

Passing the Torch of Mathematical Love

By Alan Zhang

Frances C. Richmond Middle School

Interviewee: Olivia J. Chu

“When I was seven or eight years old, I had a small blackboard in front of me, and I would write math problems on it, earnestly explaining them to my mom and dad while they listened.” This was the most memorable scene from my interview with Dr Olivia Chu, a Neukom Institute Postdoctoral Fellow at Dartmouth appointed as Research Associate and Lecturer at Dartmouth College.

Olivia Chu was raised in New York City as a fifth-generation Chinese American. In this bustling metropolis, when she spent time with her grandmother, who loved people-watching, she began to develop an interest in human behaviour. Though at that time, no one knew what career path Chu would take and the impact she would make, these childhood experiences followed her throughout her life and into the future.

Dr Chu has always been proficient in mathematics, but she had not seriously considered pursuing it as a career until she met Mr Cocoros, her high school calculus teacher who inspired her to love math. Dr. Chu reflected, “[Mr Cocoros] made math so fun. He taught us using themes like Lord of the Rings and Harry Potter. He led us to explore various mathematical principles from different perspectives, which was very different from what I had learned before.” This newfound motivation to pursue math would lead her down a difficult, winding, but rewarding path as she pursued higher education.

Dr. Chu studied mathematics at New York University and tutored high school students. She enjoys applying mathematics to various aspects of life, instead of just “doing math for the sake of it.” During college, she collaborated with her advisor, Trushant Majmudar, on the study of Euglenoid motion, which studies locomotion by shape deformation of organisms. This was her first experience applying mathematics to other fields, and it excited her immensely. Though she liked this experience, Dr. Chu still wanted to keep an open mind as she transitioned to Princeton.

During her doctoral studies at Princeton University, one of the most prestigious math programs, Dr. Chu attended numerous workshops and lectures, continuing to explore the path of mathematics. Dr Chu had an advisor, Corina Tarnita, who encouraged students to follow their passion and pushed students out of their comfort zones to find their interests. Dr. Chu, under the guidance of Professor Tarnita, flourished and her interest illuminated the path before her. Professor Tarnita’s work on applied math in human behaviour piqued Dr. Chu’s interest, especially because it was 2016, and the presidential election had deeply divided American

society. The various behaviours and dynamics during that time led her to study human behaviour, seeming to bring her back to the old times she spent with her grandmother.

In 2021, Dr Chu graduated from Princeton University with a PhD in Quantitative and Computational Biology, focusing on using mathematical modelling, computer simulations, and data analysis to understand biological relationships and systems. Afterwards, she joined the Department of Mathematics at Dartmouth. She leads students in exploring mathematical principles, encourages logical thinking, and aims to inspire students, much like her calculus teacher Mr. Cocoros. Her passion for mathematics is transmitted to her students, helping them realize that, regardless of gender and background, everyone is equal in the exploration of the mathematical path.

In addition to teaching, Dr. Chu is also a dedicated researcher. She delves into the study of behavioural dynamics and investigates the increasing social divide and violent polarization, addressing issues such as the widespread phenomenon of “close-mindedness” worldwide. Dr. Chu hopes her work has a real impact on the world, not just in theory. Before I met her, I was unaware that mathematics could be so intricately connected to many aspects of the world, and meeting her has altered my perception of mathematics.

Along with her mathematical adventure, Dr. Chu also faced discouragement and microaggressions due to gender, highlighting the gender gap in STEM education opportunities. Dr. Chu recalls that only two of the fourteen math professors during her college years were women. The lack of female role models made it tough for her to imagine herself as one of them. Furthermore, she faced everyday gender stereotyping and was sometimes seen as inferior to her male classmates. In most of her math classes, there were very few women and at times her opinions and corrections in group projects seemed to not be accepted solely because of her gender, which felt unfair. Once, one of Dr. Chu’s classmates even commented, “How did you make it this far? You are a girl.”

In the face of hardship, Dr. Chu always kept going with the same energy and curiosity. “Most things worth doing are not going to be easy. I just had a desire to learn as much as I could.” This is how she described it to me, a simple yet powerful motivation. Dr. Chu wanted to learn and ask questions even if it was tough. She was motivated by her mother, who told her to try and learn at least one new thing per day. Dr Chu disregarded the unsupportive voices and instead focused on her goals, hoping to learn how to create a more welcoming and kind community along with applicable mathematical tools.

This fall, Professor Chu is set to leave Dartmouth to join Bryn Mawr College, marking a significant moment in her career. As a female professor about to teach at an all-woman’s college,

Professor Chu is genuinely excited, describing it as her “dream job.” The college values providing equal opportunities and fostering an inclusive environment for everyone, the exact values Professor Chu has at heart. She lights a desire to learn with an open mind in every one of her students, proving challenges should not impede one’s path but should allow one to grow. Listening to her mathematical odyssey, as a seventh-grade student who loves math, in my eyes, Professor Chu is like a torchbearer in a long relay race, unafraid of difficulties in the pursuit of mathematical discourse. She has received enthusiastic support from family and mentors, and now she is poised to continue running, faster than ever, passing on the torch of love for mathematics to more people.

I am Alan Zhang, a 7th grader at Frances C. Richmond Middle School, also a part of the math and quizbowl team. I love mathematics, particularly quantum mechanics and applied maths. Starting in kindergarten, I led a "weather station" for two years to predict the weather and alert the school. We used math models and research, (albeit very basic models), and predicted based on improvised meteorology instruments. I like to research science, languages, and random facts. I also enjoy playing the piano and saxophone. I am on the local swim team and in my free time I like to learn, play games, and exist.