YOUR NEWS WANTED

The news section gives updates on what has been happening in physics education worldwide. Items included show how events in one country could be relevant to good practice elsewhere in the world. Contributions are welcome from all our readers and should be about 200 to 300 words and can include a picture. Please send your news items for the May issue of Physics Education to ped@iop.org before 21 March 2003.

MARS

Artist’s impression of Mars Express.

Express journey to Mars

New Media and the European Space Agency will be jointly sponsoring a website to provide live data about the Mars Express Mission (MEX). From its launch in May 2003 until the spacecraft reaches the Martian atmosphere, the following data will be available: velocity, mass, distance, fuel consumption and acceleration. Other features of the website will include school Assembly packs, a diary from the project manager working on the MEX project, images of the spacecraft before and during the launch, and a talk area for teachers and space experts. Access this via the New Media website www.new-media.co.uk/

ASE 2003

Knocked out by meteorites

Real moon rocks and meteorites were featured as part of the PPARC Astronomy and Space Day. Teachers were excited by the opportunity of seeing and handling them for their first time as they learned about the NAS/PPARC loan scheme. Teachers interested in borrowing the lunar samples and meteorites pack should contact PPARC: www.pparc.ac.uk

EVENTS

Sun–Earth Day

Once per year NASA promotes an event known as ‘Sun–Earth Day’. This year, on 18 March 2003, the European Space Agency is joining in and promoting Europe-wide participation. Sun–Earth day aims to promote public interest in the Sun, its fascinating physics and its effect on Earth (space weather).

For information on the Sun–Earth connection outreach effort see http://sunearth.gsfc.nasa.gov/sunearthday/2003/sed2003aurora.htm

A European, ESA-led version will become available shortly. Watch out for events in your area.

Lyndsay Fletcher
University of Glasgow

NASA’s promotional poster for Sun–Earth day.
**NEWS**

**APPOINTMENTS**

Well-known science presenter Kathy Sykes has been appointed to Bristol University’s Collier Chair in the Public Understanding of Science and Technology. Since she was interviewed for Physics Education (January 2001) Professor Sykes has become a high-profile science communicator, in particular as Director of the Cheltenham science festival and in the hugely successful BBC TV series Rough Science. In her new job the 36 year-old physics graduate will seek to communicate scientific and technological research in a user-friendly way to the general public.

**Fun Physics—popular as ever**

Physics on Stage: Exciting Demonstrations’ was a great success at January’s ASE meeting, attracting a huge variety of teachers to pack the large physics lecture theatre. Sharing some of their favourite physics demonstrations from the wealth on display at the 2002 physics festival ‘Physics on Stage 2’, six of the UK delegates demonstrated a range of simple activities.

Bernard Taylor started with a trick to make an old textbook appear to go up in flames, followed with a neat way to mix colour lights using only one projector, and had some great laser demonstrations. Kerry Parker followed with a dozen things to teach with balloons—from Newton’s laws to the Hubble expansion of the universe. The ubiquitous microwave oven got pressed into service on several occasions. Nick Fisher left everyone wondering where he really does his teaching as he shared a wealth of physics demonstrations that can be done in a bar, and Sally Divall risked accepting a gender stereotype as she got out the washing-up liquid to demonstrate some amazing bubbles and standing waves in films. But this was not just an event for teachers: Wilson Agnew, a technician from Northern Ireland, did some great electromagnetic demos before letting Bernard Taylor finish the event with a bang: an explosion from one of the theatrical flashes he loves to use to wake up his students!

Hundreds of teachers enjoyed about 50 demonstrations; “one of the most enjoyable ‘talks’ in the last 20 years” according to one teacher.

For full details see the UK Physics on Stage website: www.physicsonstage.co.uk

**Sykes to bring science to the people**

Professor Sykes said: ‘I’m completely thrilled about my appointment. Bristol University is involved in really exciting research and already communicates about science with the public. But I want to catapult this onto a whole new level, so that talking with the public about science and issues around it becomes an integral part of what our scientists do.’

KP

Sally Divall and Bernard Taylor carefully make a giant soap film.
UK SCIENCE EDUCATION

The future’s bright, the future’s science

In the United Kingdom more than £50 million will be invested over the next ten years in an innovative national network of science learning centres.

