
The Leverhulme Trust

1 Pemberton Row London EC4A 3BG

Philip Leverhulme Prize Winners 2008

The Leverhulme Trustees are pleased to announce the results of the 2008 competition for Philip Leverhulme Prizes. These Prizes, with a value of £70,000 each, are awarded to outstanding young scholars who have made a substantial and recognised contribution to their particular field of study, are recognised at an international level, and whose future contributions are held to be of correspondingly high promise.

The Prizes commemorate the contribution to the work of the Trust made by Philip Leverhulme, the Third Viscount Leverhulme and grandson of the Founder.

The broad fields of research covered by this year's awards were:

- **Earth, Ocean and Atmospheric Sciences**
- **History of Art**
- **Medieval, Early Modern, And Modern History**
- **Mathematics and Statistics**
- **Zoology**

Earth, Ocean and Atmospheric Sciences

Dr Stephen Barker

School of Earth and Ocean Sciences, Cardiff University

Dr Stephen Barker has established an international reputation in palaeoclimate research, the carbon cycle and analytical geochemistry. His work spans marine sediment and ice cores, radiocarbon dating and carbon cycle feedback, and ranges from laboratory-based studies to more theoretical approaches of computer modelling. His research has focussed on reconstructing climate variability in the past and understanding the mechanisms which govern this variability, crucial for our understanding of current and future climate change. His current work investigates changes in the South Atlantic and Southern Ocean during the last deglacial period, and he plans to build on this by extending the records to encompass the entire glacial period.

<http://www.cardiff.ac.uk/earth/contactsandpeople/profiles/barker-stephen.html>

Dr Alan Haywood

School of Earth and Environment, University of Leeds

Dr Haywood is an international leader in understanding and modelling the climate of the Pliocene, which was between 1.8 and 5.3 million years ago. This was an important epoch because it was the last time that the Earth was warmer than present for a sustained period of time and potentially as warm as some predicted scenarios of the future with carbon dioxide thought to have been one of the main forcing factors. Dr Haywood has developed the first fully coupled atmosphere and ocean simulation of the Pliocene, the results of which featured in the most recent IPCC (Intergovernmental Panel on Climate Change) report. Alan Haywood's recent work has been on using the Pliocene to make revised estimates of climate sensitivity and also examining the El Niño Southern Oscillation and its impact on warm climate intervals.

<http://www.see.leeds.ac.uk/people/a.haywood>

Dr Heiko Pälike

School of Earth and Ocean Science, University of Southampton

Dr Pälike's main research interest is the palaeoceanography of the Palaeogene using stable isotopes and rapid, non-destructive sediment core measurements. The generation of such high resolution proxy methods has resulted in his notable contributions towards a greater understanding of the impacts of orbital forcing and internal feed-back processes on the climate system during past greenhouse periods and the transition into the early icehouse world. He has been a key player in a number of IODP (Integrated Ocean Drilling Program) initiatives, and his current leadership role on the IODP Science Steering and Evaluation panel emphasises his international standing.

http://www.noc.soton.ac.uk/palaeo/index.php?action=staff_entry&SID=1174

Dr Paul Palmer

School of GeoSciences, The University of Edinburgh

Dr Palmer's research involves the novel use of satellite measurements to comprehend atmospheric chemicals emitted from natural and anthropogenic sources. His observations of variations in these chemicals have allowed him to quantify their origin and improve our understanding of their atmospheric transport and chemistry. He pioneered techniques to estimate emissions of biogenic hydrocarbons, and also isoprene from the ocean, both important in the context of air pollution. A major focus for his future work will be the sources and sinks of the vital greenhouse gases, carbon dioxide and methane, building on techniques he has recently developed.

<http://www.geos.ed.ac.uk/research/eochem/group/pip/>

Dr Rosalind Rickaby

Department of Earth Sciences, University of Oxford

Dr Rickaby is one of the most dynamic and innovative of the new generation of scientists working on the topical and important field of palaeoclimatology. She uses a variety of novel measurements on sediments from the deep sea to reconstruct past climate over time periods ranging from the last century to hundreds of millions of years. She has been at the forefront in developing new techniques, using sophisticated chemical instrumentation, often on single microscopic fossils. Among her recent innovations she has demonstrated that water molecules trapped in a particular kind of mineral calcium carbonate preserve a record of sea level over recent glacial cycles. She has also developed a new method to use the remains from one group of microscopic plankton to diagnose the concentrations of atmospheric carbon dioxide millions of years in the past.

