



## Science and Heritage Programme

### Science and Heritage Programme Call for Research Cluster Proposals - Specification

**Closing date for proposals: 4pm, Thursday 4<sup>th</sup> September 2008**

The Arts and Humanities Research Council (AHRC) and the Engineering and Physical Sciences Research Council (EPSRC) are taking forward a joint programme entitled *Science and Heritage* to support leading-edge research which will explore new ways to understand the cultural and physical nature of heritage and to prepare society for the challenges that cultural heritage will face in the 21<sup>st</sup> Century. This £8.1m programme will run for 5 years until May 2012.

We wish to draw the programme to the attention of all researchers both within and outside higher education institutions (HEIs), heritage stakeholders and industrial and commercial enterprises with an interest in cultural heritage. This includes researchers within anthropology, the applied arts, archaeology, archaeometry, art history, architecture, biological sciences, chemistry, computer science, conservation, conservation science, electronics, engineering, environmental design, environmental science, history, management, materials science, philosophy, physics, sensor and instrumentation design and technology.

As part of this programme, AHRC and EPSRC are making funding available to support cross-disciplinary network activities through Research Clusters. AHRC is administering this call on behalf of the AHRC and EPSRC.

#### **Contacts**

Prospective applicants are encouraged to contact officers for information on the scheme before submitting a proposal.

Enquiries about the scholarly content of the Science and Heritage Programme should be directed to the Programme Director, Professor May Cassar, at the contact address below:

Professor May Cassar

Director, Science and Heritage Programme

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Other enquiries about the *Science and Heritage Programme*, this call and the Councils' remits should be directed to one of the people below:

**AHRC Programme Manager**

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**AHRC Senior Awards Officer**

Karen Buchanan, [k.buchanan@ahrc.ac.uk](mailto:k.buchanan@ahrc.ac.uk), 0117 987 6655

**EPSRC remit queries should be directed to:**

Dr Louise Tillman, [louise.tillman@epsrc.ac.uk](mailto:louise.tillman@epsrc.ac.uk), 01793 444 510

General enquiries about this call for Research Clusters and the application process can also be directed to one of the people below:

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## Science and Heritage Programme

### Introduction

1. The AHRC/EPSRC Science and Heritage Programme is a 5-year strategic initiative that will investigate new relationships between portable (or moveable) heritage, for example small 3D and 2D objects or collections of objects, and fixed (or immovable) heritage, such as buildings, objects in situ, archaeological sites or cultural landscapes, and their meaning, history, value, significance, composition, condition, conservation and use. The Programme will seek to develop a deeper and critical understanding of the whole object and its context and the cultural and environmental challenges it faces in the 21<sup>st</sup> century in order to transform our understanding and the resilience of material culture. It will embrace researchers and stakeholders who fall within the AHRC's and EPSRC's subject domains and areas of interest, including anthropology, the applied arts, archaeology, archaeometry, art history, architecture, biological sciences, chemistry, computer science, conservation, conservation science, electronics, engineering, environmental design, environmental science, history, management, materials science, philosophy, physics, sensor and instrumentation design and technology.
2. Research in science and heritage is well established in fields such as archaeological science, building conservation, conservation science and technical art history. The Programme will build on and complement important research that is already being done in for example, universities, the National Museums and Galleries, English Heritage and Historic Scotland, CADW: Welsh Historic Monuments and Environment and Heritage Service (Northern Ireland) to develop new knowledge and data on the characterisation and interpretation of materials and their production, developing innovative methodologies in heritage science across the full range of disciplines.
3. The Programme will encourage new and different approaches in order to bring innovative insights into heritage science by addressing historical, physical and environmental aspects of cultural heritage within one programme. It is intended that new interdisciplinary groups as well as established and experienced groups will develop their research interests in science and heritage. The purpose is to understand, explore, reinterpret and conserve collections, buildings, sites and landscapes, to reach new audiences and to fascinate the public by the juxtaposition of arts and sciences.
4. This Call for Research Clusters is intended to act as a catalyst for building a community around a number of research themes key for the advancement of scholarly knowledge and practice in heritage science. The Call is intended to provide a framework for interdisciplinary groups to examine potential research topics in preparation for future Calls for research projects and/or to build heritage science capacity that will last for the duration of the Programme and beyond.
5. The full Programme Specification will be available in September 2008 and will include details of further Calls for funding. These are likely to include interdisciplinary research grants and post-doctoral fellowships.
6. Research under the *Science and Heritage Programme*, in particular, the 'Resilience and Adaptation' theme will help us understand environmental change and so will

contribute towards the cross-Research Council programme, [Living with Environmental Change](#) (LWEC).