On 10 December 2002, the Education and Skills Secretary Charles Clarke and Wellcome Trust Director Dr Mike Dexter announced their joint vision of excellence in science teaching at a school in London. Speaking at the school, Charles Clarke said: “It is essential that we build a society in which the impact of science is understood and appreciated by young people.”

The learning centres will provide continuing professional development for both teachers and technicians, in an attempt to move beyond the more traditional ‘textbook’ approach to science.

The Department of Education and Skills will be working closely with the Wellcome Trust in an attempt to boost both the morale of science teachers and also the enthusiasm of young people to study science past the age of 16.

Dr Mike Dexter stresses the importance of teachers as role models and says: “I think it is really important for teachers to have an opportunity to find out what’s new and exciting in their field, especially for science where the pace of scientific discovery is so fast.”

Further details are available at www.wellcome.ac.uk

UK goes to the planets

2003 marks the start of an exciting time for planetary scientists. This spring, SMART-1 will embark on a two-year mission to the Moon, testing new technologies for the European Space Agency along the way. In May, Mars Express will set off for the Red Planet. On arrival it will release the Beagle 2 probe, which will land on Mars just before Christmas. In September, Galileo’s eight-year tour of the Jovian system will end when it dives into Jupiter’s crushing atmosphere.

This flurry of planetary activity will continue through 2004 and will culminate in 2005 with the launch of Venus Express—the first mission to Venus in more than ten years. The UK has played an important role in each of the missions, contributing scientifically or providing equipment and testing. The ‘UK goes to the Planets’ website give details of the missions and related events. Posters, leaflets other display materials are available from PPARC.

To find out more, visit www.uk2planets.org.uk or e-mail anitaheward@btinternet.com. Anita Heward

Philip Britton, John Lewis and Catherine Wilson at the ASE meeting.

ASE 2003

A grand finale for Catherine

After many years as a mainstay in the Institute of Physics Education Department Catherine Wilson has retired. For her immediate colleagues at the Institute there was a dinner in December, but it was at the ASE meeting in Birmingham that Catherine was able to bow out before the many teachers who have enjoyed her support and friendship over the years. (Catherine worked at the ASE before moving to the Institute of Physics in the 90s.)

Many teachers had travelled to Birmingham particularly to hear Catherine deliver the John Lewis lecture and attend a reception afterwards, where there were lots of hugs and a few tears. The lecture, delivered with Philip Britton, reflected on the developments in physics education in the last 40 years. The Great Grandfather of UK Physics Education, John Lewis, was himself in attendance, having come along, so he said, to prove to everyone that he was still alive and that this was not a memorial lecture!

March 2003

Physics Education  83
Cambridge Physics Update

Basement physics

The physics update course held at Cambridge University in December 2002 was a resounding success. However, in addition to the formal programme a few selected teachers were treated to a special late night/early morning demonstration of the Coriolis force by fellow of Trinity College, Professor Hugh Hunt. Some time after the bar had closed, Professor Hunt took a small group of us to a secret location in the basement of a building in the town. Hugh had the key to a locked basement where there resided a special underground laboratory. This was Hugh’s special place, the place where he held seminars and demonstrated the power of the Coriolis force, but only after dark.

In the basement was a huge steel turntable, about 5 m in diameter. Hugh managed to get the turntable spinning through the sheer force of his personality. We then experimented by walking in a straight line across the diameter (almost impossible) and by throwing objects to each other whilst balanced on the spinning platform. It was not until we had experienced and discussed the forces present in these activities that the significance of the Coriolis force was appreciated. This was a truly significant practical experience, and one that was enriched by Hugh’s enthusiasm and generous hospitality.

Thanks Hugh.

Bob Kibble

Physics teachers have fun in the strangest places: The delivery yard under Trinity College Cambridge, 1.30 am, December 2002.

Conferences

Earth Science Teachers’ Association Conference 2003

ESTA’s annual Course and Conference will be held in Manchester on 12–14 September with the theme of ‘Earth Sciences in the 21st Century’. The course will feature support for primary and secondary science teachers and also updates for teachers working at post-16 level and Higher Education with a field trip on the final day. The organizers aim to give all teachers more confidence in teaching Earth Science aspects of science by giving them more background knowledge. Teachers can attend on any of the days and there will be a free open lecture on Saturday. There are fees for other aspects of the conference, to cover refreshments, overheads and, if required, accommodation.