<http://www.earth.ox.ac.uk/~rosr/>

Professor Christian Turney

School of Geography, University of Exeter

Professor Turney has made very significant contributions to understanding the evolution of the Earth's climate over the last 50,000 years, during and after the end of the last Ice Age. He has achieved this success primarily by looking very carefully at the dating of events in different parts of the world, and correlations between precisely-dated events. For example, he used evidence from sediments filling a volcanic crater in Queensland to look at possible links between the El Niño cycles and the melting of the ice sheets in the North Atlantic region; and he used the dating of Irish bog oak to test whether there was a link between solar activity and climate change on the thousand-year timescale. These and other achievements were recognised by the award of the Shackleton Medal of the International Union for Quaternary Research.

<http://www.christurney.com>

Dr Jill Burke

History of Art, The University of Edinburgh

Dr Burke's path-breaking research is centred in the field of patronage. She brings to this traditional branch of Renaissance art history an intellectual curiosity that revivifies the subject, and she is not afraid to turn some earlier assumptions on their head. Resisting any simplistic assessment of the intentions of patrons and other contemporary beholders, she seeks to emphasise the high degree of ambiguity and subjectivity that was inherent in the reception of Renaissance art. Her future research will focus on the Renaissance nude, investigating how the development of the artistic nude was related to the way people perceived their own bodies and nakedness in general.

<http://www.arthistory.ed.ac.uk/Contacts/Profile/JBurke.htm>

Dr Caroline Vout

Faculty of Classics, University of Cambridge

Dr Caroline Vout is emerging as one of the most impressive of the younger generation of interpreters of the art, especially the sculpture, of classical antiquity. Her arguments about the meaning of ancient objects, such as portrait busts and standing statues, are grounded in her belief that meanings change with time and with circumstance. The intelligence of this position is matched by Dr Vout's interest in addressing herself not only to her immediate constituency of experts on antiquity but to a much wider circle. She has acquired ways of communicating powerfully and clearly about little-understood works of ancient art to a broader public, as was evident from her highly successful and ground-breaking exhibition on the *Antinous: the Face of the Antique* (Leeds 2006). In her new project she will turn from images of a single individual to representations of the city of Rome itself, in particular to consider how it has been portrayed through the ages as an imperial centre and symbol set upon its famous "Seven Hills." Her work relies on subtle insights and imaginative interdisciplinary contextualisation and promises to enhance our understanding of the workings of imperial power well beyond the Roman historical period that is her starting point.

http://www.classics.cam.ac.uk/faculty/staff-bios/academic-research-staff/carrie_vout/

Dr Alexander Marr

School of Art History, University of St Andrews

Dr Marr's work on art and material culture illustrates the enormous potential value of scholarship that is prepared to challenge conventional subject boundaries. Starting with the material object itself, he explores its intellectual contexts, seeking to understand its meanings by projecting his studies into parallel histories – of collecting, the book and of gardening. Over-arching all these studies is his attempt to re-examine the broad question about the relationship between the arts and the sciences. Alexander Marr works in an historical period – the period from the Renaissance to the Enlightenment - when that relationship little resembled our assumptions about a spectrum of knowledge which tends to have a notion of scientific truth and value at one end and of artistic inspiration and opinion at the other. The scholarly world where his material belongs requires him to explore arcane knowledge systems and to acquire a working familiarity with a number of languages, ancient and modern. He has published highly innovative studies of individual objects as intriguing and outlandish as automata and mathematical instruments. Alexander Marr's is a highly imaginative and thought-provoking contribution to the historical understanding of visual culture.

