UNIVERSITY OF SURREY

A decade of discussion:

A review of international multidisciplinary workshops sponsored by the University of Surrey's Institute of Advanced Studies (IAS)

IAS Institute of Advanced Studies

Cover image courtesy of Paul Kaiser, OpenEndedGroup

Introduction

Professor
Nigel Gilbert
IAS Director

In academia today, research is becoming increasingly interdisciplinary, and ever more global. The University of Surrey has a strong reputation for working across the disciplines, leading international research in fields as diverse as 5G mobile communications and the science of sleep disorders.

The Institute of Advanced Studies (IAS) was set up at Surrey in 2004 to bring a new dimension to Surrey's research activities, attracting a flow of international scholars to the University and encouraging new, productive research collaborations.

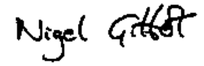
We host academic workshops which are small in scale but large in impact, gathering together academics who are experts in their fields to discuss specialist topics in a free-flowing, dynamic environment, away from the pressures of everyday work. Each workshop focuses on an interdisciplinary topic at the cutting edge of science, engineering, social science and the humanities, with topics proposed by a Surrey academic or researcher in a competition we run annually.

This brochure aims to give you a snapshot of some of the 57 workshops we have sponsored to date, demonstrating how perspectives from different disciplines bring fresh thinking and often new directions. Some workshops have addressed key questions such as whether quantum biology holds the key to life, and the logistical and moral implications of military UAVs. Others have focused on fascinating, formerly unexplored aspects of the arts – for example the influences which shaped one of the world's most influential composers, Gustav Mahler.

The key aim of the IAS is to encourage international scholars to visit Surrey, engage with our academics and share innovative ideas, increasing goodwill for the University around the world – and this objective has certainly been achieved time and time again. But there are also some very tangible outcomes: over the past two years our workshops have resulted in collaborations that have won over £1.5 million in new research grants, while special issues of respected journals, and sometimes books aimed at a broader audience, have been published following the workshops.

Now twelve years old, the IAS is at an exciting time in its evolution, with the launch, later this year, of our new Fellowship Scheme.

We hope that you enjoy reading about some of the workshops we have been very proud to host at Surrey in the past, and hope we may welcome you to the University at some point in the future – a list of the workshops we have planned for 2016 appears on page 31.



Institute Director

Nigel Gilbert
Professor of Sociology
n.gilbert@surrey.ac.uk

Nigel Gilbert read for a first degree in Engineering and obtained his doctorate on the sociology of scientific knowledge from the University of Cambridge. His research and teaching interests have reflected his continuing interest in both sociology and computer science (and engineering more widely). His main research interests are processual theories of social phenomena, the development of computational sociology, and the methodology of computer simulation, especially agent-based modelling. He is Director of the Centre for Research in Social Simulation. He is the author or editor of several textbooks on sociological methods of research and statistics and was the founding editor of the *Journal of Artificial Societies and Social Simulation*.

As Director of the University's Institute of Advanced Studies, he is responsible for its development as a centre for international intellectual interchange.

Institute Coordinator

Mirela Dumić
m.dumic@surrey.ac.uk

Mirela Dumić is responsible for the overall management of the Institute in collaboration with the Institute's Director, including its annual workshop grant competition and liaison with the Advisory Board, the University's academic community, the events team, external academics and similar institutes. She is also responsible for the coordination of sponsored events, the Institute's publicity and the dissemination of the events' outcomes. Mirela will be developing and managing the Institute's new International Fellowship Scheme which will start in 2017.

Advisory Board

Distinguished Professors

The Distinguished Professors at the University of Surrey are recognised as leading figures in their fields and have demonstrated academic excellence at an international level as well as in professional organisations and committees within their discipline. They have also made major contributions to the leadership of the University.

Alf Adams
Professor of Physics

Roland Clift
Emeritus Professor of Environmental Technology

Greville Corbett
Professor of Linguistics

William Gelletly
Emeritus Professor of Physics

Josef Kittler
Professor of Machine Intelligence

Janet Lansdale
Emeritus Professor in Dance Studies

Jim Lynch
Emeritus Professor of Life Sciences

Sir Martin Sweeting
Professor of Aerospace Engineering and Chair of the Surrey Space Centre

Associate Deans for Research and Enterprise

Ilke Inceoglu
Senior Lecturer in Organisational Behaviour and Human Resource Management

Ali Mobasheri
Professor of Musculoskeletal Physiology

Steve Schneider
Professor of Cyber Security

Vince Emery
Senior Vice-President, Global Strategy

Professor of Translational Virology

Making sense of the social world

Social Cognition: Origins, Mechanisms and Disorders

28 to 29 August 2014

The way we understand and interact with others – social cognition – is what defines us as humans. No other primate species has humanity's capacity for large-scale cooperation, culture and conflict. The IAS workshop on 'Social Cognition: Origins, Mechanisms and Disorders' has led to a commitment by scientists across the disciplines to tackle the key questions together.

In order to interpret and engage with the social world, we need to understand how we relate to others. Research into this 'self-other' understanding, which is particularly crucial in helping people with socio-cognitive disorders, has seen considerable advances over the past 20 years but efforts across different scientific fields have not always been coordinated.

Aimed at encouraging a multi-disciplinary approach to social cognition, the IAS workshop welcomed participants from a rich array of disciplines including anthropology, biology, education and psychiatry, as well as all areas of psychology. With international experts from the UK, Europe, Hong Kong and Canada, it was a unique opportunity for scientists with very different perspectives to share research and discuss theory, building a deeper understanding of how we relate to others in a social world.

While the workshop was organised around four areas (evolutionary origins, lifespan development, psychological and neuroscientific mechanisms, and disorders of social cognition), a number of common themes emerged during the workshop. These included 'what is the relationship between social cognition and intelligence?' and 'how can we harness our knowledge of social cognition to understand atypical development and cognition?'

> What I've found extremely fascinating recently is that there seem to be very basic mechanisms shared by both human and non-human animals that are the building blocks of more complex social cognitive skills.
>
> **Professor Marcel Brass**
> **Ghent University**

Four keynote speakers led the discussion programme, which also included ten shorter papers and two lively poster sessions over the two days.

Professor Josep Call of the Max Planck Institute for Evolutionary Anthropology, Leipzig, and the School of Psychology and Neuroscience, University of St Andrews, highlighted current research agendas into the psychology behind competition and cooperation in non-human primates. While the majority of work on competition has been done in the context of theory of mind and deception, work on cooperation has mostly focused on collaboration and helping; Professor Call proposed potential directions to realign research agendas in these two areas.

Speaking on 'The cultural evolution of cultural learning', Professor Cecilia Heyes of All Souls College and the Department of Experimental Psychology, University of Oxford, challenged the belief held by cultural evolutionists that the mechanisms underlying cultural learning are 'innate modules' (evolved genetically). In contrast, she argued that some of the most important mechanisms of cultural learning – such as imitation, mindreading and 'social learning strategies' – are themselves the products of cultural evolution. "We learn from others how to learn from others," she said.

Professor Marcel Brass, Department of Experimental Psychology, Ghent University, explored the intriguing topic of 'automatic imitation' – when the observation of an action leads to a corresponding action in the observer. Outlining different theoretical accounts of automatic imitation, he reported on the conditions under which automatic imitation occurs and whether it can be anticipatory in nature.

Professor Sue Leekam, School of Psychology and Wales Autism Research Centre, Cardiff University, told the audience why we need to pay greater attention to diverse clinical features when explaining social cognitive impairment in autism, since these features include not only perceptual and sensory processing impairments but also social cognitive and social attention impairments and non-social cognitive impairments.

The most immediate outcome from the workshop has been a sense of shared endeavour across scientists from the different disciplines, and an appreciation of the importance of interdisciplinary discussion in highlighting future research priorities. The workshop also led to the publication of a theme issue of the prestigious journal *Philosophical Transactions of the Royal Society B* containing contributions from several of the keynote speakers and other workshop participants. Following the IAS event, Bangor University hosted a similar workshop on social cognition in 2015.

