

## 10 DAYS AT SCOTTISH SPACE SCHOOL, HOUSTON

**Gemma Milne, Leckie Road, deservedly won a place at the Scottish Space School in Houston, Texas recently, ran the gauntlet of Hurricane Ike, but came back with stars in her eyes.**

### The Background

It was quite surreal standing at Glasgow Airport at 6.45am on the 5th of September 2008 with 24 strangers, a few Careers Scotland leaders and my good mate Claire. We were about to embark on the trip of a lifetime – to the Scottish Space School...

Scottish Space School is a programme, set up by Careers Scotland, which gives students the opportunity to visit Johnson Space Centre in Texas for 10 days, where they are set space-related missions, whilst also seeing 'behind the scenes' at NASA. They also get the chance to meet NASA astronauts and engineers – and it's all free!

### When it all began

It all began in February 2007, when I arrived home from school thrusting a leaflet about a trip to America into my parents' hands – to which they chuckled and made a joke about 'Gemma the astronaut'. At that point, we had no idea of the work that was going to span over roughly 4 months, and could never have dreamed of the trip to follow.

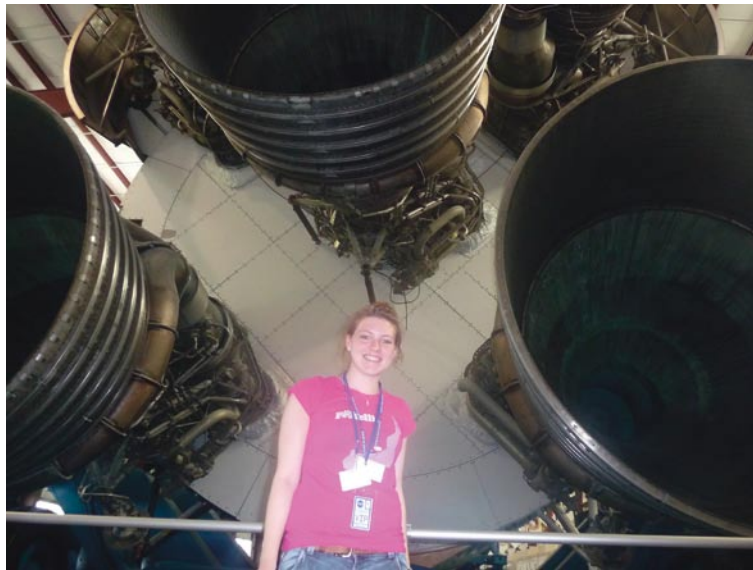
The application module, which any 4th year student in Scotland studying science or maths could submit, consisted of a mixture of multiple-choice space/maths/physics-related questions and essay-based general questions.

3000 students, who submitted initial applications, attended a conference with NASA astronauts and engineers in Strathclyde University in June 2007. We were given a 30-page booklet containing a further 6 modules, all to be sent away for specific deadlines between June and September (yes, we spent our summer holidays researching NASA...!) The modules consisted of various mathematical problems, and activities – the activities took the most time as they ranged from a discursive essay on whether we should return to the moon, to designing a Mars Rover and a research society (buildings, government, leisure and all!) to live on Mars.

It was a difficult and time-consuming project, but also very interesting. In September 2007, every student who submitted all 6 modules attended a workshop in their region, which assessed their team-building and social skills. Then we just had to wait...

### Success!

On the 15th of October 2007 I finally received a letter from Careers Scotland – I was one of only 52 students who had been selected to go to NASA! As you can imagine, I was ecstatic! I was even more excited when I found out that my friend Claire had been selected too! We were the only two students to have been selected from the same school (huge credit to Stirling High as a further 2 pupils were runners up) going on the same trip! It was pure luck that we happened to be in the same form class and were good mates as well! Twenty six of the selected students went to Houston in January of 2008, and the rest (including myself) went in September. It was a long wait from October 2007 till September 2008 – but it was worth it!



"Huge rocket engines make an impressive background to this photo"

### What a Welcome

And that brings us back to Friday the 5th of September at Glasgow Airport. We were given our Space School T-shirts and ID and met the rest of the students – all of whom became good mates by the end of the trip. We arrived in Houston to the sound of bagpipes and the sight of photographers! It had been a long day after the monster 11-hour flight, but it was rounded off brilliantly with pizza, more free t-shirts, being presented with Gene Kranz's (the Apollo missions' flight director) autobiography, and the itinerary for the rest of the trip.

