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In the mid-eighteenth century, astronomers came together for the biggest scientific collaboration the world had yet seen. To determine the distance between Earth and the Sun, over a hundred scientists traveled all over the globe to observe the rare event of Venus transiting the Sun. A French astronomer, Guillaume Le Gentil, was assigned to observe from India. Unfortunately, this was during the Seven Year's War, so passage was difficult and when the event happened he was still on a boat. Not discouraged, he decided to stay for *eight years* until the next transit. After patiently waiting, the day finally came: and it was completely overcast. Dejected and partially insane, he returned to France: only to find his position at the Royal Academy of Sciences gone, his wife remarried, and his estate plundered.

Research is hard. You can be brilliant, hard-working, innovative, and yet fail purely from bad luck. I, like probably most of you, am here today due to some combination of persistence, creativity, and luck. None of which I've always fully appreciated or known how to use. Today I'm graduating with a degree in physics and astronomy, but I've only recently come to think of myself as a "science person". Growing up, I didn't feel smart. My second-grade teacher even refused to recommend me for an advanced class because I was bad at math. I stood out more as a creative person – putting most time into drawing, playing piano, and writing atrocious poetry. However, it was astronomy that always held my attention. So I decided to give it a go – and found that succeeding in science means a lot more than just being 'smart'.

I entered college with a simple goal of graduating in four years, even if I failed some classes. So I was surprised how well I could do when I learned to not to be intimidated by text or equations which initially made no sense. Research was harder to get the hang of though – often it felt like I was going nowhere. I spent Spring 2018 trying to figure out a weird pattern in my data – only to eventually discover it was a problem in my code: out of thousands of lines, I missed two characters. A 1 and a 0 stole months of my life. I think many of you may relate. Research is a lot like the weather in Boulder. It can be confusing, difficult to see consistent trends, and just when you've finally got it, you have days of sun and think winter is over – bam. Bomb cyclone.

Persistence is vital, but so is the way you approach problems. I didn't turn out to be smarter than I thought, I just realized the potential of skills not traditionally associated with science. Creativity is integral to the scientific process. This is not a new idea, and may seem cliché to some of you, but it took me a while to appreciate. Generating new approaches, making connections, novel research, and even presenting your work in an accessible way all require creativity. Talents I thought would be reserved for hobbies are what helped me stand out. As Arts and Sciences, we are a college of very diverse disciplines, but we intersect here – as fields all reliant upon thinking differently.

And then there's luck. I'm fortunate there are mentors here who put extra time into working, talking, and just being honest with me. Two in particular who I can't thank enough are Dr. Erica Ellingson and Dr. Zachory Berta-Thompson. I was also fortunate of the opportunities at CU. Although many don't realize it, this campus is home to the best university planetarium in the country (and defendably the best planetarium in the world, but I'm a bit biased). Developing and presenting shows here taught me far more than I learned in any single class. But some may say luck had nothing to do with it – we were the ones who took advantage of what CU has to offer. Which is true, but I never would've known *how* to take advantage of these if it wasn't for my early education and continued support from those around me. I had brilliant elementary school teachers, a fantastic family, parents who gave me opportunities instead of just pushing me, a brutally honest little sister, a patient partner, and encouraging grandparents who I hope can see me now.

Some of you may have gotten here purely by yourself, for which I have great admiration, it's not something I could've done. But for the rest of us, think how your life would've been different if you didn't have a supportive family member, an inspiring teacher, a quality education, or whatever helped *you* get *here*. This is why I want to, ultimately, dedicate my life to outreach. Help make science more accessible for students who otherwise might not have access to these resources.

Despite being perhaps the unluckiest astronomer in history, Le Gentil eventually sorted out his life and lived happily. He died having not only discovered three of the most well-known objects in the night sky, but, while in India, he studied local astronomy traditions and ended up disseminating and preserving techniques previously unknown to Western science. Shoot for the moon. Even if you miss, just call it a gravitational assist and keep on going.

…which is what I know you will all do. The most common questions I get asked at the planetarium – what's inside a black hole? Does the universe go on forever? Where are the restrooms? And what's the deal with dark matter? – are (mostly) questions that no one has the answer to. Which is sort of terrifying, but also exciting. There's so much to discover, to learn. And so many ideas that may be missed if not everyone has the opportunity to realize their potential like so many of us did. Thank you for listening. I hope you all succeed in whatever you do, and never forget to share what you learn.