Organiser: Dr Caroline Catmur.

> I think there are a number of things that make humans special. One is our tendency to social motivation, which leads us to being very interested in doing things with other individuals.
>
> **Professor Josep Call**
> **University of St Andrews**

Key outcomes

- Theme issue on social cognition 'Understanding self and others: from origins to disorders' published by *Philosophical Transactions of the Royal Society B* in January 2016
- Further workshop on social cognition at Bangor University in August 2015

Other sponsors

- Economic and Social Research Council (ESRC)

Can a computer help us dance?

> Recently we've shied away from motion capture and have invented stereoscopic camera systems, for example, that can do a more primitive type of capture, and include the body and environment in a much richer way.
>
> **Paul Kaiser**
> **OpenEndedGroup**

Corporeal Computing

2 to 4 September 2013

Computers are increasingly being used in the world of performance and film – whether to help a choreographer to devise a new piece or enable a video games animator to portray natural movement. This workshop explored the connection between digital technologies and human movement, and considered the many creative uses, and possible limitations, of these technologies in the arts.

The three-day workshop welcomed computer scientists, cultural theorists, digital media artists and artists in the movement arts (dance, theatre and digital music) and presented 50 speakers from over 20 countries – making it a truly multidisciplinary and international event.

Speakers and panellists discussed and debated two key questions: how machines can capture and represent human movement; and how computers can read and process information derived from movement data. These questions were explored via sessions on the notation of human movement, motion capture technology, and computation of movement, with discussion also focusing on commercial applications such as CGI motion picture animation, video animation, games animation, digital dance, and digital sculpting.

Four well-known names from the worlds of art, dance and computer graphics made keynote presentations. Paul Kaiser of US digital arts collective OpenEndedGroup gave a fascinating insight into how unusual digital processes can be used to evoke what the mind's eye sees, creating imagery that defies conventional 'seeing'.

Artistic Co-Director of German performance ensemble Troika Ranch, Mark Coniglio's presentation investigated the past and future of new media performance, arguing that rigorously embracing computational technology will push us towards compositions that are unexpected and compelling.

Kirk Woolford (University of Sussex) looked at relationships between computer graphics tool makers and tool users, and asked whether recent projects using advanced technology have moved significantly beyond the demos created by the original tool makers.

Tom Calvert, Emeritus Professor in the School of Interactive Arts and Technology at Simon Fraser University (Canada) spoke about what the future holds for software that supports dance. While motion capture studios have been around for decades, these are very expensive and, Professor Calvert explained, the development of inexpensive consumer products like Microsoft Kinect and the iPad are opening up a new world for choreography and dance teaching.

Throughout the workshop, delegates also enjoyed a range of inspiring live performances across different art disciplines. These included performances by Daniel Ploeger and Mindbeat 2, installation work by OpenEndedGroup and CIA Proyecto Uno, original video work by LarTech and Salazar Sutil + Melo, and site-specific performance by Kirk Woolford.

These ground-breaking performances – along with the workshop presentations – were brought to a far wider audience because the entire workshop was also streamed online.

Organisers: Dr Nicolas Salazar Sutil, Professor Paul Krause.

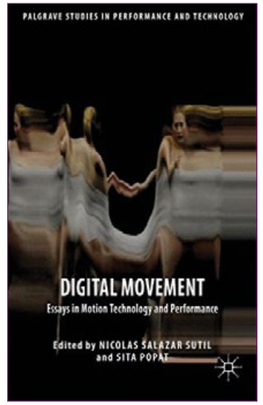
> I think the critics are concerned that they're losing the kinesthetic experience of a live dancer. That's not the intent at all. The intent is to help the choreographer to plan a dance, and work with live dancers to plan more complex pieces.
>
> **Emeritus Professor Tom Calvert**
> **Simon Fraser University**

Key outcomes

- Publication of a book, *Digital Movement: Essays in Motion Technology and Performance* in 2015. The book was published by Palgrave Macmillan UK in the Palgrave Studies in Performance and Technology series and edited by Dr Nicolas Salazar Sutil and Professor Sita Popat (University of Leeds).

Other sponsors

- Models and Mathematics in Life and Social Sciences (MILES), University of Surrey



Fuelling change

Anion-Exchange Membranes for Energy Generation Technologies

25 to 26 July 2013

One of the most promising areas of research in the field of clean energy is the development of anion-exchange membranes which are used in solid alkaline fuel cells and electrochemical systems. To mark ten years of world-leading research in this area at the University of Surrey, a two-day workshop was held in July 2013.

Anion-exchange membranes are used in various electrochemical devices such as fuel cells, redox flow batteries, electrolysers and reverse electrodialysis cells – technologies which underpin the development of clean, sustainable alternatives to the earth's fast-depleting fossil fuels. The electrochemical energy materials team in the University's Department of Chemistry has been leading study into anion-exchange membranes since 2003.

> Of the three recent workshops on this subject, this was – in my humble opinion – by far the most important, friendly and productive. 80 % of the players worldwide [in the field of anion-exchange membranes] were here.
>
> **Dr Dario Dekel**
> **Cellera, Israel**

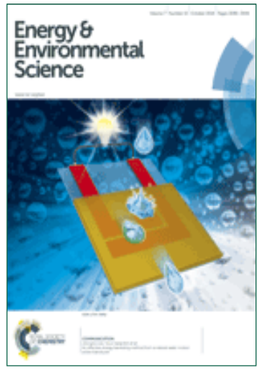
The main objective of the IAS workshop was to provide an interdisciplinary forum for researchers to establish a consensus about the state-of-the-art regarding the use of anion-exchange membranes in electrochemical devices. International delegates from seven countries (Canada, China, Germany, Israel, Japan, Netherlands and USA) and a number of UK-based researchers and scientists attended the workshop.

During the event, a total of 22 speakers each made 20-minute presentations on their specific area of research in anion-exchange membranes, allowing plenty of time for interaction and discussion. The topics covered included membrane production, ionic transport, application in novel technologies, current industrial applications, and the use of non-platinum electrocatalysts.

Throughout the workshop, there was a particular focus on barriers to the widespread use of anion-exchange membranes, such as the low ion conductivity of readily available materials, and on the current and future work aimed at overcoming these barriers. Speakers also highlighted emerging technologies which could improve the efficiency and reduce the cost of fuel cells, making them economically viable. In addition, they highlighted the urgent global need to develop both sustainable energy systems and low-energy desalination techniques to enable the provision of clean water. A final session opened up discussion on the targets and key issues relating to each technological application for alkaline membranes.

The workshop was highly successful in achieving what it set out to do: providing a small and targeted meeting which would bring together many of those involved in the alkaline membrane field and encourage frank discussions about the challenges and opportunities of this technology. As a result of the discussions, road maps have been produced for the different energy generation technologies using alkaline membranes, and material exchange has been agreed between a number of research bodies. Lead organiser Professor John Varcoe has subsequently been invited to attend related international seminars as a direct response of publicity generated by the IAS workshop.

Organisers: Professor John Varcoe, Dr Simon Poynton.



