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Place: NASA Jet Propulsion Laboratory (JPL)

Dates: 20th June 2016 till 27th Aug 2016

Purpose: Summer Internship Program

Working at NASA had been a dream of mine for as long as I can remember. Every time anyone asked me where I wanted to enjoy my career when I grow up, without a second to spare, I would proudly say NASA. However, every time there was a little voice in my head which said these dreams were too big. Working at NASA once seemed unrealistic and exaggerated but as Dr. A. P. J. Abdul Kalam once said 'Great dreams of great dreamers are always transcended', so I kept dreaming.

After applying for the NASA Jet Propulsion Laboratory internship for 3 years in a row, I was finally offered one in the summer of 2016. I remember thinking this summer is going to be a turning point in my career. I will finally get to experience what my dream job entails. Along with being over the moon for getting this opportunity, I also felt a little frightened. What if working at NASA is completely different to what I have been dreaming about all these years? What if it's something I do not like? I assured myself by thinking that internships are designed to answer these questions and provide insight into what it is I love doing. And I was right; it was different from what I had imagined, it was a great deal better.

JPL is a research and development centre managed by the California Institute of Technology (Caltech) for NASA, located in Pasadena, California. Upon my arrival at JPL, I was immediately introduced to my mentor for the next 10 weeks, and sent on my way to get badges and to receive my laptop. They wasted no time in getting me situated and acquainted with the JPL campus. I was offered the internship to work in the science division. My work involved mapping the carbon dioxide and temperature of the Martian atmosphere in the Polar Regions. I used data from the Mars Climate sounder on board the Mars Reconnaissance orbiter which has been orbiting Mars since 2006. I worked on mapping the temperatures of the South Pole in the winter season of Mars Year 29. The idea of being in NASA and getting the opportunity to map the atmosphere of our neighbouring planet filled my heart with joy. I was learning so much about the atmosphere of Mars and discussing the possible mechanisms that are occurring in the polar region with experts from NASA.

NASA JPL is amazing. It has an amazing campus, amazing people, amazing projects... the list goes on. Every day as I walked around the lab, I would think to myself the great people who gave us the courage to reach for the stars once walked and worked here. The remarkable scientists and engineers that got us to other planets and as far as the interstellar medium once worked here. That was enough motivation to 'Dare Mighty Things'. JPL, as a federally funded research lab, is so open and transparent. Someone in the lab said – all the research work we do here is funded by people's money, so our policy is to make all our research available to people. In the world of open government, the boundaries of countries are diminishing. I got the chance to learn about and work on some of the most interesting projects at JPL despite being a foreigner.

Every week we had a group meeting with the chief scientist of JPL. We would individually present what we had been working on and discuss with the group the science behind the results. The first couple of meetings were daunting; I would present a couple of graphs I had made to the experts and

explain what I understood from the graphs. As an undergraduate student, my knowledge of the Martian atmosphere obviously did not stretch as far as the experts in the room. However, every single person was patient, listened to what I had to say and was thoroughly impressed by my progress. When I was wrong, which happened often in the first few weeks, they would correct me in a non-intimidating manner. After the first few weeks, these meetings starting feeling comfortable and my confidence was higher than it had ever been. At the end of the internship, all the interns had to present their work. When I was presenting my work, I felt confident and in control, purely because of these weekly meetings. Not only did these meetings improved my presentation skills and my communication skills, I learned so much from them, they soon became my favourite part of the week.

One of my favourite things about JPL is the work atmosphere. It is a very friendly atmosphere where one can thrive. Everyone you speak to would give you advice on how to succeed. I learnt very early on that the scientists and engineers at JPL love to talk about their work. You can approach anyone at lunch or in the line for coffee and ask about their work. I met a lot of remarkable people this way starting from the chief technologist who has worked on almost every major mission by JPL to a summer intern working on artificial intelligence to the engineer who thought of the skycrane idea. (The skycrane was used to land the curiosity rover on Mars and will be used in the next Mars2020 mission.) I met people who are experts in mechanical engineering, electrical, antennas, robotics, propulsion, telescopes, physics, chemistry, biology, magnetism – anything you can name. My favourite JPL robot is a walking robot inspired by the way geckos walk. I even managed to arrange myself a meeting with the director of JPL, Dr Michael Watkins.

There were a lot of people I met who would say they interned at JPL as an undergraduate and started working once they finished with their studies and have been there ever since. For some it had been 20 to 40 years. Most people want to work on their projects from the very start to finish, they want to see the transformation of their idea to a proposal into a prototype, then watch the spacecraft get assembled in the clean rooms, see it get launched into space and operating it to push forward the science. Of course, there are short lifetime and short impact projects here too. When one has the courage to dream about reaching distant planets or studying far away rocks that spin and shine, one has to be ready to give at least a decade or two of your life. It's not that JPL asks for this commitment, it is what most people do to feel the sense of completion of work they start.

A person who took interns on tour to the mission control and Space Flight Operations Facility said – Once an engineer or a scientist gets a job at JPL, he/she will never leave JPL. As my internship came to an end, I actually felt it – I was not ready to leave. Why would someone who loves space and research want to leave JPL?

On top of the academic experiences, as JPL is in Los Angeles County in California, I had a great summer exploring Pasadena and LA. I lived at California insitutute of technology (Caltech) dorms and met students working at JPL, LIGO and doing research at Caltech. With the great friends I made, I spent my 21st birthday at Disneyland – another dream come true! I visited Universal Studios, went hiking and of course visited the famous California beaches.

It was truly a life changing summer where I learnt so much more than I could have ever imagined. This internship went beyond fulfilling my dreams, it gave me inspiration!



At the Mission Control/ Space Flights Operations Facility building



Model of curiosity rover



JPL mission control



The Dockweiler beach in LA