Tell us about your current and near-term career-related activities and goals, as well as why you decided to pursue the specific graduate program(s) and school(s) that you have.

“They are only there because of DEI.” In my disabled condition, I have an enlightened rebuttal to this notion, which has dominated the national conversation. Survival rates for young adult leukemia are just over 50%; <5% was the chance of surviving the fungal infection in my brain that caused my stroke; one could argue that the compound probability of me starting graduate studies at Harvard three years after these events is 0. The thing that unites the disadvantaged in DEI is that we are not supposed to be here, so we make the most of the opportunity. At Caltech, I had the privilege of befriending a Black freshman, who excelled in my graduate quantum physics classes. When an adventurous female friend made him join a friend group to go to a strip club, he tried to bring his computer inside to do some work, but the bouncer would not let him. Last year, I took classes with an 87-year-old professor, who still drives to work independently, even though he moves slowly with a cane. The only time I did not see his car parked in front of his office was on Sunday nights, when walking back from dinner at Chipotle. The challenges posed by my stroke are unique; as an aspiring researcher, I have to write and speak with ease in order to communicate science. Before the stroke, I was a teaching assistant for a quantum mechanics class at Caltech and wrote a publication for the Caltech Undergraduate Research Journal (CURJ). But now, my fine motor function and speech are impaired. It has taken a combination of hard work and creativity to overcome these.

In order to recover these skills and the ability to speak, I practiced singing for intonation, tongue twisters for my intelligibility, and longer book passages for speech rate and endurance. I took the initiative to learn dictation to code by voice, which mitigates my fine motor impairment and also happens to be good speech therapy for me! The computer doesn’t register everything perfectly due to my speech impairment, but all of the commands are customizable, so I am able to choose ones that work for me. For example, I might say super in order to write supercalifragilisticexpialidocious. I have been delighted to apply this to my passion of scientific communication.

Last year, I embarked on a senior thesis project, which involved programming a computational method known as the GW approximation. As the final product, I dictated a ~40-page final report and gave a 15-minute oral presentation. I also took on an editorial position at the CURJ, helping to prepare a submission for publication. This was in the adjacent theoretical chemistry field of nonlinear spectroscopy, where researchers shine more than one (otherwise it would be called linear) laser onto a sample in order to investigate its properties. The material that had been studied was a cuprate, which shows superconductivity at high temperatures, a phenomenon that is a holy grail for scientists, which would revolutionize fields like quantum information or sustainability. During the summer, I gave a talk on my senior thesis work at the 4th annual Goldwater Symposium to further hone my presentation skills. I love the challenge of scientific communication—there are wrong ways to explain a concept, but there is not one right way to do it. It takes a combination of knowledge and imagination to craft an explanation for your specific audience, ranging from technically minded scientific researchers to unfamiliar government policy officials.

This fall, I begin my PhD studies at Harvard in the Division of Chemistry and Chemical Biology. I will be working with Professor Joonho Lee. He is a leading expert on developing quantum chemistry simulations for periodic (repeating) systems; I hope to aid in the discovery of new materials with sustainability applications, from catalysts to photovoltaics. Specifically, I will be developing atomistic simulations that experimental researchers (in a wet laboratory) will use to discover more efficient solar panels.

I also chose Harvard because it is a place where my work can have an impact outside of scientific circles. Harvard has the top school in public policy, the Kennedy School, where people influential in science policy come regularly to give talks. I will be doing research that makes solar panels more efficient, a technology that will drive the green energy transition. I want to better understand policy issues in order to bring solar energy to the consumer. I will attend these talks as my schedule permits. I am inspired by the story of Caltech Professor Frances Arnold, who is a recent Nobel laureate. She is an expert in her respective field of protein evolution, but she also oversees many corporate sustainability ventures and is the president of the Biden Sustainability Council.

My career goal is to become an expert in quantum chemistry and use my disabled identity to make an impact in sustainability.