For further information, contact the Conference Convenor: Dr Paul Selden, Department of Earth Sciences, University of Manchester, Manchester M13 9PL. Tel: 0161 275 3296; e-mail: paul.selden@man.ac.uk

Manchester University has a website, with details of the Manchester earthquake last autumn, at: www.earth.man.ac.uk

Peter Kennett
**NEW WEBSITE**

**JESEI sets sail**

The Joint Earth Science Education Initiative (JESEI) website [www.jesei.org](http://www.jesei.org) was launched at the ASE in January. Warmly welcomed by ASE participants, the website contains a wide range of activities, free to download, especially written to brighten up Earth science teaching and to correct misconceptions commonly found in science textbooks (see *Phys. Educ. News*, November 2002).

Science teachers in Birmingham were enthusiastic: "The Earth science I have taught has been very dry; these new practical ideas will help me to brighten it up a lot" said one teacher. "We find it difficult to teach the Earth science at our school because none of us knows much about it—this website will make a big difference".

The website will continue to evolve as new material is added and as feedback is used to make it more 'teacher-friendly' and useful. Meanwhile, many of the practical activities have been incorporated into 90-minute workshops that can be brought free to science departments in secondary schools in England and Wales by local facilitators of the Earth Science Education Unit. More details of the workshops can be obtained from the ESEU Administrator on 01782 584437 or from the ESEU website: [www.earthscienceeducation.com](http://www.earthscienceeducation.com).

Peter Kennett

**GIREP**

**Teacher education seminar**

The Second International Girep Seminar will focus on quality development in teacher education and training, with participants sharing ideas and considering how to prepare their students to work in schools. It will take place on 1–6 September 2003 in Udine, Italy. The full details, including a call for papers, can be found at [www.uniud.it/cird/girepseminar2003/](http://www.uniud.it/cird/girepseminar2003/).

Application forms should be sent to Marisa Michelini (email: michelini@fisica.uniud.it) as soon as possible and not later than 1 April 2003.

Marisa Michelini

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**MALAYSIA**

**Rewards for curriculum change**

After some political gnashing of teeth during the last half of 2002, the Malaysian Ministry of Education on 5 January 2003 launched its plan to switch the medium of instruction for mathematics and science in all government schools back to English. For almost three decades, ever since English medium education was phased out, the teaching of these subjects has followed the language medium of the individual school (Malay, Chinese or Tamil for primary schools, and Malay only for secondary and tertiary education). As reported in the September 2002 issue of *Physics Education*, the move was announced both to improve the proficiency of all pupils in English and also to prepare Malaysians to better integrate into a world of science and technology in which the medium of communication is predominantly English.

The initial announcement of the plan last June met with some uncertainty on the part of both educators and parents, and eventually some political opposition was felt from various entrenched ethnic language supporters. The most vociferous opposition came from two groups: one who felt that the move might erode the predominance of Bahasa Malaysia (Malay) as the national language; and, from another side, a group associated with Chinese-medium
primary schools who felt that they did not want to ‘dilute’ the strictly Chinese medium of their schools through the inclusion of more English in the curriculum. These issues were worked out in dialogues with the groups concerned, and some compromises reached. The final compromise, which came late in October, was that the Chinese primary schools would be allowed to teach the two subjects in both English and Chinese if they so choose.

In any event, when the new school year began this January, pupils aged 6, 11 and 16 began their maths and science lessons in English. The Ministry had sent all of their teachers for special training, and even granted them special pay increments for having to do their teaching in English. To support the move, some other unprecedented things took place. All of the teachers involved were provided with laptop computers and LCD projectors, along with CD-ROM software especially designed to smooth the teaching of the subjects in English. Textbooks, also accompanied by CD-ROMs, were provided for all pupils.

The plan is to extend the use of English by one class per school year, so that in 2004 Primary Year 2, along with Form 2 and Upper Form 6 will have science and maths in English. The Education Ministry has promised that teacher training will be ongoing. Within less than a decade then, all secondary and tertiary maths and science education in Malaysia will be in English.

Steven H Mellema

Cambridge Physics Update

My boomerang will come back!

Boomerangs and why they work was just one of a host of topics addressed during ‘Physics Update’, a course for practising science teachers held for the first time at Cambridge University’s Department of Engineering (CUED) in December 2002. With just two weeks to go until Christmas, it was a sign of true dedication that more than 70 physics teachers decided to spend their weekend at this event.

