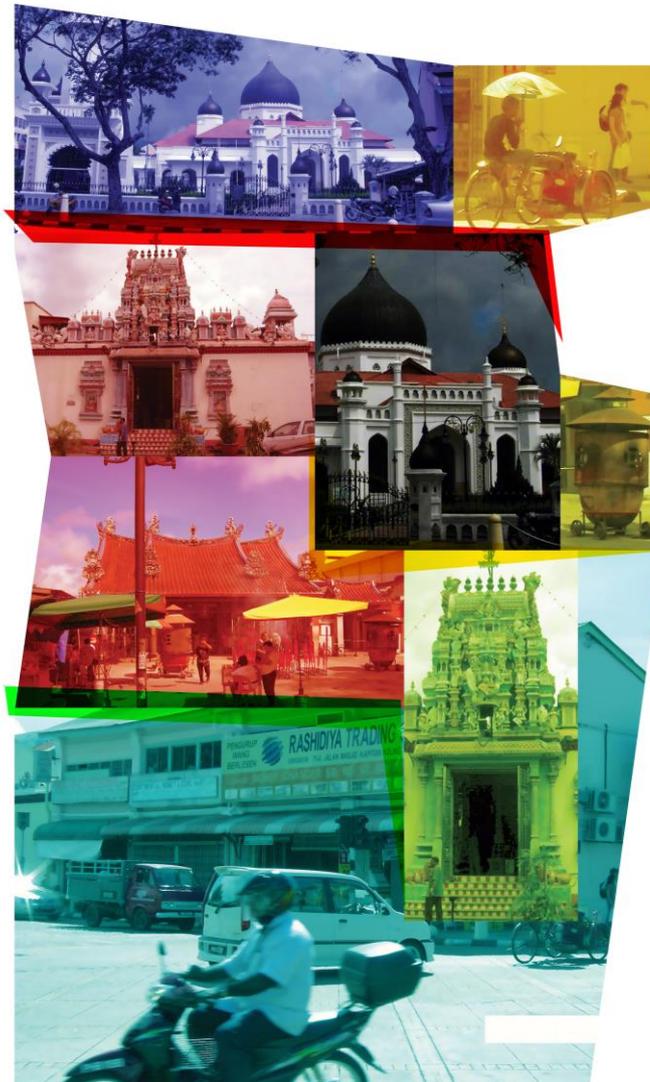


**The University Graduate School
presents**

Images of Research 2016

The Catalogue





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Relationship Status: It's complicated

Aidatul Fadzlin Bakri, Doctoral Researcher, History and Culture

Cultural heritage is a dynamic and interactive process, which is closely linked to the perception, representation, and experience of particular places by and through people. The relationship between tangible heritage and intangible heritage is said to be strong, complicated, and intertwined. However, there is a lack of concerted action taken in integrating the heritage in totality; and the protection of tangible and intangible heritage continues to be separated. By looking at George Town World Heritage Site, Penang, Malaysia, I seek to trace some of the ways in which, space and place have shaped and changed representations of cultural heritage and provided an arena through which to convey, negotiate and performed contested notions of identity and culture. The site demonstrates the cultural activities of three predominant races (Malay, Chinese and Indian), which is also rich with its tangible heritage, with significant influence of unique and eclectic architecture. The study examines the concept of understanding the values of cultural heritage in the context of post-colonial urban context with its multicultural identity.





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Shadows of the Past: the Dawning of a New Age

*Andrew Blackler, Doctoral Researcher
Byzantine, Ottoman and Modern Greek Studies*

The Late Medieval period in the Eastern Mediterranean, stretching from the sack of Constantinople by forces of the Fourth Crusade in 1204 until the city's annexation by the Ottomans in 1453 brought an end to the Byzantine Empire, was one of almost continuous conflict. Christian forces— Byzantine, Frank, Venetian, Genoese and Catalan - vying for supremacy, fought as much amongst themselves as against the rising Turkish threat.

This conflict has left a legacy of fortifications and isolated towers in the landscape. My photograph captures its essence: an angry dawn sky overlooks a crumbling Byzantine castle threatened by two upstart towers – one Venetian, the other probably Turkish. Yet the angle of the photograph suggests that the towers also challenge one another, the glint of the sun off their walls reflecting the impending struggle in the coming centuries between the rising empires of their constructors.

Few documentary records have survived, and my research aims to understand the period through the shadowy archaeological record left behind by such towers, a ubiquitous, but little understood, feature of the modern Greek landscape – who built them, when were they constructed and was their role economic, strategic or simply the display of a new feudal elite?