### Team Building?

On Saturday, there was no time for a long lie as we began the experience by having a good ol' game of football (or is it soccer?! ) against NASA employees – yes, astronauts as well! I scored 2 goals (though women are considered bad football players, and the Americans awarded a female goal with 2 points, so it was 4 instead) and we ended up winning 5-3! I was well chuffed as my contribution won me (wo)man of the match and we returned to the hotel to jump into the pool to cool down. The day was rounded off with a party at Hyang Lloyd's house (the lady who was in charge of the programme) where we had the chance to chat to astronauts, other NASA employees and their families, with a buffet and music!

On Sunday, we were allowed a longer lie-in then headed to the Outpost bar for lunch. This bar has been in Houston since the building of the Johnson Space Centre and it's where NASA employees hang out after work! The walls were

covered in signed photos and NASA memorabilia, along with \$1 bills, which had been signed by astronauts and visitors alike. We all wrote our initials on one and had it stapled up with the others!

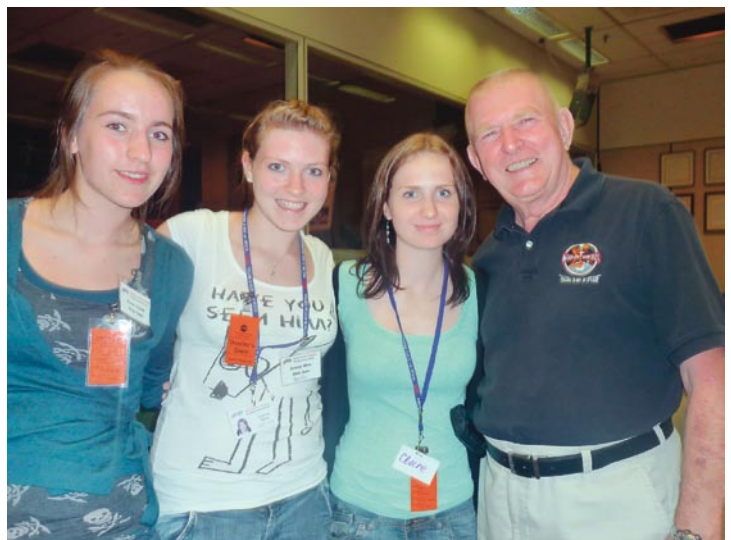
After being fully fed with the most chips I have ever seen, we headed to the George Observatory, which is located in the centre of a wildlife reserve. We had to walk through a forest with massive spiders everywhere, and over a lake containing alligators – we spotted a baby one but, to everyone's delight, no fully-grown ones were any where near us!

### Challenging Mission

Beside the Observatory, was the Challenger centre where there was a mission control mock-up. Here we split up into two groups and had a shot at being mission control and the shuttle staff! I was in the Capcom pair – this is the sole team in mission control who can verbally communicate with the shuttle during missions and the two of us had a ball attempting to use phonetics and shouting 'Houston we have a problem' over the loudspeaker! Next was some astronomy using some of the biggest telescopes around! We saw both the Moon and Jupiter extremely clearly, and also watched as the 'Motorola' satellite's mirror reflected the sun and passed over us – it looked like a shooting star that appeared for only 5 seconds or more – we were all so amazed at how accurately the astronomers could place the event! We went back to the hotel for an early night before the real programme began the next day.

### Down to Work

**Monday** was the start of the Space Centre Houston programme, and we were all split up into 3 student teams (one of which I was elected to project manage) and one Careers Scotland leaders, aptly-named, silver adult team. We designed and built rovers, which had to be able to collect rock samples which differed in value



Kristy, Gemma & Claire met Gene Krantz, Flight Director of Gemini & Apollo flight programmes, best known for his role in the ill-fated Apollo 13 mission.

depending on size and weight, i.e. the rovers had to be pretty strong. Ours cost a mere \$122.6 million! After lunch, we heard a talk from a British astronaut, Piers Sellers, who had studied at Edinburgh University! It was truly inspiring to hear from someone you could relate to but whose job is something you only really dream of.

