Keble Advanced Studies Centre

Keble College

News from Michaelmas Term

Research grants and prizes for Keble academics highlight 2012

This issue of our Advanced Studies Centre newsletter leads with news of research funding. Grants have become the lifeblood of academic research. They enable academics to focus on a specific problem or issue and provide the money to employ team members, cover costs related to travel and consumables, equipment and conferences. They also cover the time costs for academics to commit a higher proportion of their time to a specific research project. A large grant provides autonomy for a researcher.

On page 2 of this newsletter we describe news of a very substantial grant recently awarded to Professor Dieter Jaksch, one of the leaders of the Keble Networks cluster. He is part of a Synergy Grant team, along with several other colleagues from different European universities. Together, they have been awarded €10 million to investigate superconductive materials. The grant is a tribute to the novel work of Dieter and his close collaborator Dr Stephen Clark, both key members of the Networks cluster here at Keble. A glance at the other Synergy grant winners (only 11 of more than 1100 applicants were funded) reveals the quality of the projects that were funded. Amongst the list is Konstantin Novoselov, Nobel prize winner in 2010 for his co-discovery (with Andre Geim) of graphene.

Synergy grants fund pioneering frontier research amongst interdisciplinary teams and only exceptional projects are funded. The award of such a significant grant is testament to the quality of research being undertaken here at Keble and the wider University.

From the ASC Director, Prof. Tom Higham

Further evidence of Keble's quality research is shown by the tremendous success of some of our younger academics in winning prestigious prizes in 2012. Dr Apala Majumdar won the British Liquid Crystal Society Young Scientist prize. Dr Majumdar is a world expert on the mathematics of liquid crystals and works towards developing better ways of building Liquid Crystal displays. Dr Tom Sørensen (a key member of the Keble Imaging Cluster) won the Lundbeck Foundation Talent Prize for younger scientists. His work focuses on chemical dyes that absorb light and emit fluorescence. These characteristics make them important in developing new ways of biological imaging.

Success in winning research funding and prizes comes with hard work from committed researchers with good ideas. Such success often breeds further success and creates an environment of ideas and creativity. The Advanced Studies Centre aims to encourage this, support academic endeavour here at Keble and stimulate our undergraduate and graduate students to achieve further success in the future.

Networks cluster leader wins funding for superconductivity research

€10 million European funding for "Synergy" project studying Frontiers in Quantum Materials Control (Q-MAC)

Prof. Dieter Jaksch (left) with close collaborator Dr. Stephen Clark

Professor Dieter Jaksch, one of the leaders of the Keble Networks Cluster, is part of a team that has secured a prestigious European Research Council Synergy grant. The grant totaling €10 million is focused on developing and optimizing novel superconductive materials with the elusive and much sought after long term goal of making them work at room temperature. The project is part of a collaboration between 4 European universities and will be a 6–year research effort.

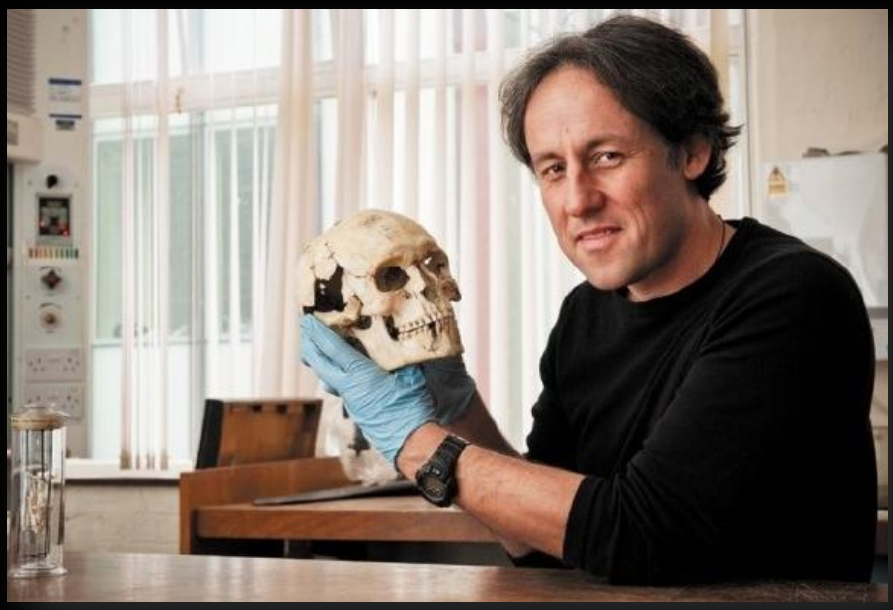
Superconductivity is the term used to describe the properties of certain materials that allow electricity to flow without resistance. Despite huge efforts this macroscopic quantum effect has so far only been expressed at very low temperatures, which has precluded its wider application in everyday technologies. The overarching goal of the Q-MAC project is to exploit material design and coherent optical methods to enhance these kinds of novel "quantum materials". Professor Jaksch said that; "In contrast to ordinary materials, quantum materials exhibit *strong* microscopic interactions between charge carriers making their behaviour highly cooperative and resulting in colossal responses to external fields. Such properties potentially have wide ranging technological application in energy transmission, computing, data storage and ultra-sensitive sensors. Unfortunately, a major issue with quantum materials is that their remarkable properties are washed out at room temperature. We will use a variety of methods to attempt to stabilize quantum effects, like superconductivity, close to or even at room temperature."