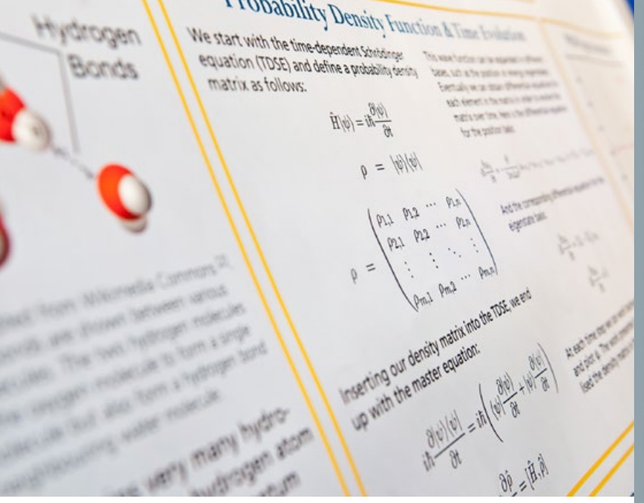
Key outcomes

- Publication of a major 'perspective' article in *Energy & Environmental Science* (DOI: 10.1039/c4ee01303d)
- Production of road maps for energy generation technologies using alkaline membranes
- Agreement of exchange of materials between research bodies

Other sponsors

- Engineering and Physical Sciences Research Council (EPSRC)
- Alvatek
- Caltest Instruments Ltd
- Princeton Applied Research
- Energy & Environmental Science (Royal Society of Chemistry Publishing)
- Solartron Analytical (Ametek)
- RCUK Energy Programme H2FC Supergen Hub

> Often at big conferences not everyone tells you what the problems are with other materials and their approach, but at this workshop we got to hear the truth about different sets of technologies. I think better science will come from it.
>
> **Professor Michael Hickner**
> **Penn State University**



Does quantum biology hold the key to life?

Quantum Biology: Current Status and Opportunities

17 to 18 September 2012

How do migrating birds know where to go? How do we really smell the scent of a rose? How do our genes manage to copy themselves with such precision? There's a growing theory that quantum biology holds the answers. An IAS workshop in September 2012 explored this most mysterious of scientific fields, revealing a maze of rapidly unfolding discovery.

Evidence is emerging that quantum mechanics (where particles can be in two places at once, or connected over huge distances) is at the heart of a number of processes found in nature. Scientists have found that plants use a form of quantum computing to calculate how best to direct energy through their photosynthetic apparatus, and there is firm evidence that enzymes – which drive much of the action in our cells – use a process known as quantum tunnelling to accelerate chemical reactions. What makes these ideas ground-breaking is that they mean that phenomena previously thought to be confined to laboratories, at carefully controlled temperatures, manage to survive in the wet, warm biological world.

> It's only in recent years that we've been able to glimpse through the fog of complexity to see, here and there, tantalising pointers towards genuine quantum effects. We're looking for clues – little pinnacles of what might just be the tip of a huge quantum iceberg.
>
> **Dr Paul Davies**
> **Arizona State University**

The IAS workshop was a meeting of scientists working at the forefront of three very different fields – quantum physics, quantum chemistry and molecular biology. Over the two-day conference, eleven academics made keynote speeches, presenting the results of recent ground-breaking experiments in quantum biology from around the world.

Professor Johnjoe McFadden of the University of Surrey looked back at the theory first outlined by Erwin Shrödinger, in 1944, in his book *What is Life?* He explained that despite the work of Shrödinger and other early molecular biology pioneers, the theory of quantum biology lay virtually dormant for decades and is only now being revived with the arrival of new experimental evidence of quantum mechanics in biology.

Three of the phenomena observed in nature as having quantum-like qualities are quantum tunnelling (where a particle appears to tunnel through a barrier), coherence and entanglement (both of which refer to groups of particles which act collectively in a single state). These issues were a key theme throughout the workshop.

Professor Nigel Scrutton (University of Manchester) discussed the existence of quantum tunnelling in enzyme systems, presenting evidence that this process could be assisted by fast promoting motions. Professor Jim Al-Khalili (University of Surrey), focused on the role of quantum tunnelling in genetic mutations alongside other, better understood mechanisms.

The topic of quantum coherence was addressed by Professor Vlatko Vedral (University of Oxford) who explored whether it plays a role in electron transport, and by Professor Greg Engel (University of California), who discussed the design principles behind long-lived quantum coherence. In his talk, Professor Sandu Popescu (University of Bristol) addressed the issue of entanglement versus simple quantum coherence.

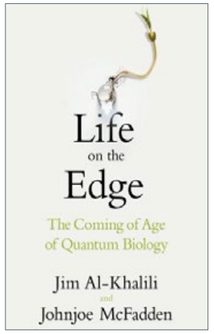
Presenting two of the key pieces of evidence that have come to light in the field of quantum biology, Professor Thorsten Ritz (UC Irvine, USA) revealed experimental evidence that a quantum-based compass exists in birds, while Dr Jennifer Brookes, Harvard University (USA) explored theories explaining how quantum mechanics may play a part in our smell response.

Professor Paul Davies, (Arizona State University, USA) spoke about the different ways biological organisms process information – genetically and epigenetically – and described a new experimental project which may throw light on the little-known process of epigenetic information flow.

In his talk, Professor Greg D Scholes of the University of Toronto, Canada, discussed the implications of quantum mechanical effects in the optimisation of light harvesting, and what this means for the design of artificial light-harvesting devices. Also on the theme of light, Dr Alexandra Olaya-Castro of UCL addressed the subject of quantum photonics, examining how energy steering in some molecular components of living organisms may take advantage of their vibrational environments.

An exciting and dynamic experience for all those who attended, the IAS workshop has had a lasting legacy in the field of quantum biology, with the publication of the first book on the subject aimed at the general reader, *Life on the Edge: The Coming of Age of Quantum Biology*. Already translated into 17 languages, this book was shortlisted for the Royal Society Winton Science Book of the Year Prize as well as being named 'book of the year' by a number of notable publications including the *Wall Street Journal* and *Physics World*.

Organisers: Professor Jim Al-Khalili, Professor Johnjoe McFadden.



Key outcomes

- Series of monthly seminars held at Surrey, initially funded by the Biotechnology and Biological Sciences Research Council (BBSRC), including a seminar by Nobel Prize-winning biochemist Sir Tim Hunt
- Publication of *Life on the Edge: The Coming of Age of Quantum Biology*, in 2014, by Bantam Press (UK) and Random House (US)
- Publication of two research papers on quantum biology: 'Environment-induced dephasing versus von Neumann measurements in proton tunneling', A.D. Godbeer, J.S. Al-Khalili, and P.D. Stevenson, Phys. Rev. A 90 (2014) 012102; and 'Modelling proton tunnelling in the adenine–thymine base pair', AD. Godbeer, J.S. Al-Khalili and P.D. Stevenson, *Phys. Chem. Chem. Phys.* 17 (2015) 13034-13044

Other sponsors

- BBSRC (Biotechnology and Biological Sciences Research Council)
- MILES (Models and Mathematics in Life and Social Sciences), University of Surrey

> As a biologist I've always been somewhat dissatisfied with the classical explanation of what life is – that it's basically just a mechanism not very different in principle to the boiling of a kettle.
>
> **Professor Johnjoe McFadden, University of Surrey**

A musical paradox

Gustav Mahler: Contemporary of the Past?

7 to 9 July 2011

Gustav Mahler's influence on the development of music – and the cultural landscape – over the last hundred years is well documented. However there has been little discussion to date about the influences that shaped Mahler's own music. Taking place on the centenary year of his death, this conference invited delegates to strip back the myths attached to Mahler's work and look at his past in order to rethink his present and future.

With the benefit of hindsight it is clear to see that many of Mahler's ideas and techniques heralded early 20th century modernism, and this is how the composer is most often recognised, but his music did not come from nowhere. One of the main aims of the workshop was to explore how Mahler was engaged with his own musical and cultural past and – setting aside the popular image of the composer which has emerged – re-evaluate his position within the musical, cultural and multidisciplinary contexts of the 21st century.

The keynote address by Professor Julian Johnson of Royal Holloway, London, explored the position held within music history of this 'most contradictory and multi-faceted of composers'. Pinpointing the paradox at the heart of his music, he said that while Mahler's symphonic forms underline the rupture of the past from the present, at the same time, they constantly re-tell their own past in order to re-arrive at the present as a site for the potential overcoming of the past.

Professor Johnson concluded: "All of the various ways by which we might approach Mahler's music – questions of genre or programme, of stylistic allusion and quotation, of material social resonances, of subjectivity and identity – are, in the end, functions of what this music proposes about the experience of time."

