Pint of Science presents...

Creative REACTIONS

26TH MAY 2016

CAMBRIDGE UK

On 26 May, Creative Reactions, marked the finale of the Pint of Science Cambridge 2016 Festival at St. Barnabas Church.

A collection of brilliant local artists employed a vast array of techniques to create a variety of diverse science-inspired pieces based on the talks at our Pint of Science Festival 2016! These ranged from sketches, paintings, and illustrations, to glass artwork, jewellery, clay figurines, poems, dance and a programmed drawing machine! Our artists were either independent, or part of one of four local artist networks we were lucky enough to collaborate with: Cambridge Creative Network, Urban Sketchers, Pivotal and STEAM: ED Collective.

Our Creative Reactions event celebrated artistic creativity and science in an evening which marked the grand finale of the Pint of Science festival in Cambridge. Julian Huppert, former Member of Parliament for Cambridge delivered an opening speech, which was followed by entertainment provided by Datum Plane and Zach Abbs! Sponsored by Microsoft and with free beer generously supplied by Calverley's brewery the event was a huge success!"

I design and make contemporary jewellery pieces with a touch of Italian flair. I'm inspired by nature, textures, memories and pure imagination. Most of my pieces are one-off designs, meticulously crafted by combining traditional precious metal fabrication with the ancient techniques of glass fusing, lampworking and ceramic bead making. Incorporating dichroic glass into my designs allows me to add colour and bring contrast to the metal qualities of the silver. To balance the richness of the glass medium, I keep my silverwork simple, using slim lines, clean geometrical shapes and simple stylised natural forms.

The Science

Colour with cellulose: From Nature to Application

Dr. Silvia Vignolini

Cellulose, the main constituent of a plant cell wall, is the most abundant, natural renewable resource available on Earth. By understanding how the plant uses cellulose to create colours, we can discover ways to make artificial colourants in the lab using using the same chemical compound.

Creative Reaction

Photonic structures in nature

Necklace and Earrings set made of Sterling Silver, 9ct Gold, Dichroic glass. Inspired by the structure and arrangement of cellulose microfibrils in nature the jewellery pieces are hand sawn, textured, and fired.

Atoms to Galaxies

Cambridge Contemporary Dance

Cambridge Contemporary Dance is a dance company who creates collaborative dance works as a collective. The Company is solely run by the five core company dancers, with a shared passion to create, experiment and develop different professional experiences, constantly seeking opportunities to collaborate with others artists across a variety of media platforms.

The Science

Colour with cellulose:
From Nature to Application

Professor Erwin Reisner

Plant photosynthesis can guide us toward the building of synthetic systems to generate sustainable fuels. Changing components of the fundamental life-sustaining process that generates energy from sunlight could yield different types of fuels. Our solar fuel research exploits biological enzymes and synthetic catalysts and is progressing toward the creation of an artificial photosynthetic system.

Creative Reaction

Artificial photosynthesis

Inspired by Erwin Reisner's team's work, Cambridge Contemporary Dance and film maker Anastassia Elizarova have created a visual representation of the difficulties faced when we artificially try to replicate a natural process. Starting with a simple movement phrase that works effectively in a natural environment, the dancers explore what happens when things are replicated in a different 'artificial' location, investigating how our own physical catalysts can play a different role in the scientific process.

Film Maker: Anastassia Elizarova; Dancers: Hannah Spencer, Chess Boughey, Lorenza Toffolon, Camila Miranda; Sound: Jacob Abbott

I like painting highly detailed scenarios using strong contrasts and bold colours. I always want my paintings to tell a story or communicate a concept that I find much easier to express through an image than through words. As a result, my paintings tend to have a dreamlike, one could say surrealist, quality to them.I currently hold a foundation diploma in art and design from Cambridge School of Visual and Performing Arts (CSVPA) and a bachelor's degree in design from Goldsmiths, University of London.

The Science

Our Place in the Universe

Prof John Barrow

Looking at the expanding universe reveals a number of unexpected connections between the size and age of the universe and conditions needed for life. Provocative evidence in support of the idea that our universe is part of a multiverse will be revealed. Finally, we will see what the observed acceleration of our universe's expansion today signals about its future. Our own place in cosmic history is one that is advantageous for arriving at an understanding of the universe.

Creative Reaction

Relativity - Gravitational waves

Looking at the expanding universe reveals a number of unexpected connections between the size and age of the universe and conditions needed for life. Provocative evidence in support of the idea that our universe is part of a multiverse will be revealed. Finally, we will see what the observed acceleration of our universe's expansion today signals about its future. Our own place in cosmic history appears to be one that is advantageous for arriving at an understanding of the universe. I am creating three paintings that form a triptage using oil paint on canvas. Each painting is of a different location where stars are born.

Martin Stephen

I am a painter, musician and multi-media performer. My works of art are inspired by the 1943-70 abstract expressionist movement. Musically, I create improvised music albums based on 1970's progressive, experimental jazz and rock. My influencers are De Kooning, Pollock, Gorky, Alan Davie, Joan Mitchell, Roger Hilton, William Scott. German experimental scene, Canterbury, Christian Vander, Robert Wyatt, and Peter Hammill.

The Science

Finding Earth-like Planets

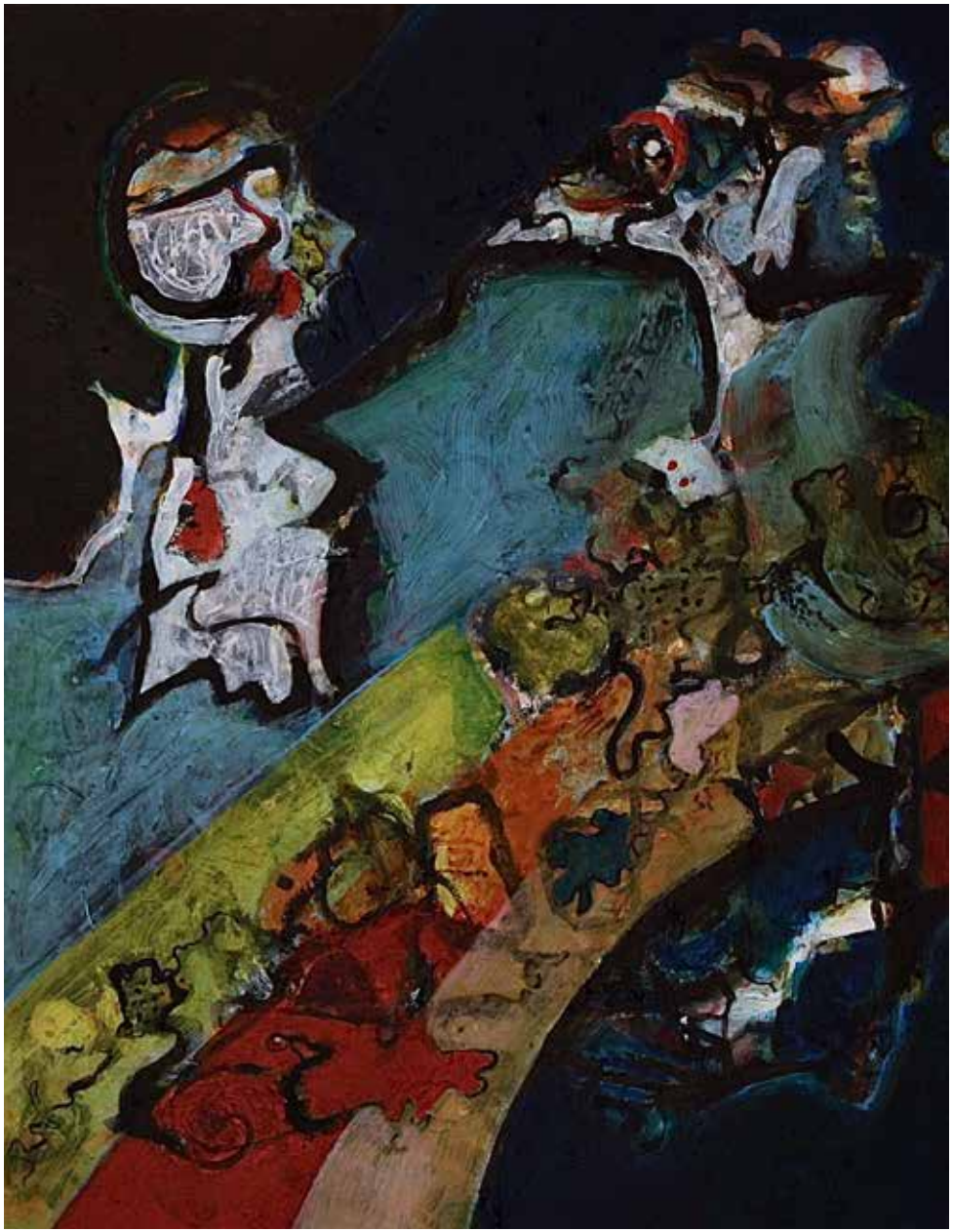
Amaury Triaud

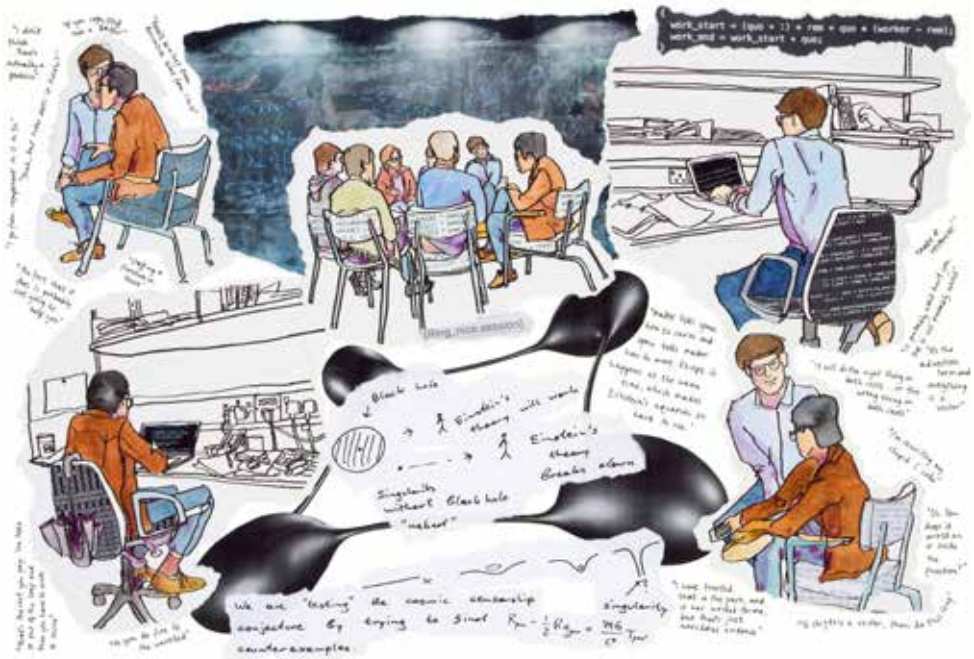
I will describe our preparedness for the discovery of planets that are similar to the Earth, in temperature and in size. Once identified, the atmospheres of those worlds will be remotely explored. They will become the first Earth-like environments to be studied outside the Solar system.

Creative Reaction

Finding Earth-like Planets

Finding earth-like planets around distant stars requires detection of the smallest changes in observational effect. Precise measurement of rotation, shadow and compositional data. Expanding our knowledge of the unimaginably large to the indescribably small. Years, decades of observation, measurement, verification, written, edited, published for the scientific community to evaluate. For this project I seek to interpret artistically movement and random effect of the quantum 'dance', the unpredictable indeed strange events which may lead to life on other planets. I work with emotional thought to create art and music from spontaneity whether improvisational sessions with music or intuitive painting. A too clearly conceived idea before beginning work can for me be a restriction. It's the art of construct, deconstruct, magnify, distort using sound and visual textures searching for the right statement to set up push/pull tension. Working also with counterpoint ideas, creative mixing, layering of abstract forms, intuitive use of colour, shape and studio effects to bring the work to a point of balance and resolution.





I' m both an artist and a professional genealogist - I like to switch between left and right brain. I work directly in pen, which I colour with watercolour. I draw quirky observations of everyday life - whatever is around me. I' m aiming for a real scene, rather than a chocolate box view of the world. My work is exhibited in both galleries and coffee shops. I' m a member of Urban Sketchers Cambridge and Cambridge Open Studios.

The Science

Can general relativity break down outside of black holes?

Markus Kunesch & Saran Tunyasuvunakool

The theory of general relativity breaks down inside a black hole, but this is not a problem for the world or the theory since nothing escapes a black hole. In this talk, we will describe our recent discovery of a situation where the theory can fall short outside of black holes. We will explain why this might be a bad thing for the theory but why we hope that it cannot happen in our four-dimensional universe.

Creative Reaction

Naked singularity

I chose to collaborate with theoretical physicists although I hated physics at school, my family are physicists and mathematicians. Although physics is still definitely not my thing, I've come to love seeing how it excites people. I love the animated body language, the intensity of the discussions. Their working environment is a pared down, stark space. There isn't art on the walls, and the shelves are bare. Functionality rules, even down to where to hang your umbrella. The vibrancy is instead concentrated in the collective brain. I've collaged my drawings from my visit. They're simulating something so fundamental - how the universe itself hangs together. I asked Markus and Saran to draw their research and I've included the heart of this in the piece. If a singularity can occur outside a black hole, the universe is not as we know it. The complex and intricate coding to do this is the fabric of their work, and it surrounds them, even at the coffee break, which is where I think the magic really happens. Pen, watercolour, and paper collage.

