We are seeking your views on HEFCW’s plans to develop Wales’s higher education system over the next three years.

If you would like to provide your views in writing, please use the reply form below, and submit your response to Craig.Brett@hefcw.ac.uk by Friday, 12 October 2012. You don’t have to respond to every question.

If you would prefer to contribute in person, our annual public meeting will be held on Friday, 19 October 2012 and we will be discussing our draft strategy. Please contact info@hefcw.ac.uk for further information.

Name:

Professor Manuel Grande, Chair, the Institute of Physics in Wales

Professor Peter Main, Director, Education and Science, the Institute of Physics

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| 1. What should be done to create a world class higher education system in Wales? | In terms of the HE system in Wales, it could stay more or less as it is now competing for students with the English system but with the corresponding opportunity to collaborate on a larger scale or it could become increasingly independent. Currently, public research is funded via Research Councils UK (RCUK), as in the former model, while teaching and learning are supported by a scheme different from that in England, notably with regard to fees. If research continues to be funded essentially on a UK model, it is clear that, for international competitiveness, adequate funding must be provided for teaching. Whether that occurs via increasing fees or via public spending is a political decision but, without it, it is difficult to see Wales competing at a world level. An alternative model would be for Wales to become independent of RCUK but this strategy has such a high risk that it is unlikely to be contemplated. Due to the global nature of modern physics research, the former model is preferred.

While there is great virtue in variety, particularly in teaching provision, for international impact, it is important that research is coherent. With national and regional collaborations springing up across the rest of the UK, for example, SUPA in Scotland, Wales needs to follow a similar line for subjects of strategic importance, such as physics. Previous panels within the HEFCW remit have
studied alliances of academic departments within Welsh universities. We urge that this activity is both continued, and, importantly, funded at appropriate levels. If not, Wales will be left behind in future REF exercises and in other measures of research quality if it does not follow a similar route and establish national consortia of university disciplines. We urge HEFCW to invest funds to facilitate this development.

In addition, there has been a recent decrease in the availability of RCUK-funded PhD places which has had a serious impact on the research productivity of university groups across the UK. To address this issue, HEFCW should introduce a number of fully funded (i.e. scholarship based) PhD places for Welsh university research groups. This is a specific and concrete action for HEFCW which would significantly enhance Welsh HE. It would act alongside the recently announced £50m “Sêr Cymru” programme to attract world-leading researchers.

Finally, there is a funding shortfall in Welsh schools compared to their English counterparts. It is reported that this gap now runs at £500 per student per year, see [http://www.bbc.co.uk/news/uk-wales-16634491](http://www.bbc.co.uk/news/uk-wales-16634491). It is clear that the creation of a “world class higher education system in Wales” is severely limited by the funding of Welsh students’ high school education. The quality of HE depends crucially on the skills and knowledge of the incoming students.

2. How well has the HE system worked since 2010?

The reputation of the HE system in Wales suffered greatly last year due to the widely reported issues related to the University of Wales. The quality of several of its degree schemes was brought into the spotlight and its issuing of student visas was investigated by the UK Border Agency. The reputation of this (once) flagship institution, which was given the Royal Charter in 1893, has been hugely damaged. It is not clear whether the facts surrounding this affair have been fully uncovered.

In other recent and current developments, there has been a push towards merging various HE universities in Wales. While initiatives to bring Welsh universities into a more competitive environment are welcome, care must be taken in the details of how this is achieved. In particular, care should be taken to maintain provision and increase coherence at the subject level.

3. What ambitions should we have for HE in Wales from 2013

The corporate strategy is correct to set targets for RCUK funding but these will not be achieved in a vacuum. Broadly speaking, good people attract funds and funds can attract good people. In physics, the very disappointing performance in the RAE2008 has done damage to the reputation of physics in Wales. Any ambition for Wales should include a much improved performance in the forthcoming REF and similar future exercises, which will only be achieved with significant investment in new people and infrastructure, together with a more coherent research environment based on supportive collaborations.
A very reasonable and achievable ambition is to win a ‘fair share’ pro-rata of competitive RCUK funding for Welsh universities.

In addition, ambitions for teaching should include a balance between students moving to England to study and English students crossing the border in the other direction; the balance should include an indication of quality to allay fears that the better Welsh students study in England. In this area, a medium-term ambition should be for Wales to have a university that competes with the best of the English red-bricks, if not the golden triangle.

Higher education should also be looking to improve its diversity. This should certainly not happen by the lowering of standards to accommodate students ill-prepared for their programmes, but by working with schools and other organisations, such as the Institute of Physics, to raise the standard within schools. In physics and mathematics, government-funded projects in England are having a major positive impact on the take up of A-levels and the number of qualified specialist teachers; Wales is undoubtedly being left behind and HEFCW should join with the Welsh government to develop a long-term plan to increase the diversity and numbers of students entering HE, particularly in strategically important subjects.

