Report on TUSLIP day of Physics 2011

http://www.st-andrews.ac.uk/~bds2/tuslip/

The annual TUSLIP day of physics was held at the University of St Andrews, the School of Physics and Astronomy. The programme was designed at the request of local teachers after similar successful events in previous years. The visit is designed to allow pupils to experience something of university level physics, and to take part in workshops of direct relevance to their current studies and future career prospects.

The programme for the day, staffed by colleagues from Dundee and St Andrews was:

10.10 - 12.00 Laboratory work in St Andrews first and second year laboratories.

12.05 - 13.00 "Real" lecture from St Andrews first year Waves and Optics course, Dr Bruce Sinclair

13.00 - 13.40 Lunch in main concourse. .

13.45 - 14.00 Physics in action - "Acoustic Tweezers and the Real Sonic Screwdriver?" Dr Mike MacDonald, University of Dundee.

14.00 - 14.05 Comments on physics study at university from Claire Motion, a former pupil of Kirkcaldy High School, fourth year student, and recent School Student President.

14.05 - 14.20 Interlude: physics demonstrations and discussions with current students

14.20 – 14.40 Careers using Physics - Dr David McGloin, University of Dundee

14.40 - 14.55 Low temperature physics, members of the Scottish Doctoral Training Centre in Condensed Matter Physics

14.55 – 15.10 Astronomy in action - Professor Moira Jardine, University of St Andrews

The bus bringing students from the west of Fife was delayed by roadworks etc, which unfortunately meant that some of the visitors arrived part way into the lab time. Otherwise the transport worked well.

The laboratory section was the most expensive session to run, but we believe this to be very important. The pupils all pre-booked an experiment to tackle over a couple of hours, in many cases working in pairs. Our staff and students acted as demonstrators guiding the explorations of the visitors. The experiments are mostly modified version of the St Andrews first and second year teaching lab experiments, and were

Rotational motion

Latent heat of liquid nitrogen

Charge to mass ratio of the electron

Standing waves on a string

Galaxy search and classification

Jupiter's Moons

Polarisation of light

HeNe and diode lasers

Zoom lens

Electrons in semiconductors (Hall effect)

Black body radiation (Stefan's law)

Radioactivity

Gas laws

As ever, the pupils worked well on the experiments, and it was good to see their achievements.

My waves and optics lecture was given to a packed theatre B. This was a lecture that involves posing questions to the students and asking them to think through things, and it was pleasing to see the visitors engage well with this. The material covered was on example of two-beam interference, including the Michelson Interferometer and thin-film interference.

After lunch Dr Mike MacDonald from Dundee gave a fascinating presentation on his physics research, and this was followed by a brief presentation by a former local pupil on her experiences of studying physics. We also had students from Dundee and St Andrews chatting with groups of visitors answering their questions about studying physics at university. I then ran some demonstrations of interesting physics before Dr David McGloin from Dundee gave a short presentation on career opportunities using physics. Postgraduate students from the Scottish Doctoral Training Centre in Condensed Matter Physics (part of SUPA) then used liquid nitrogen to make ice cream for all those present, which seemed to be well received. There was of course the opportunity to say something about the physics involved. The day ended with a brief presentation from Prof Moira Jardine from St Andrews on her astronomy research work, which seemed to go down well with the visitors.

Before the event I wrote to physics departments in Scotland's universities inviting them to provide promotional material, and there was a good stand of stuff available for the visitors at the end of the day, much of which was taken.

118 pupils were booked in to the event, from the following schools, Beath High

Bell Baxter (Cupar), Dunfermline High, Grove Academy, James Gillespies, Kilgraston, Kirkcaldy High, Madras College (St Andrews), Morrisons Academy, Queen Anne High, St John's High, Wallace High,

The major input that the IOP made to the event was acknowledged in all the materials associated with the event. Bruce Sinclair thanked IOP Scotland for their support of the annual IOP/TUSLIP Day of Physics held in St Andrews for sixth year pupils studying physics.