Atoms to Galaxies

Nick Edwards

In 2003 I sailed to the Arctic on a schooner full of artists and scientists as part of Cape Farewell's expedition to raise awareness of climate change, I made some work, got exhibited and finally got my full artist license. I am now licensed to drive anything up to and including tanks, as long as the tank contains fish.

The Science

What is relativity?

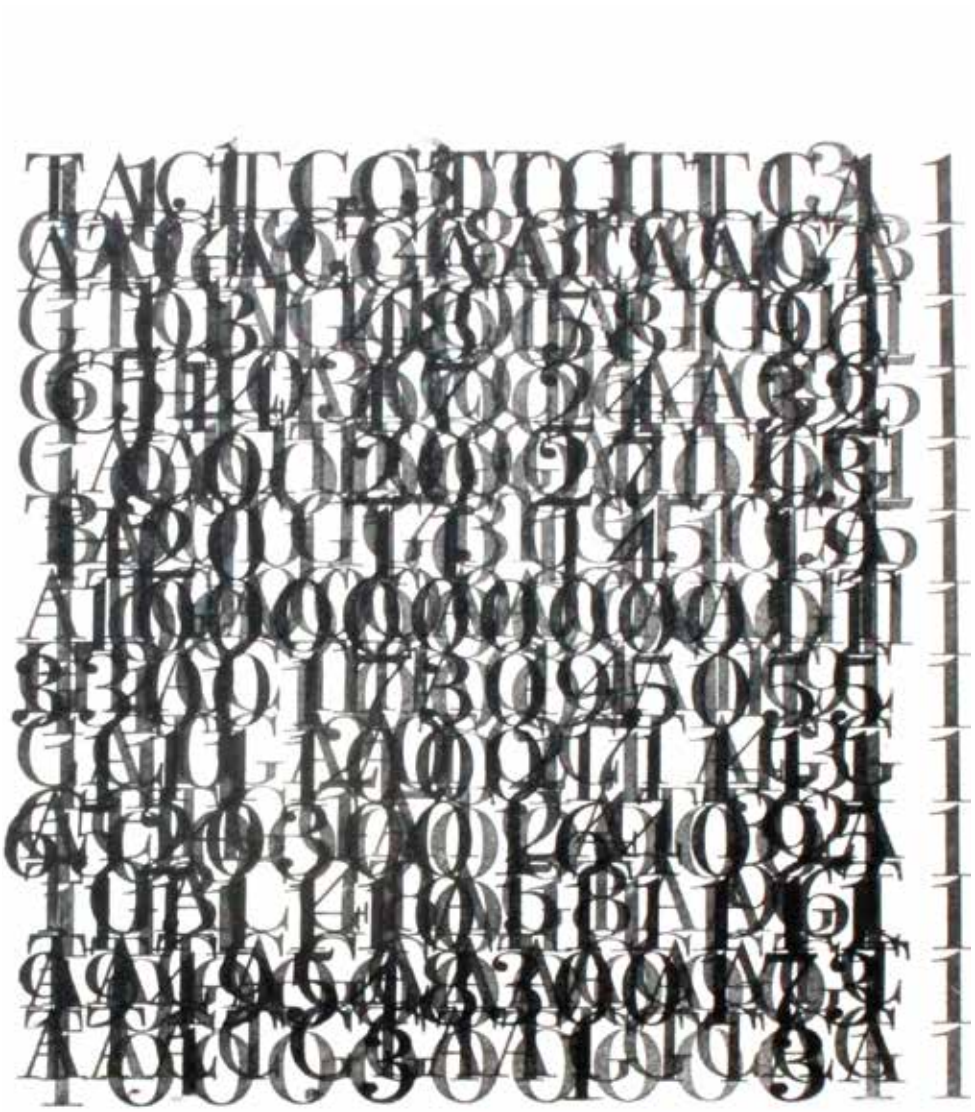
Prof. George Efstathiou

In 1905 Einstein developed the special theory of relativity which changed people's perceptions of space and time. Ten years later, Einstein added gravity and came up with a general theory of relativity. I will try to explain these ideas and their relevance to everyday life. For example, some of you will rely on Einstein's theory of gravity to get to the venue.

Creative Reaction

Calabi Yau Manifold

I drew inspiration from last year, when I produced a work based on an electron microscopic image that revealed a cracked, dusty reality that contradicted the clean euclidean diagrams produced by science to describe the material world. This year I have applied that same idea to the universe that cosmologists describe.



I work cross-discipline, and collaboratively, taking inspiration from scientific practice that embraces concepts of data, code, rekindled history, technology and environment concerns and rephrases them from an art perspective. Installation, projection and sound is my preferred media, working with live performers to make the work increasingly immersive, surprising and relevant.

The Science

Chemical Characterization of Extrasolar Planets

Dr. Nikku Madhusudhan & Ryan MacDonald

New instruments and other astronomical advances have enabled an unprecedented rate of exploration and revelations concerning the chemical compositions of exoplanetary atmospheres, interiors, and their formation conditions. We will discuss developments and future prospects of this new frontier, from detections of water vapour in exoplanets, the first hints of volcanism on a super-Earth to prospects of studying habitable exoworlds.

Creative Reaction

Exoplanets-Research/Exoplanets-Star Exoplanets-White Noise

I have really enjoyed meeting with Dr Madhu Madhusudhan and Ryan MacDonald who have passionately shared their current research into exoplanets with me. I particularly enjoyed their problem solving approach, process and ingenuity that resonated with my own engineering background as well as my art practice. Madhu and Ryan are highly skilled and creative. Taking a small detail of data, almost hidden within 'white noise', they gather, refine, reform and rephrase the information into a big idea; the high probability of habitable life on planets beyond our solar system! This research prompts an emotional reappraisal of how we think of ourselves as not alone in the universe as well as a rational one. During our second meeting, we conceptualized a 'matrix' design that summarized the research methodology and key data from a conceptual perspective and this became the inspiration for the work I have produced.

Beautiful Mind

Charlotte Morrison

Most of my work has a starting point in our relationship with the body. I am particularly interested in the complex dynamics between body and mind, perception and knowledge. I work with kiln fired glass and porcelain, in wax and on paper – most often creating small interchangeable compositions of works.

The Science

Sex, love and the puzzles of sexual orientation

Gu Li

Are there differences between men and women as they develop a sexual orientation? This talk will explain how sexual arousal may influence a man's sexual preference and the role romantic love may play in a woman's description of her sexual orientation. It further considers the expression of sexual orientation among girls and boys during early adolescence, when sexual impulses are more subtle compared to the later stages of life.

Creative Reaction

Unfolding

Sexual identity as we understand it today is not a straightforward subject. And as it turns out there are probably no simple answers either. What is certain is that there is plenty to explore – both within science and art. The collaboration between Gu and I has resulted in artworks which visually explores sexual development and our capacity for having different sexual identities. However, it is done though imaginary flowers – each one a different colour combination – each one with its' own developing, changing and unfolding "personality". In the Pint of Science exhibition the flowers appear in both collagraph prints and kiln formed glass. They may be identified and labelled, combined and paired in a variety of ways. Instead they are presented as an eclectic collection celebrating diversity and change.

I am a filmmaker and an obsessive collector of hands. I collect horse brasses, hand of Fatima charms, soap dishes, bottle openers, anything in the shape of a hand. Hands are our workhorses but possess magical powers to ward off the Evil Eye.

The Science

Love and war: hormonal influences on the human brain and behaviour

Richard Bethlehem

Testosterone is primarily known as the hormone involved in male dominance, aggression and sex. Oxytocin, a hormone released in childbirth, was dubbed the 'love drug' by the media due to its reportedly positive effect on social behaviour. In my talk I will touch upon the way in each of these hormones leaves a footprint on how are brains are shaped and how they influence our day-to-day lives.

Creative Reaction

Unfolding

Richard Bethlehem's research looks at the effect of the neuropeptide oxytocin - which is associated with feelings of love and trust - on people on the autistic spectrum. In his experiment the subjects are given oxytocin or a placebo control. They are then shown photographs which suggest pain, whilst their brains are scanned in an MRI scanner. The photos show close up hands or bare feet: a hand about to be hit by hammer, caught in a car door, or holding a broken glass.

The subjects are asked to imagine firstly that the hands and feet are their own, then someone else's. The experiment is to see whether oxytocin affects feelings of empathy. Inspired by the montage scene in The Parallax View, a 1970's thriller, images of caring mothers, strong fathers, patriotic gatherings, political leaders are intercut with single words: LOVE, COUNTRY, MOTHER, FATHER. The images change to ones of violence and cruelty, but the words remain unchanged.

In PARALLAX-Y-TOCIN, I edited together the actual photos used in the research to place the viewer inside the MRI scanner.

Beautiful Mind
Dr Kate Grant

Kate in fifty words: Doctor, Artist, GP, Drugs & alcohol service, Homeless clinic, Family planning, Sexually transmitted diseases, Watercolours and mixed media, Seascapes and children's portraits, 8 years Stellers Gallery Florida, 8 Non-profit events USA and UK, What's next: Bluebell Inn Hempstead, painting a mission trip to Romania, more seascapes, more portrait.