The principal charitable aim of the sponsors, Armourers and Brasiers, is to support teaching in Materials Science: the opening lecture on the ‘Magic of Materials’ from Professor Colin Humphreys was an ideal start. Professor Humphreys regaled the audience with stories ranging from new materials for artificial hip joints, through the wonders of gallium arsenide for LED lights (the use of which will result in significant reduction of global warming), to memory metals: their application (ranging from underwired bras to rubbish bins) and crystallographic changes which relate to those of viruses (providing the potential for creating a replacement for antibiotics as a method for control of bacterial disease). ‘I was surprised how many times I found myself saying ‘I never knew that!”’, commented one of the audience—a view probably shared by many.

During the weekend, lectures were followed by workshop sessions which had the teachers making boomerangs and playing with all manner of toys to demonstrate the quirky things that happen when centrifugal forces come in to play (courtesy of Dr Hugh Hunt, who coordinated the event at Cambridge). When they weren’t doing that, they were playing at being electrical circuits and focusing on how to use models to teach physical principles, whilst being aware of the pitfalls involved in oversimplification. Or else, measuring the energy absorbed during fracture of materials at liquid nitrogen temperature and at the boiling point of water. The astronomers even got a look-in with a workshop based on the wonders of the sky at night, and when things got too hectic there were always the multi-
Everyone was taken aback on Saturday afternoon when Dr Holger Babinsky, an aerodynamics expert in CUED, told them that they had all been teaching the wrong thing for years. The reason wings work is nothing to do with the Bernoulli principle; he gave both a mathematical proof and experimental evidence for this statement.

Over and above everything else, everyone was having fun. The dinners in Trinity College, late nights in the bar doing physics quizzes, the spectacle of King’s College Chapel brightly lit the night sky for the Christmas carol service lifted the spirits. But above all the delegates were inspired by the enthusiasm of all the participants—lecturers, helpers and delegates alike. And the lecturers’ comment was ‘what a treat to lecture an audience which is not only intelligent but also enthusiastic!’

**Wales**

First Ffiseg

The first Welsh Physics Teachers Meeting took place at Builth Wells High School last autumn. With a distinctly Welsh feel to the day the meeting was cozy and welcoming for teachers who had travelled from all four corners of Wales. This event has grown out of the successful smaller meeting that Physics teachers from Powys have been holding recently. John Munday, Head of Science and Physics at Builth Wells, did a great job as host and the IoP and the Physics Department at UoW Aberystwyth covered the cost of the speakers.

Gareth Kelly from the Welsh exam board passed on useful information about the marking of examinations but it was the ‘Bring and Tell’ session that captured the essence of the day as Simon Rhodes, John Beddoes School, demonstrated electrostatic repulsion of foil pie tins on a van der Graaff generator.

Professor Neville Greaves, the Head of the Physics Department at University of Wales Aberystwyth, presented a fascinating lecture entitled ‘Glass—more than it’s cracked up to be’ and, after a superb buffet lunch prepared by catering students from the High School, Malcolm Cornwall (who is originally from Merthyr Tydfil) gave a few demonstrations of ‘Lasers in the Lab’.

The next meeting will be held in the autumn of 2003 at Christ College in Brecon, Powys. The Welsh meeting would incorporate the Powys meeting once more. For further details contact Gary Williams at gw@wales.gwydir.ac.uk

**Teaching Resources**

Widening participation through ideas and evidence with the University of Surrey

The Ideas and Evidence element of GCSE Science courses is intended to put science in a real-life context and ensure that 14–16 year-old pupils get a feel for the nature of science. All very worthy objectives but where do you get some really useful material featuring real live scientists doing state-of-the-art work but still accessible to those working through GCSE?

As part of the University of Surrey’s Widening Participation Initiative, a collection of very readable ‘case studies’ of Surrey Scientists (of all persuasions, not just physicists) have been produced. Here you’ll find them talking about:

- how they feel about media portrayal of their work;
- how the views of the public influence the sort of research that gets done;
- how they got into science in the first place.

Each case study is written at a reading level accessible to GCSE students, covers no more than two sides of A4 and is accompanied by two sets of questions (on separate sheets) either to challenge the more able or to provide lower ability pupils with a way of consolidating their knowledge of basic GCSE principles while all the time looking at the issues behind Ideas and Evidence.