At night, we received one of the most inspiring talks. We visited the old mission control where all the Apollo missions (lunar) were based, and had a talk from Gene Kranz. As I said earlier, he was the Flight Director of all the Apollo missions (played by Ed Harris in the film Apollo 13!) He spoke about his many missions and wowed us with his stories, which took place behind the scenes at NASA. It was so interesting and his signing of our books and posing with us for photos was pretty unreal. The best part of all, however, was when we then sat and watched the movie 'Apollo 13' in the actual Mission control in which the events in the movie took place - and where the movie had been filmed! It was absolutely brilliant! We were watching the room in which we were sitting!

**Tuesday** was the day we first heard the news about Hurricane Ike, but it didn't stop us that quickly! We received a 'Level 9' tour of Johnson Space Centre - for which we required VIP passes. We all felt like celebrities, except we were really just a big bunch of nerds! The tour consisted of seeing the Neutral Buoyancy Lab - the big pool which NASA train their astronauts in; the active Mission Controls where we watched the International Space Station docking, live; one of the vacuum chambers where space technology is tested - the door of the chamber was around the height of two Double Decker buses - in the Space Environment Simulation Lab; the Space Vehicle Mock-up Facility, including full-scale International Space Station module mock-ups and several Space Shuttle cabin and payload bay mock-ups; the actual Saturn V rocket which took NASA astronauts to the moon in the 60s and the 70s; and so much more! It was unreal as everything was so big and this was stuff you only really see on TV!

After the tour, we went to a restaurant for 'Geek night'. This was a social gathering of 20+ NASA engineers and scientists and we had the opportunity to chat away to them all! I ended up having an in-depth conversation with a mathematician called Kevin, amongst others, who gave me lots of advice about University course choice - it was so helpful and I was very grateful for the opportunity to discuss my career with a NASA employee! When we arrived back at the hotel, we had a presentation on rockets to compose for the next day, and our team was up to the wee small hours trying desperately to finish before daylight!

**Wednesday** turned out to be our final day at Space Centre Houston due to the hurricane, however, we filled it up well. We started the day off by having a go on the shuttle simulator, which I crashed to the ground just short of the runway, and received two talks - one on space suits (where we were allowed to try on astronaut gloves, helmets and under suits) and another on space food. We then began our Lander designing, building and testing. Basically, we had to design something that we could insert an egg into and drop it from a 3 story height without the egg breaking. It was harder than it initially sounded as we were given limited resources and, as with everything, equipment had a steep price! We also built our rockets, which turned out to be extremely difficult, as



**"It's not often you get to fly a shuttle simulator. I crashed just short of the runway"**

we couldn't fit the parachute into the top of the body for at least 20 minutes...and we were at NASA! At lunch, we dined with astronauts, and sitting at our table was a younger astronaut called Alvin who entertained well with his microgravity stories and tales of his application to be an astronaut - it was unbelievable! After lunch came our presentation, and we did it in the form of a radio programme, complete with a 'chart' countdown, adverts, music and interviews...rockets included in all parts...sort of...

We spent the night back at the hotel down by the poolside singing, dancing, swimming, and generally having a great time. This was one of my favourite times at space school as it was such a fantastic atmosphere!

#### Evacuation

**Thursday** - We had originally been told that we would spend the morning at Space Centre Houston and would get to launch our rockets and test our rovers, then go to the NASA gift shop. However, the state ordered a mandatory evacuation, so we had to pack up and head off to the centre of Houston (we had originally been in the Hilton, near the coast, which was subsequently badly damaged in the storm). We were then told that our flight home on the Sunday night had been cancelled. Before leaving, we had lunch at the Kemmah Boardwalk. We later saw on the news that it had been completely destroyed by Ike. Hotel number 2 turned out to be much more glamorous than number 1, so everyone was really pleased with the decision to move! We spent the rest of the day chilling out in the new hotel and waiting for more information on what was to come next, while eagerly watching the weather channel.

**Friday** - A few astronauts and engineers, who had been evacuated with us, conducted a small workshop in one of the conference rooms in the hotel. We had

discussions on recent space debates such as whether we should go to Mars or not, and the effects of microgravity on the human body. It was really interesting to get everybody's point of view on matters which are at the heart of the space industry, and it was really generous of the NASA employees to give us their time and help us complete the 5-day programme.

In the evening, we went outside the foyer of the hotel in the strong wind to do some ceilidh dancing to the astonished but bemused faces of the other hotel guests. Some even joined in, and we were all buzzing with excitement - none of us had ever seen a hurricane after all, and the worst of it wasn't to hit until during the night, so we all felt safe and secure. My roommate and I stayed up to watch the hurricane that night - we couldn't see much due to the darkness, but there was a lot of lightning of all different colours, plenty of wind which blew over trees and blew in some windows (thankfully none in our hotel), and a lot of rain. It was scary, but also quite exciting, and unlike anything we had ever seen before.

