nature

17 June 2004 Volume 429 Issue no 6993

Schools at 10^{20} eV and beyond

A project that explores a research frontier, attracts high-school students of both sexes and diverse ethnicities and that can be scaled up to international level deserves not only celebration but also the €1-million support that it has just won.

Where do the highest-energy cosmic rays come from? Where did all the science students go? In the Netherlands, where physics undergraduate numbers are taking a dive, experimentally addressing the first question is hopefully countering the problem reflected in the second, thanks to an imaginative scheme in which universities and schools are collaborating in particle astrophysics.

The "high-school project on astrophysics research with cosmics" (HISPARC) seems to fire up the enthusiasm of school students in a way that few other schemes have done. And, encouragingly, this is just one entry among several in a competition, run by the Altran Foundation, that this year focused on innovative school projects. Announced this week as the winner, its technology and approach will within a year become accessible to schools in other countries.

With its first detectors set up in 2002, HISPARC focuses on the air showers produced when cosmic rays hit the upper atmosphere, each stimulating a cascade of secondary particles travelling in the same direction. The higher the energy, the larger the area at the ground over which secondaries arrive. At the highest energies seen so far — more than 10^{19} electronvolts — the secondaries can be detected by an array of detectors spread over 100 km^2 or so. Such showers caused consternation when detectors discovered them in the early 1990s; the numbers of 'primaries' hitting the atmosphere had been expected to tail off below such energies.

Initiated by physicists at the University of Nijmegen, a cluster of schools was chosen to host a network of detectors of these extraordinary events. The detectors — more sensitive than those that made the original observations — consist of a pair of plastic scintillators that detect light given off as secondary particles arrive. Events that trigger coincident bursts of light in both detectors, timed with the help of the Global Positioning System, register within the network. Now tens of such detectors are being developed in schools in collaboration with several Dutch universities (see www.hisparc.nl/NL/english.shtml).

A key to the project's motivational success, according to its coordinators, is that the schools become stakeholders by working with researchers in constructing the detectors. Importantly, those who are motivated include an even balance of both sexes and a healthy representation across ethnic groups. And that motivation could grow further as the networks develop into a system capable of having a scientific impact, pursuing rare events for which only a few detectors exist.

The project's impact will be magnified by its success in winning this year's Altran Foundation for Innovation Award. The prize money of €16,000 (US$19,000) will no doubt be useful. But much more useful will be an unusual and commendable feature of the awards, whereby the foundation, based in a major consultancy organization (see www.fondation-altran.org), will also provide €1 million of support-in-kind over 12 months. This support is intended to ensure that the technology and software become cheaper to build and that the project spreads to schools in other countries.

The short-listed entries show that physics is not the only area in which imagination is being deployed to involve schoolchildren in the ideas of science. Measurements of climate change, the development of hands-on mathematical instruments modelled on historical originals, and the use of easy-to-make fuel cells are among the other projects dreamt up by universities and museums, and already in action. At a time when everyone is agonizing about the dearth of interest in science among schoolchildren, such projects should not only be noticed but also nurtured. Wherever science students have been disappearing to, here's hoping that these schemes can encourage some of them back. ■

On with the show

Why scientists should support an artist in trouble.

For more than a decade, the Critical Art Ensemble, a US-based art cooperative, has used scientific tools to produce commentaries of the ways science and capitalism are shaping modern society. But has their latest act gone too far?

The ensemble, whose past theatrical roles have included a biotech firm and a cloning cult, recently assumed the trappings of a military germ-warfare research team. While teaching the history of germ research in the United States, they subjected their audience to a fake anthrax attack using real, but benign, microbes.

The show was meant to provoke public discussion, but it may have also provoked a federal anti-terrorism task force. As reported on page 690, a federal grand jury will convene on 15 June to decide whether Steven Kurtz, one of the group's founders, has broken US bioweapons laws by possessing laboratory equipment and biowarfare literature reportedly used in the ensemble's performance.

On hearing this news, many researchers' first inclination may be to shrug their shoulders. Since 11 September 2001, scientists have worked overtime to ensure that their labs comply with federal bioterror laws. If an artist is running a mini-laboratory out of his home and reading up on bioweapons, it seems obvious that he would attract the authorities' attention.

True enough, but the draconian way in which the prosecutors are acting is unwarranted. Supporters of Kurtz's group say that it consulted regularly with scientists to make sure the shows were safe, and it is clear from the ensemble's past performances that no real attack was planned. As with the prosecution of some scientists in recent years, it seems that government lawyers are singling Kurtz out as a warning to the broader artistic community.

Kurtz's work is at times critical of science, but researchers should nevertheless be willing to support him (see www.caedefensefund.org/support.html to find out how). Art and science are forms of human enquiry that can be illuminating and controversial, and the freedoms of both must be preserved as part of a healthy democracy — as must a sense of proportion. ■