These materials are available free and are fully photocopiable. Please e-mail d.faux@surrey.ac.uk for a free pack or look at [www.ph.surrey.ac.uk/schools](http://www.ph.surrey.ac.uk/schools) for more information.

Averil Macdonald and Dave Faux
December may not be the most obvious time to bring a solar-powered car on a tour of northern Europe, but the midwinter gloom was certainly brightened by the appearance of Nuna in a number of schools in Britain.

Nuna won the World Solar Challenge in 2001, travelling 3000 km across Australia from Darwin to Adelaide in under four days. Nuna reached speeds of over 100 km/h (almost 70 mph) but had to slow down to obey speed limits in urban areas!

Nuna was built by a team of students from the universities of Delft and Amsterdam with support from the European Space Agency (ESA), the Dutch energy company Nuon, and a number of other companies. The solar cells were provided by ESA and had an efficiency of about 30%. The two strips of solar cells along the sides were used to power the communications equipment keeping Nuna in touch with the support van. These cells were originally on the Hubble Space Telescope and were donated by NASA as a lucky mascot to the Dutch team.

Nuna arrived in a special display trailer complete with audiovisual display equipment. Two members of the winning team gave a series of talks and an audiovisual presentation about the race, about Nuna and about their own experiences of being involved in such an exciting project. It was truly impressive to see and hear these university students communicate so clearly and enthusiastically with pupils of a wide range of ages and interests. The students gave out posters, booklets and DVDs describing the race and the technology used in Nuna, and in some cases signed autographs!

It was fascinating to hear something of the human stories behind this project. The team worked day and night for 18 months to get the car ready for the race and put their victory down to teamwork. It was clear that they were an enthusiastic, talented and highly motivated group of students who really felt that they could achieve anything they put their minds to. Having them visit was both a pleasure and a true learning experience.

For further details see:
http://wsc.org.au
and
www.alpha-centauri.nl

Ken Zetie and Bernard Taylor

| Nuna fact file:                      |
|-------------------------------------|
| - Maximum speed: 108 km/h           |
| - Theoretical top speed: 160 km/h   |
| - Dimensions: 5 m long, 1.8 m wide, 0.97 m high |
| - Body: carbon fibre and Kevlar reinforced with a foam core |
| - Motor: 12 kg, brushless dc, 168 V, 97% efficient |
| - Batteries: 46 lithium ion cells, 35 kg |
| - Solar cells: double and triple junction GaAs cells, total area of 8.4 m², giving 100 V |
| - Driver cooling: a vest filled with ice cubes! |
Physics on Stage 3 will be an international festival of physics teaching, held at ESA–ESTEC in Noordwijk, The Netherlands between 8–15 November 2003 during European Science Week. The theme of this year’s festival will be ‘Physics and Life’. Following the pattern of the first two PoS events the festival will involve exciting demonstrations, innovative presentations, workshops and a fair at which every country is invited to showcase the best of its physics teaching. In addition to this, PoS3 will feature seminars and a commercial exhibition area.

The network of teachers already established by previous Physics on Stage events will be enriched by inviting representatives of the biology teaching community to participate in the Physics on Stage 3 programme alongside physics teachers. The National Steering Committees of the 22 participating countries have been challenged by the organisers to propose performances, presentations and workshops reflecting the ‘Physics and Life’ theme.

Whilst physics teachers are well aware of the importance of biophysics, astrobiology and medical physics, as well as the importance of physics in medical imaging, it is already clear that many countries have little of this in their school curricula. Republic of Ireland representative Brendan O’Donoghue writes “We feel that some physics educators may be uncertain as to the merits of the inclusion of biology within the programme, but on balance, the opportunities to exploit cross-curricular components make this a natural extension to Physics on Stage activities.”

For more information about the main event see [www.physicsonstage.com](http://www.physicsonstage.com) or contact the Executive Coordinator, Helen Wilson: Helen.Wilson@esa.int. The UK coordinator is Kerry Parker (also Editor of *Physics Education*): kerry.parker@physics.org with the UK website hosted at [www.physicsonstage.co.uk](http://www.physicsonstage.co.uk)

NB: The above is the correct URL for the website, rather than the hyphenated version given by mistake in the January issue.

In what sense a nuclear ‘debate’?