#### Hurricane Aftermath

**Saturday** When we woke in the morning, after very little sleep, we had no electricity, air conditioning, water or flushing toilets. Someone with a battery operated radio let us listen to descriptions of devastated downtown Houston - fortunately, the area we were in saw the least of the damage. We were pretty sombre up until we were informed that we were going to be moved again to San Antonio, which meant a 4 hour bus journey, but also a shower! The journey turned out to be brilliant as the atmosphere from the days before came back and the terrible singing commenced again!

Unfortunately, we couldn't find a hotel in San Antonio with enough rooms for all of us, so we had to be split up into two hotels. I had the unenviable task of helping the Careers Scotland leaders make up the two lists. It was difficult to split up the group which had been quite united throughout the last week, but we somehow managed to keep almost everyone happy and hotel number 3 was even more luxurious than the two previous!

**Sunday** - We all had breakfast together in our hotel and we were all given papers to vote for



**"The graduation dinner was fantastic. Everyone got really dressed up in gowns and kilts and no one failed to make an effort."**

'most outstanding student'. We were told it was to be someone that we thought had given most to the trip and had been popular throughout the week. After the voting, we visited the Alamo, which was the site of one of the battles fighting for Texan independence from Mexico in the late 1800s. It was quite impressive and obviously a treasured historical site for Texas. We spent the rest of the day in the mall, and returned to the hotel to get ready for our graduation dinner and ceilidh - tired, happy and with very light purses!

The graduation dinner was fantastic. Everyone got really dressed up in gowns and kilts and no one failed to make an effort. I sat with the closest friends I had made over the course of the trip, which made it all the more special and memorable. The table allocated me to do a vote of thanks to the Careers Scotland staff so, after the main course, I stood up and gave a short speech, ending with our presentation of a bottle of Champagne to the fantastic Careers Scotland leaders (goodness knows how I got away with purchasing the bubbly - you have to be 21 in Texas to buy alcohol...!) After dessert, it was time for awards presentation - one was for 'most outstanding student'. I was so touched when it was announced that I had won this award - I really wasn't expecting it - I was overwhelmed when I got a standing ovation! It was a moment which I will never forget.

The good fun was brought to a halt not long after when we were told that our flight the next day had been cancelled again and it wasn't

going to be until Tuesday that we would fly home. However, we soon cheered up when the ceilidh began - we danced all night long and retired to bed far too late, again...

**Monday** - My group moved hotel to join the others - this was hotel number 4 for half of us and, by this time, the packing had resulted in clothes literally being stuffed in the cases! We spent the day around beautiful San Antonio and, at night, had our final dinner and sing songs (again), followed by late night chatting in our room (again)!

**Tuesday** morning. We had to pack our bags and head to the airport for lunch. It was quite sad to think it was our final day as we had had such a ball over the last week and half! We flew first to Chicago, 4 hours, then to London, 8 hours and then, finally, back to Glasgow! Due to the time difference, it was 1pm on Wednesday here, but we were all in 7am mode and due to my lack of sleep on the flights, I was absolutely shattered! Our parents met us at the airports, which was quite emotional as everyone was so pleased to see their loved ones, but also because we all realised that this was really the end of our trip. We were also 'welcomed' home by lots of press, and I was interviewed for STV news looking absolutely shattered - my mum was pleased to have her starring role as well, though, when they asked for the 'parents' perspective of the hurricane!

Saying goodbye was the only part of the trip which I disliked. As much as we all knew we are going to keep in contact, it was the end

of what was 13, as opposed to 10, days of complete awe-inspiring experiences and close friendships. There were quite a few people who I really bonded with on the trip, and I know that I will really miss them - we're already planning the first reunion!

### Back to Normality

Now we're back to normality - we've posted our photos on the net where we can all look at them, however we are not allowed to post the ones of NASA on the internet due to 'confidentiality' stuff...so the photos in this report are, in a way, exclusive!

Well, that has been enough excitement for me to last a lifetime and it really was a trip that I'll never forget - I have been so inspired by so many people to do something really worthwhile, and I really do hope I can achieve that!

**Gemma Milne**



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