

LANCASTER ENVIRONMENT CENTRE

FURTHER DETAILS

POST REFS: A043/A044/A045 & A046

This document presents detailed further information relating to the 4 new academic staff posts within the framework of an overall departmental strategy to:

1. Broaden our established research excellence for the REF
2. Play a significant role in Faculty and University level research strategy
3. Maintain our undergraduate portfolio in the light of staff retirement
4. Maintain and grow our postgraduate taught portfolio
5. Consolidate the Department's international strategy
6. Fully exploit significant capital investment made to LEC
7. Further develop income streams from sources other than HEFCE and RCUK

Broadening our established research excellence for the REF

The Lancaster Environment Centre has brought together previously distributed excellence in environmental research and teaching across a number of departments – a strategy which resulted in a significant success in RAE2008. Our forward strategy is geared to ensuring that we preserve and build upon this excellence and accord with the University's strategic objectives (particularly in terms of increasing our international visibility) while recognising that we can readily expect income from 'traditional' sources for both research and teaching to be at risk.

The cases for particular areas we are keen to recruit to have been developed over a number of months and after some considerable discussion, initially within the Department's management team – and now, in the development of the detailed academic rationale for the posts, theme leaders and centre directors in LEC.

We know that the impact of our research and teaching can be achieved through a broad range of endeavours which result in innovation in terms of technological development, societal well-being and policy change. Such an approach usually requires cross-cutting, multi-disciplinary expertise and this is reflected in the academic posts proposed here and the (ultimately) convincing rationale within our 2008 RAE submission. We also recognise that this desire to focus posts across disciplines is only made possible via the established disciplinary foundation on which LEC is built.

We believe LEC has a market lead on our competitors through the development of partnerships across our research themes and integrating research centres. We have effectively traded on the fact that LEC brings together a unique community of academic researchers, government scientists and both public and private sector partners (and take advantage from it) but we cannot afford to stand still. Comparator universities have moved quickly in similar areas of endeavour to mirror the structure developed in LEC and we must continue to develop and innovate in both our research and teaching strategy to ensure we both maintain and grow the position we have secured relative to such comparator institutions.

Playing a significant role in Faculty and University level research strategy

The most significant specific faculty level initiative the department is keen to play a full role in is *Energy Lancaster*. This new development provides a significant opportunity for LEC to play a leading role in an area now synonymous with the environment. We have considered the expertise across

LEC and the possible ways in which the department can contribute to this new initiative. We are proposing that LEC leads on a specific environmental 'challenge' around the management of the environment for carbon capture and storage. Our strong feeling is that while we are well placed with expertise pertaining to the physical, biological and social aspects of carbon capture and storage at a landscape scale, we need to compliment this with new expertise around environmental economics – to bring market based instruments into this arena. We would see the proposed sustainable cities and environmental economic geography posts playing a key role within *Energy Lancaster* and our decision to propose this post is heavily influenced by the ongoing discussion taking place to establish *Energy Lancaster* in 2010. We are also co-ordinating this proposed area of development with the Department of Economics who are planning complimentary investments in this area which will ensure that any new appointee would also provide a useful point to further develop inter-faculty partnerships.

Maintaining and growing our PG taught portfolio

In the financial year 2008-9 teaching (UG and PGT) contributed 71.7% of LEC income, and despite a significantly increased HEFCE R contribution following the last RAE, teaching income is estimated to contribute 65.3% of LEC income in 2009-10. In 2008-09, the divisions within LEC recruited 102.5 PGT and 16 PGR students, while in October 2009, LEC recruited 100 PGT and 33 PhD students. In the 2009/10 planning document, LEC PGT/R admissions are expected to remain high at around 128 students. LEC has maintained a strong and flexible MSc portfolio, supported strongly by interfaces with the business sector, making PG training in LEC attractive to home and overseas students. The appointment of staff in these four areas is crucial to the expansion of LEC's PG portfolio at MSc and PhD levels, with MSc programmes in analytical chemistry, and food security/sustainable agriculture; importantly, these positions will support the development of international PGT/R training programmes, e.g. China Bridge links with the Chinese Academy of Sciences. Further, these positions will, in part, support the replacement of staff recently left or staff that plan to either retire or reduce to part time from October 2010.

Maintaining our undergraduate portfolio

In the 2009/10 planning document total home/EU UG admissions to LEC are expected to remain high at around 230 FTEs, and there has been a steady increase in A level entry grades across all degree schemes. In the 2009-10 admission round applications to LEC degrees have increased overall by almost 10% and recent changes to the structure of LEC UG degree schemes (especially improved flexibility and stronger employability skills) should make these schemes increasingly attractive to both home and overseas students.