<http://www-ah.st-andrews.ac.uk/staff/marr.html>

Dr Natasha Eaton

Department of History of Art, University College London

Dr Eaton has carried out outstanding work on the interrelations of British Imperial culture and the production of art in colonial India. Her research is highly enterprising and combines a rigorous attention to specific artistic questions with a strong theoretical grounding, especially in issues of colonial confrontation and some of the hybrid identities which result from it. In particular, she has paid attention to the effects of this confrontation in both the colonial Indian and the Imperial British art markets in relation to such themes as the development of taste, the diplomatic use of works of art as gifts, the circulation of prints between colony and conqueror. In moving on from this, Dr Eaton's forthcoming work promises a particular emphasis on the development of museums as cultural institutions in the context of Imperial South Asia.

http://www.ucl.ac.uk/art-history/staff/natasha_eaton

Dr Carol Richardson

History of Art Department, The Open University

Into the field of Renaissance studies which have hitherto privileged the cultural and art historical analysis of Florence and Venice, Dr Richardson has refocused attention on the neglected area of what was happening in Rome, in the crucial period of the fifteenth century after the papacy returned from Avigno. Overcoming the substantial and radical difficulties of establishing the primary archival resources for an innovative study of a new area, Dr Richardson's analysis of her material has furthermore produced an understanding of the complex interplay of ecclesiastical and cultural politics in relation to the role of the Cardinals in the formation of artistic representation and the political functions of art, monuments and buildings in this era. Her new project, emerging out of her critical excavation of papal culture in the fifteenth century is equally innovative in its intention to examine Anglo-papal relations through the prism of a history of the Venerable English College in Rome. The importance of this work lies in its fine negotiation of substantial archival research with subtle and careful reading of the resulting materials, promising to place art historical studies in conversation with other disciplines around this shared venture.

<http://www.open.ac.uk/Arts/arthistory/richardson.htm>

Mathematics and Statistics**Professor Marianna Csornyei**

Department of Mathematics, University College London

Professor Csornyei has been awarded this prize for her many distinguished contributions to geometric measure theory. A central theme of her work has been the analysis of viable definitions of "negligible" in infinite-dimensional situations, with a view to applications in nonlinear geometric functional analysis. One spectacular achievement is the proof of the unexpected result that the three main notions of negligibility (for Gateaux differentiability of Lipschitz functions) coincide. Another startling result revealed delicate phenomena in the theory of Lipschitz quotients, even in the finite dimensional case. Major ongoing work with Albert and Preiss concerns the novel and fascinating notion of tangent fields to null sets. Her work is distinguished for its technical difficulty and the startling nature of many of her results.

<http://www.homepages.ucl.ac.uk/~ucahmcs/>

Dr Martin Hairer

Mathematics Department, The University of Warwick

One of the fundamental questions that one can ask, when trying to understand a dynamical system, relates to its asymptotic behaviour. Does the system have an invariant measure, and is it unique? Such questions are important in discrete and continuous contexts, in pure mathematics and in understanding fluids. Determining the ergodicity of the system can be complex, even in one or two dimensions, but many of the interesting systems are already infinite dimensional. This significantly magnifies the technical challenges required to understand and resolve these questions. Dr Martin Hairer, with collaborators such as Jean-Pierre Eckmann and Jonathan Mattingly, has pushed forward our understanding of this area and has established ergodicity results for the evolution of significant classes of non-linear stochastic PDEs, such as the two-dimensional Navier-Stokes equation, when subject to degenerate and focused stochastic forcing. Degeneracy of the noise in these systems does not result in the systems getting trapped in special modes. A crucial tool in doing this is the Malliavin calculus and the extension of Malliavin's proof of Hoermander's Regularity Theorem to infinite dimensional problems. There are many important concepts used in finite dimensions to discuss ergodicity aside from Hoermander's Theorem, and these also needed to be extended to infinite dimensional contexts. Dr Hairer has shown care to get the details correct, and a strongly original and innovative approach to finding appropriate extensions of these ideas to get to his primary goals.