Ten paper sessions provided a forum for speakers to examine Mahler's work from a range of different perspectives including culture and interpretation, analytical approaches, performance, and nostalgia. A number of fascinating themes emerged from these sessions, such as the composer's attitude to the music of his own past and to inherited processes; other composers' and conductors' creative responses to Mahler's music; and Mahler's engagement with other art forms such as literature, philosophy, theatre and film.

> The conference revealed ways in which his music interfaces with other art forms such as painting, film and theatre; and it explored issues of time and history in order to understand better the complex nature of his 20th and 21st century socio-cultural and musical reception.
>
> **Dr Jeremy Barham**
> **University of Surrey**

This was a conference about one of the great classical composers and there were plenty of opportunities to savour his music. Paper sessions were interspersed with musical performances including concerts by Maureen Galea and Michelle Castelletti at Hatchlands (in Clandon, Surrey) on a piano once owned by Mahler, the Tetra Guitar Quartet (including the world premiere of Stephen Goss's Mahler Song arrangements), Uri Caine, Emilie Capulet and the Endymion Ensemble.

The workshop also included an exhibition on Mahler's composing environments by Keith Clark, and an art exhibition, 'A Celebration of Mahler', by artist Caroline Tate, great-great-granddaughter of Tate Gallery founder Sir Henry Tate. Having listened exclusively to Mahler's music when painting for many years, the colours and shapes in Caroline's work have been heavily influenced by the composer. This exhibition was accompanied by a specially commissioned sound installation by Matthew Sansom, 'Spirit redux' – a re-interpretation of the experience of the spiritual in Mahler's symphonies.

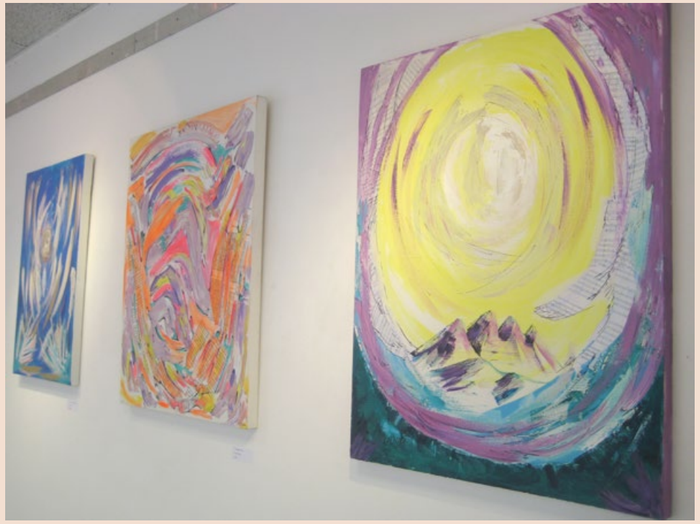
Organiser: Dr Jeremy Barham.

Key outcomes

- Publication scheduled of a special volume, *Rethinking Mahler*, by Oxford University Press

Other sponsors

- The British Academy
- The Music & Letters Trust
- The Institute of Musical Research, University of London
- The Austrian Cultural Forum



A healthier future for our ageing population

> A key research priority in this very complex area is looking at the combination of diet and exercise, and how that influences our fracture risk, our muscle strength, and our development of bone mass when younger.
>
> **Professor Susan Lanham-New**
> **University of Surrey**

Musculoskeletal Health in the 21st Century

30 June to 1 July 2015

One of the most pressing challenges for today's health service is our ever-increasing ageing population because – while we may be living longer – older adults can, on average, expect to be unwell for the last decade of their lives. Focusing on one of the key causes of disability and morbidity globally, this workshop brought together clinicians, scientists and funding bodies to explore musculoskeletal problems in older people.

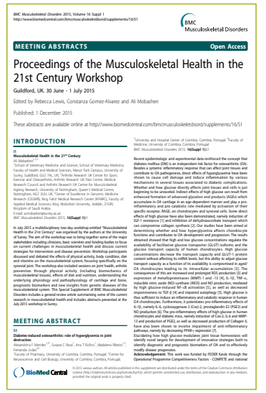
Arthritis and other musculoskeletal problems decrease quality of life for hundreds of millions of people worldwide and result in enormous costs for our health and social care systems. Understanding healthy musculoskeletal ageing is therefore a key research priority for the healthcare sector, and one which requires a broad multidisciplinary approach since nutrition, body condition, activity and genetics all play a vital role.

The IAS workshop provided a platform for clinicians, academics, funding bodies and specialist research institutes from as far afield as Australia, the Netherlands and Portugal to discuss musculoskeletal health, focusing specifically on the synovial joint, as well as intervention and disease prevention.

The two-day event included a total of 23 presentations covering joint health, arthritis prevention through physical activity (including the biomechanics of musculoskeletal tissues), the effects of diet and nutrition, understanding the underlying physiology and pathophysiology of cartilage and bone, prognostic biomarkers and new insights from genetic diseases of the musculoskeletal system.

A plenary lecture by Professor Anthony D. Woolf, Honorary Professor of Rheumatology at University of Exeter Medical School, highlighted the urgent need to prioritise musculoskeletal health in order to enable older people to remain economically independent and enjoy a good quality of life.

> Multidisciplinary research is absolutely crucial for understanding ageing. Ageing is a complex process and no matter what system you look at, it's not down to a sole cause or factor.
>
> **Professor Janet Lord**
> **University of Birmingham**



BMC Musculoskeletal Disorders

MEETING ABSTRACTS Open Access

Proceedings of the Musculoskeletal Health in the 21st Century Workshop

Guildford, UK, 30 June - 1 July 2015

Edited by Rebecca Lewis, Constanza Gomez-Alvarez and Ali Mobasheri

Published: 1 December 2015

These abstracts are available online at http://www.biomedcentral.com/bmcmusculoskeletdisord/supplements/16/S1

INTRODUCTION

Musculoskeletal Health in the 21st Century

MEETING ABSTRACT

Diabetes-induced osteoarthritis: role of hyperglycemia in joint destruction

BioMed Central

He highlighted findings from the Global Burden of Disease which indicate that musculoskeletal disorders (including osteoarthritis, rheumatoid arthritis, gout, low back pain and neck pain) cause 21 per cent of the total years lived with disability globally.

One of the overriding themes of the workshop was 'One Health' – the movement to unite understanding on human and animal health by encouraging collaboration between healthcare and veterinary researchers and practitioners. Rene van Weeren (University of Utrecht, the Netherlands) asked 'what can we learn from large and small animal models', while TV's 'Supervet' Noel Fitzpatrick (Professor of Veterinary Orthopaedics at the University of Surrey's School of Veterinary Medicine) explored how elbow disease develops in dogs. Dr Clare Rusbridge (University of Surrey) presented findings on canine chondrodystrophic intervertebral disc disease, and Dr Peter Bell (Newcastle University) addressed how animal models and systems biology approaches can throw light on rare skeletal diseases in humans.

Other presentations investigated the role of Vitamin D in bone health, how diabetes can contribute to osteoarthritis, and what we can learn about joint degeneration from rare and orphan diseases.

Professor van Weeren summed up the feelings of many after the workshop when he said, "I really like the spirit of this event, with approaches from very different areas and people from very different backgrounds. I think that this multidisciplinary approach is the way we need to go in the future with research."

Organisers: Professor Ali Mobasheri, Dr Constanza Gomez Alvarez, Professor Susan Lanham-New, Professor Margaret Rayman, Dr Rebecca Lewis.

Key outcomes

- Publication of a special supplement in the *BMC Musculoskeletal Disorders* journal (Impact Factor 1.72) in December 2015. This included 19 abstracts presented at the workshop along with a general review of current research into MSK health.

