

I was six years old when Voyager sent its final images of the solar system. I was enchanted by the dramatic, mysterious blues of Neptune and the icy volcanoes of Triton. Voyager taught me about the solar system, but it also taught me about the human need to understand the universe and our place in it. Each Voyager spacecraft carried a record titled the Sounds of Earth, filled with music, images, and greetings from across the globe. Even then, I understood the important symbolism of that message of peace and hope floating to the stars as the Berlin Wall crumbled and a new generation dared to dream. This is a vision that still inspires me and drives me, one that experience and education have refined but never tamed or diminished.

Voyager was just the beginning. I loved learning physics, and enjoyed my coursework at Harvey Mudd College. I'm still amazed by the power of physics to explain a wide variety of systems, from neurons to sunsets to black hole accretion disks. My coursework and research taught me how to think critically and reject half-hearted comprehension. I learned to focus, work hard, and push myself to learn concepts and do projects that I thought were beyond my grasp. It is beautiful to see so much science I have studied—solid state physics, fluid mechanics, thermodynamics, quantum mechanics, relativity, optics, and chemistry—come together in astronomy. I draw upon all of my training to solve research problems, and I treasure that breadth of background and experience that I received as an undergraduate. Research continues to test my understanding, my creativity, and my patience, but I have learned to approach problems with quiet confidence and humility.

While studying science, I met people who were themselves complex and fascinating. Harvey Mudd boasts students and professors marked by their passion and creativity in all aspects of life; it was as if studying the natural world gave all of us a greater appreciation of life's rich beauty. The astronomers I met in courses and at conferences were broad-minded, independent individuals, experts in their field but also able to use their minds to understand the wider world. It is an honor to be part of this community of truly extraordinary people.

When I was young, I was fortunate to have relatives, teachers, and clergy who encouraged my interest in space. Now, with a group of Cornell astronomy students, I am trying to do the same by answering questions from the public on our astronomy website (<http://curious.astro.cornell.edu>). It's a fun and rewarding way to encourage public interest in astronomy. I've learned a lot from these questions, and feel they really help me understand astronomy. A friend once told me that if I can't explain my research to a child in kindergarten, then I don't really understand it.

I've learned that it is important to convince senators as well as six-year olds. This summer I attended an international seminar on the European Union in Rome and presented a paper on European space policy. I was impressed by my brilliant and friendly peers. But I was also shocked by how little they knew about their domestic research programs or the implications of science on their field. Italian scientists told me not only about their research; they also described frustration and difficulties stemming from a national freeze on tenure and low research budgets. Scientists know how to reach across continents to solve common research problems. We must make

sure we reach out with equal ardor to policymakers, not only to ensure the vitality of our research, but also to help all people better enjoy the benefits of modern science.

I also know that scientists must always remember that we work within a larger society. I spent a good part of my free time in college coordinating volunteer activities. I enjoy working with people who can see beyond the “bubble world” of deadlines and dorm life to work for positive change in the community. With the help of many wonderful friends, I encouraged our scientific community to think about the world we want for ourselves and the future. We donated blood, organized canned food drives, volunteered with a food pantry, sent books and letters to prisoners, worked on Habitat for Humanity houses, and shared laughter and stories with homeless men during our Saturday Brunch program. These experiences taught me about project management, budget fights, and even corporate liability, and will be helpful when I lead a research team. But more importantly, these actions made a tangible difference in our community. We connected with people beyond the safe world of middle-class familiarity, and I believe we are better for it. We found balance and perspective, and now see both our duty and capacity to build a more just and compassionate world.

I look forward to research in extrasolar planets, to the excitement and recognition that will come with the discovery of other Earths. Yet I am also mindful of the debt I owe to those who helped me get here, and to those who weren't so fortunate. I remember the world I left behind when I graduated from a poor public high school. I remember the critical importance of those few great teachers who fought standardization and indifference to bring passion and inspiration to the classroom. As a member of the Harvey Mudd chapter of the Society of Hispanic Professional Engineers, I mentored students interested in science from my high school district, located in a low-income, first-generation Hispanic and Asian community. Our shared experiences—problems with principals, crime on campus, and a consistently bad football team—helped us connect and understand each other. It scared me to think how close I came to forgetting our shared history, our community, while I pursued personal glory and curiosity. It took the daylight drive-by shooting of a student two blocks from my house to remind me that the situation is urgent and grave. To these men and women we mentor, science is not only a beautiful subject and a way to serve mankind, but also a source of freedom from the poverty and violence that grips our community. I owe it to them to help them bring honor and a better life for their families, find freedom from violence, and restore dignity and hope to our hometown.

The opportunities and challenges of science in the twenty-first century will call upon the visionary ambition, technical brilliance, and personal character of the citizen-scientist. We need people who will exemplify the excellent and somewhat paradoxical meld of tradition and revolution that characterizes scientific inquiry. It is a difficult thing to ask of anyone, but I know I am not alone. I have the inspiring example and fellowship of other brilliant, compassionate scientists. Together, we will push the frontiers of research, serve our communities, and engage a quickly-changing world with passion, determination, humility, and conscience.