The body responsible for managing the UK’s nuclear wastes, NIREX, sees its mission as providing safe, environmentally sound and publicly acceptable options for the long term. For this reason it promotes discussions about the management of radioactive waste among members of the public. So, early in December 2002, NIREX sponsored a one-day symposium, *Joining the Nuclear Debate*, for some 50...
sixth-form physics students at Ely, Cambridgeshire. This was planned as a first step to developing online consultation among students on the nuclear issue, through the website www.schoolscience.co.uk.

‘Scientific literacy’, if this is a meaningful term, enables participation in informed debate about science-related issues. But is it possible to come to the nuclear debate with an open mind? Or to alter group thinking once it has arrived at a viewpoint? How should students be engaged in discussion about nuclear issues?

The students at this symposium listened to brief presentations about general matters such as risk and ethical argument, as well as arguments for and against the building of new nuclear power stations. Speakers included representatives from Greenpeace, British Nuclear Fuels (BNFL), NIREX and Friends of the Earth. Most of the day, however, was spent in small groups, trying to answer questions of three kinds:

- can UK energy demand be reduced, particularly the demand for electricity?
- what should be done with the UK’s existing nuclear legacy?
- should the UK build new nuclear power stations?

Although there is a limit to how much information can be absorbed and considered collectively in a few hours, the symposium succeeded in some respects. The students made commendable use of the briefings, together with background knowledge. Many were able to articulate their values, judgements and questions. Sceptics left Ely as they had arrived: unsure whether the public can trust technical experts or whether sponsorship, by any party to the debate, distorts their science.

Yet, in my view, the day was disappointing. It did little to clarify how technical and political decisions about nuclear power are actually made, or indeed what the balance is between these. A strong message from the organizers seemed to be that key decisions should be based on a national consensus, despite (poorly identified) vested interests. The international dimension was barely mentioned. At a personal level, while recognizing the energy demands that their own lifestyles make, few students seemed motivated to change this.

Two websites are already conducting surveys to assess public opinion about energy and the environment:

- The Science Museum’s debate about how we generate and use electricity, www.sparkingreaction.info/Sparking reaction was sponsored by BNFL but the Science Museum reportedly had complete editorial control.
- INTUSER, a European information network that aims to raise public awareness of the benefits and drawbacks of using various energy resources. Check out its questionnaire at www.intuser.net/

Search Google for ‘nuclear power debate’ and you will see a similar ‘debate’ is happening in many countries around the world. The nuclear business is truly global.

Peter Campbell

### Gifted and Talented

**Able pupils experiencing challenging science**

The APECS Project is a collaborative research project between the Universities of Cambridge, Reading and Surrey Roehampton aiming to develop suitably challenging experiences for the most able pupils in science lessons. It is currently supported by the University of Cambridge Faculty of Education, through its research seminar series ‘Meeting the Needs of the Most Able in Science’. The inaugural meeting of the seminar series, on 5 October 2002, considered how to recognize high ability in science and how the seminar series could be used to move the project forward.

Professor John Gilbert (University of Reading) began with a list of the characteristics that might identify pupils with particular high scientific ability. Providing a special needs/inclusion perspective, Carrie Winstanley (University of Surrey Roehampton) described how some pupils present a very uneven profile of abilities—seeming quite gifted in some areas whilst having special needs in others. Sue Muswell (Module-club) described how she had worked with pupils who had
considerable potential in science, but who were often seen as less able, perhaps because specific learning difficulties or particular learning styles made it difficult for them to meet the teacher’s expectations in typical classroom settings. Sue described how she had set up a form of science tuition especially geared to the needs of such pupils, to enable them to achieve their potential. Professor Mike Watts (University of Surrey Roehampton) summarized: there are at least two potential focus groups: (a) pupils of exceptional ability who are able to respond in normal science classrooms, but are not always stretched by the demands made of them, and (b) pupils who are not meeting their high potential in school science because of other barriers (limited literacy, disaffection, etc).

The next meeting (planned for 15 March 2003) will be a workshop: ‘Using models and modelling to challenge the most able in science classes’. This aims to provide teachers with some ideas and activities for use with able pupils. For further information, access the project website www.educ.cam.ac.uk/apecs/index.html or contact Dr Keith Taber at kst24@cam.ac.uk.