Other sponsors

- University of Surrey (School of Veterinary Medicine, School of Biosciences and Medicine)
- D-BOARD – an EU FP7 consortium focusing on novel diagnostics and biomarkers for early identification of chronic inflammatory joint diseases
- Arthritis Research UK
- Arthritis Research UK Centre for Sport, Exercise and Osteoarthritis
- Arthritis Research UK and Medical Research Council Centre for Musculoskeletal Ageing Research

The changing face of war

'Hitting the Target?' How New Capabilities are Shaping Contemporary International Intervention

12 to 13 July 2012

Forty-five nations are now building, buying and using military UAVs (unmanned aerial vehicles or 'drones'), with 7,000 owned by the US army alone. But what are the implications of this technology? What responsibility, if any, do inventors and developers have for the social and ethical consequences? And how can we ensure that the correct policy and legal frameworks are in place?

Since the end of the Cold War, new technologies have enabled precision air campaigns without the commitment of large numbers of troops on the ground. The objective of this workshop was to explore how new capabilities available to military and intelligence forces are shaping approaches to international intervention, examining these issues both from the viewpoint of those on the receiving end of drone strikes and those who carry them out. The workshop provided a forum for dialogue between the academic disciplines – including law, social science, engineering and physical sciences – as well as between academia, policy-makers and practitioners.

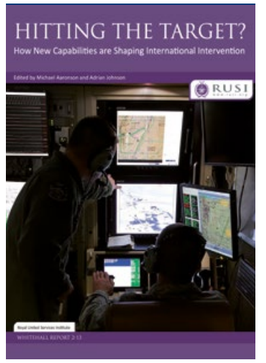
Three keynote speakers highlighted some of the complex issues around international intervention. Dr Jamie Shea, Deputy Assistant Secretary-General of NATO, opened the workshop with a talk examining the political and strategic consequences for NATO as a result of unmanned warfare devices. Jason Ralph, Professor of International Relations at the University of Leeds, started the second day with an exploration of US norms for preventive self-defence and what this type of military action might mean for British foreign policymakers. Mr Geoff Loane, Head of Mission at the International Committee of the Red Cross, UK, drew the workshop to a conclusion by sharing his reflections on the issues raised.

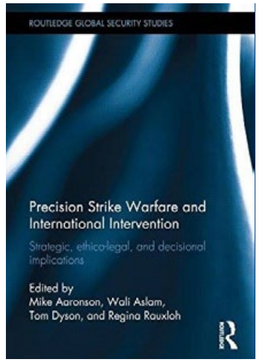
There was also a round table discussion on Social and Ethical Dimensions of New Technology featuring inputs from the fields of nanotechnology, medicine, digital communications, and protection science.

> What legal framework are we applying? This is the most challenging aspect of drone-based targeted killing.
>
> **Professor Gregory McNeal**
> **Pepperdine University**

The workshop's greatest value was in bringing together very different perspectives on the ethics and usefulness of drone strikes. For example one panel included a paper from the perspective of the US military on steps taken to mitigate collateral damage, alongside another given from a journalistic perspective on 'the fiction of zero casualties'. An examination of how military technology can be used to provide a justification for intervention contrasted with insights into the psychological factors and systems limitations affecting the operators of unmanned aerial systems, and the implications of this in international law. The overall conclusion was that the only thing that is precise about 'precision strikes' is the machine that delivers them.

Bringing another dimension to the workshop, a poster exhibition presented the work of Australian artist Carl Gopalkrishnan and drone strike photographs from Pakistan by Noor Behram. Carl's paintings – which included the work featured on the programme cover for the workshop – imagined the hidden narratives that drive political decisions. He commented, "Through engagement with my art, I hope I can encourage the workshop participants to consider creative thought processes as just another tool when investigating alternate responses to the challenge of new capabilities."





As a result of the workshop, a book has been published summarising the topic, and a policy brief produced in conjunction with RUSI (the Royal United Services Institute). These have both helped to expose the academic community and policy-makers to ideas discussed at the workshop, and demonstrated the merits of taking an inter-disciplinary approach to a complex question.

Key outcomes

- Publication of an edited volume, *Precision Strike Warfare and International Intervention*, by Routledge Global Security Studies
- Production of a policy brief, *Hitting the Target?*, in conjunction with RUSI (the Royal United Services Institute)

Other sponsors

- Centre for International Intervention (cii) School of Politics, University of Surrey

> On the one hand, we don't face a single overwhelming threat like we did in the 20th century – such as fascism – but on the other, there's an enormous range of very complex things to think about.
>
> **Dr Jamie Shea**
> **NATO, UK**

Organisers: Professor Sir Mike Aaronson, Dr Wali Aslam, Dr Tom Dyson, Dr Regina Rauxloh.

The art of food

Creativity in the kitchen

7 to 8 July 2014

In the 21st century, food is as much creative as it is functional – with chefs taking inspiration from art, nature and science. Unlocking and developing cooks' creative processes could help consumers to make healthier food choices both at home and in restaurants. With this in mind, the IAS workshop enabled delegates from academia and industry to explore the theory – and also get their hands dirty in the kitchen.

The workshop was a collaboration between three Schools and Centres at the University of Surrey: the School of Hospitality and Tourism Management; Food, Consumer Behaviour and Health Research Centre (FCBH), and ILLUME – a multidisciplinary creativity research centre.

Welcoming delegates from across Europe, the workshop explored how creative chefs create new food forms or sensory experiences using a combination of personal predisposition, knowledge acquired through training, repetitive practice and rules. While many chefs believe that their creative process cannot be described, academics agree that doing so could have significant advantages for restaurants and consumers, while also benefiting flexible thinking processes and creativity more generally.

Each of the two days of the workshop began with a keynote presentation. James Kaufman and Ron Beghetto (University of Connecticut), who are leading figures in the generic discipline of 'creativity', spoke on 'Applying creativity research to cooking', while Dr Marc Sterand (Lausanne Hotel School) talked about the experience of creativity from a chef's point of view, sharing insights from world-class chefs.

Additional speakers Nel Mostert (of the Mostert Consultancy for Creativity and Innovation), Nuria May Masnou (Alicia Foundation cuisine research centre) and Dr Paul Sowden (University of Surrey) chaired practical workshops which enabled delegates to interact while gaining a more 'hands-on' understanding of how the creative process works when it comes to food. In her session, Nuria Masnou talked about a range of creative techniques before tasking delegates with using them to develop dishes from ingredients provided.

> If you have food left in the cupboard, how can you use that in order to produce something that's tasty and nutritious? This is good both for sustainability and for the sense of achievement of the home cook.
>
> **Dr Paul Sowden**
> **University of Surrey**

At the end of the two-day event, delegates gathered for a final session to sort their ideas and thoughts into key themes for future research. These included available resources (how the home environment influences creativity), promotion and creativity (how the way food is marketed and presented influences creativity), creativity and risk, gaining expertise and translation into practice, how consumers evaluate creativity in dishes, and measuring creativity in cooking.

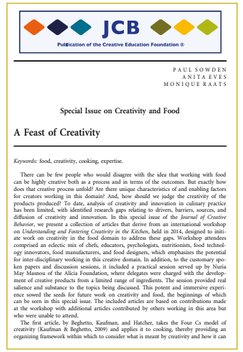
In addition to the publication of papers in the *Journal of Creative Behavior*, the workshop succeeded in identifying potential research themes and creating a network of academics and industry professionals committed to further developing these themes.

Organisers: Dr Anita Eves, Professor Monique Raats, Dr Paul Sowden.

> We want to understand the creativity of world class chefs, and how they come up with new concepts, but also the creativity of the chef at home – the father cooking on the weekend, the mother cooking during the week – which increases the wellbeing and happiness of the family.
>
> **Dr Marc Sterand**
> **Lausanne Hotel School**

Key outcomes

- Publication of a special issue of the *Journal of Creative Behavior*, the original and longest-standing journal in the field of creativity (DOI: 10.1002/jocb.124)



JCB
Publication of the Creative Education Foundation ®

PAUL SOWDEN
ANITA EVES
MONIQUE RAATS

Special Issue on Creativity and Food

A Feast of Creativity

Keywords: food, creativity, cooking, expertise.

