiny mystery of our universe together, so that we might all understand the cosmos (and each other) a little better.