Noah Blumenthal – Preferred Name: Emmy

2019 Wolfram Summer School — Personal Resume

Some academic facts

High School Weighted GPA: 4.35

ACT: 34

I am currently attending Rowland Hall high school in Salt Lake City, Utah, and will be attending Boston University in Fall 2019 as a freshman.

On the right, there is a list of subjects in which I have a deep interest. I have a extensive familiarity with many of these subjects, but this list serves to give an impression of interests.

AP and Advanced Topics Classes Taken

Advanced Topics French IV
AP Literature and Composition
AP European History
AP Language and Composition
AP US History
AP Calculus BC
Advanced Topics Mathematics
AP Chemistry
Advanced Topics Statistics
AP Psychology

Personal Research Interests

Differential geometry
Topology
Partial differential equations
Group theory
General relativity
Quantum physics
The super-symmetric theory of stochastic dynamics

Academic Achievements

Research Assistant in the Minteer Group

I interned and now currently work in Dr. Minteer's lab (https://chem.utah.edu/directory/minteer/research-group/) at the University of Utah Department of Chemistry for my summer breaks in 2018 and 2019 for approximately 35 hrs/week. I worked on a project with graduate students Matthew Kummer and Mengwei Yuan. We investigated the enzymatic mechanism of the conversion of carbon dioxide into methanol facilitated

University of Utah Department of Chemistry High School Research Award

This award is annually given to one high school student involved in research at the university. I was given this award for my work in Dr. Minteer's lab. This award is presented to someone who demonstrates an understanding of complex topics and is able to quickly engage in new research methods that they may not have a deep background in.

AT Mathematics Paper and Presentation, Differential Geometry

AT Mathematics is a coursed offered to advanced students in mathematics which surveys many topics in undergraduate mathematics including algebraic topology, graph theory, set theory, group theory, linear algebra, and modeling with MatLab. At the end of the year, each student writes a paper and gives a presentation on a topic of their choice. I wrote my paper on differential geometry which included a proof of the Gauss-Bonnet theorem which I arrived at independently. The paper is accessible here: https://drive.google.com/file/d/1pf9lYVoJL8nNyn_2ECFigQsmrtT8qrao/view?usp=sharing

Independent Study Paper and Presentation

I was assigned to pursue an independent study as the teachers in my school's science department had determined that I had advanced out of our school's science curriculum. I elected this option over taking university classes because I was not able to find a class that fit my schedule. I am the first student at my school to lead an independent study in the sciences, so the structure and expectations have often been quite vague, but my personal motivation to research and learn has given the project direction. I chose to focus my independent study around models of enzyme kinetics and mechanisms. The outcome of my independent study will be a presentation and a paper. In the paper, I explore the derivation and assumptions of Michaelis-Menten Kinetics, numerical solutions to differential equations simulating enzyme-catalyzed reactions using Wolfram Mathematica, the validity of these different models in biological systems, and experimental approaches to testing the validity of these models.

Boston University Trustee Scholar

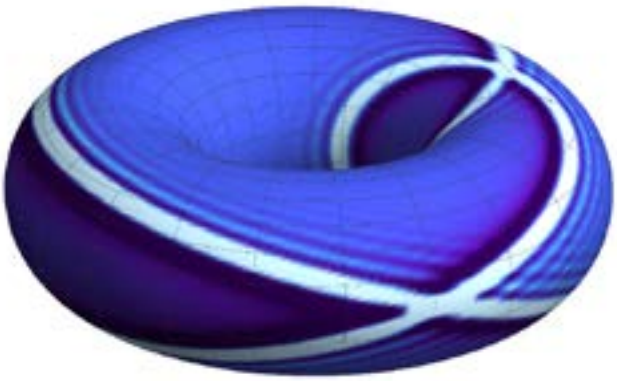
The Boston University Trustee Scholarship is a full tuition scholarship presented by Boston University to applicants who demonstrate exceptional academic achievement and dedication to their field of interest while also embracing interdisciplinary study. The scholarship is very selective; Boston University awards this scholarship to approximately 20 incoming freshman each year.

Emmy Blumenthal

Brandeis University Book Award

The Brandeis Book Award is a recognition given by my school's faculty and staff, commissioned by Brandeis University. The award is given to students who demonstrate academic excellence while examining how the impact their academic work has on social justice issues. My teachers chose me for this award because of the work I had done presenting on queer theory to my school's Queer Straight Alliance which I also organized. I was additionally recognized for my leading the National School Walkout at my high school and working with my school's administration to create gender-inclusive policies.

Mathematica



This is an informal achievement, but I want to note that the majority of my research and investigation is conducted using software simulations. I am skilled at using Mathematica and MatLab. Typically, my research process involves me reading then manipulating equations and creating visual representations using Mathematica. Going through this process helps me understand how concepts can be applied while developing an intuitive understanding. I have a folder full of graphics I have created which I would love to share if whoever is reviewing this application is curious. The figure included was produced using Mathematica. It shows a particular numerical solution to the wave equation on a torus where the value of the solution is displayed using a gradient. This model considers the metric and topology of the torus. I created this Mathematica script when I was studying differential forms on curved spaces—specifically, the Laplace-Beltrami operator. An animation of the solution described and pictured above is accessible at https://drive.google.com/file/d/1gf0fMxZeM_SInLbLe_mtFkvg1cGDb5ss/view?usp=sharing .

Some things I do outside of school

Planned Parenthood Teen Council

Teen Council is a group of high school students who meet weekly to discuss social issues and teenage sexuality. Our group focuses on addressing issues through a framework of reproductive justice and direct action. Teen Council members teach classes in local community centers and high schools. These classes cover consent, healthy relationships, and sexual health, ensuring young people have access to accurate information and can have their questions answered in a non-judgmental manner. Being a Teen Council member has helped me become a better public speaker and teacher. I have learned to effectively organize and communicate my ideas. Find out more: https://www.plannedparenthood.org/planned-parenthood-utah/education/teen-council

March For Our Lives Utah, Outreach and Policy Director

I joined March For Our Lives Utah because I saw that the student-led movement had the opportunity to not only create legislative change but also social change. I joined the organization as an ambassador after I had organized and spoke at my school's walkout. As an ambassador, I used my graphic design, writing, and analytical skills to generate infographics about how gun violence influences students and queer populations. I organized and led a community discussion about the role of lethal force in Utah; police officers, concerned students, and racial justice activists attended and added nuance to our discussion. I was then chosen by previous organizers to direct outreach for MFOL UT during the 2018-2019 school year. As Utah has astonishingly high teen suicide rates, my goal this year is to create a community that is supportive and has resources to help others through difficult times. Additionally, during the legislative session, I have been meeting with legislators and testifying at committee hearings to try to pass reasonable gun regulation. Our organization has received awards from Equality Utah and Salt Lake City Weekly. Our website is http://www.marchforourlivesutah.com/

Climbing

I joined the Front Climbing Club competitive climbing team when I was in middle school. I have competed at local, regional, and divisional competitions. Our team takes an approach of analyzing the kinematics of the body to improve efficiency. While I found some of the approaches to be more heuristic than scientific, I appreciated the connection. A few months ago, I stopped climbing competitively; however, I still climb frequently.