We are currently making changes to LEC degree programmes to make it easier to accommodate staff leave (for instance an integrated LEC Part 1 course, removal or re-launching of poorly-recruiting schemes and more flexibility in ES and LEC-BS schemes), but without replacement staff it will become impossible to deliver the range of degree schemes that LEC currently needs to recruit students, and to maintain the high quality of teaching that LEC currently has (as evidenced by recent NSS results). We have also seen net reductions in support staff. The four posts requested are the minimum needed to maintain UG teaching in LEC.

Consolidating the Department's international strategy

The Department's international strategy, particularly with regard to our teaching mission – has arguably been slow to develop. However, recent significant research partnerships (most notably with both China and Brazil) are beginning to provide some significant opportunity for further strategic develop. The successful award of a China-Bridge grant to LEC is enabling us to cement and deepen our research partnerships with a number of Chinese institutions, including the Chinese Academy of Sciences (China's elite research institution) and China Agricultural University (one of the world's top 10 agricultural universities). The University has recently signed a MoU with the Chinese Academy of Sciences (CAS) – with a view to deepening the level of collaboration initially with the CAS Institute for Geochemistry (in Guangzhou), Eco-environmental sciences (in Beijing) and Institute for Urban Environment (in Xiamen). The academic areas of the proposed posts have been informed by likely areas of collaboration with CAS in the next three years and we would wish to consider whether all proposed posts would make a significant contribution to the development and deepening of collaborative links with these institutes.

Exploiting significant capital investment

The university has made a major investment in compound specific and stable isotope equipment to be co-located within NERC's Centre for Ecology and Hydrology life sciences stable isotope facility at Lancaster during 2010. This purchase has already resulted in an EPSRC CASE studentship to Wynn and Barker and offers a major potential for new research activity. The new post in isotope geochemistry will build on this investment.

Develop new income streams from sources other than HEFCE and RCUK

The most obvious signals of desired change by Government to the way in which Universities should consider their research mission, came at the start of the Brown premiership – with the formation of a new Government Department for Universities, Innovation and Skills (DIUS) – uniting government policy (and funding) underpinning research and its impact, for the very first time. The desire of Treasury to maximise the impact of research in social, policy and economic terms is unlikely to go away, with all research councils requiring full articulation of such impact in applications for grant and the anticipated allocation of HEFCE-R monies in part on the basis of a measure of the research impact of units of assessment highly likely following the REF. The governments *Higher Ambitions* framework for higher education and the cross-party input to it, reassures us that this agenda will not diminish, even following the election in 2010. While the economic downturn and recently announced cuts to the sectors budget (and those anticipated in the Science Budget) will constrain the opportunities for new posts to capitalise on public funding opportunities in the same way as may have been possible until recently, we have aimed to develop proposals for posts which stand the best chance of capitalising on those priorities we may anticipate being maintained in research budgets.

In addition to anticipating maintained research priorities of public funding going forward, we need to build capacity to better exploit the opportunities we have begun to realise by working more closely with the commercial sector. LEC continues to develop an increasing number of relationships with the commercial sector and many of these partnerships, particularly those developing via company co-location provide a new dimension to LEC (with clear value within the impact agenda of the REF and RCUKs) and a potentially useful opportunity to form research partnerships enabling access to new (or currently inaccessible) research funding.

A recent analysis over the last 4 years has shown that the activities of *Enterprise & Business Partnerships* in LEC has led to relationships with over 400 companies, £4 million in cash income from ERDF for outreach projects, £3 million in capital investment from ERDF and NWDA, provision of 130 placements for MSc students, a number of PhD CASE Studentships from BBSRC, EPSRC and NERC, £0.5 million in cash income from continuing professional development training, £0.6 million in cash income from the private sector (for applied research), a long-term partnership with Waitrose Supermarkets – the Food Shops of the John Lewis Partnership and £3 million from the research councils for applied research and knowledge exchange activities. We have been mindful in the development of proposals for new posts to ensure they are well placed to take full value from relationships with the commercial sector and we would anticipate that new posts would be targeted to increase funding from these less traditional, but potentially more resilient income streams over the coming 2-3 years.