To make true progress in this ambitious project a unique synergy of complementary expertise is required, from materials design, to coherent and ultrafast optical physics, and strong electron correlation and quantum optics theory. Keble fellows Prof. Dieter Jaksch and Dr. Stephen Clark will provide the latter specialization. The other research members come from the University of Hamburg, the École Polytechnique and the University of Geneva. Among several tools, the team will attempt to apply strong laser fields to the materials under study. Instead of cooling the entire material which is costly, this may allow cooling to be carefully targeted to the parts of the material responsible for its superconductivity. While the challenges are immense, if successful the project may well usher in the Quantum-age in materials.

European Research Council Synergy grants fund pioneering frontier research in any field of science, engineering or scholarship. The grant scheme is extremely competitive. Only 11 of more than 1100 applications in this recent call were funded.

ASC Director wins large European research grant

A grant of €2.48 million will fund a 5-year project tracking the spread of modern humans from Africa into Eurasia. Four post doctoral research posts will be funded, including a former Keble D.Phil. scholar.



Professor Tom Higham, interim Director of Keble's Advanced Studies Centre, has received a major grant from the European Research Council (ERC) to continue his research into the process by which early modern humans moved out of Africa and into wider Eurasia. The grant is an Advanced Investigator award for €2.48 million and covers the next 5 years of research, starting early next year.

The project concerns the Middle and Upper Palaeolithic periods, part of what has been termed the Old Stone Age, with a specific emphasis between around 70-30,000 years ago. This period sees the final dispersal of anatomically modern humans (AMH) out of Africa, colonising the Old World and Australia, and the disappearance of Neanderthals from the areas they had occupied for the previous 200,000 years. The field of palaeoanthropology is seriously hampered in this timescale by problems of chronology and dating, and Professor Higham's work is at the forefront of finding new more accurate ways around these difficulties. At 40-50, 000 years, radiocarbon dating becomes prone to issues of contamination. New developments at the Oxford Radiocarbon Accelerator Unit, however, have resulted in significant improvements in both the dating accuracy and technology, and the interpretation of the results using Bayesian statistical methods. Professor Higham's team have permission to reinvestigate more than 70 key sites from Europe to eastern Siberia and Mongolia to provide reliable chronologies using new approaches. Only through doing this it will be possible to map the distribution of new cultural adaptations and technologies, and human populations too, across time and space.

One of the key sites in the project is Denisova Cave, where Russian and German research groups have identified a new species of humans called the Denisovans. Professor Higham will work at the Denisova site next summer at the excavation base in the Altai Mountains. The team want to pin down the dating of the appearance and disappearance of this species if possible. Recent DNA research has shown the Denisovans interbred with modern humans on their way out of Africa. Professor Higham will work at the Denisova site next summer at the excavation base in the Altai Mountains.

The new grant will allow Professor Higham to employ 4 postdoctoral researchers in the research team as well as graduate students.

Meetings and events

Medieval and Renaissance Cluster Lecture Series 2012-2013

The first Medieval and Renaissance Cluster Lecture Series started this term with two interesting talks. Dr. Richard Ashdowne from Oxford University delivered the talk "*The Making of a Dictionary of Medieval Latin*". Started back in the 1920's as a research project, Dr. Ashdowne reviewed the work and history of the making of this dictionary, as well as its significance to understanding medieval Britain from AD 540 to 1600.

Dr. Michael Hawcroft, Dr. Tracey Sowerby, Prof. Andrew Pettegree and Prof. Robin Briggs (left to right) after Prof. Pettegree's talk.

The second talk, entitled "*Tabloid values. On the Trial of Europe's first newshound*", was given by Prof. Andrew Pettegree from University of St Andrews. Here, Prof. Pettegree introduced us to the building of a commercial market for news by Abraham Verhoeven of Antwerp in the XVII century, and showed us how Verhoeven's work shaped our concept of how news should be reported and presented.

