

Vision Statement

Jolyon Bloomfield, May 16th 2012

My journey through physics started with my involvement in the Australian Physics Olympiad program. I had thought I was going to go into medicine, or perhaps psychology. It wasn't until a fateful day of reflection in May 2002 that I let those desires slip, and embraced physics for all it was worth. Since that day, I haven't looked back.

There are two aspects of physics that called to me. The first was general relativity, the study of the curvature of space and time. I was always good at maths, and I had heard that general relativity was particularly mathematically challenging, and so I wanted to learn it. The other aspect that always intrigued me was high energy physics: the physics of particles and quantum fields. I knew that these were the directions I wanted to work towards, right from the very beginning.

My undergraduate education was quite thorough, and covered a lot of aspects of physics. It turned out that I didn't actually like general relativity, and I got the impression it was a rather niche subject. It also turned out that high energy physics wasn't a particularly active research area in Australia, and there was nobody at my university to teach it. And so I drifted for a while. I think the best decision I ever made in my undergraduate was to go overseas to do my graduate education.

My experience at Cornell was rather different from my undergraduate. Perhaps the biggest thing was that advanced concepts that I had struggled to teach myself in Australia were handed to us on a silver platter in graduate courses at Cornell. I've now learnt quantum field theory. I know particle physics. I struggled through my string theory course. I relearnt general relativity. I found that I actually liked it. I discovered that it's not a niche subject; it's just completely underappreciated in Australia. I also discovered cosmology, which I didn't even know existed. And so I started working in general relativity, and will soon graduate with a PhD specializing in that field.

One of my most profound realizations came to me on one of my lowest days as a graduate student, early in my second semester. Overnight, I had somehow convinced myself that I was not good enough to be a physicist. This upset me a great deal, mostly because I wanted to be a physicist. I couldn't imagine not being a physicist. And damnit, I was going to be a physicist. (My friends eventually talked me through my outbreak of imposter syndrome). Since that day, I've known that I am going to spend my life as a physicist, performing research at a university.

A question I often get asked is "Do you think you'll go back home?" My answer to this question has developed during my time at Cornell, and now forms an integral part of my vision for the future.

I am currently concluding my graduate studies at Cornell, and plan to undertake post-doctoral studies for the next three to six years. I have a number of aims for these years. Research-wise, I hope to expand my understanding of my chosen area of physics, as well as diversifying somewhat. With regards to developing for my future career, I see these years as critical in establishing collaborations and forming networks with other physicists around the world. For this reason, I do not plan to return to Australia in the near future, as geographically, it is rather isolated.

For these years, I currently hope to remain in the USA, preferably at universities with a strong research focus. I would like to work with a variety of research groups, both in order to make ties with different people, as well as to become exposed to

different aspects of my chosen field. I also hope to solve my personal two-body problem.

Following my postdocs, I hope to begin a tenure-track position in a research university. My philosophy here is to strive to be the best physicist I can be, and I hope to learn a lot from this position. I hope to teach one class a semester, ranging from introductory courses through to graduate courses in my field. I hope to have a research group comprised of graduate students and a postdoc or two. I hope to successfully apply for research grants. I hope to have a reasonable publication output. And, perhaps against my better judgment, I hope to start a family.

I see myself developing as an independent researcher at this stage of my life, while figuring out how to juggle my teaching obligations with my research work, my graduate students, and my family. I will use these years to build my reputation as a researcher, but strangely, I also find myself drawn to developing my skills as a teacher.

In my physics education to date, I have had two mentors in particular I see as role models. The first, in my undergraduate, was Professor John Close. John had a knack of being able to take anything and boil it down to its most fundamental concepts. He also had an impressively good grasp of everything pertaining to his field of physics. His lectures were always amusing and insightful. But perhaps the most important thing, looking back, was the relationship he had with his students. We'd go sailing on the weekends. We'd have picnics and dinners, we'd drop by to chat about life, not just about physics. That's something that I haven't found at Cornell, where even graduate students and professors have a very professional divide, and I think it's something that is missing. I hope that when I get to this stage of my life, I will be able to incorporate what I've learnt from John into my own research, teaching, and life.

My second mentor is Professor Eanna Flanagan, my current graduate advisor. Although quite unassuming, he seems to know everything about everything, and I sincerely hope to get to this stage in my understanding of physics. Furthermore, he has the ability to take some scholarly information, cut to the heart of what's important about it, and present it in a manner that everybody can understand. When I compare this to my own lecturing attempts, I really admire that. If I can become a physicist in the footsteps of John and Eanna, then I will know that I have done well.

My very long-term goal (15 years, perhaps longer) is to return to Australia as a professor at a university there. I want to teach what was not available to me as an undergraduate, and I want to teach it well. I want to excite students about high energy physics. I want the very best of the students in my country to be able to learn about the subject of their passion without needing to travel overseas to do so. I want to help high energy physics research in Australia get off the ground. I want to bring the skills and expertise that I've learnt, and the networks and collaborations that I've established, back to my home country.

Therein, I think, lies my primary motivation. My vision for the future involves doing the best I can overseas, then returning home with the knowledge and reputation I have gained, and building a better future for my children and my country. I don't find surprising at all that my life goals aren't all about making a better life for me – they involve making a better life for those who come after me.