PHYSICS

UK launches fellowships

The UK Science and Technology Facilities Council (STFC), a government funding agency, is creating a five-year physics and astronomy fellowship programme. Under the Ernest Rutherford scheme, 12 fellows will be appointed each year until there are 60, a number that will then be maintained. The pay rate is undisclosed, but fellowships are open to residents and non-residents and can be taken at a UK university of the fellow's choice. Fellows can apply for extra funding from an STFC pot that will total £3 million (US$4.9 million) by 2016. Applicants must be early-career astronomers or particle or nuclear physicists who can head a research group and have a track record of leadership. Applications will open by July, and decisions will be made in early 2012.

RESEARCH AND DEVELOPMENT

Asian spending grows

China, Turkey, Iran and other Asian countries are spending more on research, says a report, making creation of science jobs likely. *Knowledge, Networks and Nations*, released on 28 March by the Royal Society in London, finds that China expects to spend 2.5% of its gross domestic product (GDP) on research by 2020, and India hopes to reach that goal by 2022. South Korea has pledged that research spending will reach 5% of GDP by 2012. Turkey increased its expenditure six-fold between 1995 and 2007, and Iran is forging industry–academia links in nanotechnology and biotechnology. The report recommends easing cross-border movement to help scientists fill the research posts that will arise as a result.

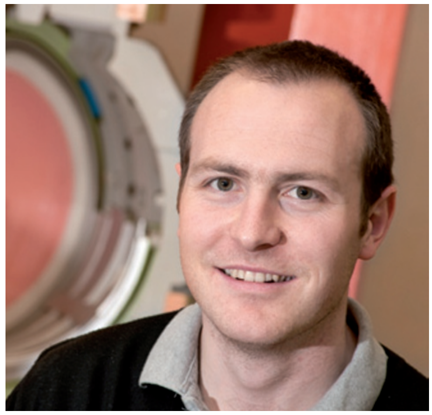
COMPUTER SCIENCE

Postdoc prevalence rises

A growing proportion of US computer-science PhD holders are pursuing postdoctoral research or industry rather than tenured academia, says a report by the Computing Research Association (CRA) in Washington DC. *The Role of PostDocs in Computer Science*, out earlier this year, says that the number of new doctorates who were hired for tenure-track posts fell by one-third from 2004 to 2009, yet that hired by industry tripled. Postdoc appointments grew three-fold between 2001 and 2009. The report asks whether the field will come to resemble the life sciences, with researchers doing several postdocs before securing a permanent academic job.

TURNING POINT
Ian Chapman

Ian Chapman, a nuclear physicist at the Culham Centre for Fusion Energy in Abingdon, UK, won the Cavendish Medal at the Science, Engineering and Technology Student of the Year Awards in London in March, after proving his ability to convey the significance of his research to Parliament.


UKAEA

Describe the work that won you the award.
To get energy from nuclear fusion, you must heat the hydrogen fuel to 150 million °C — ten times hotter than the centre of the Sun — so that the isotopes can fuse. But when you heat an ionized gas, or plasma, that much, it can become unstable. My job is to understand when and how the instabilities appear, and how to get rid of them. One example is a periodic collapse in the temperature and density of the plasma. The administrators of ITER, an international project to build an experimental fusion reactor, asked the community to investigate this instability. I chaired a collaboration of 16 labs to model the instability and demonstrate that we understand what is required to control it.

Are communication skills important for fusion researchers?
Yes. Communicating what we do is a problem for physicists in general. It's absolutely important. Awards like this help to raise public understanding of fusion, which can only be good for future funding. And, when working on large international teams, I've found that I'm good not only at generating enthusiasm, but also at helping partners to tackle problems together.

What's the status of ITER?
It is being built in the south of France, and will prove once and for all whether fusion is viable — specifically, whether we can get more power out than is put in. The first plasma in which fusion can occur should be produced in November 2019. In terms of the size and number of collaborations, ITER is similar to the Large Hadron Collider (the world's largest high-energy particle accelerator, located at the CERN particle-physics lab near Geneva, Switzerland), but some things have yet to be worked out — for example, whether researchers will remain at their home institutions or become ITER employees.

Do you have to be involved now to have a role at ITER in the future?
No. All the partners are collaborating to make ITER work so that there will continue to be opportunities for research and jobs. Those with the best ideas will get the jobs.

What challenges does ITER face?
ITER is set up so that all knowledge about how to design, assemble and run the experiment is shared among the collaborators. For example, the biggest component of ITER is the field magnets. Rather than having one partner provide those, it was decided that everyone would be involved in manufacturing them so that everyone would have the knowledge to build their own fusion power plants in future. That is a sensible long-term strategy, but it adds a lot of negotiations and complexity to the project.

What have you done to set yourself apart from other young researchers?
The vast majority of machines to heat plasma use neutral-beam injection, which spins the plasma at hundreds of kilometres per second. A mentor pointed out that nobody was looking into the effects of that on the plasma. We worked out how to model the rotational dynamics, which gave us a unique skill.

Are younger scientists flocking to fusion energy now that ITER is a reality?
Yes, the calibre of PhD students and postdocs interested in fusion has increased dramatically in the past few years. We are getting more publicity now that ITER is really going ahead, and is no longer simply a paper exercise. This is the most exciting time to work in fusion, because the next decade of work will make or break the field — and define whether fusion can work for humankind. ■

INTERVIEW BY VIRGINIA GEWIN