Building Environment parametric data structures

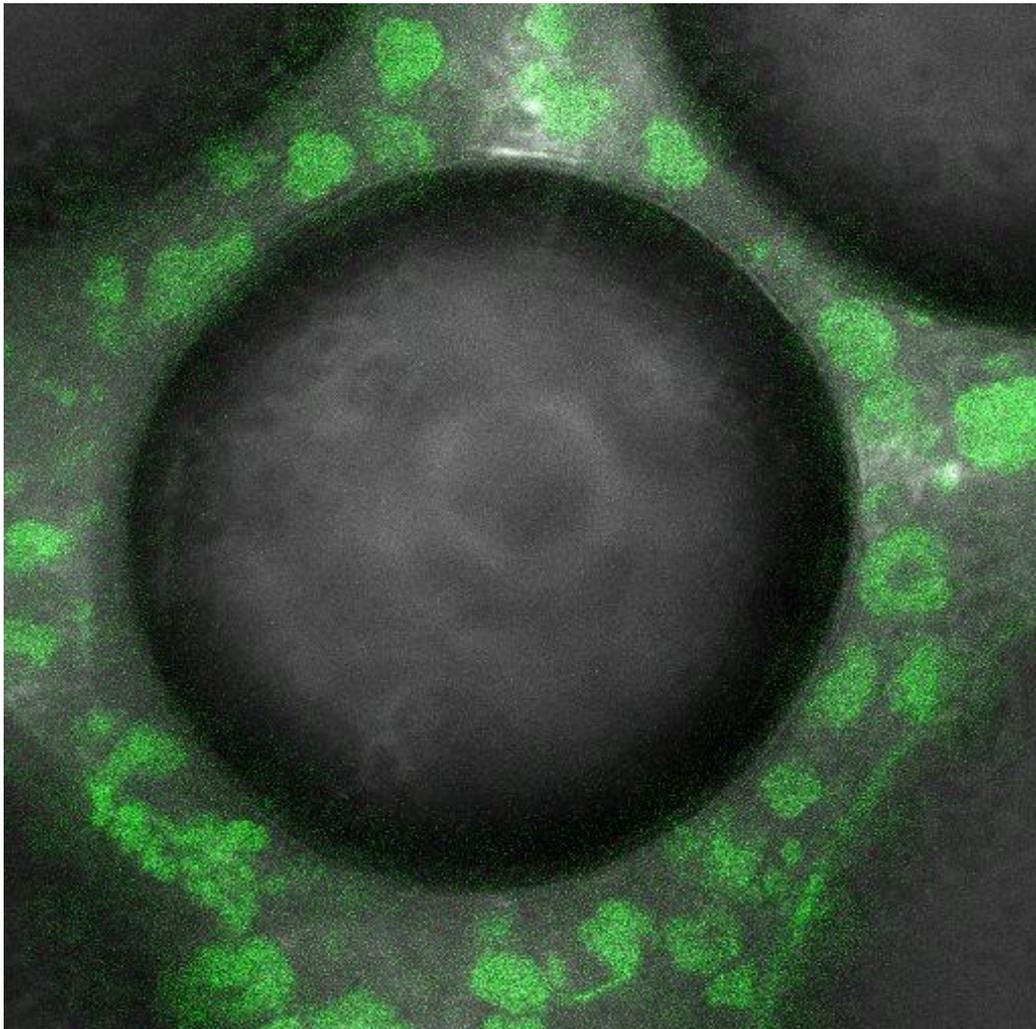
Angel Gigante-Barrera, Doctoral Researcher, Civil Engineering

This image aims to represent the chaos in which current Building Environment data is immersed. As my doctoral research focuses on Building Information Modelling (BIM) life cycle processes, I examine the current Manufacturer's industry BIM Model Elements (ME), which are represented by 3D MEs and intelligent parametric data. This research will result in a learning algorithm that will predict ME graphical and non-graphical progression during design processes.

While my work focuses largely on relationships between MEs and data uses, it is helpful to carry out an abstract thinking exercise where parametric rules try to bring order to the chaos. To create the image, the researcher has combined two different kinds of data. Parametric geometric data (boxes) and parametric non-geometric data (colors), which are depicted by using data rules. The palette of the painter or data rules are represented next to the parametric MEs.

Four different abstract objects or MEs created out of certain parametric rules, evolve from a chaotic configuration to a more structured organisation of the constituent elements. These four parametric objects represents different sets of data such as electrical systems sizing, maintenance and other possible data uses. This "sets of data" metaphors meet towards a point in the image that demonstrates the researcher's effort to clarify the different Building Environment Data structures.