The proposed posts have also been decided upon in anticipation that public funds for research (from RCUK, TSB, RDAs and successor bodies) will continue or be increasingly prioritised against research (and increasingly mainstream teaching) endeavours most likely to lead early economic re-growth in the UK (be this under an existing or new government administration). We believe that the posts proposed are well disposed to take full advantage of this anticipated continued focus on funding for research and teaching. These growing sources of income, particularly those from the private sector (or those public monies aligned to boosting economic recovery), alongside both maintained home/EU undergraduate recruitment and an increase in both international undergraduate and postgraduate student numbers form the basis for income generation by these posts, which we aim not to be constrained directly by the almost certain reduction in the funding envelope for Universities next year and as part of the next CSR.

A046: Readership in Sustainable Cities

We are seeking to make a permanent appointment at Readership level that can bring new strengths and experience to the interdisciplinary work of LEC in urban environments. We are therefore looking for candidates with established expertise and a substantial track record of international quality publication, research income and research student supervision and experience of research leadership within their field. We are particularly interested in candidates who approach sustainable cities from a geographical perspective and/or who work in the interface between geography and other disciplines such as sociology, planning and politics. A PhD in Geography or closely related discipline is therefore required. To maximise opportunities for engagement with programmes of work within the Society and Environment theme and with others in LEC and the wider University, we would be particularly interested with candidates in expertise in the following areas:

- Sustainable urban energy and transport infrastructures
- Urban resilience and low carbon development
- Urban governance and systems of sustainable resource provision:
- Urban health and well being and environmental justice
- Cities and sustainability transitions

Specific expertise such as these would promote collaborate working with other staff in the Society and Environment theme, including *Medd* (infrastructure, water, resilience), *Pooley* (mobility and sustainable transport), *Faulconbridge* (learning, knowledge, green architecture) and *Walker* (sustainable energy, inequality, transitions). There are many relevant research funding priorities and opportunities (such as EU FP, ESRC, EPSRC and LWEC) where team collaboration is required and leadership to develop these team approaches is needed. The Society and Environment Research theme has a strong focus on engagement with a wide range of external actors (governmental and

non-governmental) and publics, and candidates with a commitment to this way of working and to achieving effective research impacts will be particularly welcome.

This post has the potential to fit closely with ongoing strategic developments, including proposed new cross Faculty Centres in Energy Research and in Sustainable Practices. There will be many opportunities for collaboration within LEC and the wider University, for example with the Centre for Sustainable Water Management (CSWM), Centre for Mobilities Research (CeMoRe), Centre for the Study of Environmental Change (CSEC) and the Imagination group in Lancaster Institute for Contemporary Arts (LICA). The appointment will also fit directly into the Geography and Environment pathway of the bid for a joint ESRC Doctoral Training Centre between Lancaster, Manchester and Liverpool Universities.

The geographical focus of expertise could encompass both developed and developing world urban contexts, with particular potential to add an urban dimension to the existing and emerging international programmes in LEC in China, Africa and South America.

This post will contribute to core UG teaching across Geography degree schemes (which recruit over 50% of all LEC undergraduate students) and will also provide modules to be taken by students on other LEC degree schemes including the new BSc degree in Environmental Change and Sustainable Development. The post will also contribute to existing postgraduate teaching programmes (such as the MSc Resource and Environmental Management, MRes Environment and Development) as well as being centrally involved in innovations in the development of new postgraduate teaching provision.

A043: Lectureship in Environmental Economic Geography

We are seeking to make a permanent appointment at lectureship level to develop capacity and make a distinctive contribution to LEC's concern with addressing critical current environmental issues. Our intention in investing in the new sub-field of environmental economic geography – or the 'spatially conscious economic analysis of environmental issues' (Heidkamp 2008) – is to stimulate new thinking and open up opportunities for innovative interdisciplinary work. We are looking for a candidate who has (or is very near to completing) a PhD in Geography and that has existing (or emerging) publications, conference and teaching experience. A commitment to interdisciplinarity and achieving effective research impact is also required. Whilst we are open to a broad definition of 'environmental economic geography', the following provide examples of relevant more specific areas of research:

- The low carbon economy, carbon trading and offsetting
- The economic geography of sustainable energy and low carbon transition
- Environmental and local energy entrepreneurship,
- Biodiversity trading and offsets; environmental services
- Spatial strategies, governance and green economic development

Specific expertise in these areas would promote collaborate working with other staff in the Society and Environment theme, including *Walker and Vermeylen* (local energy governance and transitions), *Ochieng* (landscapes and livelihood, trade and environmental services), *Faulconbridge* (global networks, professions, economic actors), *Vermeyelen* and *Ellis* (biodiversity and commodification, property rights). The post is opens up opportunities for involvement in the proposed new cross Faculty Centres in 'Energy Research' and in 'Sustainable Practices' and there will be many opportunities for collaboration with other theme groups and centres within LEC and across the University. The Lancaster University Management School (LUMS) is making new investments in

environmental economics and has a distinctive profile in sustainability and leadership. In Sociology the Centre for Mobilities Research (CeMoRe) and Centres for Study of Environment Change (CSEC) have cognate interests, as do others in politics and potentially engineering.