The Science

Speech perception and misperception

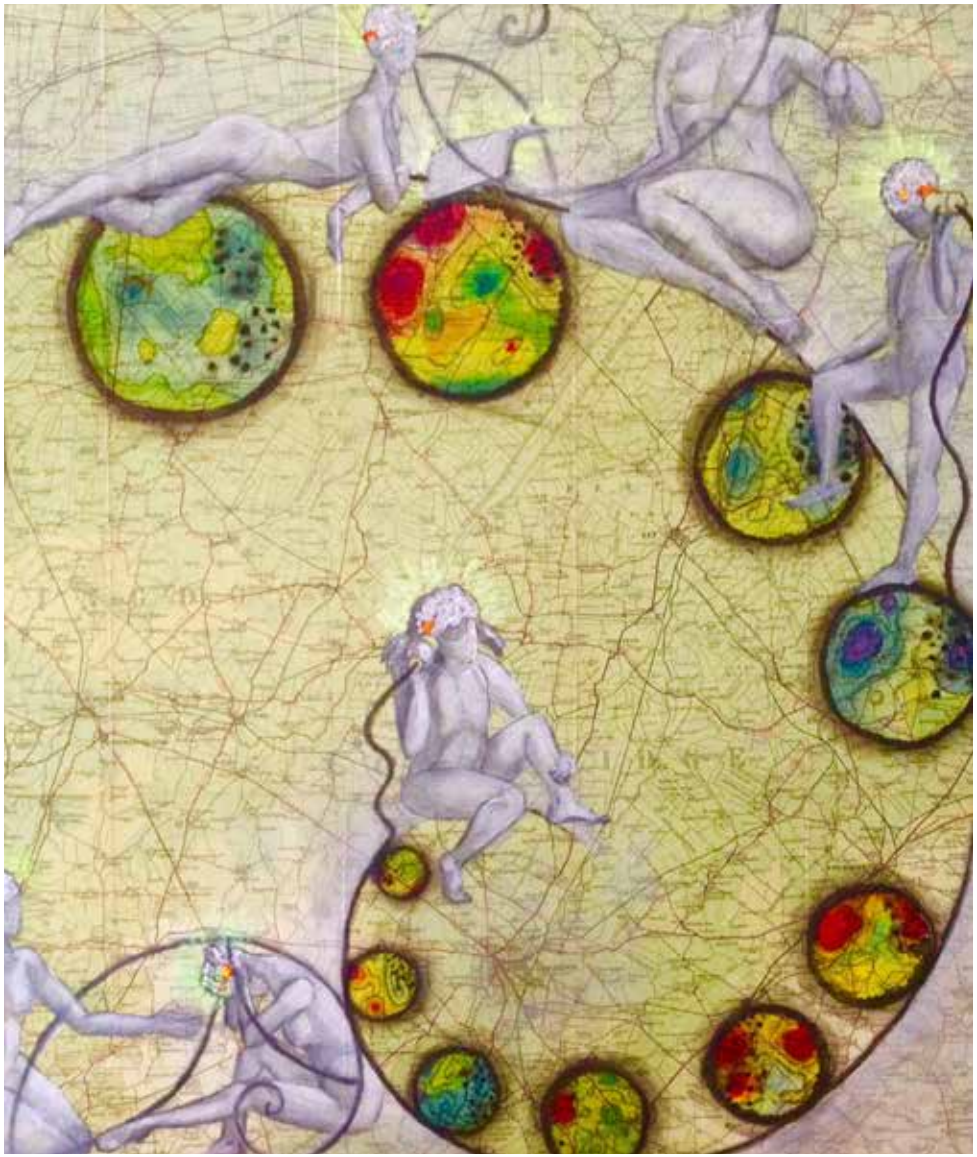
Dr Matt Davis

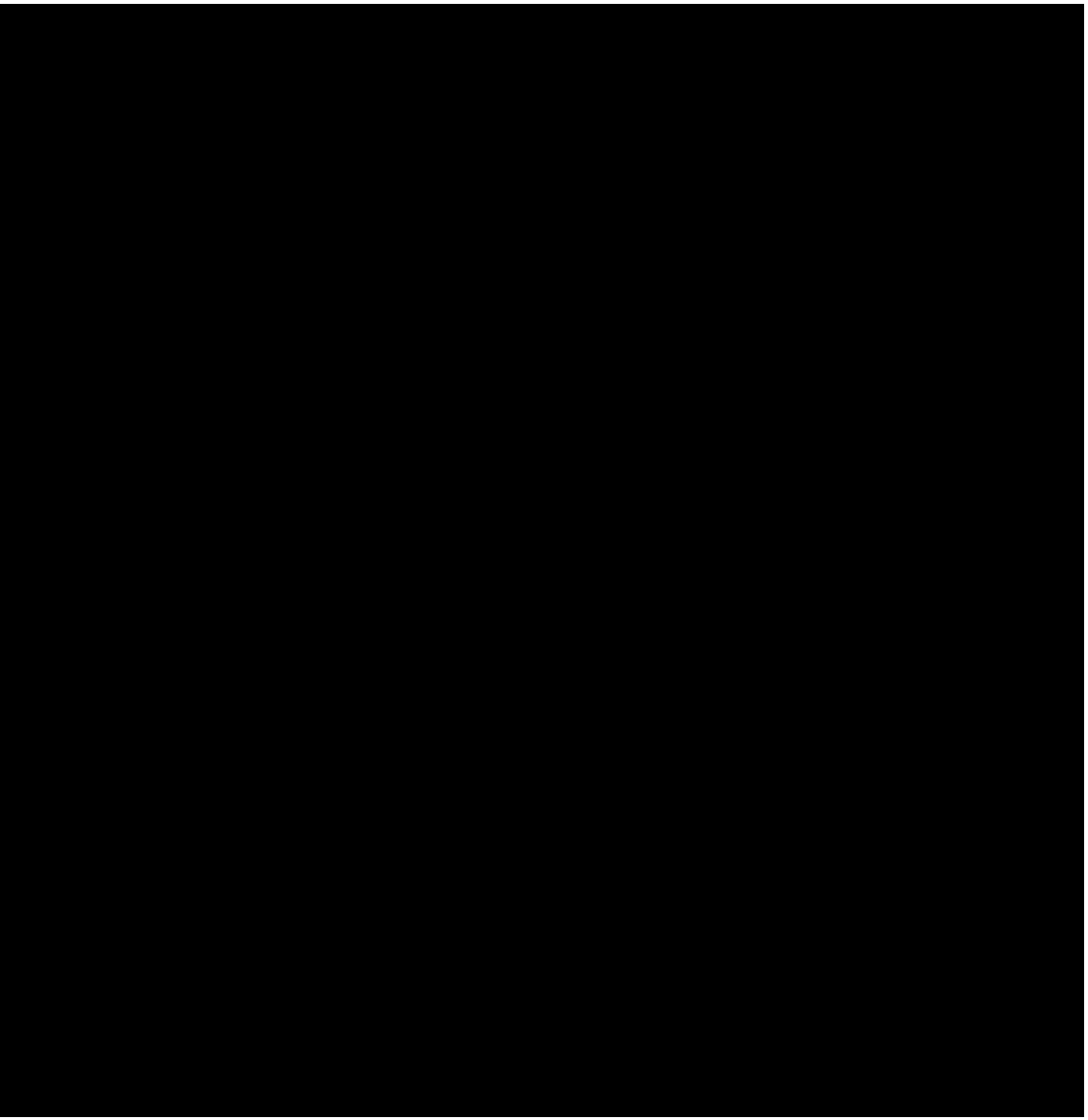
Human listeners are much better than machines at perceiving and comprehending speech. This is particularly true when we hear speech that is degraded, ambiguous or spoken in an unfamiliar accent. In this talk, I'll explain what we know about how the brain processes speech. I will also play some auditory illusions that illustrate when and how perception of speech succeeds or fails.

Creative Reaction

Sounds like love to me

I was excited to be paired with Matt, and we discussed his research on misperception of speech and the distortions that can interfere with our understanding. It's incredible to realize that in split seconds, our brains can make sense of what we hear from multiple sources of information. To me, there is no division between art and science. I love that equations can be represented graphically,and that logarithmic curves, exquisite geometry and Fibonacci patterns that can be found in art, nature and science, from DNA and embryos to galaxies. I combined images of the human body, the brain, cochlea, communication, and the beautiful images and graphics generated from Matt's research,scans, and data. My Creative Reaction has layers of information, to make you work to perceive what you are seeing, but all harmonised using the Golden Section /spirals, also called the Divine Proportion or God's Fingerprint.





I use the techniques of Narrative Therapy to 'describe, examine, evaluate and change problem saturated dominant stories, as I encounter them. Through this approach, I seek to deconstruct the perceived limiting structures around me in order to emancipate myself (and others) from their oppressive qualities. More than merely using these ideas in the content of my work, I push against traditional uses of the chosen mediums, in order to reconstruct the forms at my disposal. In doing so I attempt to turn the viewers into active collaborators.

The Science

Deciphering Addiction

Dr David Belin

Human listeners are much better than machines at perceiving and comprehending speech. This is particularly true when we hear speech that is degraded, ambiguous or spoken in an unfamiliar accent. In this talk, I'll explain what we know about how the brain processes speech. I will also play some auditory illusions that illustrate when and how perception of speech succeeds or fails.

Creative Reaction

Transmission

Sarah Harley uses print, textiles and installation to explore aspects of human relationships and is currently developing an ongoing project about neuroscience exploring the complexity and mystery of the human brain.

In response to Dr. Chennu's work with coma patients Sarah was moved by the search and investigation into the brains of people who are otherwise unreachable which shows the value and care we place on human life and relationships.

Her embossed print, 'your unknowable thoughts' is taken from a collage of found textiles referring to the fibrous networks of the brain. It requires close inspection to be seen and explores the loss in relationship between a coma patient and their loved ones as well as the place of 'unknowing' where scientific and artistic endeavour begins. The gold frame denotes the value and care of human life within Our Society and the love we feel for one another in personal and family relationships. Sarah Harley's mixed media piece entitled 'the search for your spark' presents a peaceful sleeping head in water unreachably encased in a thick glass jar. The threads attached to the head look like EEG wires but float and move gently up and around the head among fragments of gold leaf referring to the sparks of brain activity and thoughts of a person in coma. Although the head exists in a separate underwater space by shaking the jar we can interact causing movement and response within that world.

Beautiful Mind

Rebecca Lindum Greene

My images, informed by circumstance, personal experience and interdisciplinary thought, exploring and questioning the boundaries of the world we live in are inspired by Nature, all things creative, organic & good. I play with words, images and objects; the works are a mixed media illustration of my view.

The Science

Deciphering Addiction

Dr Jan Freyburg

During most of our lives, you walk around fully trusting what you see. Every now and again, you can't quite believe your eyes: maybe something seems too beautiful, or someone is tricking you with an illusion. You question your eyes. But what happens when your eyes and your visual system cannot determine what you are seeing? I'll talk about what happens, and how we can use it to study the brain.

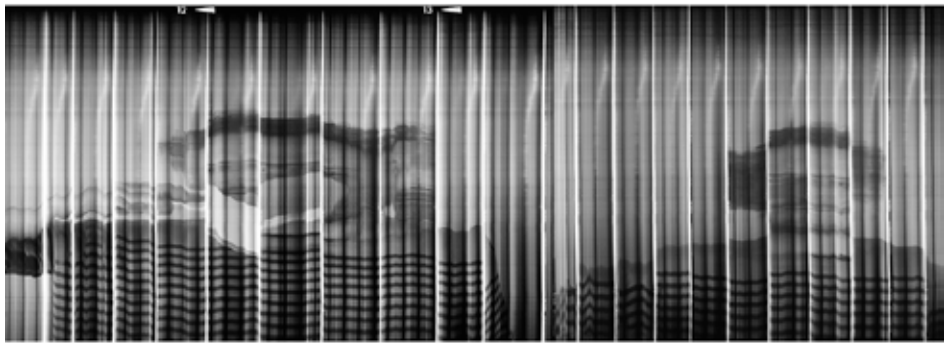
Creative Reaction

Beautiful Mind, a Pivotal Illusion I-IV

Skyping with my collaborator in early April. I was struck by the event as I sat before my computer talking with Jan who likewise, sat at his device. That information, our conversation both visual and audio, was compressed in to electronic particles and transmitted across the World Wide Web of binary communication. I learned about his research in vision, particularly in relation to Autism and it led me down a rabbit hole of 'thought experimentation'. This journey took me through a world of acceleration: a mass media of words and data, communication on information highways, articles and ideas, images and research, like flashing road signs as you speed by. It led me to a situation of sensory overload and a realisation that for many with abject Hypersensitivity, it is a world of confusion. In the search for Homeostasis, I was left drawing back to white noise.

Beautiful Mind

Tiina Teaspoon



For my work as a fashion lecturer and in my personal practice I think about what creativity is and how it can be encouraged, focusing on sustainable design and analogue techniques. My work has been collected and exhibited internationally, and I have published two books of photography.

The Science

Some drugs are smarter than others

Dr Muzaffer Kaser

Amongst all drugs that change brain function, those that boost cognitive abilities such as concentration and memory, are unique relative to their potential impact on society. The recent surge in the use of smart drugs raises many questions. Are they safe? Should all people be encouraged to take them, or only certain professionals? This talk will explain how smart drugs work in the brain. I will also discuss their potential in helping people with depression.

Creative Reaction

Enhanced family

Photography has long been used to capture and help in the recollection of memories of those close to us. I am creating a series of enhanced family portraits; improved using experimental analogue techniques including slit-scan photography and caffenol film developer.Smart drugs are also called Nootropics - from the Greek for 'mind' and 'to bend or turn'. I have adapted two film cameras to take images whilst film moves continuously past a narrow slit inside the camera. This combination of time and movement enables me to distort the conventional process of film photography. As part of this project I'm testing an unusual film developer - caffenol. The main ingredient of this recipe is one of the most well known cognitive enhancers - coffee - showing its usefulness beyond keeping us alert and awake.

I studied fine art at university in Ankara, graduating in 2002. In the years following I taught art in private schools in Ankara and Istanbul. Since moving to Cambridge last year I have founded Urban Sketchers Cambridge and been involved in numerous art projects and festivals. My work for the Pint of Science festival is a mixed-media collage.

The Science

Judging personality:
Are computers and humans comparable?

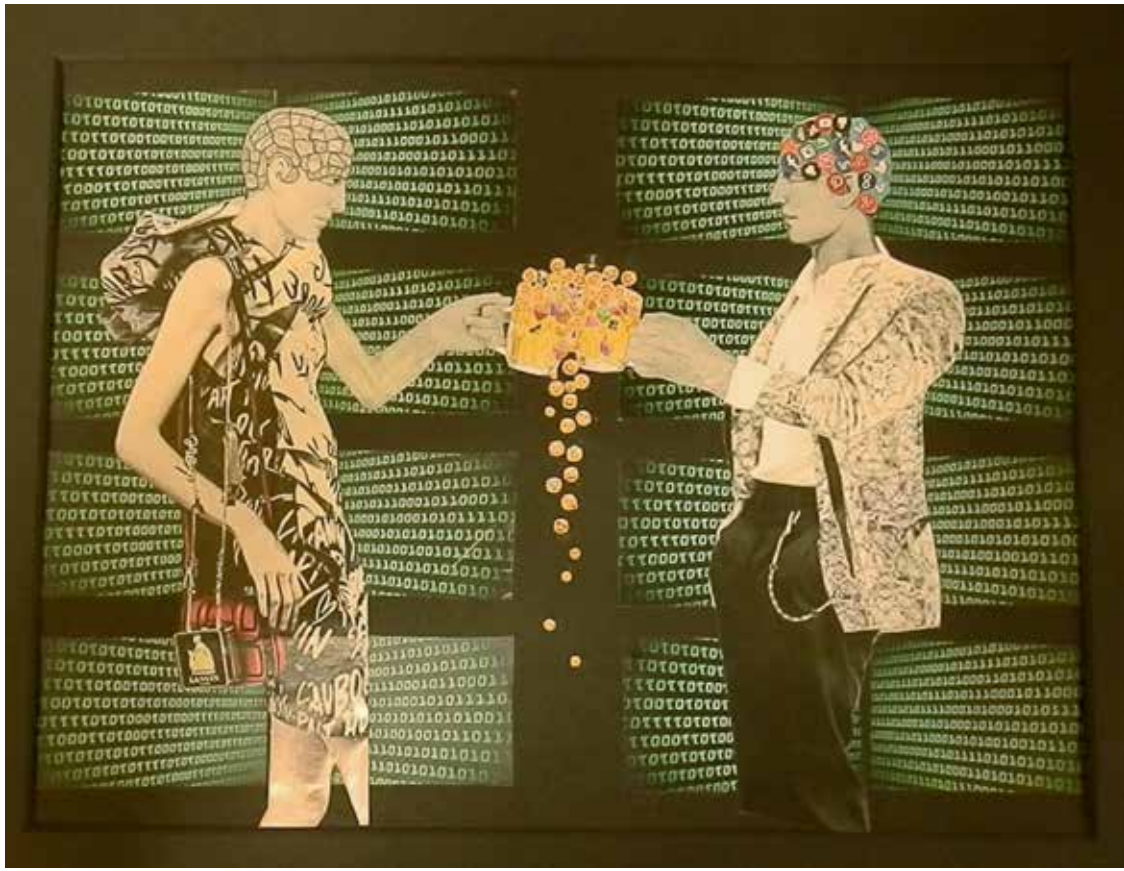
Youyou Wu

Our research examines a computers' ability to make personality judgements – a ubiquitous and important social-cognitive activity. We find that personality judgements made by computers based on digital footprints (Facebook Likes) are comparable to those made by romantic partners. The ability to accurately assess psychological traits occupies an important milestone on the path towards more social human-computer interactions.

