

Follow Me To The Northern Lights
By Allyson Lee
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Interviewee: Kristina A. Lynch, Ph.D.

January 10th, 2021. That was the day I was launched into space, touching the northern lights as I went, and taking in new information that I had never known before. That was the day I met with Dr. Kristina A. Lynch, Professor of Physics and Astronomy at Dartmouth College. She was the one who set me free from my launch pad. The one who opened my eyes and showed me that there is more to this world than I had first thought there was.

Dr. Lynch was born in New Jersey and grew up in Connecticut. As a young teenager, her middle school and high school experiences were not the most enjoyable. “I hated middle school. High school was better but, still, I was happy to leave Connecticut,” Dr. Lynch stated strongly. She explained that by the time she was in high school, she had been stuck with the same 100 classmates from kindergarten. Despite her overall dislike for middle school, though, Dr. Lynch managed to maintain and nourish her interest in stars and astronomy, having first been able to use telescopes as a Boy Scout — yes, a Boy Scout! — and later being able to work with and study telescopes again in high school.

“I like science because it’s hard and it’s confusing. I like being confused; I get bored with stuff I understand,” Dr. Lynch explained. “And so, this is something I try to encourage my students who are having difficulty in my classes, that the fact that they find something hard doesn’t mean they should stop.” When Dr. Lynch told me this with full confidence, my eyes grew wide and my jaw dropped. It shocked me at first to hear that she *liked* being confused, but at the same time I admired her way of thinking. I remember all the times when I have been confused and frustrated over a subject I did not understand. However, now I wish to be patient with myself and persevere whenever confusion takes place. To remember that I must continue to try at whatever is confusing me and not become discouraged.

As an undergraduate, Dr. Lynch attended Washington University in St. Louis, hoping to leave Connecticut and use the university’s space science center. There, she let herself fall into the fascination of the Red Planet after being shown a photograph of a cloud on Mars by one of her professors. “And it just blew my mind. You know, you think of Mars as this thing that doesn’t change. And the idea that that shadow from that cloud ... was temporary and had only been there when that picture was taken — I thought it was the coolest thing. It just made Mars seem much more real.” Subsequently, Dr. Lynch completed her doctoral work on auroral sounding rockets at the University of New Hampshire.

Today, Dr. Lynch studies the northern lights with a group of students. They experiment by using devices called NASA sounding rockets. These are similar to satellites orbiting in space, except instead of circling the earth over and over again, the rockets are sent up into space for about ten minutes until they come down. Think of it as a baseball, Dr. Lynch told me, that “if you throw a baseball across your yard, it will land on the ground.” Just as satellites collect data as they orbit the earth, Dr. Lynch sends sounding rockets up into space to gather information about the northern lights before landing again. And what about the northern lights? Dr. Lynch kindly explained to me that they are actually air molecules being “excited,” or in other words being energized by “the energy from space,” in the earth’s atmosphere. Once the air molecules have “calmed down,” the energy they created emits light; and due to the different types of gas in the atmosphere, the light emitted are the greens, blues, reds, and other colors of the northern lights.

Launches do not always go as planned, though. Dr. Lynch has faced the hard reality when a sounding rocket and all the devices attached to it explode during launch. That is a full “three years of work down

the drain,” she added. However, despite the fact that “it’s demoralizing and it’s hard,” she chooses to rise back up after falling and begin back at stage one. “Cause even if doing it sounds awful, not doing it is worse,” Dr. Lynch stated. There have also been times when Dr. Lynch has made regretful mistakes, but instead of doing nothing about it or storing it away in the back of her head, she helps her students avoid that error so that they will not make the same choice. Dr. Lynch told me that there was a time when she was in a group of thirty physics majors, and only two of those thirty undergraduates were women. “We never became friends, I think we considered each other a threat,” she noted. “...So I try to get the women in my classes to have each others’ back, look out for each other, and be friends with each other.”

Now I have touched back down again. Those ten minutes in space were short, but after landing, the way I view the world has changed since before the launch. I have found better ways to handle confusion and even collected data about the northern lights themselves, that the streams of color are air molecules floating around in the Earth’s atmosphere, emitting multifarious hues of light. While Dr. Lynch focuses on guiding her students along in their physical and astronomical paths, she also emphasizes the importance of teamwork and resilience, launching them into space like sounding rockets headed towards the northern lights.

Short Bio:

My name is Allyson Lee (13) and I am an 8th grader at Frances C. Richmond Middle School in Hanover, NH. Though math is not my strongest subject, nor my favorite, I am currently enjoying it more than I ever have before! As an 8th grader, I’m taking Algebra 1 and am aiming for Honors Geometry at Hanover High School next year when I’ll be a freshman. Some of my hobbies and favorite activities are creative writing, drawing, painting, cooking, and spending time with family. I also play the viola and have a unique liking for *Squishmallow* octopuses!