The geographical focus of expertise could encompass both developed and developing world contexts (and the interchange and relationships between the two), with particular potential to add to the existing and emerging international programmes in LEC in China, Africa and South America.

This post will contribute to core UG teaching across levels 1, 2 and 3 of the Geography degree schemes and will provide modules relevant to students on other degree schemes across LEC. It is expected that the post will contribute to existing team teaching (lectures, tutorials, practicals, dissertation supervision and field work) as well as offering innovative new modules attractive both to students on Geography programmes and others in LEC including the new degree scheme in Environmental Change and Sustainable Development. Opportunities for involvement in postgraduate teaching will also be available, contributing to existing postgraduate teaching programmes (such as the MSc Resource and Environmental Management, MRes Environment and Development) as well as being involved in innovations in the development of new postgraduate teaching provision. The appointment will also fit directly into the Geography and Environment pathway of the bid for a joint ESRC Doctoral Training Centre between Lancaster, Manchester and Liverpool Universities.

A045: Readership in Sustainable Agriculture

After several decades of relative obscurity, food security is once again becoming an issue of global concern. Indeed, the estimated number of hungry people in the world is rising at an alarming rate, rather than declining. This may be attributed to a variety of factors:

- Rising population
- Changing and converging consumption patterns
- Rising per capita incomes, leading to increased resource consumption
- Growing demand for livestock products (meat and dairy)
- Growing demand for biofuels
- Increasing water and land scarcity
- Soil degradation
- Increased cost of fossil fuels used in fertiliser production
- Impact of climate change
- Slowing of increases in productivity

Together, these and other changes have forced widespread recognition of the vulnerability to disruption of the activities that underpin food security and to a search for means by which food security might be improved and its impacts understood and moderated (e.g. Beddington 2009 etc – The Perfect Storm).

Lancaster University is well placed to address the challenge of increasing world food supply and is looking to build capacity in its team addressing the science underpinning the sustainable intensification of world agriculture.

Following the strong early lead provided by Professor Terry Mansfield FRS, research in plant stress biology has been a major headline for the Lancaster University for more than 30 years. Plant science research within what is now the Centre for Sustainable Agriculture (CSA) has an excellent track

record in fundamental science but has also contributed significant 'science into agriculture' as is evidenced by the broad range of industry funding received by the group (HDC, LINK etc) and the establishment of the Waitrose Centre. The impact of the work has been recognised by the award in 2009 of a Queen's Anniversary Prize and the THE prize for Research Project of the Year. CSA is developing a strong link with the Biodiversity and Global Change Theme.

The plant science group within CSA works across the scales from the cell and molecular level to the community and landscape scale. There are very few groups in UK Universities that have this range of expertise and still fewer who work collaboratively across the disciplines and with end users. Plant scientists in CSA work effectively with other groups within LEC This appointment will strengthen one of the following areas:

- The exploitation of novel understanding in plant stress biology via plant improvement aimed at 'plants for enhanced food production under a changing climate.
- Development of novel crop management techniques based on our understanding of plant functioning under environmental stress (new irrigation/fertigation techniques, fertiliser and water management, novel stress sensing techniques for sustainable use of resources in agriculture, soil manipulations, pest and disease management).

The proposed disciplinary development will offer substantial opportunities for research, knowledge transfer and training. The research and training agenda of the proposed appointee will be cast in the context of societal development in a region of the world where agriculture suffers resource scarcity. LEC already works effectively in China and in the Mediterranean region and we seek to strengthen these efforts and other global links.

The research and training components of this proposed post and associated development depend upon establishing partnerships with Universities, Institutes and food producers and suppliers in different regions around the world where enhanced sustainability of agriculture will allow sustained/enhanced food production. We have already started to establish networks for this development in China (based on the £1.3 million China Bridge Consortium). Two other Research Council grants are linked to this programme

The proposed appointment will be tasked with further developing links between the existing LEC themes and centres and the wider university community (particularly in our management school, engineering, arts and social sciences, computing and school of health and medicine.

The CSA currently has research funding from BBSRC, NERC, RCUK, Defra, LINK, HDC, EU, The UN, the Royal Society of London and from several companies (including Plant Impact and Waitrose). Food Security is a high priority for future funding by RCUK (a cross research council effort is currently being led by BBSRC).