There can be few people who would disagree with the idea that working with food can be highly creative both as a process and in terms of the outcomes. But exactly how does that creative process unfold? Are there unique characteristics of and enabling factors for creators working in this domain? And, how should we judge the creativity of the products produced? To date, analysis of creativity and innovation in culinary practice has been limited, with identified research gaps relating to drivers, barriers, sources, and diffusion of creativity and innovation. In this special issue of the *Journal of Creative Behavior*, we present a collection of articles that derive from an international workshop on *Understanding and Fostering Creativity in the Kitchen*, held in 2014, designed to initiate work on creativity in the food domain to address these gaps. Workshop attendees comprised an eclectic mix of chefs, educators, psychologists, nutritionists, food technology innovators, food manufacturers, and food designers, which emphasizes the potential for inter-disciplinary working in this creative domain. In addition, to the customary spoken papers and discussion sessions, it included a practical session served up by Nuria May Masnou of the Alicia Foundation, where delegates were charged with the development of creative products from a limited range of ingredients. The session provided real salience and substance to the topics being discussed. This potent and immersive experience sowed the seeds for future work on creativity and food, the beginnings of which can be seen in this special issue. The included articles are based on contributions made at the workshop with additional articles contributed by others working in this area but who were unable to attend.

The first article, by Beghetto, Kaufman, and Hatcher, takes the Four Cs model of creativity (Kaufman & Beghetto, 2009) and applies it to cooking, thereby providing an organizing framework within which to consider what is meant by creativity and how it can

Tripling the opportunity

Entrepreneurial University, Engaged Industry & Active Government: Triple Helix Opportunities

29 to 30 May 2014

Government-Industry-University interactions – known as the Triple Helix model – are the key to progress across many sectors. Bringing together internationally-leading academics, practitioners and knowledge transfer experts, this IAS workshop looked at ways of optimising the Triple Helix model to improve the effectiveness of these collaborations and maximise the benefits of technology transfer.

The workshop was organised in close collaboration with The Triple Helix Association and welcomed senior academics and industry professionals, totalling 40 participants from 13 different countries around the world.

The programme kicked off with a webinar organised by the Triple Helix Association on 'Triple Helix for newbies and how institutions can enhance the effectiveness of TH relationships', Led by Dr Emanuela Todeva, Director of the research centre on Business Clusters, Networks and Economic Development (BCNED), this was an excellent opportunity for delegates to get up-to-speed on the fundamental concepts of Triple Helix, and to understand the entrepreneurial behaviour that emerges within the model and the critical role of institutions.

Making the keynote presentation, Mike Danson (Professor of Enterprise Policy and Director of Doctoral Programmes at Heriot Watt University) spoke on 'Triple Helix and clusters: institutions and local voices'. Collaboration theories and practices established in central areas and capital cities are dominant but may not be appropriate to shadow towns and rural areas. Professor Danson compared and contrasted the experiences of SMEs and other local actors in rural Northern Europe with those in core and capital regions, exploring how the roles of institutions and agents vary in different environments.

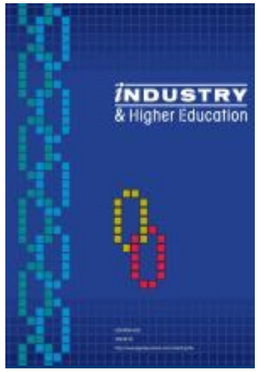
A number of lively panel sessions took place during the workshop, tackling some difficult and sometimes controversial topics that have arisen around the Triple Helix model. The panel on 'International Dimensions of Triple Helix' raised questions on different motivations and practices in cross-border alliances and innovation support, and the panels on 'Business-led Triple Helix' and 'University and business relationships in a Triple Helix context' asked how the needs of different actors are met in a Triple Helix collaboration, as well as predicting the challenges ahead. Other panels looked at the territorial context of Triple Helix, the impact of innovation policies on territorial ecosystems (with case studies from Greece, the Netherlands and Denmark examined as examples), and modern techniques in the Triple Helix interface.

> The core idea is that universities play a new and expanded role in innovation - [we see] new ideas coming out of the universities and translated into firms, firms working more closely with the universities to improve their product development, and governments playing a role in incentivising universities and industries to work together to fill gaps in local economies.
>
> **Professor Henry Etzkowitz**
> **President of Triple Helix Association**

Providing ample opportunities for social interaction as well as work-based sessions, the two-day conference generated an atmosphere of creativity and enabled academics and industry professionals to learn from each other's perspective.

Organisers: Dr Emanuela Todeva, Professor Alan W Brown.

> In Greece in the last 20 years we've done excellent research, but the research stays in the universities – it never reaches the market.
>
> **Professor Panayiotis Ketikidis**
> **Triple Helix Association, Greece**



Key outcomes

- Publication of a special issue of *Industry and Higher Education*, 30 (1), February 2016; and *In the Triple Helix: A Journal of University-Industry-Government Innovation & Entrepreneurship* (Springer), due to be published during 2016.
- Publication of two papers on the Social Science Research Network: 'Regional Dimensions of the Triple Helix Model: Setting the Context' (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2746354) and 'Government and Governance of Regional Triple Helix Interactions' (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2746384)

Other sponsors

- Business Clusters, Networks and Economic Development (BCNED)
- The Triple Helix Association (THA) *Industry and Higher Education Journal*

Seeing the light

Key outcomes

- Organisation of an event on human centric lighting in February 2016 as a direct result of the IAS workshop
- Submission of EPSRC grant application to work on the development of new LED technology for lighting applications

Other sponsors

- Institute of Physics (IOP)
- Lumie

Organisers: Professor Stephen Sweeney, Dr Konstanze Hild, Professor Debra Skene, Dr Vikki Revell.

Future Light Technology and Human Health

21 to 22 September 2015

Light, whether natural or artificial, is closely linked to human health, work performance and sleep. Celebrating the 2015 UNESCO International Year of Light, this workshop was dedicated to understanding the effects of light on our bodies and minds and – against a backdrop of constantly evolving technology – exploring the optimisation of modern lighting design to meet human needs.

'Future Light Technology and Human Health' was a strongly interdisciplinary workshop bringing together researchers from the fields of photonic device physics and engineering, lighting technology and design, circadian and sleep research, physiology and psychobiology. It was staged as part of the UNESCO International Year of Light, which was aimed at highlighting the vital role light plays in our daily lives.

The objective of the IAS workshop was to develop a better understanding of the properties of modern lighting required for health, but also to identify how challenges and opportunities in lighting design for varied applications can be met through interdisciplinary research.

One of the key focuses was the success of the first blue LED, for which its inventors were awarded the 2014 Physics Nobel Prize. This innovation has been the main factor driving the development of solid state lighting, which promises to significantly reduce the energy cost of lighting over the next decades, while researchers have also found that short wavelength blue light (contained within blue LEDs) has a strongly positive effect on circadian timing, sleep, alertness and performance.

Throughout the workshop speakers from academia, industry and the public sector gave their different perspectives. Opening the workshop, Professor Sir Colin Humphries of the University of Cambridge gave an excellent introduction to the latest developments in LED science and the technology behind solid-state lighting. This theme was taken up by Professor Tao Wang of the University of Sheffield who revealed his research into a new method for grow semiconductors (one of the building blocks for LEDs) with high optical performance. Dr Simon Hall of the National Physical Laboratory brought a metrological perspective in his presentation which looked at the need for universal standards in solid-state lighting.

Professor Anna Wirz-Justice of the University of Basel in Switzerland took delegates back to a fundamental question, asking why humans need light and discussing the effect it has on them. Professor Rob Lucas of the University of Manchester reminded delegates that the effect of light on humans goes beyond seeing, giving a fascinating insight into the neurophysiology of non-visual responses to light.