The Medieval and Reinaissance Lecture Series continues next term with four more talks in January and February 2013.

Financial Cartography

The Networks Cluster welcomed Dr Kimmo Soramäki, *Founder and CEO of Financial Network Analytics*, to talk at Keble in November. Dr Soramäki, who has carried out extensive research on networks and financial systems, discussed how understanding of the financial system can be improved through the analysis of large-scale financial transaction data as a network. He also showed how visual analytics of asset correlation networks can enable a stronger understanding of market dynamics.

Prof. Gesine Reinert (right), one of the Networks Cluster leaders, with Dr. Co-Pierre Georg (left) and invited speaker Dr. Kimmo Soramäki.

Coming events...

All ASC events are listed on www.keble.ox.ac.uk

Medieval and Renaissance Cluster Lecture Series 2012-2013

The Medieval and Renaissance Cluster Lecture Series 2012-2013 has four more lectures to offer next year:
18 January: Prof. Helen Hackett (UCL) – '*Sisterhood and female friendship in a seventeenth-century verse miscellany: Constance Aston Fowler's manuscript anthology*'
8 February: Prof. Bill Sherman (York) –Reading practices and interactions with Renaissance books (Title to be confirmed)
18 February: Prof. Miri Rubin (QMUL) –Late Medieval and early modern religious practices and identities (Title to be confirmed)
22 February: Prof. Greg Walker (Edinburgh) – *'Conscience and Satire in John Heywood's Play of Love'*

All are welcome.

Creativity Lecture Series 2013

The Creativity Cluster is planning to have three lectures during Trinity term. Two of them have been already confirmed:

Professor Maurice Bloch (LSE), expert in ideology and cognitive anthropology, will be speaking on 26 April 2013. Prof. Block's research has been mainly carried out in two different areas of Madagascar and he is the author of an extensive list of articles and books dealing with religion, kinship, economics, politics and language.

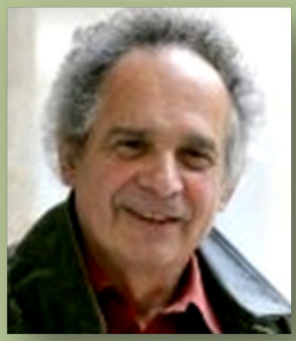


Image: www2.lse.ac.uk

Image: www.richardsennett.com

Professor Richard Sennett (LSE & New York) will be speaking on 14 June 2013. His research entails ethnography, history, and social theory; although he is best known for his research on how on how individuals and groups make social and cultural sense of material facts -- about the cities in which they live and about the labour they do.

ASC updates

Senior Research Visitors for 2013

We are pleased to announce the visits of the following distinguished researchers who will be contributing next year to the activities and work of our clusters. During their visit they will be engaged in different activities including public lectures. All are welcome to these talks.

• **Prof. Marshall Slemrod**, University of Wisconsin, will be in Keble for two months during the year. He will be collaborating with the Complexity Cluster working on **partial differential equations** in mechanics and geometry.

• **Prof. Jean-Claude Bünzli**, of the École Polytechnique Fédérale de Lausanne, will be visiting for one month in early 2013 and collaborating with the Imaging Cluster on **lanthanide imaging**.

• **Prof. Harry Allen**, University of Auckland, will be at Keble between September and November with the Creativity cluster. Working on **Australian Aboriginal technologies** and attitudes to the material world.

• **Prof. Richard Wilson**, University of Houston, will be in College for two weeks during Hilary Term 2013 collaborating with the Networks cluster on **protein-protein interaction networks**.

• **Prof. Larry Goldstein**, University of California San Diego, will visit for two weeks between spring and early summer with the Networks cluster working on **small sub-graphs in random networks**.

New ASC member

The ASC welcomes Dr. Nicola Gardini who will be contributing to our Medieval and Renaissance Research Cluster. Dr. Gardini is Keble fellow in Modern Languages and his research interests are on the Renaissance; Stylistics and poetics; poetry; autobiographical fiction; translation from Latin, Greek and English. More details on his work can be found at www.nicolagardini.com

Interested in forming a new research cluster or joining an existing one?

The ASC would like to hear from you. Please contact Prof. Tom Higham (thomas.higham@keble.ox.ac.uk).

Or if you are interested in joining an existing cluster, you can contact them directly for more details.
Complexity Cluster: Prof. Gui-Qiang Chen and Dr. Apala Majumdar
Creativity Cluster: Dr. Lambros Malafouris
Imaging Cluster: Prof. Stephen Faulkner
Medieval and Renaissance Cluster: Dr. Tracey Sowerby
Networks Cluster: Prof. Gesine Reinert and Prof. Dieter Jaksch