

Space Camp – Katherina Mazai-Ward

From the 17 to 21 April, I attended the South Australian Space Camp. Only 24 Year 11 students across South Australia were selected to attend the camp, that spent 2 days in Adelaide, and 3 days in Melbourne. We partook in various activities. The first day, I arrived at Warradale Urban Camp at 9:00 in the morning. We were split into 4 groups of 6, each named after a rover made to study Mars, that are either there or on their way (Curiosity, Opportunity, Spirit and Insight). My group was called Opportunity. After being split into our groups, we were taught how to make a rocket, following the instructions given to us. After an hour of supergluing fingers together, and sticking parts on the wrong way, we finally finished our rockets, which were powered by gun powder.

In a two-part phase, these rockets, hypothetically, were meant to fly into the sky, the nose cone then coming off for a streamer to act like a parachute to slow the descent. This was the first time the organisers ever used this rocket design. Counting down from five, we waited for the rocket launch. Nothing. 15 minutes later, we finally managed to get the first rocket launched. Doing four rockets at a time, we watched in amazement as they sped off, a couple of them taking the rods that held them also. We watched as the records fell from the sky, the rods like spears, falling to the ground. We were all hoping to see at least one rocket explode, our wish was granted.

After this fun activity, we learnt about how big our solar system really was, and how far all the satellites really were. We used the building itself, to give us a picture of how far everything really was, walking fairly big distances to get to the next planet. We later took a train into Adelaide, and attended a lecture by a professor about gravitational waves in Adelaide Uni. We learnt a lot about how these waves were done. A lot of these waves are caused by orbiting black holes, where they literally cause a ripple in space time. Walking over to the laser department, we saw mirror configurations, which made the lasers path change direction done by Uni students. Ending the day on a high, we had dinner at San Giorgio's, which had the best pizzas by far.

We spent our second day at the RAAF base, and at DST, which is where they develop missile and satellite technology. We got a tour through the safety department at the RAAF, where they tested, made and fitted different aviation safety equipment such as life rafts, pilot helmets and parachutes. We managed to also get a tour in the P3 Orion, which will unfortunately be getting retired by the end of this year. The best part of the Orion tour, was being able to move the camera at the bottom of the plane, switching it from infra-red and zooming in on things at the base.

After this tour, the bus took us to the medical department, where a doctor talked about medical issues that they have to take into account and minimise when going into space or travelling through space in the future. This included protecting astronauts from radiation, and G forces. We got to see a hypobaric chamber, which is used to test pilots, for it stimulates high altitudes by lowering the oxygen and air pressure. After the tour of the base, we travelled to DST, where they spoke about new cube satellites that will be used in the future, and how they develop lasers for missile navigation.

After our day at these facilities, we went to Adelaide Planetarium, and watched a 30-minute movie about the Solar System and the universe. Telling us about the discoveries that we have made, the satellites that are currently exploring space, and facts about the different planets in our Solar System. Once again, we finished the day off with delicious food from the Schnitzel House.

Waking up at 4:15am the next day, we flew to Melbourne. As soon as we landed, we travelled straight to VSSEC (Victorian Space Science Education Centre). This building held the Mission to Mars program. Students participate by being an astronaut changing over and being Mission Control, in a Mars like scenario. The astronauts collect samples and data on the surface, while Mission Control issued instructions and recorded the data needed. The first day here, we put on the white coats and became researchers. We tested our fitness, calculated data, to see who the best astronaut would be to fit the job. It ended up being a rock, paper, scissor match between Jess and I, for both our results passed the NASA space flight requirements.

We then measured radiation from different radioactive materials, using a Geiger counter, trying to determine which material or liquid blocked radiation the best. We discovered that human bodies were the best and decided that spaceships should be made out of human bodies, or at least have a water layer around it, for water was the second-best radiation blocker. We then set up a cloud chamber and placed it on dry ice. What was amazing about this experiment, was we actually saw alpha, beta and gamma particles. Every one of them had a shape, where alpha appeared was a short thick cloudy line, and gamma appeared as a cloud corkscrew. The last thing we did for the day was a urine and blood test, to see which 'astronaut' was healthy enough to go to space. The urine was not real, but made using different chemicals, I mean who would actually want to smell real urine.

Looking through microscopes and testing pH levels, we found that only astronaut 1 and 2 could go to space, for the others either did not have enough red blood cells or had too many white blood cells. Exhausted from the long day we got to the apartments and just relaxed for the next 2h.

On the second day at the VSSEC, we got dressed into flight suits in preparation for the Mission to Mars. We were all given a role as an astronaut on the surface, and a role for when we were in Mission Control. I was a Chemist, and got to put rocks in Hydrochloric Acid to look for a reaction, and in a test tube filled with the Universal Indicator, to see whether the rock was neutral, acidic or basic. Getting into the space suits was a pain. We had to put on another suit on top of the overalls we had just put on, heavy but to simulate the gravity on mars, delayed comms in our helmets, and heavy backpacks that was actually blowing air into our helmets. Being a chemist, I had to crouch a lot with a metal detector to find metallic rocks, and test different ones. I also had to continuously relay my results to mission command. Through the headset we wore, four people were on at once, the second chemist and two people in mission control. We spent an hour on the Mars surface, which was in fact the complete replica of a crater on Mars!

Unfortunately, all scenarios had to end with Mission Control screaming into our ear "get off the surface, you are going to die," even though we couldn't exactly leave until the door

opened. The commanders got off seconds before the 'storm' hit. Changing positions, I spoke to the physicists. They had to set up the weather station and monitor radiation. Their scenario ended with radiation levels increasing to dangerous levels. After this, we tested the rocks found. Being a chemist, I crushed the rocks collected in distilled water, collected the filtrate, and put it through a laser to see what type of rock it was. To end our last day, we headed into Melbourne and went on the sky deck, which was on the 88th floor. Enjoying the sights of Melbourne was a great way to finish off the week.

Overall, I had a great time. I made a lot of new friends, which I am sure will be friends for life. The experience was probably the best I've ever had considering it was to do with my passion for space exploration. The food was really good, and I encourage anyone interested on the topic of space, to get on board. It is a very interesting topic full of mystery and wonders, and never ceases to amaze me.