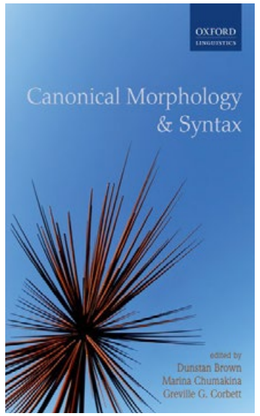
Giving an industrial perspective, Dr Luc Schlangen of Philips Lighting, Eindhoven, brought the spheres of technological innovation and user experience together in his fascinating discussion on how research and user insights are shaping lighting innovations.

Taking place at a time when new technology is opening up myriad opportunities in lighting design, the workshop was unique in spanning both technological innovation and the human-centric perspective.

Finding order in the diversity of languages

Key outcomes

- Publication of *Canonical Morphology and Syntax* by Oxford University Press, 2013, edited by Dunstan Brown, Marina Chumakina and Greville Corbett
- Follow-on workshop on Canonical Typology was held during the Eighth Biennial Conference of the Association for Linguistic Typology at Berkeley (USA) later the same year



Creating Infrastructure for Canonical Typology

9 to 10 January 2009

Languages vary dramatically, and yet they share many characteristics. A structure in one language may not equate fully to a structure in another. Canonical typology, a framework for comparing constructions and categories across different languages, offers a logical approach to this challenge, and was explored in fascinating depth at an IAS workshop.

There is a growing movement within linguistics to promote the use of formal definitions for describing language. However differences in terminology and underlying logic are major stumbling blocks. One way of addressing these problems is to adopt the 'canonical' approach to typology, which means taking the clearest, most indisputable instance as a starting point, and creating a multidimensional space in which language-specific instances can be placed. It is then possible to calibrate where a structure fits by its distance to the canonical ideal.

Researchers from the USA, Australia and Europe (including Germany, Netherlands, Norway and the UK) gathered to address these issues at a two-day IAS workshop in January 2009.

Hosted by the Surrey Morphology Group, the workshop had two central aims: to address the difficult problem of cross-linguistic comparison by applying the canonical approach to typology, and to address how canonical typology can be used to develop linguistic descriptions that can combine seamlessly.

Speakers described the range of different types of language which are being tested using this methodology, and explored to what extent the approach works. Among the keynote speakers, Dr Frank Seifart of the University of Regensburg gave an overview of the linguistic community's efforts towards a multidimensional typology of nominal classification, highlighting some of the most interesting work achieved in the field to date.

Professor Nicholas Evans of the University of Melbourne explored the complexity of representing the words and thoughts of others and relating them to the perspective of ourselves and our interlocutors. Canonical typology, in his view, allows us to distinguish a far wider range of possibilities within the usual classifications of direct speech, indirect speech, and biperspectival speech.

Scott Farrar (University of Washington) discussed the use of canonical typology to achieve e-Linguistics – where a digital data-base can store typological data. He presented the concept of the General Ontology for Linguistic Description (GOLD) which, he said, could solve some of the challenges by using canonical typology.

By bringing together academics who are currently making a considerable impact in the field of canonical typology, the workshop succeeded in helping the linguistic community to move closer to the creation of an infrastructure for canonical typology. It also led to the publication of the first book-length review of the subject (see Key Outcomes).

Organisers: Professor Dunstan Brown, Dr Anna Kibort, Dr Marina Chumakina.

Establishing fairness

The various chapters are invariably well-written, closely-argued, occasionally memorable and eminently-quotable.

Foreword to 'Procedural Fairness in International Courts and Tribunals' by Judge Awn al-Khasawneh, former Vice-President, International Court of Justice

Procedural Fairness in International Courts and Tribunals

19 to 20 September 2014

The right of every citizen to a fair trial is one of the founding principles of our society, which is why procedural fairness is a topic of major contemporary importance, and increasingly prominent in practice. Resulting in a book which will inform debate going forward, this IAS workshop identified core standards of procedural fairness in international courts and tribunals.

The workshop brought together a wide cross-section of senior, mid-career and early career academics, practitioners and judges – including some of the most prominent names in international law – who together analysed the procedures and practices of various international courts and tribunals using a comparative approach.

Procedural fairness encompasses diverse areas, from the handling of expert evidence before the International Court of Justice, and the burden and standard of proof in investment and commercial arbitration, to the role of victims and the right of defendants to a speedy trial at the International Criminal Court.

With a lack of literature on the overarching problem of core standards of procedural fairness, the workshop opened a discussion, identifying key commonalities and divergences between different courts. The aim was to generate fresh ideas for improvements to international judicial procedure, and to query established conventions on the procedural nature of arbitration and adjudication in international dispute settlement.

Giving the keynote speeches, former International Court of Justice Judge Mr Awn al-Khasawneh spoke about 'Procedural fairness before International Courts – is the best the enemy of the better?', and Dr John Sorabji, Principal Legal Adviser to the Lord Chief Justice and the Master of the Rolls, University College London, addressed the audience on 'Procedural fairness in national jurisdictions'.

The workshop was highly interactive with the majority of the two days devoted to panel discussions on specific areas. These included procedural fairness in the International Court of Justice, International Criminal Tribunals, World Trade Organisation and in investment arbitration; equality of arms; fair trial principles and international criminal law; evidentiary fairness; and victims' rights. In a final panellist session, delegates got an invaluable opportunity to hear the views of three judges and former judges with long experience in the international courts.

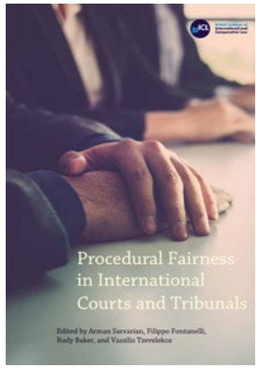
The aim of the workshop was to ask the important questions rather than providing definitive answers. Its success in achieving a holistic narrative, drawing together a number of pertinent issues on specific aspects of fairness, has been demonstrated in the resulting paperback volume published by the British Institute of International and Comparative Law.

The opportunity to take part in an interdisciplinary workshop on this subject was much appreciated by delegates. As Philip Weiner, a former international judge specialising in war crimes commented, "This has been very different. Usually I attend conferences with other practitioners but this was a mixture of practitioners and academics – that's good because we are all working on the same goal which is to ensure international tribunals and courts have fair trials."

Organisers: Dr Arman Sarvarian, Dr Rudy Baker, Professor Sir Mike Aaronson.

As lawyers we talk about procedural fairness frequently but we don't go into details about what it stands for, and that's why this conference has really identified an open space for exploration.

Andraz Zidar, British Institute of International and Comparative Law



Key outcomes

- Creation of a new network of academics in the field of international courts and tribunals
- Publication of *Procedural Fairness in International Courts and Tribunals*, in November 2015. Including papers from the workshop along with additional commissioned chapters, the book is published by the British Institute of International and Comparative Law.

Other sponsors

- University of Hull (McCoubrey Centre for International Law)
- British Institute of International and Comparative Law

Plants with the power to heal

The Hyacinthaceae: Chemistry, Pharmacology, Taxonomy and Ethnobotany

14 to 15 June 2012

While an estimated 25 to 50 per cent of currently marketed drugs owe their origins to natural products, many plants that could hold the key to life-improving medicine are yet to be exploited. The Hyacinthaceae plant family, believed to have great potential as the base for anti-inflammatory drugs, was the subject of a two-day IAS workshop dedicated to exploring its possible use and benefits

The Hyacinthaceae family includes around 900 species and 70 genera (sub-divisions), some of which have long been used in traditional medicine. However their potential as drug candidates for commercial use has been under-explored, partly because it is only in the last decade that scientists have discovered the vast array of genera within the species.

