Students experiencing the excitement of research in space - Simon Langton Grammar School for Boys

Leading space education programme

Key actions

At Simon Langton Grammar School for Boys in Canterbury, we are trying to inspire the next generation of scientists and engineers by getting them involved in real scientific activity-not just standard experiments where you turn the page and there's the answer. We got a valuable jolt of inspiration from a field trip to CERN, the European particle physics center on the Swiss-French border. It led our students to build an instrument that will be flown in space and spawned the CERN@school program, which has the goal of placing cosmic-ray detectors in school laboratories throughout Europe and beyond, allowing student-scientists to collaborate and share their data through the Langton Star Centre here at the school.

It all started in 2007, when 48 of our students visited the labs of Michael Campbell and his team at CERN. The team were working on Medipix chips-sensitive light detectors, originally developed for particle physics research at the Large Hadron Collider, that have been adapted for medical imaging and other uses. On our return to the United Kingdom, we were notified of a space experiment competition run by what is now the UK Space Agency along with Surrey Satellite Technology Limited, or SSTL, the world's largest manufacturer of small satellites. The guidelines warned that the orbiting experiments could suffer damage from cosmic rays. I remember sitting in my lab with a crowd of students who were still excited from the trip to CERN. One of them said, "Why don't we use those Medipix chips we have just seen to measure the cosmic radiation?" I responded, "Brilliant!"

My students came second in the competition with their design for a cosmic ray detector made from five chips from the Medipix series. Their instrument, called LUCID for Langton Ultimate Cosmic ray Intensity Detector, will fly on a satellite called TechDemoSat to be launched by SSTL in early 2012. The students have been developing the detector with help from SSTL engineers and Larry Pinsky, chair of physics at the University of Houston. It's thrilling to know that NASA is interested in the data.

With our students so inspired, it seemed sensible to extend this enthusiasm and involve other schools. So the CERN@school project was born. It allows school laboratories to obtain smaller versions of the LUCID detector for experiments in cosmic-ray detection and radioactivity. Students in 10 pilot schools are already taking and sharing data.

We also hope the CERN@school package will draw more people into physics teaching; recent and upcoming physics graduates I have talked with say the ability to do real research with their students would make teaching physics a more attractive proposition.

We have extended CERN@school across Kent and also taken it into Primary Schools. We are building up a student research collaboration that will provide significant data for cosmic ray analysis both in Space and on Earth.

Our school, with about 1000 students, produces between one-half and one percent of the United Kingdom's physicists. We are sure that when LUCID and CERN@school are fully rolled out they will significantly increase the number of graduating students who go into science and engineering. Even though we are a boys' school, we do enrol girls in the last two years before graduation, and the impact of the project on girls' uptake of physics and engineering courses is even more significant.

Impact on lead and partners schools

Our school has a philosophy to extend and enrich the curriculum as an integral part of what we do. In the sciences we believe strongly that by allowing students to work alongside academic researchers they can experience the excitement of being real scientists. The students take part in authentic research and this not only gives them insight as to what is required in the study of the sciences at University but also sparks their interest in the contributions they can make as part of teams working on research projects. By extending this philosophy out to other schools with CERN@school many other students are delighted to be working with state of the art technology from CERN and working with other like minded students in a scientific collaboration. There is huge interest throughout our partner schools and we work closely to share experience and continue to move the project forward.

Impact on specialism

We are a science specialist school and maintain a wealth of activities within this. We have extended our numbers so significantly at A level that we require more laboratory space and are borrowing funding to build this.

Top tips

I have found that the key aspect of our project taking off is having a few physicists and engineers who embrace what we do and are happy to support us. Don't be afraid to ask for help and support. In nearly every case I have found academics are really willing to help.

The future

We need funding to roll out this project across the UK. It is having a huge impact in Kent, looks likely to be taken up in Europe and the US but I have found it very difficult to access any funding to support more schools in the UK having access to the CERN@school kit and network.