Creative Reaction

Skol!

In this A3 mixed-media collage I contrast the assessment of psychological traits based on the once popular pseudoscience of phrenology with the current research on digital footprints to illustrate the conclusion that personality judgements made by computers can be comparable to those made by romantic partners. its usefulness beyond keeping us alert and awake.



Sue Smith is a Cambridgeshire artist working in watercolour, acrylics and coloured pencil. Member of Cambridge Urban Sketchers.

The Science

Seeing food: perception and deception when choosing what to eat

Dr Suzanna Forwood

Choosing what to eat is one of the more common choices we make... and we typically rely on what we can see and remember about a food to tell us important things we need to know to make a choice. This talk will show you some common illusions in food choice –and how you can use these illusions to eat indulgently and with fewer calories.

Creative Reaction

Fresh & Tasty

My piece is a response to the work of Suzanna Forwood and her investigation into how we perceive food as healthy or unhealthy. I have attempted to show how we are conditioned by packaging, display and context by playfully looking at our expectations and associations surrounding our food choices.

Our Body

Barbara Nasto

I studied at the Arts Students League in NYC and learned color theory from Arie Alexander Galles, while completing an undergrad degree in biology. Working as a science writer for over 20 years, I often draw on artistic and visual concepts to convey complex ideas. I run the Wednesday evening life-drawing group at King's College. It was in the 1990s when I first encountered Sir Roy Calne and his research while covering transplantation for the Nature sister journals.

The Science

Organ transplantation: then and now

Sir Roy Calne

Pioneering the practice of liver transplantation invited a number of challenges. Even, my successful preclinical experiments had met with a degree of skepticism. I will describing the challenges of human biology that have been partially overcome and those that persist in the present day. A bit of biological science relevant to transplantation will also be explained. In light of recent scandalous events, the important question of credibility, will also be explored.

Creative Reaction

On parts once thought irreplaceable

A visual history of organ transplantation, this collection of paintings highlights Sir Roy Calne's landmark discoveries and accomplishments. Calne performed the first liver transplant in Europe, here in Cambridge. Even more remarkable, Calne's research was instrumental to introducing the clinical use of azathioprine, and later cyclosporine; two drugs that curtail the destruction of a donor organ by the immune system. The use of azathioprine made survival following a liver transplant a long-term endeavour. And, cyclosporine ushered in the modern era of immunosuppression therapy. Transplantation changed society's view of the body. The images combine old and new attitudes to transplant organs. Enigmatic colour combinations translate historical illustrations, taken from 16th, 17th and 18th century ana-tomical atlases, into a modern context by. The colour variations applied for each type of organ convey that transplantation now offers options to many who suffer from terminal conditions. Vibrant colour is also a prominent feature of Calne's own fine-art. A prolific artist, Calne routinely paints, draws and sculpts. While a practicing surgeon Calne painted portraits of his patients, "That way you could become friends," he explained while discussing a child's portrait he had done.

The slide is a linocut with decoration and colours based on a victorian label design, with the 'specimen' area showing a stylised petri dish culture plate streaked with a bacterial culture and a zone of inhibition of the bacteria surrounding an antibiotic-containing disc in the centre (a routine laboratory way of testing bacteria for susceptibility to a particular antibiotic). Within the zone of inhibition is one surviving 'resistant' bacterial colony, illustrating the selection of a resistance mutant with the potential to lead to a drug-resistant strain.

My work is strongly research based, usually beginning with a social, political or environmental issue of concern. I rarely confine myself to one art form and often move from one media to another, being primarily led by the subject matter. I enjoy making evident the artifices of different media and the links between them, for example painting from photographs of a film shown on television and including the screen's frame and the lines of interference produced on the camera. I particularly favour painting and drawing, but also produce text based work, photography, sculpture and textiles.

The Science

Until the rains return

Dr Peter Bull

Every year there are about 200 Million cases of malaria worldwide leading to over 400,000 deaths. Why has it been so difficult to get rid of malaria? One reason is the ability of malaria parasites to live within humans for long periods without causing disease. Through research on the biology of malaria parasites we are learning to understand how they do this by modifying the behaviour of our red blood cells. We hope that this understanding will lead to new interventions against this extremely clever parasite.

Creative Reaction

I have really enjoyed the opportunity of working with Peter Bull. He has been generous with his time and knowledge and we have met weekly for the duration of the project. Our conversations have ranged in topic and scale from the similarities and differences of our working methods, to genetic coding and probability, the 'cleverness' of the parasite plasmodium falciparum and the human cost of Malaria. It emerged that we both cared deeply about the latter problem and the poverty and inequality that allows malaria, a potentially preventable and treatable disease, to still cause hundreds of thousands of deaths each year. I found the science fascinating if sometimes taxing and the work I created as a result of our discussions is partly about our communication and the conveying of messages, but also contains dual themes concerning both the science and politics of malaria.

I specialise in the production of 3D science images, for print or TV. I have a PhD in engineering from the University of Cambridge, and previously studied natural sciences so I have a broad range of technical knowledge from science and engineering disciplines. This means that I can communicate scientific concepts accurately and with the minimum of fuss. I have been working freelance for the past five years, using Lightwave and Modo, and have produced animations and print images for a range of companies from Blue Peter to Real Madrid!

The Science

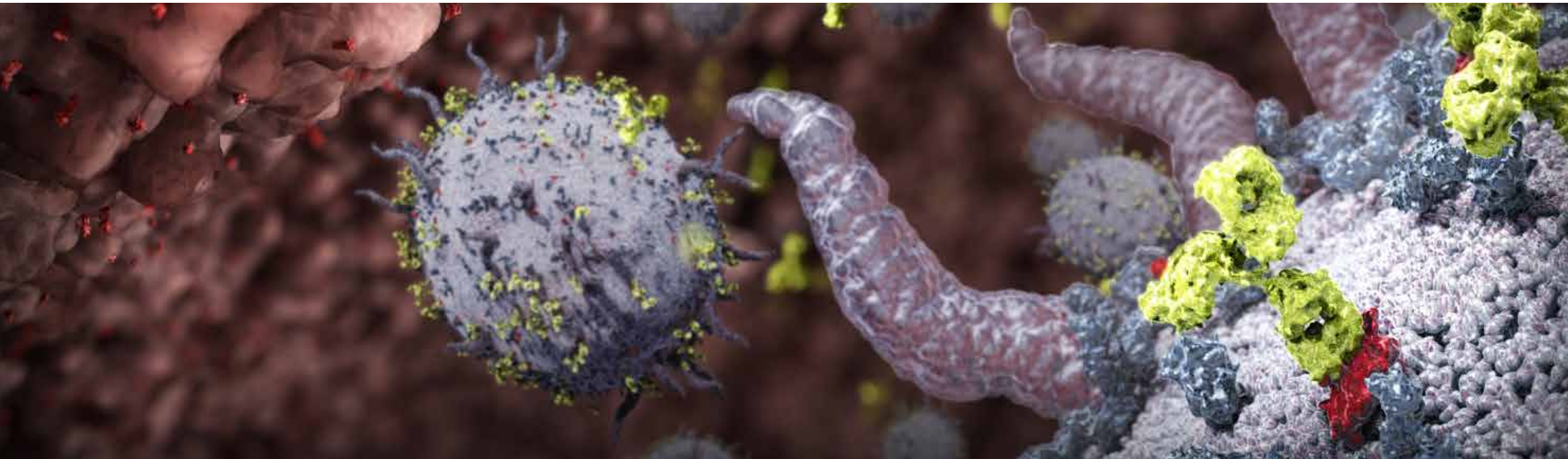
Checkpoints and cancer revealed

Dr Ross Stewart

Cancer cells exploit immune-system checkpoints or safety switches that normally prevent the immune system unleashing an aggressive response against the body's own cells. New therapies, known, as checkpoint inhibitors, restore the immune system's ability to detect and destroy cancerous cells. I will describe key checkpoints, new therapies developed to target them and some of the challenges that still exist, most notably the effective selection of patients likely to benefit from these new and effective therapies.

Creative Reaction

The image shows multiple levels of the action of a T-cell, which is part of the body's immune response. The foreground focuses on the surface proteins on the T-cell which are used by the body to recognise foreign or cancerous cells. Cancers can over-express surface proteins (shown in red) which suppress T-cell activity, in order to escape detection. Some anti-cancer drugs (shown in yellow) disrupt this route by binding to but not activating the receptors, blocking the cancer's attempts to fool the T-cell. The image depicts multiple T-cells and cancer cells, and the soup of chemicals competing to win control of the T-cell. The image has been made using real protein structures obtained through x-ray crystallography through the Protein Data Bank. It was been created using VMD, Modo, After Effects and Photoshop.



I am a creative designer specialising in animation and children's illustration.

The Science

Insights into Epigentics

Dr Wolf Reik

Epigenetic modifications such as DNA methylation and histone marks are often relatively stable in differentiated and in adult tissues in the body, where they help to confer a stable cell identity on tissues. The process of epigenetic reprogramming, by which many of these marks are removed from DNA, is important for the function of embryonic stem cells and in reprogramming stem cells from adult tissue cells. When this erasure goes wrong there may be adverse consequences for healthy development and ageing, which can potentially extend over more than one generation. More details to follow.

Creative Reaction

My creative reaction for the work on epigenetics at the Babraham institute is a lively abstract graphic image using paint and cut out technique. My art piece is inspired by the fibro glass slides on stem cells I viewed at Dr Reik's Laboratory. I was also inspired by the the team I met there. I wanted to show this in my piece using humour to demonstrate the tremendous task of the study of the tens of thousands of stem cells. I had a great time at the lab. It was very exciting and I hope I have reflected this in my work.

I am a multidisciplinary designer (graphic, web, interior, furniture). Addicted to drawing, art, internet and sweets.

The Science

Interactivity in Science Outreach

CHaOS
We will be discussing the benefit of hands-on and engaging science outreach. And, of course we will also engage the audience on the topic with examples and demonstrations.

Creative Reaction

Pint+Science+Art

When art meets science (literally!)

I was born in Sardinia, a wonderful island were I spent my childhood drawing, reading books and dreaming about travelling around the world.I lived in many different cities such as Milan, Bologna and Edinburgh, where I studied psychology and art psychotherapy. I currently live in Cambridge, where I work from my studio as freelance

The Science

Arms, armour, and self-defense in renaissance Florence

Victoria Bartels Miller

In 1584, artist and writer Giovanni Paolo Lomazzo wrote that "merchants and bankers who have never seen a drawn sword and who should probably appear with quill pens behind their ears, their gowns about them and their day-books in front of them, have themselves been painted in armor holding generals' batons." As Lomazzo's quote implies, arms and armor were no longer reserved for the battlefield in XVIth Century Italy. Using records from the city's state archives and other sources, my talk will investigate both the cultural and practical significance of arms and armor in Renaissance Florence.

Creative Reaction

I' m Sexy and I Know It

In the culture of sixteenth-century Italy and Germany, arms and armour were status symbols and strong indicators of power and masculinity. I played with this concept to illustrate a man showing off his flamboyant armour and sword, in a very fashionable way, as if he was about to take a selfie and post it on instagram.

Began his working career as a recording engineer in Chappell's Studios in Central London and then moved on to work with putting music to film and images. For a time he was writing and recording the music for McLaren / Mobil 1 motor racing but most of the compositions he does now are for technology related videos. For many years he owned and ran the High Barn music venue and studios in Great Bardfield, Essex. He is a member of the band Two Coats Colder. He is also a software developer and new technology consultant, working with 3D Virtual Worlds.

The Science

Ambition for all pupils - Cultivating Curiosity

Guy Underwood

Education led by-enquiry inspires students. We are developing a common sense; values-based approach to improving pupil outcomes and fostering independence. Ensuring pupils are engaged and enriched augments the development of resilient, co-operative, responsible and respectful pupils. In turn, these students will be enabled to enter the next phase of education with the ability to maximise the increased opportunities within and outside the education system.

Creative Reaction

Curiosity

The human race has made huge advances in some areas. Our curiosity and ambition has led to many marvellous creations and possibilities but we need "right to left thinking". We need to think about the outcomes that we are seeking to achieve and that means looking at the big picture. This is the type of inspirational thinking that Guy and his colleagues are encouraging at Great Abbington Primary School. The work is intended to be thought provoking rather than informative whilst reflecting some of the challenges we face.

Our Society

Garance Monfort

Over the past 15 years, Garance Monfort has documented her responses to the immediacy of her surroundings and culture by sketching, drawing and writing poetry while travelling. Garance Monfort was born in Cherbourg, France. She began to study art in 1996 under the tutelage of her grandfather, a renowned painter who shared a passion for art. She learned a diverse range of art techniques, from watercolour painting to etching, wood and linocut printing. A medium that she uses still today. She graduated from the National Fine Art School of Cherbourg, where she explored working with traditional and new media, and the National Superior Art School of Rouen.

The Science

Conveying Abstract Science to Kids

Philip Stephenson

I will demonstrate how we approach helping young learners to understand scientific concepts that may seem abstract or counter-intuitive. For example, the idea that air has substance (mass) in the same way that liquids and solids have substance, only the substance or mass of liquids and solids is more obvious.

Creative Reaction

From little things big things glow!

