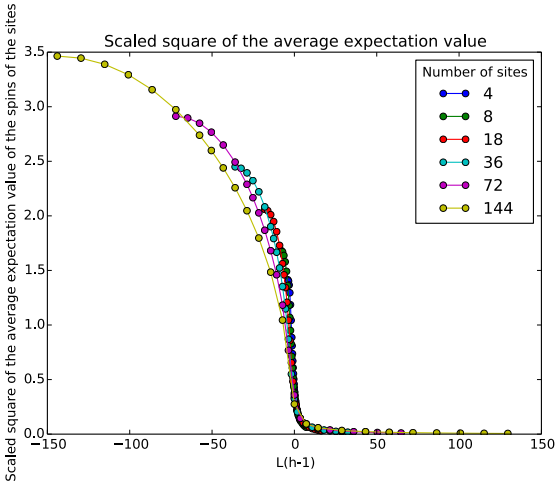
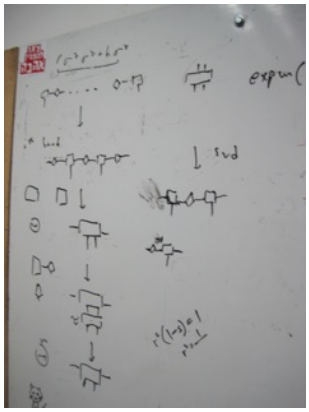
Weizmann ISSI 2015 Report: Adele Jackson (Australia)

Talking about the ISSI, the question is really where to begin -- it was easily the most incredible month of my life, and for such a range of reasons.



There was, of course, the formal scientific part of the program. I was working with Jacob Laxer (from Canada), under the supervision of Ori Alberton. Our project was to simulate one property, the average spin, of a chain of stationary particles when a horizontal magnetic field was put over the chain. Theory suggests that, as the strength of the magnetic field is increased, there should be a fairly dramatic change in behaviour of the spins of these particles. For the three weeks, the two of us learned some quantum mechanics, linear algebra, programming, and a whole lot of fun! It was incredibly satisfying when, after two weeks of work and very little apparent progress, the whole problem just started to click together and our graphs were actually right. In particular, the graph shown here was one of our final products. Theory suggests that it should be possible to turn the graphs for different numbers of particle sites into the one function around some critical value, and it worked just as predicted.



Working out our algorithm on the whiteboard

The ISSI physics students (spanning 7 countries and 4 continents)

I loved the research component. Getting to work on recently developed algorithms (the one we were using was described in a paper in the last ten years, which is a far cry from high school physics, which barely gets into the last century) to explore a problem that has applications to novel technology, was very exciting. One of the best things I got out of this program was the knowledge that I could very happily do basic scientific research as a full time job. Although this has been my intention for the last few years, not actually having done any did make me a bit nervous about the future. I now definitely want to pursue Honours at the end of my degree. It was also fascinating hearing about other people's projects throughout the month. From trialling nanoparticles aimed to kill lymphocytes in mice, to synthesising gold nanowires or analysing the data from a scanning electron microscope, the variety of science going on at Weizmann hasn't ceased to amaze me.

All the British flags in one place (Adele Jackson (Australia); Josh Richards (New Zealand); Rhys Jones (UK))

As well as doing lots of science, the eighty students at the camp also had lots of time for sport and music! First off were the country presentations, a week into the camp. I figured there was no better time to introduce everyone to the wonders of vegemite. I was pleasantly surprised by about ten people saying they didn't hate it, and a few even asked for more! Generally, it was great to learn a bit about the varied cultures everyone had grown up in. (The Brazilians making brigadeiros was

Performing Hatikvah for the president of Weizmann
Flute: Sarah Albrecht (Germany); Violin: Sarah Leah Eisenberg (Canada); Guitar: Jay Zussman (USA); Piano: Adele Jackson (Australia)

certainly a highlight.) On the sporting side, I played in the soccer tournament, which was a great opportunity to learn that "soccer" is definitely not the correct name for the sport, at least in the opinion of the Europeans. There was also plenty of time for the musicians. There was plenty of informal music-making throughout the month, such as singing along to the guitar while at Weizmann (and without one while hiking -- we certainly got through a lot of songs in the month!). We additionally put together a small recital for the most formal event of the camp, the dinner with the President of the Weizmann Institute. Prof. Daniel Zajfman gave a very inspiring speech about the importance of basic scientific research to society. In the recital, I played piano in a duet of Schubert's Sonata Arpeggione and the Hatikvah.

On days we weren't doing science, the program certainly kept us busy! Over the three weeks of research, we travelled from Haifa to Jerusalem. I found it quite an experience being in a country where the mixture of cutting edge technology and industry, a young state, and many thousands of years of recorded history is so obvious. In particular, seeing the Baha'i Gardens, and generally visiting Jerusalem (from Yad Vashem, to the Church of the Holy Sepulchre, to the Western Wall), were experiences I never thought I'd have. Getting to go to sites that are so important to so many people was both interesting and humbling. Our guides certainly did an excellent job of making it absolutely fascinating. The morning spent on Masada, "meeting" King Herod, Eleazar ben Ya'ir and talking about what it would have been like for those who lived there before and during the revolt, was a really effective way of exploring history.

"King Herod" (Hagai, one of our guides) telling us about his palace on Masada

On the more scientific side, staying in Kibbutz Ktora in the Aravah Valley was very educational. In particular, I learnt about how the kibbutz remains economically viable in such an inhospitable place, and how the members have managed to turn some of the hardest aspects — the heat, sun, saline bore water and aridity — into advantages, through an algae factory, solar fields and date palms. Coming from Australia, which is also very dry and hot, it was interesting to think about how lessons from attempts to create permanent communities in areas like the Aravah and the Negev could apply to home.

ISSI participants being shown around the solar fields and algae factory in Kibbutz Ktora

After we completed the research projects, the final week of the trip was spent hiking in the desert. In three deserts, in fact! We travelled from the Judean Desert down to Eilat over six days. Despite the heat and sun, it was an incredible part of the month. Being somewhere so isolated, and with Siv, our guide, so knowledgeable about the geology and ecology of everywhere we were, was something

very special. Hiking was great fun, especially given how beautiful the desert in Israel is. The hike to Ein Akev, near the Sde Boker field school (where we were staying), was particularly gorgeous. Thought we all grumbled a bit about waking up at 4:30am for it, seeing the sun rise above the hills of the Negev, walking across the plateau, in what looked like utter aridity, and then descending to a beautiful spring, was one of the best parts of the trip. After our last hike, on the hills above Eilat, Nelly Morgulchik (UK) described the silence in the desert as “the most beautiful music [she had] ever heard”.

Ein Ovdat

I am so grateful to have been able to attend the 2015 Weizmann ISSI. Being able to do research, to meet and form close connections with like-minded people from around the world, and visit such a beautiful country, was all just as amazing as I had been told. We were all quite close to tears on the last day. I am sure that I will return to Israel and to Weizmann, and that the connections we all made (and the love of science!) will remain strong as we go through university. It was an incredible month.

After the last hike, on the hills above Eilat

With friends in Jerusalem (Dan Jacobson (UK); Eva Angehrn (Switzerland); Adele Jackson (Australia); Nanina Föhr (Germany); Theresa Häberle (Germany))

Hiking to Ein Akev, near Sde Boker

Weizmann Institute ISSI 2015 participants and staff