<http://www.hairer.org/>

Dr Harald Helfgott

School of Mathematics, University of Bristol

Dr Helfgott's research interests are remarkable for their breadth and they have integrated ideas from across the mathematical spectrum. His work has focussed on current problems in additive and combinatorial number theory, and his most recent result concerns an apparently simple phenomenon on the growth of a small set of matrices as its elements are multiplied together. It is unusual to achieve such striking results in an area where number theory and group theory interact. The quality and significance of the work is strongly attested by some widely known senior mathematicians, who have used it to spectacular effect in their own research in number theory. His earlier work on integral points on curves made clearly visible improvements to the work of established figures, in a most satisfying way.

<http://www.maths.bris.ac.uk/people/faculty/mahah/>

Professor Andreas Winter

School of Mathematics, University of Bristol

Professor Winter has been awarded the Philip Leverhulme Prize for fundamental theoretical contributions across the rapidly expanding subject of quantum information theory. He has developed and modified powerful classical geometric, combinatorial and probabilistic methods, such as the concentration of measure and random operators to obtain deep information on the limits of information processing. As well as basic applications to quantum Shannon theory and entanglement, there are remarkable applications to statistical mechanics and cryptography. Recently, he has made a great breakthrough by resolving, in the negative, the longstanding Multiplicativity Conjecture for p -norms of normalised completely positive maps (for p not equal to 1). He has been extremely productive at the highest level on virtually all the fundamental issues of quantum information theory.

www.maths.bris.ac.uk/~csajw/

Dr Jared Tanner

School of Mathematics, The University of Edinburgh

Dr Tanner has carried out highly creative and outstandingly useful work in the area of computational harmonic analysis. Many mathematical phenomena are wave-like: they can be represented as a combination of relatively simple ingredients with a great deal of inner symmetry and pattern. Information, computers, the Internet, communication networks and satellites, telephony and broadcasting, genomics and data mining all generate, transmit, code, encode, compress, decompress and, beyond that, attempt to understand and interpret information. Dr Tanner's work is concerned with developing tools to do this by discovering novel ways to sample signals. His research shows that if we do this in different ways to those currently used then large benefits could accrue in some very important signal processing problems. For example, he has shown that there are much better ways than the traditional low-frequency Fourier sampling for signals with discontinuities, provided that the set of discontinuities is relatively thin. Dr Tanner is working on highly challenging problems essential to progress in science and technology, and he has made important contributions to these.

<http://www.maths.ed.ac.uk/~tanner/>

Medieval, Early Modern and Modern History**Dr Filippo de Vivo**

School of History, Classics and Archaeology, Birkbeck College, University of London

Dr de Vivo's book *Information and Communication in Venice: Rethinking Early Modern Politics* (2007) made a major contribution to the history of early modern Venice and also to the history of information and propaganda. Besides being original in its ideas and firmly based on the sources, the book is remarkable for something much rarer in historical monographs: its penetrating political insights. Indeed, the claim made in the book's subtitle is truly justified. Bringing politics and culture together as he does, de Vivo uses each to illuminate and redefine the other. Building on these foundations, yet far from resting on his laurels, the new project is a comparative one, still focussing on information but now moving well beyond the Italian peninsula.

<http://www.bbk.ac.uk/hca/staff/filippodevivo>

Dr Caroline Humfress

School of History, Classics and Archaeology, Birkbeck College, University of London

Dr Humfress is a brilliant young scholar who has deservedly won international recognition and respect for her path breaking work on Roman law and its reception and on the history of political thought. Her recent book, *Orthodoxy and the Courts* (2007) is an outstanding interdisciplinary study combining law, history and theology. In this she examines legal practice in the courts and law as process on the basis primarily of the evidence offered by ecclesiastical writers, many of whom were trained advocates and jurists. This work has opened up new perspectives in demonstrating the importance of education as the basis of legal discourse, regardless of religious affiliation. This has obvious and far-reaching implications for the history of early medieval Christianity. Her insistence on the social and intellectual context and impact of the law also singles her out among those who work on legal history. Her conclusions have substantial implications for our understanding of emperors, law and society in late antiquity and the early Middle Ages.