### Programme Aim

7. The Programme will aim to transform our understanding and the resilience of material culture in order to be better placed to avoid drastic change in the face of natural, environmental and human challenges in the 21<sup>st</sup> Century. It will advance and expand knowledge by supporting innovative research, seeking answers to pressing cultural and scientific questions.

### Programme Framework

8. By the end of the five-year period, the **Science and Heritage** Programme will have:
  - *Overcome a fragmented research base by developing the hybrid heritage science research discipline:* the Programme will have stimulated high-quality research in the **Science and Heritage** thematic areas, by drawing on a wide range of discipline based knowledge, resources and skills and encouraging interdisciplinary collaboration among and beyond universities.
  - *Developed significant understanding of the relationship between cultural and scientific research questions:* the Programme will have made distinctive contributions to the theoretical, conceptual, applied and empirical study of heritage science. It will have created an arena for shared debate among the arts and humanities and science communities on the creation and use of evidence, approaches and methods in order to address the issues of those working with museum, gallery, archive and library collections, historic buildings and their contents, archaeological sites and cultural landscapes.
  - *Increased the capacity of heritage science:* the Programme will have developed a vibrant research community whose activities will continue beyond the life of the **Science and Heritage** Programme. It will have supported interdisciplinary research projects and built capacity in this field in part by supporting early career researchers and post graduate students.
  - *Addressed national research priorities within an international context:* the Programme will have provided opportunities for critical and creative collaboration among universities, heritage organisations, museums, galleries, archives and libraries, industrial and professional bodies in order to generate research findings and outcomes of international significance. Disseminate them to an international audience both within and beyond academia and to influence policy makers and future research priorities.
  - *Facilitated connections, communication and exchange:* the Programme will have brought together – at both project and programme levels – researchers and a wide range of individuals and organisations outside academia with an interest in the research and its outcomes, including but not limited to those in cultural heritage, museums, galleries, archives and libraries but also public policy and

legal sectors, media, industry and commerce. These connections will be international in scope.

- *Increased public engagement with science and heritage:* the Programme will have contributed to public awareness of this research through programme and project-based outputs and events, through public participation in the Programme to inform and influence public policy in this field.

## Research Themes

9. The Programme will explore themes focussing on understanding, valuing, protecting and enjoying cultural heritage. These themes, identified over the course of the last year by the Science and Heritage Programme, cover the lifetime of the object, both moveable and immovable:

- *Nature of transformation:* from the moment the materials for an object are selected, through to its production and use, an object may undergo many cycles of cultural and material change and renewal. This theme will focus on socio-scientific questions including qualitative and quantitative assessments of composition and condition, explorations of acceptable limits of damage, developments in risk assessment including monitoring and predictive modelling to inform life-cycle and cost/benefits studies and new or improved conservation treatments.
- *Authenticity, authentication and security:* fakes and forgeries have long sought to confound understanding, value and appreciation of culture and society. More recently, theft and trafficking of art works have compounded the risk. This theme will focus on historical, scientific and technological processes of dating and characterisation of materials. The evidential value of materials, combined with advanced technologies, will be used to develop recognition techniques and tools to improve the traceability of heritage materials.
- *Interpretation and representation:* the approach to exploring this theme is richly layered. Science can help our understanding of how humans are represented in art and artifacts; it can also deepen cultural interpretations of heritage. The scientific analysis of moveable and immovable objects can also help us understand and interpret the relationships between those objects and their changing historical contexts. This will shed new light on those contexts, the cultural, social and political forces that influenced them as well as illuminating heritage for diverse audiences. It can also enhance understanding, appreciation and acceptance of changes in appearance as heritage materials age. Predicting and modelling surface textures can not only improve understanding of heritage objects; broader applications of this research could result.
- *Cultural encounters and explorations:* this theme will examine the approaches to research of heritage science and other sectors that affect well-being, specifically culture, health and education, as well as the tourism and creative industries. It will investigate the opportunities and barriers to cross-cultural and cross-industry engagement with heritage science and deepen understanding of

the cultural and scientific basis of different regional approaches to conservation of moveable and immovable heritage.

- *Human and machine interfaces:* cultural heritage consists of complex material assemblies, often with unknown variables. Knowledge and skills are both needed to deliver exacting treatments and interventions on objects. In a small field of highly skilled researchers and practitioners, and when cultural heritage can be found in inaccessible places, advanced intelligence, haptic, or full or hybrid robotic systems are needed to provide remote intellectual and physical access to heritage. At the same time, new or re-engineered tools, predictive models and expert systems can transform remote sensing and instrumentation for evidence-based management of cultural heritage.
- *Resilience and adaptation:* environmental and anthropogenic effects, from climate change to visitation, will take their toll on cultural heritage in the 21<sup>st</sup> Century. One focus of this theme is cultural material change and evolving conservation needs in response to climate change as a pre-requisite to studying how heritage protection aligns with statutes including Building Regulations, Health & Safety, and UK Government Sustainable Development targets. Research may be carried out to examine conservation standards, materials tolerance and environmental thresholds in order to predict and increase the time between cycles of intervention, to make efficient use of natural resources, taking into account changing and different climates. This theme, in particular, will contribute towards objectives under the [Living with Environmental Change Programme](#).

