



BRISTOL VISION INSTITUTE

BVI REFRESH – SPRING 2015

Keeping you up to date with the latest news from Bristol's vision community

EVENTS

2015 Young Researchers Colloquium

The annual BVI Young Vision Researchers Colloquium will be held in the Sky Lounge, New Life Sciences Building, 24 Tyndall Avenue, BS8 1TQ on 22nd June 2015.

Register your attendance via the [University of Bristol Online shop](#).



We are delighted to announce that Lars Chittka, Professor of Sensory and Behavioural Ecology at Queen Mary, University of London, will be the keynote speaker.

Lars is a world expert on insect vision and cognition, with particular interests in the coevolution of insect colour vision and flower colour signals. He has written many high profile articles on the processing power of insect "mini-brains" and what we can learn from them.

After first and second degrees at the Free University of Berlin, a fellowship at SUNY Stonybrook and a lectureship at Würzburg, he has been at QMUL since 2002, where he holds a Royal Society Wolfson Research Merit Award and an ERC Advanced Grant. He is also a Fellow of the Linnean Society, the Royal Entomological Society and a member of the Faculty of 1000.

Seminar Series: Todd Handy

Benjamin Meaker fellow Professor Todd Handy, from the University of British Columbia, is being hosted in The School of Experimental

Psychology at Bristol University by Dr Ute Leonards.

Prof Handy will give a Bristol Vision Institute seminar on Friday May 29th 2015 in 2D1, 12A Priory Rd, the last BVI seminar of the academic year!



CVI@BVI

200 YEARS



VISIONARY CARE
1810-2010

Cathy Williams hosts a one day conference supporting children with cerebral visual impairment in mainstream and special schools, in the Merchant Venturers Building, Wednesday 24th June, 2015

Confirmed Speakers:

Dr Lea Hyvarinen - Dortmund University, Germany.

Dr Maggie Woodhouse (OBE) - Cardiff School of Optometry and Vision Science, Cardiff

Mr Richard Bowman - Great Ormond Street Hospital, London

Dr Jonathan Waddington - WESC: West of England School for Children with Visual Impairment, Exeter

Cost - £50. Please register online at the [University of Bristol online shop](#) or email: Jane Elvin: Jane.Elvin@bristol.gov.uk (Sensory Support Service –Bristol).

2015 Richard Gregory Memorial Lecture



Richard Gregory lecture, 29th October 2015, 5pm (venue TBA). This year's Richard Gregory lecture will be given by Anya Hurlbert, Professor of Visual Neuroscience and Director of the Centre for Translational Systems Neuroscience at the University of

Newcastle. Her topic will be "colour constancy", the ability of the visual system to identify colours accurately despite large changes in the spectrum of the illumination. It is also central to identifying the colour of "that dress" which caused an Internet storm earlier in the year (and will be demonstrated during the lecture).

Anya did her first degree in Physics at Princeton, followed by a Masters in Physiology from Cambridge, where she held a Marshall Scholarship. She then obtained a Ph.D. in Brain and Cognitive Sciences from MIT, studying with Tomaso Poggio and Peter Schiller, and followed that with an MD from Harvard Medical School. After a Research Fellowship at Oxford University in Andrew Parker's lab, she joined Newcastle as a lecturer in 1991. She has been ahead of the Division of Psychology, Brain and Behaviour, created a new School of Psychology in the Faculty of Medical Sciences, and co-founded the Institute of Neuroscience then, more recently, the Centre for Transitional Systems Neuroscience.

Anya's research interests range beyond the neuroscience of colour perception, from medical testing of colour vision through hyperspectral analysis of foods to the spectral analysis of art. She is a keen proponent of the public understanding of science and bringing an appreciation of visual neuroscience into schools.

Rank Prize Symposium on biological iridescence, April 2015

Heather Whitney (Biological Sciences): co-organised a three-day international meeting generously funded by the Rank Prize charitable foundation (as in Rank Xerox and J. Arthur Rank films). Delegates from as far afield as Australia and the United States converged on Grasmere, in the beautiful Lake District, to discuss all aspects of iridescence, from the light-trapping mechanisms of photonic crystals to the evolution and adaptive function of structural coloration. Among the speakers were Bristol-based Innes Cuthill (Biological Sciences), Jakob Vinther (Biological/Earth Sciences) and Martin Lopez Garcia (Physics).



The meeting provided the perfect launch-pad for Heather, Innes and Nick Scott-Samuel's (Experimental Psychology) new £760k BBSRC grant on the role of iridescence in animal defensive coloration.

Change of venue:

From October 2015 onwards Bristol Vision Institute's seminar series will take place in the seminar room, Life Sciences Building, Tyndall Avenue.

VISUAL MOVERS AND SHAKERS

New appointments

Welcome to new BVI members Davide Pisani and Jakob Vinther. Both are joint appointments between the Schools of Biological Sciences and Earth Sciences and, although new to BVI, have been in Bristol for just over 2 years. Many of you will have seen their talks this last term.



Davide combines organismal and molecular approaches to answer questions about the deep evolutionary origins of both taxonomic groups and their adaptations. His BVI talk was on the origins and divergence of opsins, the key proteins in visual pigments that underpin light reception

Jakob's research also uses multiple approaches, from traditional palaeontology (hitting rocks with hammers) to molecular biology and advanced spectrometric methods for determining chemical compositions. His best known work, although far from his only interest, is the



reconstruction of the colours of dinosaurs from exceptionally well preserved feather fossils.