<http://www.bbk.ac.uk/hca/staff/carolinehumfress>

Dr Simon MacLean

Department of Mediaeval History, University of St Andrews

Dr MacLean is an outstanding and very productive early mediaevalist who combines intellectual power and integrity with mastery of the technical aspects of his field to an impressive degree. One instance of the latter is his recent volume of translations from the Latin, with detailed commentary, of the important tenth century Chronicles of Regino and Adalbert. He has won international recognition for his work on political history, queenship, and history-writing in the early Middle Ages. His book *Kingship and politics in the late ninth century* (2003) is excellent in its sophisticated interpretations of the complicated politics of the time, his reassessment of the traditional narrative of the 'collapse' of the Carolingian empire, and his ability to conceptualise the period within the entrenched modern historiography of the origins of nations and role of the aristocracy in Europe. The book opened up new perspectives on Carolingian politics, royal ideology and government, and has an historiographical resonance beyond its immediate subject. He has also brought much needed freshness to the discussion of queenship. He offers an analysis in particular of how queens, many of them foreigners, sought to gain leverage in political cultures that were suspicious of female power. It is this that he will be exploring further in his comparative project on queens and politics in tenth and eleventh century Europe.

<http://www.st-andrews.ac.uk/history/staff/simonmaclean.html>

Dr Hannah Smith

St Hilda's College, University of Oxford

Dr Smith is an historian of political culture in early modern Britain whose interests range from the monarchy to the army and from the royal court to the work of the pro-women writers Mary Astell and Judith Drake. Her meticulously researched first book, *Georgian Monarchy: Politics and Culture 1714-60* (2006), not only breathed new life into the history of the first two Georges by restoring them to their essential continental context, but also offered a cogent and persuasive challenge to recent theses about the nature of British identity and the idea of a Protestant monarchy in Britain. No stranger to controversy, she is now bringing her unusually broad range of interests to bear in a new book on reactions and responses to the emergence of a standing army in Britain.

http://www.st-hildas.ox.ac.uk/index.php?option=com_content&task=view&id=117&Itemid=359

Dr Paul Warde

School of History, University of East Anglia

Though a young scholar, Paul Warde has established a unique international position as Britain's leading historian engaging with questions critical to our times relating to material and ecological dependencies and capacities for adaptation in the face of change. He deals in particular with early modern Germany and Britain, and has made a fundamental contribution to socio-economic history. His work examines the transition from organic (particularly wood) to fossil fuel and the concomitant emergence and development of ideas of sustainability in the use of valuable but limited community resources. He has demonstrated highly original investigative techniques to understand community management of its timber supplies and the resultant effects on relationships between contiguous communities so as to achieve consensual ends and what can be called sustainability.

<http://www1.uea.ac.uk/cm/home/schools/hum/Old%2Bpeople%2Bpages%2B%2528hidden%2529/hispeopleold/Academics/DrPaulWarde>

Dr William Whyte

St John's College, University of Oxford

Dr William Whyte's research has made a highly original contribution by integrating architecture and the built environment into cultural and intellectual history. He combines the ability to write vividly about architectural styles with a sophisticated knowledge of ideological, social and political contexts. His monograph on the Victorian architect T G Jackson was a work of profound scholarship, and his subsequent work has continued to explore the relationship between architecture, education and social identities, with a particular focus on the architectural history of modern British universities. In this research he aims to explore why the buildings were built, how they were used and how these institutions developed, thus offering a new view of modern universities and modern Britain.

<http://www.sjc.ox.ac.uk/index.php?A=2&B=3&X=204>

Zoology**Dr William Hughes**

Institute of Integrative and Comparative Biology, University of Leeds

Dr Hughes is fascinated by the nature of interactions between organisms. His research revolves around three fundamental themes in this area: sex, sociality, and symbiosis. Using a combination of different approaches, and working primarily with social insects, Dr Hughes has shed important new light onto each of these themes. In the field of sex and mating systems, he has shown that monogamy was the ancestral state in social insects, with important implications for the role of kin selection in the evolution of eusociality. In the field of social evolution, he has identified a role for both nature and nurture in the development of the worker caste. Finally, in the field of symbiosis, he has shown how group-living makes ants more resistant to parasites, especially when in groups that are genetically diverse. These studies indicate the diversity of Dr Hughes's work and its significance for our understanding of animal behaviour, ecology, and evolution.