## Call for Research Cluster Proposals

### Summary

10. This call for proposals within the Programme aims to support innovative cross-sector and interdisciplinary networking activities, falling within research 'clusters'. Proposals with full economic costs of up to £30,000 and for a period of between 4 and 12 months may be submitted. It is expected that the Programme will fund around 10 clusters through this Call. **Please note that in order to coordinate the work of the Research Clusters, all awards must have a start date between 1 December 2008 and 31 March 2009.**
11. Proposals for Research Clusters are sought that explore ideas from one of the following themes which are expected to be studied further during the period of the award. The themes are:
  - Nature of transformation
  - Authenticity, authentication and security
  - Interpretation and representation
  - Cultural encounters and explorations
  - Human and machine interfaces
  - Resilience and adaptation
12. Research Clusters are similar to networking grants offered by the AHRC and EPSRC (e.g. AHRC Research Networks and Workshops scheme or EPSRC Networks). These Research Clusters will be a forum for the discussion and exchange of ideas on a specified thematic area, complex issue or problem. The Research Cluster awards are intended to facilitate interactions between researchers and stakeholders from a range of disciplines and institutions, and each award will be expected to include participants drawn from subject areas from both AHRC and EPSRC remits. Priority will not be given to proposals whose subject area falls solely within the remit of the AHRC or EPSRC.
13. The participants **must be drawn from a number of different types of Research Organisations** (higher education, research institutions, heritage institutions, museums, galleries, libraries and archives), in order to achieve the kind of intellectual interaction and exchange envisaged. The inclusion in the Research Clusters of participants from beyond the academic community, for example through the involvement of [Knowledge Transfer Networks](#) (KTNs) is particularly encouraged, as is the involvement of new researchers and research students. **All proposals must involve researchers and practitioners from subject areas covered by both the AHRC and EPSRC.**
14. Awards will cover the operating and support costs involved in establishing and organising the operation of a Research Cluster, which will be a forum for the discussion and exchange of ideas on a specified thematic area, complex issue or problem. Further information on eligible support can be applied for can be found in the *Science and Heritage Programme 'Details of the call for proposals for Research Clusters'* document and paragraphs 43 – 50 of the **AHRC Research Funding Guide** (under information on AHRC's Networks and Workshops scheme).

## Aims of the Research Clusters call

16. The Call is aimed at stimulating networks that cross boundaries. This would generally be expected to entail intellectual exchange **across and between disciplines**. The aims of the call are:
- To support networking activities that address the research objectives and themes of the *Science and Heritage Programme* (see above).
  - To support interdisciplinary collaboration between and involving researchers from both the arts and humanities, and from science, engineering and technology along with non-academic stakeholders.
  - To foster understanding of the different perspectives of heritage science research and to advance thinking on one of the Programme themes in order to enhance knowledge and understanding.
  - To encourage cross-fertilisation of ideas, methods, practices, processes and technologies which could lead to tangible projects and maximise opportunities for advances in creativity, knowledge and understanding within the science and heritage research community and with other sectors where appropriate.
  - To enable researchers within the research community to form innovative partnerships within and beyond heritage science by involving new researchers and research students, as well as people or organisations from outside the research community, in the discussion and development of ideas to build capacity.
  - To foster (where appropriate) international channels of communication with overseas researchers in order to enhance research standards, and to develop understanding through engagement with different cultures and parts of the world.
  - To encourage the establishment of innovative interdisciplinary networks of researchers where the impact of the interaction will extend beyond the life of the award to sustain capacity.
  - To provide a framework for the Science and Heritage Programme to learn of emerging areas of intellectual urgency and potential strategic importance, both within the UK and internationally by identifying key research challenges by building new collaborations as well as strengthening existing ones.
  - To promote and integrate the role of research through knowledge transfer to practitioner communities so that the likely range of applications and practical outcomes can be explored.
  - To facilitate exchanges between research clusters funded by this Call.

**It is expected that proposals for Research Clusters will address the majority of these aims.**

### **What is the research element in the cluster?**

It is expected that the networking activities which take place within the Research Clusters will enable participants to work together towards the identification of research questions within the Programme themes, which could inform the focus of research proposals for submission to future Calls of the Programme, although this is not essential. A conference will be held in July 2009, to explore the ideas from the Research Clusters.

