

Fellowships and Internships

Lessons From, and How to Achieve

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Abstract

This is a brief resource letter on the importance of fellowships, or internships, as well as how to achieve one. The importance will be on the reflection of a personal one achieved for the Summer of 2020 at Lehigh University with what was taken away from it, what I did, and personal experience. Secondly, we will go into how to achieve one. From this, we assume a fair GPA for the intended field to apply with. We will go into personal and professional motivation to apply for an internship, necessity for follow-ups, and how many to apply towards.

1 My Fellowship

As a quick note before we dive in, I will be using fellowship and internship in the same context. The only distinct difference between them is that fellowships are mainly for professional development and academic research at the graduate and post-graduate level, not professional experience, which an internship is the latter of the two.

My fellowship was over the 2020 Summer with Lehigh University in Pennsylvania. I say *with* Lehigh University and not *at* since it was during a Pandemic, and online (luckily since many were canceled). This fellowship is usually called an REU in physics standing for Research Experience for Undergraduates. Thus, my research was with Professor Cremonini looking into something called *duality*, specifically gauge/gravity duality, or for shorthand, AdS_5/CFT_4 . Since we are not here for my research, instead what I took away, I will not discuss anything more ¹.

What this fellowship did for me was firstly to add to my research experience. It also gave me a great personal and professional connection being Professor Cremonini since she is research heavy, which means she has worked with many people in different universities. These can be a spring board for graduate school applications, since a letter of recommendation from her will be seen as a reliable source.

2 Why an Internship

Now, the fellowship was extremely fun, from the perspective of, what I may be, an industrious person. I phrase my description of fun as such since a fellowship is and can be a lot of work. If you work the hours said by the University, or people running the program, which is an average of 30 hours week, then you will get everything described, but the minimum. However, the average 60 hours I decided

¹Of course, if you want to learn more on what I did/is my research, my email is acassem16@winona.edu or my website found here.

to put is worth it. This opportunity is not just a job, but the chance to see how graduate school is, and how research is done. I put in the extra hours solely because I enjoyed it that much. I knew previously I wanted to apply for a PhD, and afterwards I definitely knew.

2.1 Is an Internship for You

To explore whether or not you want to conduct research, or want to attempt a PhD, there are a few tricks and exploratory questions to determine how yourself or *the self* desires.

First, explore research journals and search keywords from your specific major, and sub-topics from said major. For example, I would go to the American Physics Society journal (APS), find theoretical physics, then high energy physics plus cosmology.

Secondly, although this may be just me, walk around, and find your specific field in nature (or a societal setting), and see if you can explain what is happening for a specific setting. For example, if I walk outside and see a tree, to me it is not a tree, but a geometrical structure that is thin cylinder reiterated by a third at each junction (add a third of the tree at some angle at each third of the tree).

2.2 Personal Motivation

This section can be completely omitted without loss of context. The main purpose of this section is simply to give reference to see if you may fall into this category as well.

My motivation for research, and applying towards a PhD, is best described by a few of my favorite books. For preference, I am not *just* a physics major or love mathematics, but also extremely enjoy philosophy and psychology. Hence, the books you will see are actually *life* books, not physics books.

To get started, the short book Mortality by Christopher Hitchens is a text written by a brilliant writer during his last few months battling esophageal cancer [3]. It is absolutely breath taking, and makes you reconsider your position on Earth, and its place in the cosmos.

The Righteous Mind is also a brilliant text by Jonathan Haidt on moral psychology (or psychology plus moral philosophy) [2]. To best describe the books, the subtitle is enough, "Why Good People Are Divided by Politics and Religion."

Personally, my overall health is very one-sided, so reading books being descriptive of the natures of other dynamics of *the self* is helpful. The next few books hit this topic, as well as give me motivation and empirical reasoning towards life: When Nietzsche Wept [4] by Irvin D. Yalom, The Portable Atheist[1] by Hitchens, and The Remains of the Day [5], by Kazuo Ishiguro.

3 How to Win/Earn a Internship

Now, I have given numerous reasons and motivations to participate in an internship, but never how to win one. So briefly, I will go over a few basics, and then tips/**heavy** suggestions after application.

Firstly, find at least three professors that you have a fair relationship with be willing to write a letter of recommendation for you. The best professors are those who you have either taken courses with (and done well) within your department, and especially professors you have done non-coursework *work* with. Second, of course a fair GPA, but you usually have a chance to explain why on certain courses in the application.

Now, we can finally fill out the application (and anything specific they need). After your application, I would recommend sending a personal email out towards the *specific* people you want to work with (not just the organization) introducing yourself with ambitions. This opens a chance to 'crack the door' open on a new professional relationship. The only other thing to do after applying, and about 2 weeks after (for internships) or 2 months after (for REUs, graduate school, and scholastic specific programs), ask about the status of your application.

The main point is to show the organization, or people in question how much you want this, and convince them, not everything can be shown in your application.

References

- [1] Christopher Hitchens, *The Portable Atheist: Essential Readings for the Nonbeliever*. (Da Capo Press, 2007).
- [2] Jonathan Haidt, *The Righteous Mind: Why Good People are Divided by Politics and Religion*. (Vintage Books, 2012).
- [3] Christopher Hitchens *Mortality* (Hatchet Book Group, 2012).
- [4] Irvin D. Yalom, *When Nietzsche Wept: A Novel of Obsession* (HarperCollins, 2010).
- [5] Kazuo Ishiguro *The Remains of the Day* (Vintage International, 1988).