For the Creative Reaction project, Garance has develop a technique of black and white monoprints, which have the particularity of glowing in the dark. The pictures and characters she creates are often humourous and anecdotic, with striking visual contrasts. She likes to illustrate and give life to animals or everyday objects and gives them a poetical dimension. This year's Creative Reaction she will be playing with air, water and words, illustrating some simple physic principals, whilst the scientist matched with her will be demonstrating how we approach helping young learners understand scientific concepts that may seem abstract or counter-intuitive. model this by looking at the idea that air has substance (mass) in the same way that liquids and solids have where this "substance" is more obvious.

My mixed media works are vibrant, often satirical comments on human nature and the life we have created for ourselves. They explore values and behaviours that have become entrenched in our collective conscience and the consequences and limitations they entail. The starting point is, however, almost always randomness.

The Science

Size Matters: Environment and Unhealthy Behaviour

Professor Theresa Marteau

The talk will highlight my work on identifying the cues in our environments that elicit unhealthy behaviour (consumption of tobacco, alcohol, food and sedentary behaviour), often without our awareness. I will focus on Size as a cue to overconsumption and discuss how we can "downsize" our environments.

Creative Reaction

(We Need) All The Love and Support We Can Get

Where there are consequences, there were actions. Where there were actions, there were motivations. It's the motivations that are the interesting bit. Consequences are merely symptoms. And it's motivations that I want to explore in my Creative Reaction. At the time of this guide's compilation, the exact format and dimension of my artwork are yet undecided. At this point there is the motivation, with the action waiting in the wings. The 'consequence' will be on show at the final Pint of Science exhibition and online at www.manuelahubner.com.

Our Society

Simon Prescott

I' m a Cambridge based Artist, Illustrator and children's book author. I work in a wide range of mediums from traditional to digital, 2-D and 3-D. My work is mainly narrative and figurative. I aim to put depth, drama and humour in my work and explore social/political issues.

The Science

What is in Flame?

Girish Venkata Nivarti

Over the last century, fire has propelled our journeys on and beyond the Earth. Yet, we continue to have but a fledgeling grasp on, even, a candle's flame. And when turbulence joins for a ride: all hell breaks loose! Today, with supercomputing and laser diagnostics, we are equipped to address age-old questions about turbulence and fire. I will raise one such question to illustrate how differently we see fire today!

Creative Reaction

Good servant/Bad master

As humans our ability to make and use fire is unique, it sets us apart from other species. Fire is a powerful elemental force that we have harnessed - it cooks our food, allowed us to fashion metal tools, and propels us beyond our planet. It's great destructive power can also bring new life. The ritualistic acts of fire making, burning candles, funeral pyres and bonfires stretch across human history. We sit around the campfire as our ancestors did. Although we have harnessed this elemental force we still know little about how and why it does what it does. I want to explore these themes for my creative reaction: the rich symbolic history of fire and its physical properties, how the flame itself can be used as a tool of mark making on a surface, or to illuminate an image.

Our Society

Susan Abbs

My art is all about capturing light and colours. I was born in sunny Singapore but have been living in the UK for over 20 years.

The Science

Are Your Genes to Blame When Your Jeans Don't Fit?

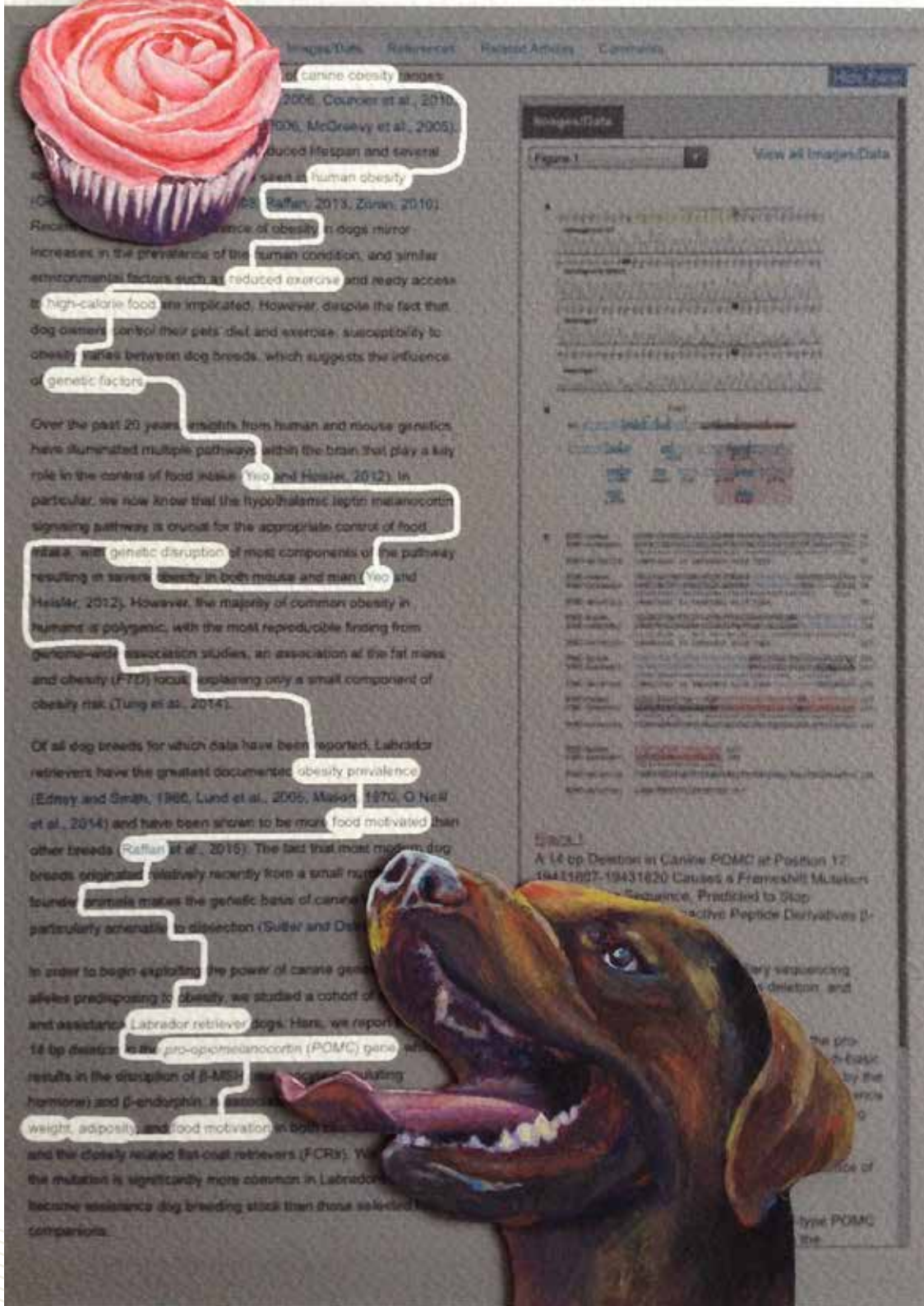
Giles Yeo

The recent increase in obesity is due to dramatic changes in our environment over the past 50 years. However, not all of us are obese. Genetic differences mean we respond differently to the environment, allowing us to use genetics as a tool to understand the mechanisms underlying obesity. Some of us are slightly more hungry all the time and so eat more than others. In contrast to the prevailing view, obese people are not bad and lazy; rather, they are fighting their biology. Society has to accept this, before we can form successful strategies to tackle this largest of public health problems.

Creative Reaction

It's All In The Genes / FLabador

In my creative reactions to Dr Giles Yeo's work, I want to show how much more of a struggle it is for some people to say no to food due to their genetic makeup. My principal artwork is an ornamental, almost wallpaper like painting, where slim figures leap over temptingly gorgeous cupcakes with ease. And when you take a closer look you will notice overweight figures, struggling and unable to remove themselves from the midst of the cupcakes. In his research, Dr Yeo has found that Labradors have a genetic variant which makes them eat constantly. I portray this food obsession by using one of his research papers as the background, linking a labrador to food.



Our Society

Tony White

I am a painter and printmaker. I am drawn to shapes and textures in my work, from painting abstract-based pieces using layers of pure watercolour to relief printing using found textured surfaces such as wood and stone. I also employ solar-plate and collage techniques.

The Science

Watching the machinery of life at high resolution

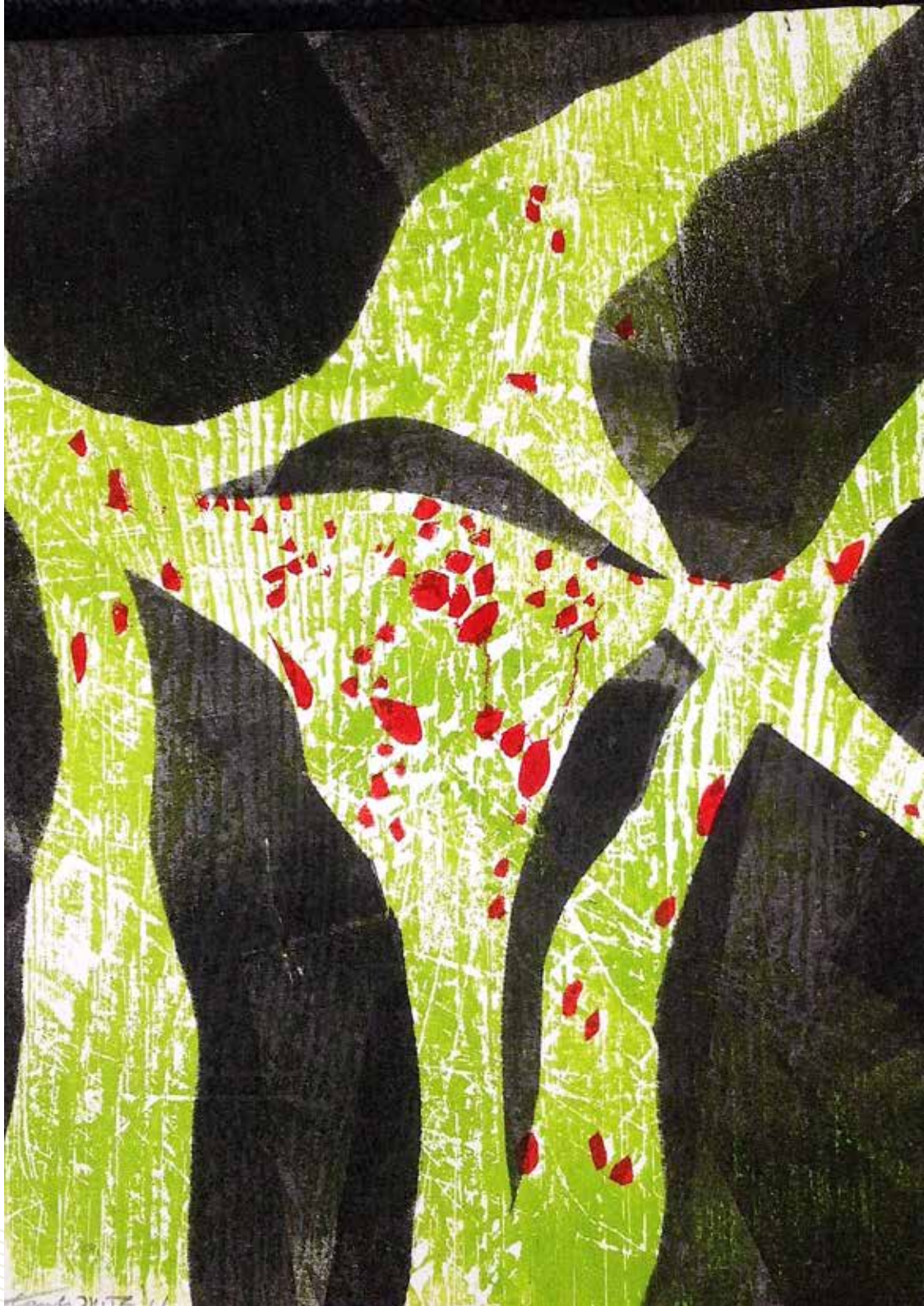
Professor Clemens Kaminski

Cells, the building blocks of life, are unbelievably sophisticated, and busy, in their effort to keep us alive and healthy. Recent advances in light microscopy permit us to watch the processes going on in living cells with a detail unthinkable only a few years ago. In this talk I will discuss such methods, permitting us to see things in cells that are much smaller than the wavelength of light itself. I shall show how we use such methods to gain a better understanding of diseases that cause brain cells to malfunction, for example in Alzheimer's and Parkinson's diseases.

Creative Reaction

Resolution Revolution-I/ Resolution Revolution-II

It was inspirational to see images of the processes taking place inside neurons which are responsible for Alzheimers disease. The evolution from simple light microscopy to current methods allows a resolution of images at a level hitherto impossible providing startling imagery along with revolutionary prospects for research and medical solutions. My creative reaction seeks to capture such imagery. One of my companion pieces, in square format mirroring the traditional microscope coverslip, comprises a depiction of the stark and sharply focussed clumps of amyloid protein assembled inside neurons and responsible for disruption of cellular processes in Alzheimers sufferers, achieved through printing from the surface of wood and overprinting through stencilled shapes. The second piece shows, through an under-exposed photopolymer relief plate a poorly resolved image of diseased neurons and the concept in lettering of the current revolution in resolution of such images.



Irene Wilkes retired from a career in Information Technology and then entered the world of Art. She is a painter who uses mixed media, including acrylics, water mixable oils, water colour and oil crayons, as well as pencils and charcoal. She uses different collage techniques including digital collage.