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<th>4. In your view, do the themes cover the role of higher education and will they help us achieve social justice and a buoyant economy?</th>
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<td>5. What more could we do to ensure inclusion, progression and success in higher education?</td>
<td>In addition to the comments in response to question 3, HEFCW should consider carefully a more active promotion of diversity standards, such as Athena SWAN or Project Juno (the latter which is administered by the Institute of Physics). Many Welsh universities are participating in these schemes but HEFCW can send a strong message if it insists that funding depends on diversity issues being addressed. Progress and success depend on high-quality teaching and the students being well-prepared on entry. However, measures need to be in place to ensure these principles are not undermined by quality assurance procedures, exacerbated by league tables. Any attempts to attract students from non-traditional backgrounds will be hampered by two common barriers. The first is the identification of failure as being unacceptable; while, obviously, one always wants students to succeed, taking students from non-traditional backgrounds is inevitably risky and will result in some students struggling and finding the course is not for them. Currently, many universities either shy away from taking such students, reducing diversity for the safer option, or accommodate them by lowering standards. Neither of these is satisfactory and HEFCW needs to find a way of making HE</td>
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more flexible in its approach.

Furthermore, HEFCW’s ‘Reaching Wider’ initiative [http://www.hefcw.ac.uk/policy_areas/widening_access/reaching_wider_initiative.aspx](http://www.hefcw.ac.uk/policy_areas/widening_access/reaching_wider_initiative.aspx) is very welcome and proving very effective, at least anecdotally. Another very positive programme which should be developed further is ITWales’s ‘technocamps’ [http://www.technocamps.com](http://www.technocamps.com) which brings young students into universities to develop their IT skills.

6. How can we ensure that the student experience in Welsh higher education is of excellent quality and that it is enhanced by the student voice?

The National Student Survey [http://www.thestudentsurvey.com](http://www.thestudentsurvey.com) is fast becoming the touchstone upon which comparisons of student experience in UK universities is based. We welcome this survey of final year undergraduate students and note that it has made a real and positive impact in university departments’ teaching methods and management. However, we note that, while the student voice is crucial within a university, it is much less reliable in comparing between universities, as students usually have experience of only one university.

One other relevant mechanism is external accreditation by professional bodies, which are respected and independent. In the case of physics, all UK physics degrees are accredited against a common core and a high standard of quality mechanisms. Since accreditation is essentially peer review, i.e. it is carried out by senior staff from other universities, it offers a robust mechanism for assuring minimum standards at the subject level. Where available, HEFCW should insist that degrees in Welsh universities are accredited by the appropriate bodies.

7. What further actions could be taken to ensure that graduates are equipped for life and work and universities deliver an upskilled workforce?

One of the key things that must be done is to ensure the Welsh HE sector produces adequate numbers of highly-skilled graduates that are in demand from industry and can help rebalance the economy. Such graduates will be trained in STEM subjects, such as physics.

Physics graduates that are employed in many nationally important areas, including the IT sector, financial analysis, engineering, environmental science, energy technology, intellectual property law and medical physics. Physics departments train numerate people who are experts at problem solving; the ability to produce detailed, analytic and numerical descriptions of both simple and complex systems is a skill that has a wide range of applications. This ability runs beyond mathematics; it embodies notions of how things work, why things work and predicting how they will work under different conditions.

These abstract problem solving skills are also coupled with very real understanding of technologically useful systems such as materials, electronics and mechanics, so there are clear, direct benefits to engineering and industry. And while such skills are commonly developed by many STEM disciplines, it is important to avoid the trap of making HE focus on the very short-term needs of industry; a broad range of skills if often more valuable than a deep knowledge of a
### 8. How can productive relationships between higher education institutions and the public, private and third sectors be strengthened?

To strengthen science and innovation across the private sector, it is necessary to facilitate knowledge exchange and expertise from HE to the private sector, whilst enabling people to move freely between the two sectors.

It is acknowledged through programmes such as Knowledge Transfer Partnerships (KTPs) that people are the most effective form of knowledge exchange; however, in terms of career progression in both academic and industrial settings, time spent away from a ‘primary’ role can be detrimental, particularly regarding the academic requirement (via the REF) for a continuous publication history that may not be possible within an industrial setting. There should be a drive towards greater flexibility, promoting a diversity of backgrounds and career paths within academia. In terms of how ‘people exchange’ could practically be accomplished, it is useful to look at a different form of knowledge exchange: direct, project-driven collaborations between companies and university departments, which have made significant steps forward over the past decade, coinciding with the implementation of the recommendations of the Lambert Review of Business-University Collaboration, i.e. “the most effective forms of knowledge transfer involve human interaction”. Schemes are run by the RCUK for people to cross the divide between industry and academia. It is a disappointment that no university in Wales has a Knowledge Transfer Account and only two Industrial Doctorate Centres (and these both involve the same university).

The Technology Strategy Board awards grants to businesses and a recent initiative is the Catapult centres. Catapults bridge the gap between universities, research and technology companies. It is not clear what the Welsh involvement is in the Catapults that have already been announced.