<http://www.personal.leeds.ac.uk/~fbswohh/>

Dr Kate E Jones

Institute of Zoology, Zoological Society of London

Dr Jones is an evolutionary biologist who forges productive collaborations with other scientists and creates powerful multidisciplinary teams. Kate Jones's analysis of mammalian species diversity on a global scale led her to study where new infectious human diseases occur. She has shown that the highest likelihood of such diseases emerging in humans is in areas where the highest populations of the latter coincide with high wildlife diversity. She is particularly interested in bats and has shown how the many groups are related, and has produced a powerful predictor of extinction risk. Those bats whose wing shape suggests they can fly and feed only inside forest are at most risk of extinction when tropical forests are felled. She has also established the first global monitoring scheme for assessing whether bat populations are increasing or decreasing in size, using a bat detector attached to a vehicle to record echolocation calls and geographic information system uses satellite data to plot position. This generates a great deal of data and it is Dr Jones's ability to analyse such large data sets on a global scale and derive powerful predictions from them that characterises all her research.

http://www.zoo.cam.ac.uk/ioz/people/jones_k.htm

Dr Andrea Manica

Department of Zoology, University of Cambridge

Dr Manica's research uses methods and ideas from animal population biology to elucidate the origin of modern humans. Competing ideas have modern humans descending independently from different predecessors in different areas, or evolving from a relatively recent expansion from one population in Africa. If the latter idea is correct, such rapid movement should lead to a progressive loss of genetic diversity, because each new population would be founded by relatively few individuals. Andrea Manica has tested this idea and found an almost perfect fit with this predicted loss of diversity and the current worldwide patterns of genetic diversity. With anthropologists, he was then able to confirm this conclusion by repeating the analysis on variations in skull measurements. The identical pattern provided by molecules and bones provides a clear, unified picture of how modern humans came to occupy the whole world. These new insights on human origins have consequences, which he is now pursuing, for the ability of different populations to adapt to diseases; populations far away from Africa are expected to have less genetic variability and therefore have less ability to adapt.

<http://www.zoo.cam.ac.uk/zoostaff/manica/index.htm>

Dr Tommaso Pizzari

Department of Zoology, University of Oxford

Charles Darwin's theory of natural selection is forever associated with the phrase "survival of the fittest," but Darwin himself realised that many features of organisms cannot be explained as adaptations to promote survival. Instead, traits ranging from the enormous bulk of the male elephant seal to the ornamental peacock's train can be seen as beneficial in reproductive competition, even if they are costly in terms of survival. Today, evolutionary biologists see sexual selection as perhaps even more important than Darwin realised, acting from the mate selection process right through to the race between sperm to fertilise the egg. Dr Pizzari's work is at the forefront of research on sexual selection, investigating the behavioural strategies females use in mate choice, and the benefits they gain from being choosy, as well as the selection pressures acting on sperm and their evolutionary consequences. In this research he has developed a strongly experimental approach, combined with rigorous theoretical tools, using jungle fowl, the ancestor of the domestic chicken, as a model system, as well as more recently branching out into other animal groups.

http://www.zoo.ox.ac.uk/egi/people/faculty/tom_pizzari.htm

Dr Jane Reid

School of Biological Sciences, University of Aberdeen

Jane Reid is an outstanding young scientist working in population and evolutionary ecology. The main focus of her research is on understanding how evolutionary forces acting on individuals influence population processes. She works mainly with wild bird populations, and uses a combination of careful field work and sophisticated data analyses to test and develop ecological theory. In a series of influential papers she has re-shaped our understanding of how factors such as mate choice and inbreeding operate in real populations. She has a commitment to the maintenance and analysis of long term data on individuals, which are essential to our understanding of the environmental factors responsible for success or failure in evolutionary terms. In addition to her fundamental research, she has a deep commitment to ensuring that her work is translated into appropriate conservation policies.

<http://www.abdn.ac.uk/biologicalsci/staff/details/jane.reid>