MICHIGAN STATE
UNIVERSITY

"Everyone is a genius in their own way" - Antonius Torode

Director,
MIT Haystack Observatory

February 3, 2017

Dear Sir or Madam,

From a very young age, and in fact as far back as I can recall, there was only one thing I strove to be when older; a genius. I have always admired problem solving, proofs and logic. The heroes I looked up to where those of intelligence such as Nikola Tesla and Jacque Fresco. To me, knowledge is not something you are generally born with, but it is something you have to work diligently to develop. That is why I have spent my whole life in pursuit of sharpening my problem solving and reasoning skills in order to better solve any challenge that I will face.

At an early age, I spent my time playing chess. Eventually this lead me to playing against computers using programs such as Deep Fritz and Chessmaster. At some point I grew out of chess and started becoming interested in other facets of technology. I taught myself HTML and CSS in high school in order to create a website for some graphical designs I had started to create. Eventually I started learning programming languages and taught myself C++, JAVA, C# and more. I've done an array of things ranging from creating my own encryption algorithms and programs to making a new language. While tutoring at Oakland Community College (OCC) I was interested in the professional aspects of a mathematics career and so I taught myself LaTeX, and wrote a paper exploring oscillations bounded between two curves.

Throughout my early schooling, I had never really been challenged. I spent a lot of time playing video games because of boredom, but after taking an AP physics class my senior year of high school I realized that there was something that did not come easily to me. My outlook on this was as if a challenge. From that point on I decided to major in physics and gain an understanding for the laws of nature. Currently, I am taking five senior level physics classes at Michigan State University (MSU) while working as a computing assistant for the department. I have a departmental wide project I am working on in my spare time. Other than a summer of condensed matter research at Oakland University, my experience in a lab has been limited. Due to this I am trying to put as much time researching or volunteering in a lab as I can in order to prepare for graduate school.

The REU program at the MIT Haystack Observatory is a valuable opportunity to those who are involved with it. Research is pivotal to gaining key problem solving skills that I have always believed are of utmost important to develop. As mentioned above, in previous years I was able to participate in an REU at Oakland University. From this I learned extensive knowledge of how a research setting works as well as an understanding of Raman Spectroscopy. I studied condensed

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matter properties of graphene as well as designed and set up my own resistivity experiments to study our composites under high pressures. After finishing the program I gave a presentation on my findings and research experience.

Both before and after my experience at Oakland University, I had tutoring positions at OCC and MSU respectively. When working at OCC, I worked in a mathematics lab, where people from any math, physics, or chemistry class at the college could come in and ask for help about any aspect of the fields (primarily mathematics). I quickly gained a solidified understanding of many areas in mathematics and physical sciences as I had to understand the subjects well enough to help others. Similarly, I worked as a Teaching assistant where I tutored for physics at MSU.

My current schedule is very busy with regards to classes. For income, as stated above, I am working at MSU for the departments of physics, astronomy, physiology and molecular biology. In order to properly perform at this position, I am required to be a quick learned since any technological issues can arise. This experience has also given me a chance to interact on a regular basis with he professors and learn about their work and experimental equipment. Along with my background in computers and programming, this has expanded my versatility and view of what is possible. Within my busy schedule, I have also compiled a book which is somewhat a reference that I freely distribute to my colleagues. This is known as Antonius' Handbook and is one of many side projects that I've participated in. It can be found by simply searching for "Antonius' Handbook" on Google.

My major up until this point has been Astrophysics and Physics. Unfortunately even though I have had an incredible interest in astrophysics, my hands on research in the field is lacking. I have never lived where the city lights are dim so using my own telescope has very tight limits. Some subjects that have greatly intrigued me include general relativity and solar physics. Since the sun is such a major part of our every day life, it is of key importance to understand the properties it exhibits and how it works. The Event Horizon Telescope is something I would be very interested in working with in hopes that I can help develop our understanding of black holes as well as increase my own knowledge of them. My overall goals of what I want to research are still very open. I have always found a vast majority of subjects fascinating and would be open to researching in a large array of topics within the field of Physics. I hope that if I am able to research within an REU this summer that it will help me better make a decisive decision about what I will want to spend my future researching as well as what I would prefer to do in graduate school.

Sincerely yours,

Antonius Torode

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