The Science

Ice, Climate, and Sea Levels
Cold Facts vs. Hot Air

Professor David Vaughan

The Larsen Ice Shelf extends along the east coast of Antarctic Peninsula. The Shelf was, not very long ago, a series of three shelves that occupied distinct embayments along the coast of Antartica. Two have collapsed and the third is thinning from above and below. During the talk I will explain the relationship between ice-sheets and glaciers and what it means to the sea levels and coastal cities.

Creative Reaction

Ice

Irene Wilkes is influenced by her surroundings in her beloved, adopted home of Cambridge. Her own garden, the old town, the surrounding countryside and coastal landscapes are the starting points for her designs. She uses her experience in Information Technology to design multi-layered representations of real objects, refining them until they border on abstraction. Her whole aim is to produce artworks which have depth of interest, are eye catching, and have a narrative. Irene loves a challenge and is open to commissions of all types.

POEM: DEEP CAUSE, SHALLOW CONSEQUENCE

"I will arise and go now, for always night and day
I hear lake water lapping with low sounds by the shore;
while I stand on the roadway, or on the pavements grey,
I hear it in the deep, in the deep heart's core"

W.B Yeats

So we're learning of the layers of force going on
underneath this natured and sometime de-natured planet
with the coscos and nasco plates
smashing and colliding
slamming hard with advection - currents?
plume-ridge interactions forcing
into the deep mantle flow
...

This is a neuro-earth topography
along such postulated locations
and the deep mantle flow
...

In the hard fibrous softening
of the human heart
ever seeking transcendent redemption
we're seeking love and warmth
and knowing
not really ever knowing the power
beneath, and the depth down there
as plume mantle's force ever upward
...

here's the roiling subduction zone
the planetary brain
a retinal view boiling ever up
into seismic velocity
emerging through caldera's
and showering .....

...

there's a link, I'm told
between the zoological and the geological
and there's a link, I know
between the head and the heart
between the knowing and the knowledge:
the sensing and the doing -
the clever and the sublime connected,
that shapes and softens a human heart
to the core of the volcanic process,
to the deep sediment of earth
with the heart-core of place
and sense of deep-time-space:
the caldera's, the beagle, the
giant ground sloth megathurium;

I'm a multi-media creative, principally working in screen-based media, with a background in theatre and journalism. I grew up in Cambridge and now find myself back in this enduring and fascinating habitat. Recent work has been with neuroscientists looking at brains & cognition, and making TV programmes exploring culture.

The Science

Volcanic Islands: Deep Cause, Shallow Consequences

Dr Sally Gibson

Many of the world's ocean islands have formed as a result of volcanic activity. Their global distribution is not random but controlled by processes at the Earth's core-mantle boundary. A unique example of the intimate link between Earth's deep and surface processes is spectacularly displayed in Galapagos. The volcanic islands, formed by a thermal anomaly anchored at the base of the mantle (2900 km), deflect ocean currents that in turn cause the unique diversity of fauna and flora. The equatorial position and biodiversity of Galapagos make it highly sensitive to changes in our planet's climate.

Creative Reaction

Deep cause, shallow consequence

This pairing with Dr Sally Gibson has challenged my artistic and intellectual boundaries to respond to the science of our earth. I've always been fascinated by the natural sciences and the soil, so to have the chance to hear about human understanding of the forces that shape land – and sometimes radically shift it from under us, has moved me. I've responded firstly in words: a poem is emerging from the language Sally used to describe how she studies volcanoes. It began by pulling apart and layering the words, 'under' and 'on the surface', including tectonic plates, the sea, the calderas and the Galapagos Islands. Then, I'm adding words of the air, ethereal, emotional words that bring heart into the equation. Secondly, I'm working on blending images, like plume mantles, with images from the world of neuroscience: retinal and brain scans. Using words and images again has been my creative reaction!

I employ various printmaking techniques in my practice, and enjoy using found objects and textured papers to print with. I use a Rochat etching press and mix my own pigments to create my colourful works on archival paper.

The Science

Why People Need Nature?

Tony Juniper

Very often the protection of our environment is seen as too costly, a barrier to competitiveness and mired in a labyrinth of red tape. Political priorities to cut consumer costs over more sustainable practices only hasten ecological damage. If humanity is to sustain the natural systems that support our lives, then we need new economic ideas, and fast.

Creative Reaction

Walking Cane

The work I have created is in response to Tony Junipers talk, 'Why people need nature, and not the other way round.' In Tony's book, 'What has nature ever done for us?' he discusses the huge economic value in sustaining nature. This resonated hugely with myself and my family. A few years ago, my husband sustained a very bad knee injury which had a devastating effect on our entire family. His slow but tenacious path to recovery was helped in a large way by our local environment. Previously we had always been city dwellers, but there's no doubt that our current situation of living in a semi-rural village has helped him to heal and get fit quicker. To be able to step out of the house straight in to the countryside, albeit on crutches and later with a sturdy, rather fancy, walking cane, was crucial to his recovery.

Tina Bone is a self-taught artist who turned professional in 2005. She has been successful at many national and local exhibitions, and paintings, prints, cards and calendars have sold the world over, including Australia, America, Canada, India, Mexico, Spain, a France, Hong Kong, Singapore and China. Tina loves to portray the natural world.

The Science

Earthquakes! Science, hazard and resilience

Alex Copley

People are dying in earthquakes around the world at an ever-increasing rate, mainly due to large populations concentrating in seismically active areas with unsafe buildings. In this talk I will describe the science we can use to work out what happens in an earthquake. I will then explain how we can recognise the effects of past earthquakes preserved in the landscape, and how their signs tell us about the future earthquakes. Finally, I will end on an optimistic note by explaining the steps that can be taken to dramatically reduce earthquake-related fatalities.

Creative Reaction

Earthquake –the Elephant moves?

In the twelfth century BC people believed that the earth was held up by an elephant (or other large animal, for example, frog or llama) and that earthquakes happened when the animal moved. In 2016 we have moved forward and have much science and knowledge in understanding nature's forces. Although man knows where the faults in the earth's crust now are, he still insists on building along these faults! Science has provided much information on how to build stronger houses, but many poor places do not have the resources to do so, hence the sometimes huge death toll when disaster strikes. "Earthquake Safety Day" is celebrated in various places the world over, and in Nepal every year, but still Nature wreaks her devastation. This illumination shows the "golden" areas of research by Alex Copley (Rajasthan, Maharashtra, Gujarat in India, and The Zagros Mountains and Lut Desert in Iran); a camel is jumping for its life as the earth opens during a tremor, and the geological stratification of mountains and rocks is depicted lower left.

Planet Earth

Stephanie O'Donnell

Stephanie is a conservationist, artist and maker living in Cambridge, UK. She works in a variety of media, including pencil, watercolour, ink and acrylic. She also sews and carves lino stamps to print unique fabrics. Her work is reflective of her deep understanding and love of the natural world, earned through years working as an ecologist in the wild places of Australia and Africa. In 2013, she moved to Cambridge to study for a Masters in Conservation Leadership and now works with Fauna and Flora International. Alongside her career in wildlife conservation, Stephanie has steadily grown her artistic practice. Particularly since moving to the beautiful, but less than wild, English countryside, she has used her artwork to connect with nature. Looking at the world through a creative, rather than scientific lens, allows the discovery of wildness even in the most unlikely of places.

The Science

Birdwatchers, birds and big ships

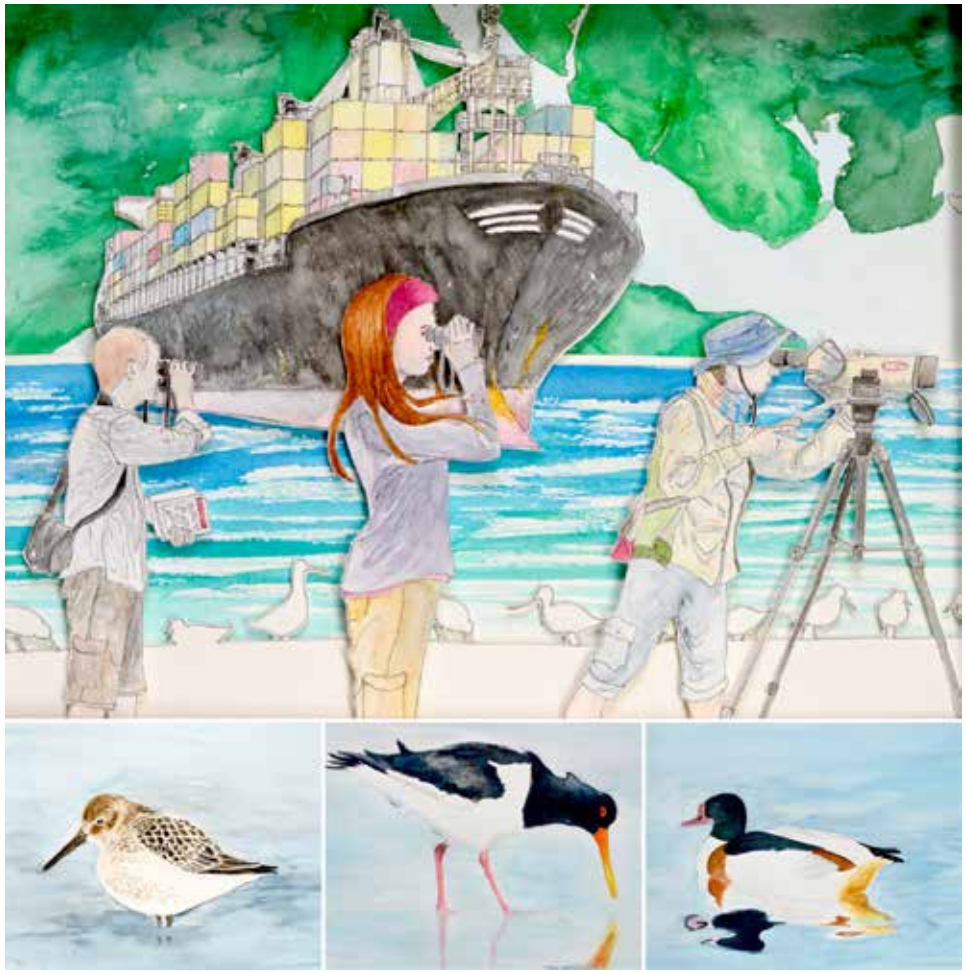
Andy Clements

Citizen scientists can have a big impact. Sometimes major development and the environment clash and we rely on strong laws to protect nature in the face of big money. How do these cases play out, what is the role of the little guy? We can learn lessons for the future where the economy and the environment work together for the common good.

Creative Reaction

Birdwatchers, Birds and Big Ships

A series of watercolour pieces, Stephanie O'Donnell's work is inspired by the power of everyday citizens as it unfolds in the BTO's story. An exploration of the goliath battle between local birdwatchers and developers, with the natural landscape at stake.



Stuart Jones is an artist and lecturer in painting and drawing, living and working in Hertfordshire. His work is inspired by the landscape and the environment, both urban and rural, using layers to create meaning and connections in his paintings. He has exhibited widely across the UK and has also been featured in a number of art publications.

The Science

A Pint of Lava and a Packet of Pumice, Please

Clive Oppenheimer

Ever wondered if you would be here if it weren't for volcanoes? If not, then this unusual talk is for you. I will cram as much volcanology into ten or fifteen minutes as is humanly possible. Why volcanoes matter; how your ancestors grew up in their shadow; where to take your next holiday; and how a super-eruption might ruin your day are among the questions answered.

Creative Reaction

Erebus

The painting I have created is a response to Mount Erebus in Antarctica, one of the largest active volcanoes on earth. It is renowned for its persistently active lava lake, which is sited in the summit crater. I have responded to infrared video footage of the active lava lake eruptions, emulating the energy of the eruptive process, the heat and layers of steam, volcanic gases and aerosol emissions from the volcano. I have used stains of oil paint direct onto the canvas flat on the ground to create a broken surface that is in flux, flicking, throwing and pouring the paint to emulate the magma explosions and using layers of spray paint and glazes of oil paint.

My work is inspired by the colours, shapes and patterns in nature, from the minute details through to the wider landscape. I often begin with observational drawings and photography, and then explore aspects of this work, using multi-media techniques, to develop images that give a more subjective view of nature.

The Science

Quito: A city's resilience to climate change

Alex Copley

In 2010, Quito's municipal authorities identified the need to investigate the vulnerability of five strategic sectors to climate change: water, biodiversity, risks, agriculture and health. The expectation being, first collect cutting-edge evidence, then develop climate-compatible policies and finally implement a solid adaptation plan to increase Quito's resilience to a changing environment. Sound straightforward right? Well... let's discuss policy implementation over a pint!

Creative Reaction

"Finding a Balance"
" Growing a Cloud Forest"

Through Creative Reactions I have been gaining an understanding of how scientists have been working with municipal authorities in Quito, to help develop an understanding of how inevitable climate changes are likely to affect the city and the surrounding areas and us and this in turn is helping to shape policies to enable people to adapt, to protect both the needs of the ever growing population and the wider environment. I have been particularly interested in the way that the many varied needs of urban areas, agriculture and the wider environment are carefully balanced to create an adaptable and sustainable future. My artwork attempts to explore this balance as well as human interaction with the natural environment. This work illustrates the complex challenge of balancing the needs of people and environment to create a sustainable future, especially as we all try to adapt to the effects of climate change'

I am a digital illustrator creating work inspired by stories and objects of all kinds; from mythology and insects to science-fiction and the human body. My work often starts out with rough thumbnails and doodles in my sketchbook but my finished illustrations are always created in photoshop. I love to make things bright and bold, and aim to create work that is eye-catching, fun and intriguing.