Davide and Jakob therefore bring new dimensions to BVI's range of research interests.

Michael Devereaux has joined the Visual Information Laboratory to work with Tilo Burghardt and Dave Bull as a Research Assistant on classifier design for underwater mine detection. Michael has a PhD in Mathematical modelling of industrial problems from the University of Limerick and joins BVI after a postdoc position at Durham University working on Automated threat detection in X-ray images

Royal Society Newton Fellowship



Dr Jose Martinez-Carranza, now working at INAOE Mexico, and a former PhD student (Supervised by A Calway) and Post doc at VIL for two

years on 3 projects supported by DSTL and the TSB (with W Mayol-Cuevas), has received a prestigious Royal Society Newton Advanced Fellowship to work on the project RAFAGA: Robust Autonomous Flight of unmanned Aerial vehicles in Gps-denied outdoor Areas.

The fellowship is hosted at the Visual Information Laboratory by W Mayol-Cuevas and will last for 2 years. Collaboration between the two institutions is expected to advance real-time visual mapping and tracking on-board UAVs for industrial and environmental monitoring applications.

Polarized light as an alternative to colour in animal vision



Martin How (Biological Sciences) has been awarded a two year Marie Curie Individual Fellowship to study polarization vision in fiddler crabs. The project will be based in the Animal Behaviour and Sensory Biology Group, Biological Sciences.

The recent discovery that some animals make use of a highly developed sensitivity to polarized light across the whole visual field of their image-forming eyes opens the way for new investigations into the use of polarized light for object detection and discrimination, a field previously dominated by the study of colour and intensity visual systems.

Martin has shown in recent investigations that fiddler crabs have highly-acute sensitivity to polarized light across their whole visual field. These animals have been model species for behavioural ecology research over the past 50 years and so represent an ideal organism for developing a clear understanding of image-based polarization vision.

IEEE Editorial Appointment



Dr Alin Achim, of the Merchant Venturers School of Engineering and VI-Lab has been appointed to the post of Associate Editor of

the IEEE Transactions on Image Processing for a three year term.

The IEEE Transactions on Image Processing is ranked in the top quartile by ISI Web of Knowledge in both Computer Science and Electrical & Electronic Engineering.

Computer science student awarded UoB interdisciplinary research internship

Third year MEng student Hazel Doughty was awarded the University of Bristol Research Committee Interdisciplinary Research Internship 2015 to work with the Department of Psychology on automatic analysis of floor patterns and walking trends in public spaces.

Hazel was one of only 17 out of 69 students whose project proposals were judged to have significant potential to promote new interdisciplinary research.

Hazel will be working with two members of the Bristol Vision Institute; Dr. Dima Damen from the computer science department and Dr. Ute Leonards from the Department of Experimental Psychology to test the dazzling effect of floor patterns on the walking trends of pedestrians in public places.

Keynote Lecture at IET Intelligent Signal Processing Conference

Dave Bull will give a prestigious keynote lecture at the forthcoming IET Intelligent Signal Processing Conference, to be held in London in December 2015. Professor Bull will talk about the recent work conducted in BVI's Visual Information Laboratory on the topic of texture synthesis for video compression.

RESEARCH NEWS

The Camouflage Machine

Nick Scott-Samuel, Roland Baddeley (Experimental Psychology) and Innes Cuthill, (Biology) have been awarded an EPSRC grant of £590k for "The Camouflage Machine: optimising patterns for camouflage and visibility".

The goal of this new interdisciplinary research is to develop a principled approach to understanding camouflage and conspicuousness and, in practical applications, deliver bespoke solutions to any situation where minimum or maximum visibility is required. The approach is biologically inspired on several levels, combining knowledge of how animal colour patterns are generated, with evolutionarily based computer learning techniques and human assessment of visual differences.

Find out more about camouflage research in Bristol at Camo Lab

Immersive video formats beyond 3D.

High Dynamic Range (HDR) video technology is able to offer high levels of immersion with a dynamic range comparable to that of the Human Visual System (HVS). However, this increase in visual immersion comes at the cost of higher bitrate requirements so efficient HDR-specific coding solutions are necessary. Two important articles have been published recently on this topic. The first, by Yang Zhang, Dimitris Agrafiotis and David Bull (from UoB) and Matteo Naccari and Marta Mrak (from BBC R&D), has been accepted for publication in IEEE Transactions on Circuits and Systems for Video Technology, and proposes a novel perception-based quantization to remove non visible information in HDR content by exploiting luminance masking. This achieves significant up to 42% bit rate savings, compared to the recent High Efficiency Video Coding Standard (HEVC) at the same quality. The second, by Zhang, Agrafiotis and Bull) is an invited review chapter on 'High dynamic range video compression' which will appear in a forthcoming Academic Press Book entitled 'High Dynamic Range Video from Acquisition to Display and Applications'.

Platform Grant Sandpit meeting

Following the award to BVI of a prestigious EPSRC Platform Grant 'Vision for the Future', which will provide flexible support and underpin adventurous research, BVI's first-of-its-kind research sandpit was held at the Mansion House, Bristol on Monday 28th April 2015.



The day was facilitated by Stephen Hinde from BVI, using *Open Space* methodology. Researchers in the BVI community enjoyed a unique opportunity to come together, share and discuss their ideas and how they might be taken forward. Several exciting proposals and collaborations were initiated at the meeting.

Proposals for short research projects have now been invited and should be submitted to Jen Hawkins on or before 10 July 2015.