A044: Lectureship in Isotope Geochemistry

This post spans our Environmental Geosciences and Catchment and Aquatic Processes themes. The successful applicant will bring knowledge of the application of isotope geochemistry to earth surface processes and/or biogeochemical cycling. They will contribute to multidisciplinary undergraduate and postgraduate programmes.

We have recently made a major investment in new mass spectrometry facilities at Lancaster giving us a capability in compound specific and stable isotope techniques. This complements and is part co-located with the NERC life science mass spectrometer laboratory within CEH Lancaster (Stott). We are seeking a new appointment who will complement existing strengths of Wynn (carbon, nitrogen and sulphur isotope work in speleothems, glacial systems and fluvial processes), SurrIDGE (oxygen isotopes as a tracer of phosphates in river and groundwater system), Barker (oxygen, carbon, silicon and nitrogen isotopes of diatoms and lake sediments), and organic chemistry (Jones and Semple). We have a long standing tradition of research in aquatic chemistry led by Davison, Zhang and Hamilton Taylor that this post will also reinforce. LEC's Centre for Chemicals Management led by Jones with Semple, Halsall and others examines environmental pollutants that could offer a further collaborative focus. Finally, this post will complement the work of Lancaster's hydrologists (Beven, Binley, Chappell) and the work of the Centre for Sustainable water Management (Heathwaite, Haygarth, Quinton) where opportunities for using isotopes as tracers of water flow exist.

We are seeking to make a permanent appointment at Lectureship level that can bring new strengths and experience to the interdisciplinary work of LEC. We are therefore looking for candidates with emerging expertise and a developing track record of international quality publication and research income. Preference is given to isotope geochemistry with an ability to contribute to environmental- and biogeochemistry in order to fit with future funder needs and collaborate widely within LEC. Such a scientist will have a strong background in geochemical processes and analytical techniques (ideally, but not exclusively, including isotopic analysis), and have applied these to understanding (one or all of) the terrestrial (including groundwater), aquatic and marine environment.

Isotope geochemistry is fundamental to aspects of environmental pollution and climate change and well aligned with research council priorities. Developments in basic geochemical research can often be readily applied in diverse areas of environmental protection and within the regulatory framework. As future policies will continue to provide a funding base we would expect a successful candidate to establish rapidly a portfolio of research projects and to publish their results in leading high impact journals. Of particular importance is the alignment to NERC's funding potential within the Technologies theme and with links to the Hazards and Climate Systems themes. Recruiting specifically within the area of biogeochemistry would present opportunities within NERC's Earth Systems Science theme (that has an explicit biogeochemistry challenge), Ecology theme, and within NERC's Sustainable Use of Natural Resources theme. Where there are potential links to human health then there would be clear opportunities within the Environmental Pollution and Human Health area. To varying degrees there is also potential to attract new funding from BBSRC, EPSRC, the EU, the Environment Agency and Defra.

The new post will help to strengthen hydrological, chemical, and geological process research within the Catchment and Aquatic Processes and Environmental Geosciences Themes, but potentially cutting across LEC. New blood in this key area of fundamental science will help to develop existing, and forge new, linkages between these research themes and with the Biodiversity and plant science themes, Centre for Sustainable Water Management, the Centre for Sustainable Agriculture and the School of Health and Medicine. We expect to appoint a geochemist whose work contributes to one or more of the following broad themes:

- Biogeochemical cycling
- Climate change
- Hydrology and groundwater hydrology

An understanding of isotope geochemistry is central to undergraduate degree schemes in Environmental Science, Earth Science, Environmental Chemistry and Physical Geography. Modules in this area also have relevance to students on Biology and Ecology degree schemes and even some human geographers interested in environmental change at introductory level. Some teaching at undergraduate level to multidisciplinary groups is expected.

We wish to develop our Masters level training in analytical aspects of environmental science in LEC and we hope this post will make a contribution. With the significant financial investment in capital equipment in this area, this position offers the opportunity to develop a new module in the theoretical and practical aspects of isotope geochemistry. Such a module/programme would also be an important training resource for PhD students. From an international recruitment perspective, this type of programme/module would support developing links with China, through the China Bridge project, as well as less well established links with other European institutions. All teaching is allocated through a workload model and new staff will be given reduced loads in their probationary period.

Further information

In the first instance, informal enquires regarding these posts should be made to Professor Graham Harris, Director of the Lancaster Environment Centre, via e.mail: g.p.harris@lancaster.ac.uk