The Science

How to Quickly Bring IoT Data to Life

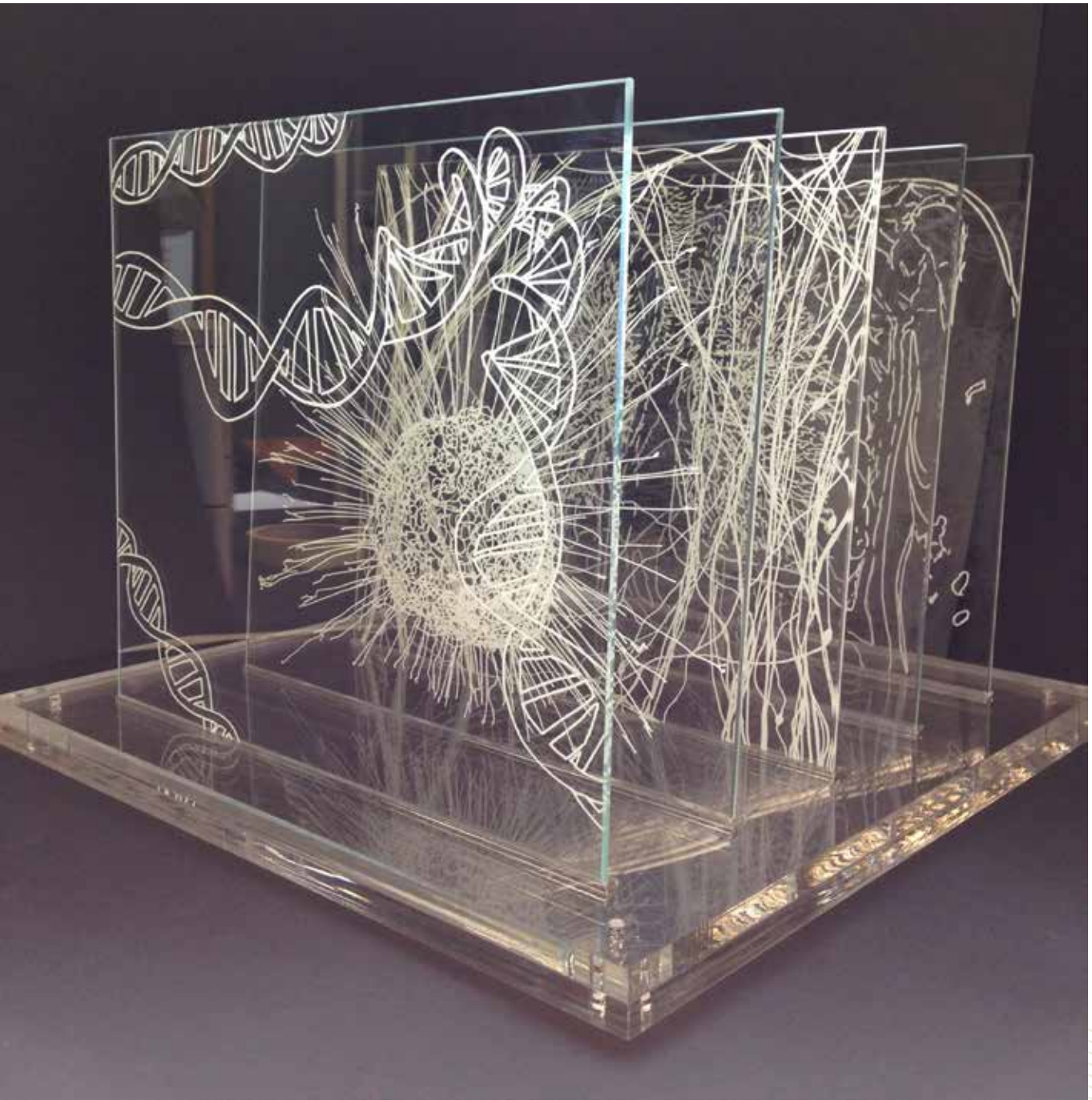
Nasser Ahmed

It is safe to say that the most difficult thing about collecting sensory data is being able to do it at scale. Specifically, accumulating a number of data updates per second and being able to derive insights from the data in real time was a hurdle to scale. During my talk, we will look at how 10 years ago Google solved this problem to facilitate itself. The milestone opened the door to an entire new set of tools, including some newer Machine Learning capabilities, provided through Google for your own use.

Creative Reaction

Fall by Numbers

My Creative Reaction is inspired by the concept of the 'Internet of Things' allowing us to collect and collate digital data from our surroundings in real time. Currently this allows us to develop self-driving cars and analyse and sort visual content. I imagined a future in which this technology could be used to analyse a person's physical health or athletic performance in real-time, as they move.



Claire has a science degree and a first-class honours in Fine Art and is interested in the parallels between these two disciplines. She combines her art practice alongside her work as a Lecturer in Printmaking.

The Science

Shining a Light on Cancer

Dr Sarah Bondiek

The use of visible light to study the human body dates back to when Hippocrates used the first endoscope. While medical imaging with x-rays, gamma rays and radio-waves has revolutionised our ability to diagnose and treat disease over the past 40 years, there has been relatively little clinical advancement based on using the light that we interact with every day. I will describe how our laboratory is using the visible and infrared light spectrum to shed new light on cancer, from the diseases development to its response to treatment.

Creative Reaction

Body Map

Current imaging techniques allow cancer to be viewed on two very different scales: whole body imaging as well as high resolution images of an individual cell. However, according to Dr Sarah Bohndiek, there is always a "massive trade-off" between sensitivity and spatial resolution. New imaging techniques are now needed, combining the technologies of whole-body imaging with microscopy approaches, which can connect all of this information. In essence, a detailed 3D map of the body. Although, in my printmaking practice, I usually use make original prints on paper, my immediate 'creative reaction' to this issue was to explore the potential of printing onto glass. A different print on five sheets of glass show a range of images from microscopic through to whole body scanning. The sheets are layered vertically creating a transparent sculptural piece. The images can be viewed simultaneously and the notion of a 3D map of the body is conveyed. My thanks to ToughGlaze, Technology Supplies and Anthony Millington of Cadisch MDA for their help with this project.

I studied Graphic Design, illustration and Biology in Italy. Im now living in Cambridge, working as a science illustrator for research institutes and magazines. I also make comics with science as a recurring theme, with the goal of making complex topics more accessible to the general public.

The Science

Computer Vision - Teaching Machines to See

Jem Davies

Modern computers have become remarkably capable. Machines can beat humans at chess. They can also conduct a search on most of human knowledge and quickly answer your questions. Though familiar, interactions between computer and humans are easily characterised as rather awkward. We humans interact with each other using speech and vision, yet our interactions with the digital world only occur through interfaces that prompt us to perform unnatural acts. So, why not, teach computers to understand us?

Creative Reaction

Sunday afternoon

Technology is something that changes our way of living since the beginning of human history. Nowadays we live in a global world thanks to common devices that allow us to chat in real time with people from another continent, share a video with all our social networks and a lot more. However, all this communications are still "cold": we have a screen between us and our contacts, we need to interact with a keyboard and to be surrounded by our physical environment while we speak with our friends through video-chats. Is virtual reality going to give us another way to communicate with people who live far from us? Will our capability of experiencing empathy and compassion improve thanks to it? Will computer vision systems help us take care of our beloved ones?

Diana is a fine artist who usually works in oils and watercolour, painting still lifes, portraits, and landscapes to commission. She enjoys realism but prefers to make her paintings look better than photographs, rather than aping another medium. This puts her in the strange position of explaining herself as an Instagram Artist in Paint. As she says, "I can paint any filter I like on it."

The Science

Artificial Intelligence Comes of Age

Valentin Tablan

Artificial Intelligence or AI has always excited the popular imagination, as a solution to most of humanity's problems or the cause of our impending doom. In the real world, AI had a difficult relationship with society, starting with great promises of the 60s, failing deliver by the end of the 20th Century. Recently, a quiet resurgence has been taking place with AI applications are popping up all over the place. Just to name a few: enabling face recognition on social networks, self-driving cars, and smart personal assistants that reside in connected speakers.

Creative Reaction

A Picture of You

Machine learning is both fascinating and terrifying. There's a big question over what machines can learn, and what they can't. Can a machine be capable of art? Well, to answer that you first have to know what art is, but that varies for everyone. My piece, 'A Picture of You' is a machine, linked to Valentin's work, but with a human choice of aesthetics as one of the steps from algorithm to art piece. The machine is just metal. The learning is done by computer elsewhere. Which part has the art? Is it just the human being? Are you really sure?

Karen Jinks is a mixed media artist, graphic designer and Creative Director of Cambridge Creative Network. Her work is inspired by connections, language and memories, looking for patterns and meaning in otherwise ordinary day to day things.

The Science

Data Driven Network Modelling

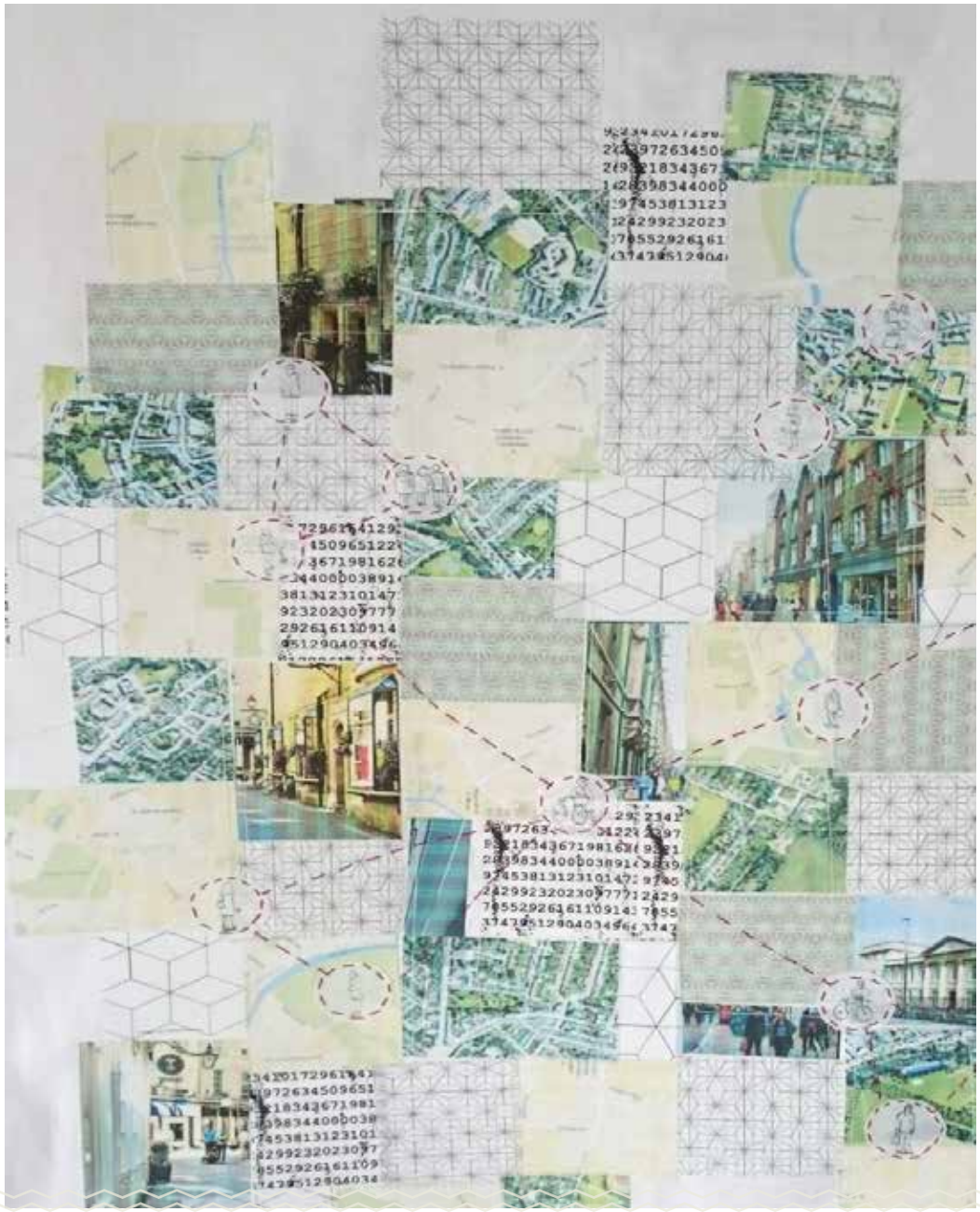
Dr Eiko Yoneki

Respiratory and other close-contact infectious diseases, are major killers in much of the developing world. Mathematical models are essential to understand how these diseases spread and identify how best to control them. How people behave and interact during a large outbreak of an infectious disease directly impacts, not only the spread of infection, but also the efficacy of control strategies. And, the economic implications are wide-reaching. We develop mathematical models based on new data, which will help us gain valuable insight into the spread and control of diseases.

Creative Reaction

Invisible Threads

My piece is in response to the work of Dr Eiko Yoneki and the modelling of big data, through the development of a flexible algorithm and mobile networks to mine data in a more responsive and efficient way. I was intrigued by the human and social element of Dr Yoneki's research, the application of which provides real-life solutions, such as understandingthe way that infectious diseases spread in order for authorities to take preventative measures before an outbreak takes hold, or allowing remote villages in undeveloped countries to have access to information on the internet, where they won't have the technological infrastructure to provide them with broadband or wifi. The idea of people moving aroundand connecting with each other via their mobile networks, with or without their knowledge, has interesting implications and I wanted to recreate this model using textiles and embroidery. The basic, time consuming and meditative nature of stitching onto fabric is in complete contrast to the fast, computer generated calculations involved in the collection and analyzing of data, but the resulting imagery is that of a map or constellation. Imagine that each beacon or node is a real person, and as they travel along their path in life they are able to silently transmit information and create connections that when seen as a whole, show just how small we really are, but how powerful we can be when we work together.



