

My love for science

Five hundred years ago, the Europeans learned about a new continent, they set out on the oceans to map what they saw as their world. Today, that job is done, all of planet earth is discovered, so what shall curious people who are eager to discover new worlds do today? They will look up in the sky and see that we humans have barely begun to map out the world. They will look up in the sky and see millions upon millions of bright stars gazing back, waiting to be discovered.

My name is Jakob Reinholdsson and I'm in love with science. I live in Stockholm, I'm 17 years old and I'm in my penultimate year of gymnasium.

If I could describe myself with one word I would say that I'm curious. Learning new things is the best thing I know. Words like physics, math and astronomy would make most people yawn. It has the opposite effect on me; it brightens my eyes and sharpens my ears, for I might learn something interesting.

I'm not sure where or when my love for science began. But I'm pretty sure it has its roots on the internet where communities like Reddit and YouTube channels can feed once passion endlessly. On Reddit there are from time to time physicists, astronomers and scientists having Q&A: s or enthusiast like me throwing out a question and having it caught by a professor answering and discussing the question.

On YouTube there are a people doing short videos about science. There is in particular a journalist, Brady Haran from Australia interviewing professors in maths, physics and astronomy about all kinds of interesting phenomena in science. He has a very popular YouTube channel called Numberphile where he puts his maths videos; he has SixtySymbols which is about physics and Deep Sky Videos which is about astronomy. I would say that he has, if no one else, inspired me to learn everything I can about maths, physics and astronomy.

I find all areas of science interesting, everything from psychology to astronomy to pure maths I find enchanting, but astronomy sticks out in my opinion. Since astronomers are the explorers of tomorrow. They gaze up in the sky, into the depths of cosmos. They look through a lens and look not only millions of light years away, but billions of years into the past.

The things astronomers can see amazes me, all the different kinds of stars and the planets that encircle them. How the multitudes of stars combine in galaxies and clusters of galaxies. It amazes me how they can pierce into cosmos with telescopes and conclude what stars are made of, how big they are, how they work and even how old they are.

What primarily makes astronomy special to me is because it can answer fundamental questions that humans have asked for millennia. Questions like, what happened in the beginning of time? How did life come to be? Are we alone in the universe?

I think being an astronomer is not a walk in the park though, it's not as easy as just "looking" at the stars and you get all the answers. You have to work for the answers, for only with the

power of maths and physics can we answer the question of how the universe began and how our planet formed. It is not a simple matter to observe for example exoplanets. An analogy I've heard is that the process of spotting exoplanets are similar to sitting in New York, looking west towards Los Angeles, and searching for a tiny little fly, briefly passing a light bulb.

What ultimately makes me most excited about science isn't how much amazing things we have discovered, but how much more there is to learn. For instance, last year the final piece in the standard model was put to place, the Higgs boson was discovered. It was now confirmed that we know all there is to know about matter in the microscopic scale. However, the standard model doesn't explain everything; you can't for example describe the motion of planets with quantum physics. You will need Einstein's theory of general relativity to explain that. There are in fact two rulebooks governing the universe, quantum dynamics which governs the very small and the theory of relativity which governs the very large. Both theories are essential in explaining cosmos, quantum physics you need to explain for example how stars work while you need relativity to explain where it's going. Unfortunately quantum physics and the theory of relativity doesn't play well together and fully explain the universe, we would need a new theory of everything, a theory of quantum gravity. Maybe, just maybe the answer to that quest is written in the stars.

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