These ideas could in themselves lead on to proposals to other research award schemes, operated by the AHRC and the EPSRC or other funders. We are not looking for completed research proposals at this stage.

### **Who else can be involved in a Research Cluster?**

Proposals can be submitted by any UK university or AHRC recognised Independent Research Organisations (formally known as Academic Analogues). Each Research Cluster should involve people from a range of disciplines across the remits of AHRC and EPSRC. The group should be constituted as widely as is needed to fulfil the bridge-building aims of the call. Cluster members should offer a diversity of expertise and experience and could include representatives from higher education, heritage institutions, museums, galleries, libraries and archives, practitioner communities, commerce, industry and related [Knowledge Transfer Networks](#) (KTNs). The Research Cluster may also include collaboration with people outside the UK.

Industrial participation in the clusters is also strongly encouraged by, for example, involving the appropriate KTNs.

Although applicants are expected to identify an initial core membership as part of the proposal, Research Clusters are expected to be "open" in the sense that they will fully advertise their activities and at any stage will allow participation of interested members of the research community in general.

### **What is the role of the Programme Director in relation to the Research Clusters?**

The Programme Director is responsible for the intellectual leadership of the Programme with AHRC managing the Call. She is supported by an Advisory Group comprising academics from a range of disciplines drawn from the arts and humanities, and engineering and physical sciences, along with any other relevant stakeholders drawn from cultural institutions and heritage agencies.

All Principal or Co-investigators of the Research Clusters will be expected to keep in regular contact with the Programme Director and to keep her informed of planned cluster activities. The Programme Director will attend some Research Cluster activities, both to observe the kinds of activities being pursued, and to gather information about research issues arising from those activities.

The Programme Director will supply a guidance framework for the operation of the clusters. This will be intended to promote co-ordination of the activities of the Research Clusters and their maintenance beyond the period of the award.

The Programme Director will organise a Research Clusters conference in July 2009 to discuss the ideas and challenges emerging from the Research Clusters. Principal investigators and any Co-investigators will be required to attend the conference as part

of the Terms and Conditions of the award, to present information on progress with Research Cluster activities and their outcomes, and to contribute to discussions on the programme. The event will also provide an opportunity for leading participants in Research Clusters to meet and network with each other. It is likely that the conference will be a two day event, in a central location. Applicants may wish to include travel costs for those likely to attend the conference as part of their proposal.

### **What will be required in terms of research outputs from the clusters?**

As the emphasis on the Research Cluster phase of the Programme is to facilitate networking and bridge-building, there is no expectation that there will be specific research *outputs* which are appropriate for dissemination via the normal academic routes. It will be expected, however, that there are *outcomes* as a result of the Research Cluster activities in proportion to the level of funding, for example the identification of research ideas and challenges. Award-holders will be expected to engage in dissemination and exploitation of any such outcomes throughout the period of the Research Cluster as widely and appropriately as possible, for example through a Research Cluster website. You should therefore specify the audiences to whom the outcomes, including likely uses of your research, will be of interest or potential benefit, and how you will present the outcomes of your activities to them. If you wish to include costs associated with the dissemination and exploitation of your activities within your proposal, you should ensure that the end-date for your Research Cluster is timed to accommodate these proposed activities. Costs may only be claimed for dissemination and exploitation activities undertaken during the period of an award.

Principal Investigators will also be expected to produce a written report at the end of the Research Cluster award, assessing the extent to which aims and objectives have been met and the wider cultural and economic impact of the cluster activities.

### **What happens after the Research Clusters?**

One of the purposes of the Research Clusters will be to identify research questions and issues that could be explored further, including through subsequent Calls under the *Science and Heritage Programme*. The Programme Director will therefore be responsible for collating the outcomes of the Research Clusters, and drawing on research areas that emerge from the thematic priorities to feed into the Programme. There will be opportunities for Research Cluster participants to apply for funding under subsequent calls for proposals in this programme. These are likely to include interdisciplinary research grants and post doctoral fellowships that will provide opportunities for those involved in heritage science to work in a new context, as well as some distinctive dissemination activities. Any such calls will, however, be open to all eligible applicants, so there will be no guarantee of further funding for those who have participated in cluster activities.

It will of course also be open to Research Cluster participants to submit proposals arising from the clusters to other existing funding streams for which they are eligible. Such proposals should acknowledge the *Science and Heritage Programme*.

From time to time, Principal investigators may be contacted by the Programme Director to request information on cluster activities for dissemination to the media, or through festivals or trade fairs.