The IAS workshop gathered international experts from the USA, Spain, Austria, Thailand, Malaysia, Italy, South Africa, Saudi Arabia, Kenya, Poland, the Netherlands, Iran and the UK, to discuss their current research and recent developments in the Hyacinthaceae. These included scientists working in the fields of chemistry, horticulture, pharmacology, ethnobotany (the relationship between people and plants) and taxonomy (the science of classifying organisms).

The remit of the workshop was very broad, with sessions investigating all aspects of the Hyacinthaceae from their taxonomy and horticultural potential to their uses by traditional communities and their potential as drug candidates.

Opening the workshop, Paul Cumbleton of RHS (Royal Horticultural Society) Gardens at Wisley, gave a presentation showing some of the key species of Hyacinthaceae and some not yet common in cultivation. He focused not just on the economic and scientific importance of the plants, but also – through photography – on their intrinsic beauty which has endeared them to gardeners around the world.

The theme of iminosugars – a compound found in plants which is attracting interest for its pharmaceutical possibilities – was the focus of a talk by Geoffrey Kite of the Royal Botanic Gardens, Kew. He outlined work currently being undertaken at Kew to accumulate data on isolating iminosugars from species in the Hyacinthaceae family.

The Hyacinthaceae family was once classified as having just three different varieties, but plant scientists now know that there are more than seventy. Wolfgang Wetschnig of the University of Graz gave an interesting overview of the different subfamilies of the Hyacinthaceae, while Professor Martin Pfosser of Austria's Biocenter Linz took the audience through the colonization patterns of different branches of the Hyacinthaceae in Madagascar and the Mediterranean region.

Bringing a perspective from South Africa, Neil Crouch of the South African National Biodiversity Institute (SANBI), University of KwaZulu-Natal in Durban spoke about the historical usage of the Hyacinthaceae, both in healing and homicide, and also discussed concerns about unsustainable use of the plant family. Also addressing the topic of taxonomy – and the contradictory classifications found within the family, Mario Martinez Azorin of the Universidad de Alicante Apdo, Spain, demonstrated that combining plastid and nuclear data results in the most accurate classifications, making different genera easier to recognise.

Professor Dulcie Mulholland of the University of Surrey's Natural Products Research Group, described some of the investigations which have been made into Hyacinthaceae from Southern Africa, which have identified a number of promising compounds. Nick Plant of the Surrey's Centre for Toxicology described how computer modelling approaches are helping to develop new drugs in a smarter way, providing an answer to the escalating costs faced by the pharmaceutical industry and the fact that many development drugs fail at the stage of clinical trials.

The workshop – which incorporated a full social programme including dinner at a 16th century inn and a behind-the-scenes tour at the RHS Gardens at Wisley – proved to be a very enjoyable and fruitful event, with one invited speaker saying that it was the most useful meeting he had ever attended.

Organiser: Professor Dulcie Mulholland.

Key outcomes

- *Review of the Phytochemistry and Ethnobotany of the Hyacinthaceae* published by *National Products Reports*
- Formation of a number of international collaborations, with Surrey's Hyacinthaceae group now having access to plant materials from Wisley Gardens and from Madagascar

Other sponsors

- SANBI, South Africa

Forthcoming Events

Law, Ethics and Quantum Theory

7 to 8 July 2016

The workshop seeks to build on the University of Surrey's research excellence in physics and quantum theory and the ambitious new direction of the School of Law. It aims to build the necessary framework and terms of reference for a debate between those working in quantum theory, quantum technologies, regulation and legal and ethical theory.

Too Cute to Kill? From the Depiction of Animals in Children's Literature to the Framing of Government Policy by Adults

21 to 22 July 2016

How have depictions of wild and domestic animals in children's literature shaped the way we view animals and their environments? This workshop will examine the cultural and emotional values we place on certain animal species and how this affects government policy and impacts environmental, public and veterinary health.

Nutrition Economics: Advancing the Research Agenda

19 to 20 September 2016

This workshop will bring together international experts from a range of relevant fields to share and discuss research in nutrition economics – the impact of diet on health, disease prevention and the economy. The objective will be to encourage interdisciplinary debate that will lead to advances in this emerging field and opportunities to impact policy.

After the Recognition of Intersex Human Rights

23 to 24 September 2016

Intersex people and their families face many challenges in today's complex landscape of law, rights and medical care. This workshop will provide a space to have much-needed interdisciplinary conversations on this topic and the implications for the future of health, medicine and the definition of human rights.

Innovative Methods for Studying Distributed and Multi-Modal Working Practices

25 to 26 May 2017

How can we combine methods, or devise new methods, to capitalise on diverse forms of data to build rich, theoretically-fruitful understandings of our digitally-suffused working life? Drawing expertise from across the disciplines – from management and organisation to work psychology and technology to design – this workshop aims to find the answers.

Spatial Audio and Sensory Evaluation Techniques

Globalizing Retail
Transnational Retail, Supply Chains & the Global Economy

Biologically Inspired Information Fusion

Advanced Space Vehicle Control

HOX Genes in Development and Disease

Audio Description for Visually Impaired People

Young People, New Technologies and Political Engagement

Future Light Technology and Human Health

Sleep, Circadian Rhythms and Cognition:
Bridging the Genotype-phenotype Gap

Integrating Multimodality in the study of Dialogue Interpreting

Intersections of Ageing, Gender, Sexualities (i-ages)

Musculoskeletal Health in the 21st Century

Workshop in Epilepsy Engineering

Designing Law for Nutrition Related Health

Work-Life Balance

FROM ANIMALS TO HUMANS:
A Multidisciplinary Approach to the Study of Zoonotic Diseases

THE MOTHER WAR:
Current Trends and Critical Discourses

Emerging Interfacial Dynamics

Mobility and Creativity

"Hitting the Target?"
How New Capabilities are Shaping Contemporary International Intervention

Corruption in a Globalising World

Definition of Best Indicators for Land Use Impacts for Life Cycle Assessment

Procedural Fairness in International Courts and Tribunals

The Emergence of the Posthuman Subject

Bismuth-Containing Semiconductors: Theory, Simulation and Experiment

Regulatory Frameworks for Transboundary Aquifers:
The Case of the Guarani Aquifer System

Modelling Urban Dynamics

Microbial Systems Biology

Theoretical Aspects of Pattern Formation

Agent-based Models of Market Dynamics and Consumer Behaviour

Quantum Biology:
Current Status and Opportunities

Dickens and the Visual Imagination

After the Recognition of Intersex Human Rights

The Hyacinthaceae:
Chemistry, Pharmacology, Taxonomy and Ethnobotany

Mahler Centenary Conference Gustav Mahler:
Contemporary of the Past?

Definition of Best Indicators for Land Use Impacts for Life Cycle Assessment (LCA)

Cultural Legitimacy and the International Law and Policy on Climate Change

Climate Change:
Science and Policy

Responsibility to Rebuild:
Linking Infrastructure, Governance and Democratisation

Creating Infrastructure for Canonical Typology

Her Make is Perfect:
A Seminar Interrogating Women's Dramatic Writing, Text and Performance (1600-1830)

Sustainable Practice in Universities: Leading and Improving

Investigating the Theory and Practice of Gender and Sexuality in the Workplace

From Production to Consumption:
Legal and Policy Challenges for a New Approach to Climate Change

The Future of Aviation:
The Airline Industry at the Crossroads

Social Cognition:
Origins, Mechanisms and Disorders

Lifecourse Transitions:
Opportunities for Sustainable Lifestyles?

Understanding and Fostering Creativity in the Kitchen

RNA Biology Meets Sleep and Circadian

Computational Social Science and Social Computer Science:
Two Sides of the Same Coin

Law, Ethics and Quantum Theory

Entrepreneurial University, Engaged Industry and Active Government:
Triple Helix Opportunities

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Institute of Advanced Studies
University of Surrey
Guildford, Surrey GU2 7XH, UK

ias@surrey.ac.uk
twitter: @IAS_SurreyUni
ias.surrey.ac.uk

7817-0416