A more innovative Wales would seek to gain a larger share of funds from UK funding agencies; if Wales is not punching its weight, it should give considerable thought as to why not. Is it because there are few Welsh applicants, or because the applications are unsuccessful?

### 9. How can we ensure excellent quality research to underpin the knowledge economy and support civil society?

HEFCW should work with universities to diversify their funding pool. With all the changes to RCUK funding policies (concentration, impact, etc.) it is crucially important that university departments have multiple sources of funds to continue to undertake high-quality curiosity-driven research.

Curiosity-driven research has an essential role to play in the science
base for the foreseeable future. All technological advances ultimately have their origins in curiosity-driven research, where the outcomes of the research cannot be easily predicted. Such research in physics often leads to significant economic and societal benefits, usually on a timescale around 15 years between the essential breakthrough in the science to the application. For example, PET, MRI, X-rays, GPS, lasers and semiconductors are all technologies that are widely used and are enormously beneficial to society; it was not so long ago that the laser was dismissed as a physicist’s toy. Similarly, few people would have thought that atomic clocks would lead to the ability to navigate to within a metre at any point on the Earth’s surface.

The UK has a strong and vibrant research base and, with sufficient investment, curiosity-driven research will reap significant benefits within and beyond the next 15-25 years.

However, there are pressures being placed on research council responsive mode grants, the means by which curiosity-driven research is funded. Research is being prioritised towards targeted areas and demonstrable evidence of the economic and societal impact of curiosity-driven research is being sought. We are not aware of any evidence to suggest that focusing on select, thematic areas will result in economic gains, in the short term or longer, but it is obvious that in the medium- to long-term, it will undermine the ability to retain the highly-trained, inventive and innovative scientists and engineers who will maintain and strengthen international competitiveness. It is these people, particularly those that have been attracted to the UK by a funding system and academic ethos that allows them to pursue curiosity-driven research, who will enable nations such as Wales to respond to new discoveries for which the economic and societal impacts are manifold.

Therefore, there is a need to find a healthy balance between the need to fund curiosity-driven research, the translation of knowledge into products and services that can contribute to GDP (and social well-being) and the need to prioritise research to address the major societal challenges. It is often tacitly assumed that innovation in business is hampered by the universities holding onto knowledge or at least being reluctant to put in much effort to disseminate it. The Institute of Physics is of the view that more attention needs to be given to where the barriers actually are within the science and innovation base, such as the lack of investment in transitional research and industrial capability that would allow the more direct products of curiosity-driven research to be widely exploited by UK companies operating within the UK.

<p>| 10. Through reconfiguration and | No comment. |</p>
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| 11. How should we measure performance in higher education?              | The REF already exists as a performance measure in HE research. However, we would urge caution in that moderation between the subject panels in successive research assessment exercises is not always perfect (as was the case in RAE 2008 in which physics appeared weaker than other disciplines while leading on measures of relative citations); therefore, care needs to be taken if financial judgements are based on ‘absolute’ ratings.  

In addition, the comment below made by the RAE2008 physics-sub-panel needs to be considered very carefully; it refers to the distribution of QR-funding to only a selective number of universities:

> “Many of the world-leading research outputs observed in submissions originated from small responsive mode grants. The sub-panel believes that continuing availability of such grants is absolutely vital to encouraging and sustaining groundbreaking research activity. Both national and European funding agencies are concentrating heavily on large collaborative programmes which, though worthwhile in themselves, if pursued to the exclusion of smaller scale grants, may place the nation in a weak position in the future...The physics and science community cannot know where future developments will come from, and attempts to focus funding too narrowly into priority research areas (or priority departments) will limit rather than enhance the prospects of breakthroughs at the highest level.”  

In terms of HE two measures of performance could be the ability of Welsh universities to attract the best students and that Welsh graduates are in demand in other countries. |
| 12. Are the measures we suggest appropriate?                             | In response to our one of our earlier comments on business-university collaboration, we suggest that a measure is included that looks at the involvement of HE in Wales in industrially-focused RCUK funding.                                                                                                                                                                                                                                                   |
| 13. Are there any impacts for equality and diversity, the Welsh language or sustainability that we need to consider? | No comment.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 14. Do you have any other comments about HEFCW’s draft Corporate Strategy | We welcome the statement: “We will continue our focus on Science, Technology, Engineering and Mathematics”.  

We welcome the comment “Recognising the importance of collaboration; governance and/or organisational effectiveness how can we better enable the achievement of our corporate objectives?” |
postgraduates to the future of the Welsh economy and the desirability of increasing the size of the postgraduate community in Wales, we will continue to provide strategic support for postgraduate research.” Following the decision taken by EPSRC to stop funding project studentships on research grants it is crucial that Wales HE has access to funding for postgraduate studentships.

Responses to consultations may be published.

I would like my response to be kept confidential.  No, publish if required

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