Keith Taber
University of Cambridge

ISS flies high Down Under

Who would have thought a trip to Alabama in 1999 by a group of secondary school students and their teachers would result in the Victorian government investing in the biggest non-school infrastructure development in Australia’s history?

Three and a half years since Strathmore Secondary College sent 17 students and two staff to the USA Advanced Space Academy to ‘immerse them in space science,’ we have established the foundations for our own space academy—the Victorian Space Science Education Centre (VSSEC).

Five days were spent at the Advanced Space Science Academy, where the students were involved in space-related activities and lived and worked in a space-simulated environment. Students also had the opportunity to visit the Kennedy Space Centre and the Washington and Smithsonian Institute to see the Air and Space Museum and learn about the history of space exploration. These visits exposed the students to careers in space science. Students are aware that Andy Thomas, Australian astronaut, obtained a PhD in mechanical engineering before he became an astronaut, and that the opportunity to fly to space, while rare, is not unobtainable for them.

Teachers were inspired by what they saw in America and wanted to create the same unique learning environment on Australian shores. In America, perhaps a project like VSSEC would be just another facility to educate and wow students, but in Australia a facility of this kind is the breakthrough that science educators needed. Science enrolment and retention rates in both secondary and tertiary education are low and the perception of science is outdated. VSSEC will lift the profile.
of science and give science a new face in education.

According to Michael Pakakis, Science Coordinator and Project director for VSSEC, “Education should be interactive and not just about looking at videos and working out of books—science should be exciting. Space research and exploration has a significant impact on civilization with the development of medicines, satellites and the connection to so many everyday careers. It is relevant to the students and there are so many sensory ways in which students can learn about space and feel connected with their curriculum.”

VSSEC was designed to provide students with this exciting and unique science experience. Its programs are based on a simulation/scenario format that immerses students in their individual activities. When the Centre is constructed, students will be able to: walk on the surface of Mars and perform scientific experiments; fly on a simulator to the International Space Station and work as scientists in a space laboratory; explore the universe in a virtual reality observatory; and be part of real scientific research, supervised by the five major Melbourne Universities: RMIT, VUT, Swinburne University of Technology, LaTrobe University and the University of Melbourne. This of course is only the beginning.

The curriculum for VSSEC is being developed to align with the Year 7–10 program. Universities will also be assisting in the creation of interactive lesson plans to satisfy the assessment requirements for Years 11 and 12.

VSSEC is developing networks with space science centres in the UK, Sweden, Canada, USA and Belgium. In addition, links have been created with industry, both in Australia and overseas, including NIDA Corporation, which is involved in producing curriculum and interactive hardware for the training of NASA personnel and also students in educational institutions. The Centre is also in the process of developing a comprehensive professorial development program for staff because we believe that science can become more popular if students are being taught more space science in the classroom.

The Centre aims to expose students to positive role models, which involves interaction with visiting present and past astronauts and scientists from around the world. Dr Harrison Schmitt, astronaut from the Apollo 17 mission, was VSSEC’s first high calibre space science guest.

Dr Schmitt visited the college in July to launch an interactive Space Weather website and curriculum that Strathmore Secondary College had developed with LaTrobe university. Dr Schmitt, a geologist himself, imparted his knowledge of working on an extraterrestrial environment to an audience of students, educators and government representatives. His visit included an interactive lesson on geology and an inspiring address to over 200 guests. Dr Schmitt drew students’ attention to the possibility of a future Mars mission and the importance of further research into the Moon’s resources. He strongly believes that the deposits of helium-3 on the Moon can be utilized as a revolutionary new energy source.

This visit is a huge leap forward in science, let alone in education. It is individuals like Dr Schmitt who inspire students and teachers to excel in what they do. We have come a long way since our initial trip to the Advanced Space Science Academy and we can only advance the perception of science by building institutions like VSSEC and by fostering relationships with key astronauts and scientists.

Australian science education has made huge advancements as students begin to see the exciting and rewarding path that science can lead to in Australia. Who would have thought it possible?

We are always looking for opportunities to expand our science networks and if anyone from the field is interested in the Victorian Space Science Education Centre and how we initiated this project and the curriculum, please e-mail pakakis.michael.m@edumail.vic.gov.au or spencer.phillip.t@edumail.vic.gov.au, or phone Michael Pakakis, VSSEC Project Director, or Phillip Spencer, VSSEC Project Manager, on 61 3 9379 7999.

Samantha Clifford