Academics in the field have long thought that postgraduate degrees in astronomy, astrophysics and planetary science and particle physics are a good bet for careers. But now a survey has confirmed that graduates bring excellence, employment prospects and average salaries, within sciences and elsewhere, boosting the case for funding studentships in order to support science and industry.

The survey was funded by the Science and Technology Facilities Council and examined careers of research students funded by STFC and predecessors. Almost all of them (97%) were employed, full and part-time, and two-thirds of them remained in scientific research. Those who moved out of specialist science favoured business and financial services, working for companies such as Barclays, IBM, BP and Goldman Sachs.

These results support the case that the training offered by PhD research is valuable both for science and for the country’s economic success as a whole. Keith Mason, Chief Executive at STFC, says: “One of our key roles is to support the development of skilled people for academic, business, and other employment through postgraduate training. The results of this study confirm that STFC’s productive investment is highly valuable to the current and future competitiveness of the UK economy.”

Mason stresses that it is the transferable skills in postgraduate research training that makes for valuable professionals in the wider fields of employment. “These are high-value, knowledge-intensive sectors that have a strong demand for people with the type of high-level computing, modelling, analytical and transferable skills that are developed through an STFC PhD.”

The survey also revealed that about 62% of respondents are earning a comparable or greater salary than the average professional worker in the UK, despite being at relatively early stages in their careers – implying that former PhD students tend to be high-achievers whatever career they pursue. Furthermore, STFC’s PhD students enjoy almost full employment, with only 1% unemployed and 2% on a career break, in the survey.

Although many use the technical competence from their PhD work, it is important not to forget those other skills that students learn, that are especially valuable in other fields. Bruce Fairley, whose PhD was on astronomy and cosmology, is now a Senior Software Engineer at Tresella plc, a company that designs bespoke scientific software, and he is drawing directly on transferable skills he learnt as a research student.

“The technical side of my PhD training, such as analysing images from telescopes, is of limited relevance to my current job,” he says. “However, I still use many of the other more general skills I developed. As an astronomy PhD student you spend a lot of time writing proposals for telescope time. This type of experience is highly relevant in the private sector, where a lot of time is also spent writing tenders and proposals.”

The survey was carried out on behalf of the STFC by DTZ; their report and summary, including statistics and career profiles of several of the respondents, can be found via the STFC website.

http://www.scitech.ac.uk/Funding%20and%20Grants/18313.aspx

**Postgraduate degrees produce employable people – it’s official**

Sue Bowler, Editor

In these tough times – for everyone – it is worth thinking a bit about the real value of our sciences. Rather than accept decisions made on the basis of a snapshot of today’s successes, we should all be aware of our catalogue of achievements in the long term. And I don’t mean just the considerable astronomical and navigational heritage embodied by, for example, the Tornion clock now at home in the Royal Observatory Greenwich – replica of the original 17th-century world-leader. Much of this issue is dedicated to the more than half a century of science in a new field: geophysical and astrophysical fluid dynamics. This is a field largely sparked by the deceptively simple experiments devised and carried out some 60 years ago by Raymond Hide. This whole new field, arising from observing the flow of fluid between two cylinders, now illuminates studies of stellar and planetary interiors, climate modelling and even brings us better weather forecasts. None of these were goals of the original experiments. They arose from curiosity, ingenuity and hard work, coupled with a lovely appreciation of the significance of the results. These are the things that make good science – and they are what attracts people to science. Just look at the responses to telescopes at a music festival, and the chance to study astronomy at school, documented in this issue. Curiosity, fascination with physical phenomena and a drive to explore are what draw people into our physical sciences. And that in turn brings them excellent employment prospects and higher than usual salaries. UK science has been very successful for many decades – even centuries. If we can keep up investment in science, science will in turn reward UK industry as well as keep our science leading the world.

**Bang: and there goes a quasar**

What makes a quasar glow? Colliding galaxies, according to an international team of astronomers scanning a quasar sideways-on. They have found that a collision between galaxies seems to fire up a quasar, driving intense activity from the central engine.

The team, led by Montserrat Villar Martin of the Instituto de Astrofísica de Andalucía-CSIC in Spain, used the Very Large Telescope in Chile and the Gran Telescopio Canarias (GTC) on La Palma in the Canary Islands, to study activity from the quasar SDSS J0123+00. This is a Type 2 quasar, oriented so that we see the toroidal accretion disc, formed as material falls towards the central black hole, edge-on. They provide useful tools for understanding quasars in general, because the dust in the torus dims the bright jet of material emerging from the central region, which otherwise overwhelms any detail to be found in the disc.

“Type 2 quasars are a family of still relatively new stars,” explains Montserrat Villar Martin, who led the research team, “which so far have been investigated mostly from a statistical point of view. We have observed a giant nebula of ionized gas associated with SDSS J0123+00, and signs of an interaction with a nearby galaxy.”

The nebula is about six times larger than the Milky Way and the authors infer that it is probably made of the debris of the interaction between SDSS J0123+00 and its neighbour. The nebula includes a bridge of material that connects the two galaxies, which strengthens the hypothesis that the quasar activity is triggered by the interaction between them, producing the accumulation of gas in the galactic central regions and providing material to feed the black hole. This process can also trigger the rapid formation of new stars.

These results, published in the Monthly Notices of the RAS, are the first based on images from the tuneable filter of the Optical System for Imaging and low Resolution Integrated Spectroscopy (OSIRIS) on the GTC. This filter allows astronomers to observe objects in narrow windows across the spectrum of visible light from red to blue, something that with older systems would need more than 5000 narrow-band filters. http://www.iaa.es/~rosa/AYA2010/AYA2010/NovedadesEntradas/2010/6/23/ Galaxy_encounter_fire_up_quasar.html

An image of the field around the Type 2 quasar SDSS J0123+01 from the OSIRIS tuneable filter on the Gran Telescopio Canarias. Red shows regions where light is emitted mainly by stars; green shows emission from hot ionized gas; yellow indicates a mixture of both.

The image reveals the existence of a giant nebula of ionized gas which extends for 180 kparsecs (590 000 light-years) and includes a bridge of material that connects the quasar with the neighbouring galaxy it is interacting with. (Montserrat Villar Martin, IAA-CSIC)

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