GLOBAL PERSPECTIVES

DR. MINH LAM NGUYEN

Despite his long list of academic accolades, Dr. Nguyen did not grow up in a scholarly home. Born and raised in Ho Chi Minh City, home of Vietnam's largest port system, Saigon, Nguyen's upbringing was more influenced by maritime trade than educational pursuits. As Dr. Nguyen put it simply: "My family is not academic by any means." The paternal side of his family worked in shipping, and his father had spent many years as a sea captain. His mother, however, had a different plan for Nguyen and his siblings; she strongly encouraged her children to learn English as a means of freedom from the local economic environment. As a result, the language "came naturally" to him. Despite the lack of a clear, predetermined trajectory, language and education represented a variety of opportunities, the most enticing of which was studying abroad.

Though today, Dr. Nguyen studies and teaches mathematics, his introduction to the subject was marked by fear. Dr. Nguyen told us about his early struggles with numbers: "I got traumatized [by mathematics], and I thought...I was not gifted in it." Mathematics was enigmatic, and at times even hostile, until seventh-grade algebra, "one of the first lessons... [of which was about] different kinds of numbers like rational numbers and irrational numbers." After a demonstration by his teacher, which proved that irrational numbers can still be visualized, Nguyen was "blown away." His confusion transformed into fascination, a fascination that soon became his purpose.



Unfortunately, with time, expectations began to complicate this newfound purpose. When he was going into 11th grade, Nguyen's mother gave him two choices: "If you want to be in Vietnam... you have to go to medical school...[or] you can go abroad and study what you like to study." The uncertainty of moving to a new country and the difficulty of finding a stable career in math posed significant challenges, but the guarantee of autonomy overpowered them.

His decision to study abroad led him to a long list of academic institutions. Dr. Nguyen received a full-ride scholarship to study mathematics as an undergraduate at Liberty University in Lynchburg, VA. Shortly after, he received an MA in Mathematics from Penn State. Following the completion of his graduate studies, Nguyen became a PhD candidate at the University of Arkansas.

Nguyen's dissertation, which he defend in 2022, focuses on the Seiberg-Witten equations, which were developed in 1994 to determine whether two 4-dimensional topological spaces are the same. For those of us who are not mathematicians, topology refers to a branch of mathematics that deals with the manipulation of shapes into new shapes through methods that do not involve cutting or reattaching them (bending, stretching, squishing). A coffee cup and a donut, for example, are topologically identical, because, in theory, they can be turned into one another without the creation of new holes. If not already obvious from the description, low-dimensional topology (3D and 4D), which Dr. Nguyen has focused his research on, is regarded as the most challenging part of topology.

Dr. Nguyen's path, which led him to complete this PhD, emulated a topological process as it was bent and shaped in different ways, some of which came close to breaking his desire to study mathematics as a whole. When completing his MA, a professor who had become an extremely important person in Nguyen's development both as a person and as a scholar, unexpectedly passed away. Nguyen described this devastating experience as losing "a second father figure." He told us that he "almost decided not to do math anymore" as a result. Dr. Nguyen stressed the importance of having a sense of community and support, crediting his peers in the mathematics department as the reason for his decision to continue his studies.

Without community, Dr. Nguyen would not have been able to pursue his PhD, after which he became a postdoctoral researcher at Washington University in St. Louis. Conducting research with Dr. Ali Daemi gave Nguyen access to more resources in the realm of topology, allowing him to continue and expand his research.

His decision to stay on his path was rewarded by the recognition that postdoctoral research and scholarship represent. These kinds of positions often act as a bridge between training and a long-term career, which is true in Dr. Nguyen's case, as it led him to become a post-doctoral research associate at MSU's Department of Mathematics. At MSU, Nguyen continues to study at the intersection of low-dimensional topology and gauge-theoretic Floer homology theories, while also pursuing new research in the application of filters to the latter with the help of topological data analysis. To put it simply: Dr. Nguyen's work at MSU is positioned at the frontier of abstract mathematics and emerging computational tools.

According to Nguyen, none of the work he is doing today would have been possible without studying abroad. Liberty University offered him an introduction to advanced mathematics, the University of Arkansas allowed him to hone his skills and build community, WashU gave him the ability to transition into a scholarly setting, and today, MSU offers Nguyen a place to continue learning while also teaching others.



He intends to continue his studies and transition into a tenured-track position, but remains open to non-academic opportunities, as his research is highly relevant to the industry realm. This seemingly linear trajectory, which in reality echoes topology, was made possible by the sense of community/shared struggle that he found amongst his mathematician peers and fellow international students. Getting to "meet these people and see that they also struggle the same… somehow [makes] it feel less lonely," says Nguyen.



Click here to learn more about Dr. Nguyen's current research.

By: David Rabinkov