

Gates-Cambridge Personal Statement

For entry beginning 2019. Character count: 2985

Obi is nine years old, and he is a genius. We chat at length about solar sails, the discovery of neutrinos, and the existence of gluons. He asks endless questions. I attempt to give answers. As of this moment, we are in stasis, and it's all because Obi lives in Snug, a small township of fewer than 1000 people. Opportunities rarely find themselves in Snug.

This year, I took on the role of a Young Tassie Scientist, visiting many schools just like the one Obi attends and meeting over 1200 Tasmanian students in similar situations. I have been cross-examined at length by inquisitive young people, unwavering in their desire to know if I've been to space, if I know how life formed on Earth, or if I've ever failed a spelling test. Many of these students had not met a scientist before and had you asked them to sketch a picture of one, they most certainly would not have drawn me. The message that I take with me in my community work is that a scientist can look like anyone, and there are many careers in science and technology open to the youth of rural Tasmania if they are brave enough to seek them out.

Our community has a strong connection to the night sky, and it is the beauty and awe of that canvas which I aim to share with others. To this end, I have partnered with the astronomy festival TastroFest with the goal of sharing the wonders of physics with the community which raised me. I was inspired to seek out this opportunity by my work with the citizen science project Radio Galaxy Zoo, which was also my first foray as a first-year undergraduate student into astrophysics research. I used data processed by citizen scientists to investigate whether the relativistic jets of plasma launched by supermassive black holes are affected by the galactic environment they launch into. As the public were co-authors of this work, I felt that it was only appropriate for them to give their questions and feedback before we presented it to the scientific community, and their interest was striking, to say the least.

At the University of Cambridge, I will be studying chaotic motions within black hole accretion disks and tackling some of the most fundamental open problems in fluid dynamics. This work will be supervised by Prof Chris Reynolds, with the possibility for interdisciplinary collaborations to take our research out of the world of black holes and into those of solar wind and fusion reactor design, to name a few. With the support of Cambridge and the Gates Cambridge community, I will continue in my outreach work with initiatives such as the Cambridge Physics Experience and Physics at Work, connecting rural communities with the wonders of science. Throughout it all, I will look to further equal opportunity in the field of physics education, particularly with the 15-25 age group. The stories of these young people are not yet written in stone. Small actions have changed the life of one young boy; larger actions by only a few people will change the lives of many.