Liza Read creates holograms, 3D laser photographs on glass plates, collaging them with mirrors, printed materials, wood and handmade paper to create engaging, thought provoking artworks which investigate our societal relationship with new and emerging technologies. Read lives and works in Cambridge, England.

The Science

An Inside Look at Bacteria

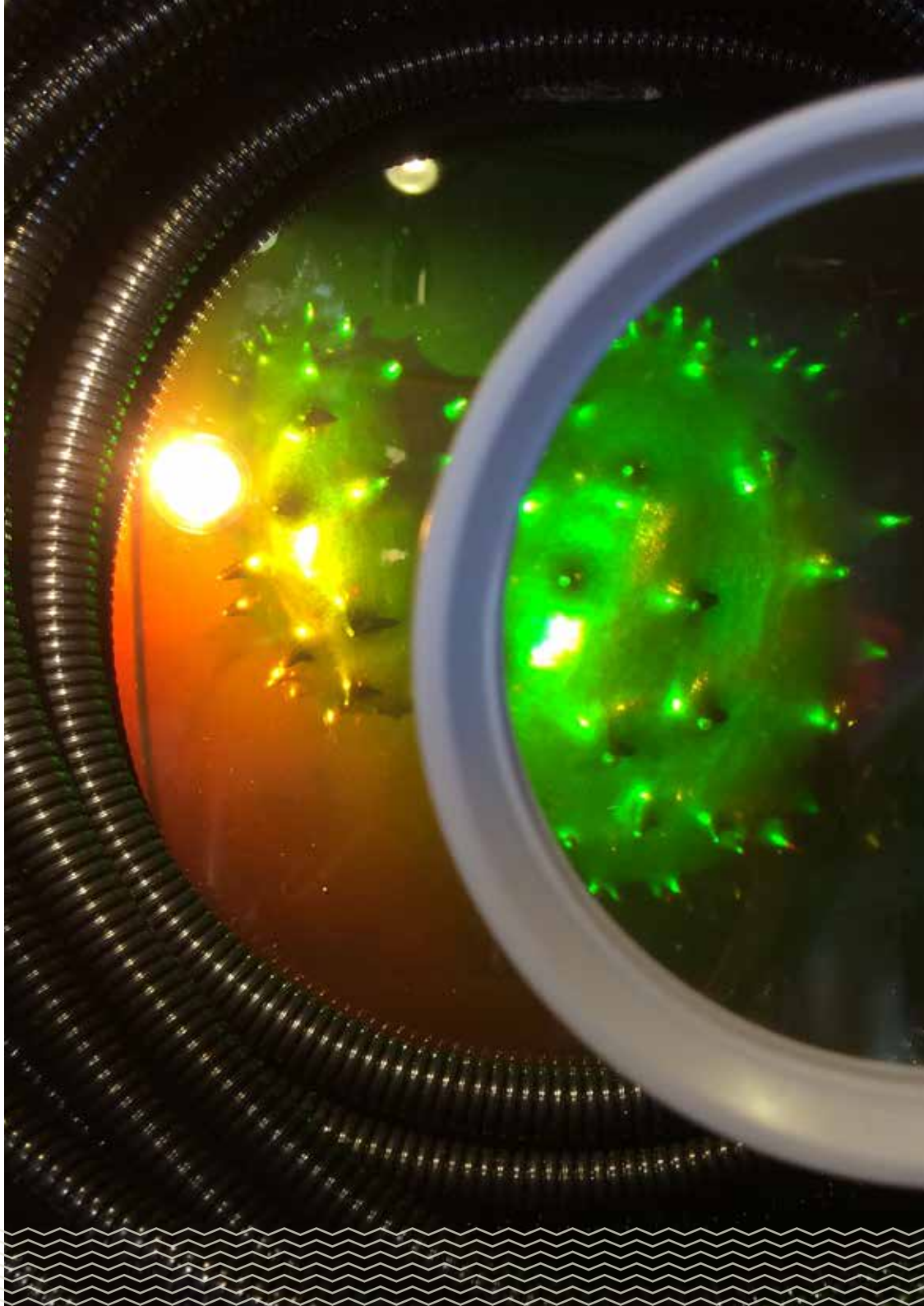
Dr Steven Lee

In his 1665 work Micrographia, Robert Hooke used drawing to help us to begin to understand the world of the small things. Today scientists continue trying to draw or depict ever-smaller objects, pushing the theoretical limits of light in order to discover more about the world. In his talk, I will discuss the latest developments in imaging technologies, while specifically focusing on understanding the structure of bacteria.

Creative Reaction

The Seventh Circle: Violence

Dr. Steven Lee's unique work using high magnification microscopy to create three-dimensional images of live cells is truly fascinating. Using traditional methods, such magnification would not be possible as it is beyond the physics of visible light. My response is to make a piece in character with the cells of a living organism under the scrutiny of magnification, incorporating the physical properties of the instruments used to make these new images. The artwork combines a hologram embedded and hidden within the flexible tubes and constructs that make Dr. Lee's extraordinary magnification possible. Under a single light source this extraordinary 3D image is revealed coming out of the darkness, to astonish and entrall.



My work is about creating unusual relationships between personal experiences and the following themes: science, natural history, navigation, weather and journeys. I take ideas from these themes and juxtapose them with my memories. Connecting unrelated lines of enquiry introduces an element of chance to my work and other possibilities arise. I prefer to respond to new directions by overworking existing surfaces rather than starting afresh.

The Science

Pursuing the Early Epochs/ of the Universe

Eloy de Lera Acedo

In this talk I will discuss the process of designing electromagnetic sensors (i.e. antennae) and radio micrography receivers to study the very early epochs of our Universe — when the first stars and galaxies were formed. I will talk about the important design targets such as sensitivity, polarisation purity and calibratability. The talk will focus on the developments for 2 major international telescopes, the SKA and HERA.

Creative Reaction

Novel Sensor

Inspired by developments for the SKA (Square Kilometre Array) telescope I have produced a multi-layered artwork which explores expansion, movement and the illusion of depth on a 2-Dimensional surface. Illustrations of antennae (and their placement maps), radio waves, galaxies and circuit boards are included on the multi-perspective surface. Contrasting warm and cool hues are intended to evoke the colours of the Australian landscape (one location of the telescope). Dense sections of the artwork are created by using repetitive, printed overlays. These areas could be suggestive of matter we cannot see or perhaps the furthest and darkest reaches of time.

Veta Gorner RE (member of the Royal Society of Painter-Printmakers) is a professional artist specialising in graphic arts and printmaking. In her practice she combines traditional techniques of etching – lithography - silkscreen with sensibilities and technological possibilities of contemporary image manipulation. Her work is centred on the human form and spirit, on what it means and how it feels to be alive.

The Science

Robots Creating Robots: Fear Not

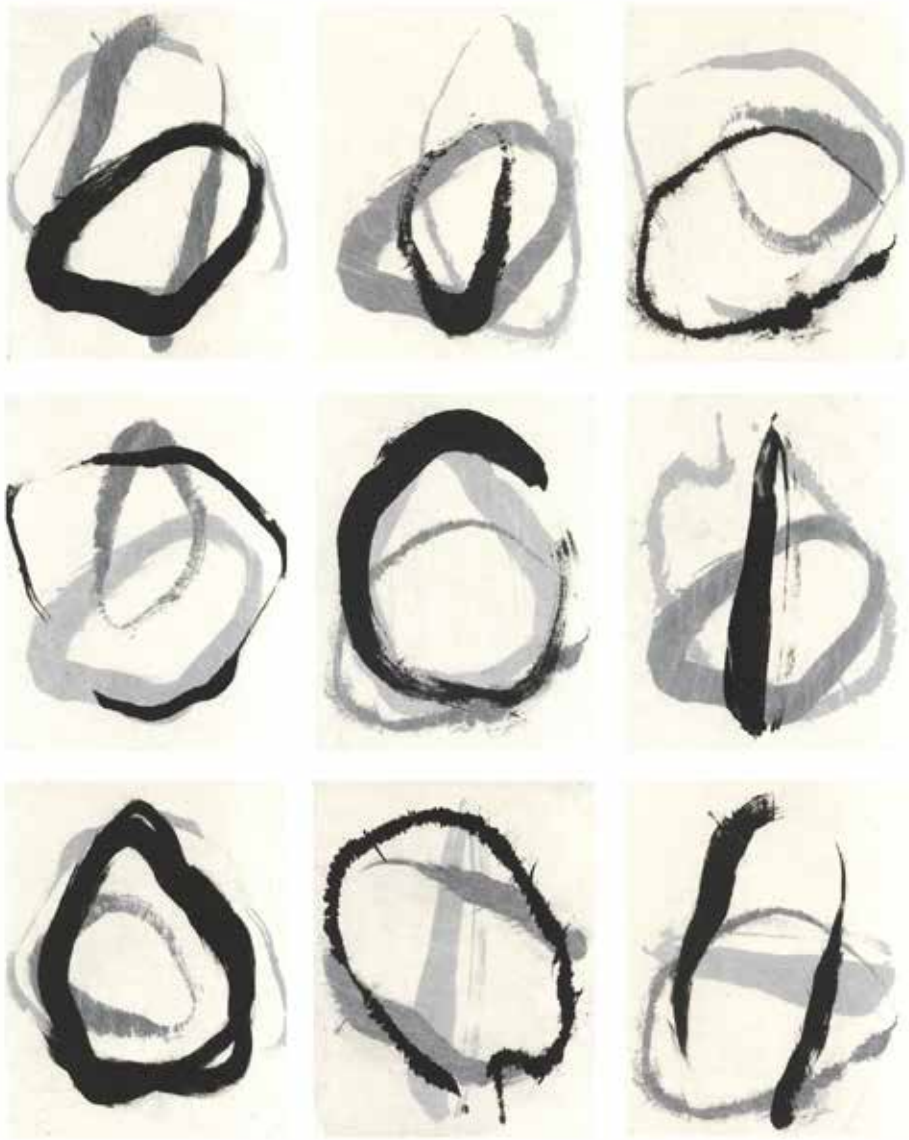
Andre Rosendo

While traditional robots follow pre-established lines of commands to build and assemble products, artificially intelligent robots adapt these lines of commands to changes in the environment. Why shouldn't we fear the possibility of these very same lines deciding to go rogue and abandon us? We built a robot capable of making robots. So far, our robot has created more than 500 other robots, and our robot-building robot shows that the answer to the previous question is quite simple.

Creative Reaction

Gameplay variations

It is possibly topical to juxtapose artificial intelligence and humans. Right now it is us against something about which we are not certain and may not quite understand yet. But by equipping robots with the capacity to explore and evolve, we are willingly accepting that one day we might be equal players learning from each other. Learning in itself is a never-ending process that shapes humankind and is yet to shape AI. Learning is also a journey of enduring improvement where the process is more important than the destination, where clarification has more value than perfection. And through this eastern philosophical prism I would like to introduce the Japanese aesthetics of wabi-sabi to the genesis of my work. A concept formed by belief that imperfections and mistakes are integral ingredients in the union of beauty and meaning, wherever it relates to a form or a process.




$X^2 + 4Y^2 = 1$
Would you date a human
artificially intelligent machi
Why / why not?
Yes, because...

Organisers

Pint of Science and Creative Reactions was a collaborative effort, involving many people, working long hours for nearly nine months. We would like to acknowledge all the fantastic organisers for their dedication to making Pint of Science in Cambridge the success it was.

Sarra Achouri, Matteo Andreozzi, Sanna Balsari-Palsule, Flaminia Bartolini, Mickey Batchelor, Valentina Borgia, Suzanne Buttar, Armando Carlone, Mauro Ciaccio, Sarah Connors, Paul Coxon, Julian Dumortier, Tamara Fanjul, Roberto Fava, Josselin Gautier, Maria Barreira Gonzalez, Julia Gottwald, Stacey Gould, Michael Harris, Vicki Highland, Julie-Anne Hogbin, Christy Hung, Stefano Iantorno, Giulio Lucarini, Charlotte Macleod, Crystal McClain, Sara Méndez, Marco Michelutto, Carme Mont, Xavier Jordà Múrria, Davide Natalini, Clara Novo, Christian Owusu, Roberto Pasqualino, Craig Pearson, Debs Roebuck, Lucia Romero, Maria Rostovskaya, Laetitia Schwab, Manos Johan Hanssen Seferidis, James Stewart, Stanley Strawbridge, Meghan Strong, Lorenza Toffolon, Patricia Vazquez, Sara Xoubanova.

What would a festival in pubs be without the pubs?

We would like to thank this year's participating pubs for hosting us:

The Architect, The Boathouse, Cambridge Brewhouse, The Castle Bar, Panton Arms, The Maypole.

We would like to thank all our generous **national** partners who supported Creative Reactions and Pint of Science in 2015

MENDELEY

eLIFE

CYBER-DUCK

Overleaf

CANCER RESEARCH UK

NC 3Rs National Centre for the Replacement Refinement & Reduction of Animals in Research

We would like to thank all our generous **local** partners who supported Creative Reactions and Pint of Science in 2015 in Cambridge

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