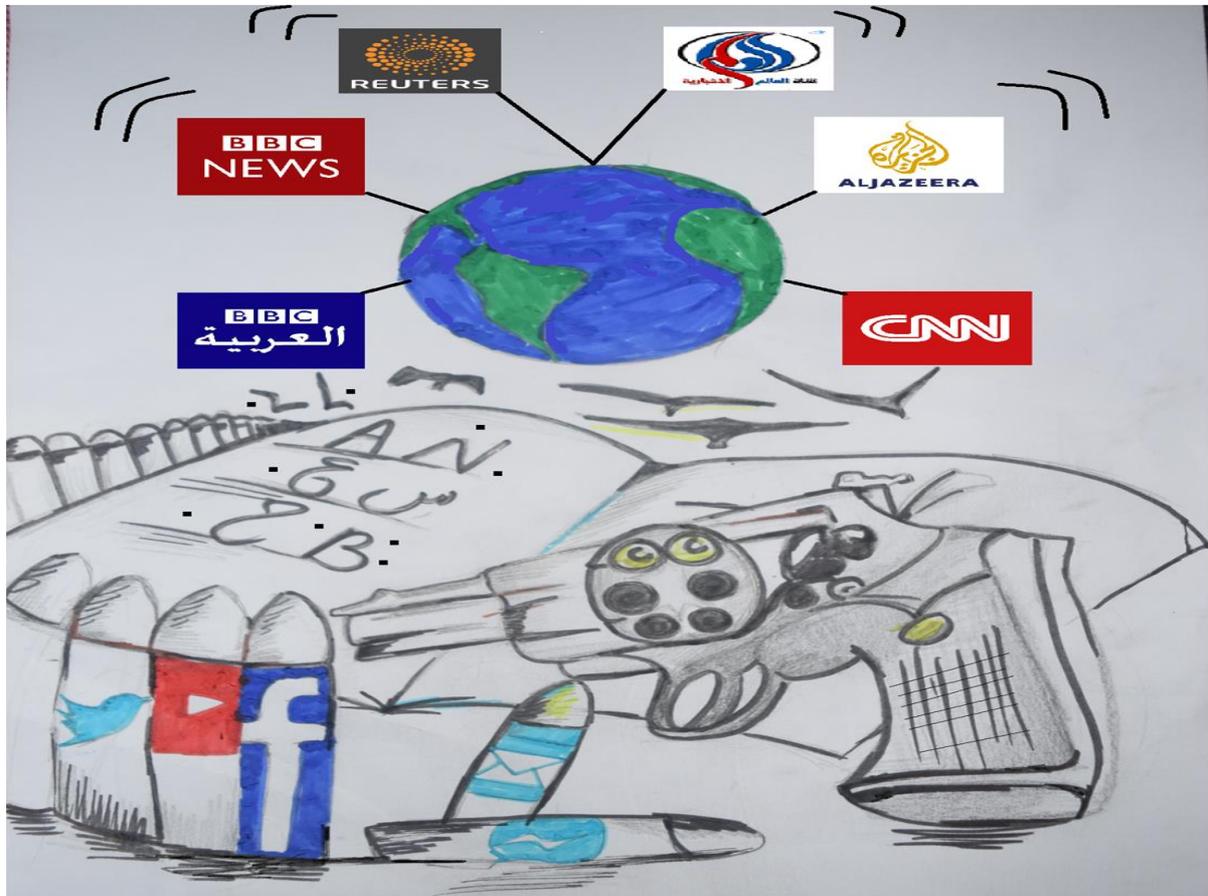
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Air bubble stabilised by milk protein gel particles

Aris Lazidis, Doctoral Researcher, Chemical Engineering

Whey proteins present in milk can be treated by a thermal process that involves applying shear and heat in order to create tailored structures that have enhanced properties compared to the native species. In this case, the technology of manufacturing flowable gels (a.k.a fluid gels) has been used in order to create whey protein mixtures that can provide very stable bubbles upon aeration. This technology can be used in food formulation where foams are essential for enhancing the pleasurable experience of the consumer (frothy beverages, gourmet foams etc.). The picture shows an air bubble stabilised by whey protein gel particles. The particles are able to surround the bubble and all the channels created by the neighbouring bubbles (plateau borders) entrapping the air very efficiently.





Translating ISIS: Reframing narratives

Balsam Mustafa, Doctoral Researcher, Languages

The image implies that narratives created by ISIS could be more dangerous than a weapon on the ground. Circulated through social media platforms, including Twitter, YouTube, and Facebook, ISIS's narratives reveal a barbarity that is compounded and reinforced through its media machine. To counter such narratives, we need to study ISIS, and investigate its different narratives and how they are framed. We also need to see how these narratives are received and translated by Western, Arabic, Kurdish and Iranian media agencies as they can support, challenge, or even misinterpret them. This is what I'm interested in my PhD project which provides a new interdisciplinary way that links translation, communication, and media studies in the context of ISIS. Redefined as a movement of meaning from one source into another irrespective of language boundaries, translation is signified in my image by birds as they move and travel from one place into another. Birds also signify the eye-witnesses and survivors whose stories can resist ISIS and present a counter-narrative when they are mediated and empowered by the various media agencies around the globe.





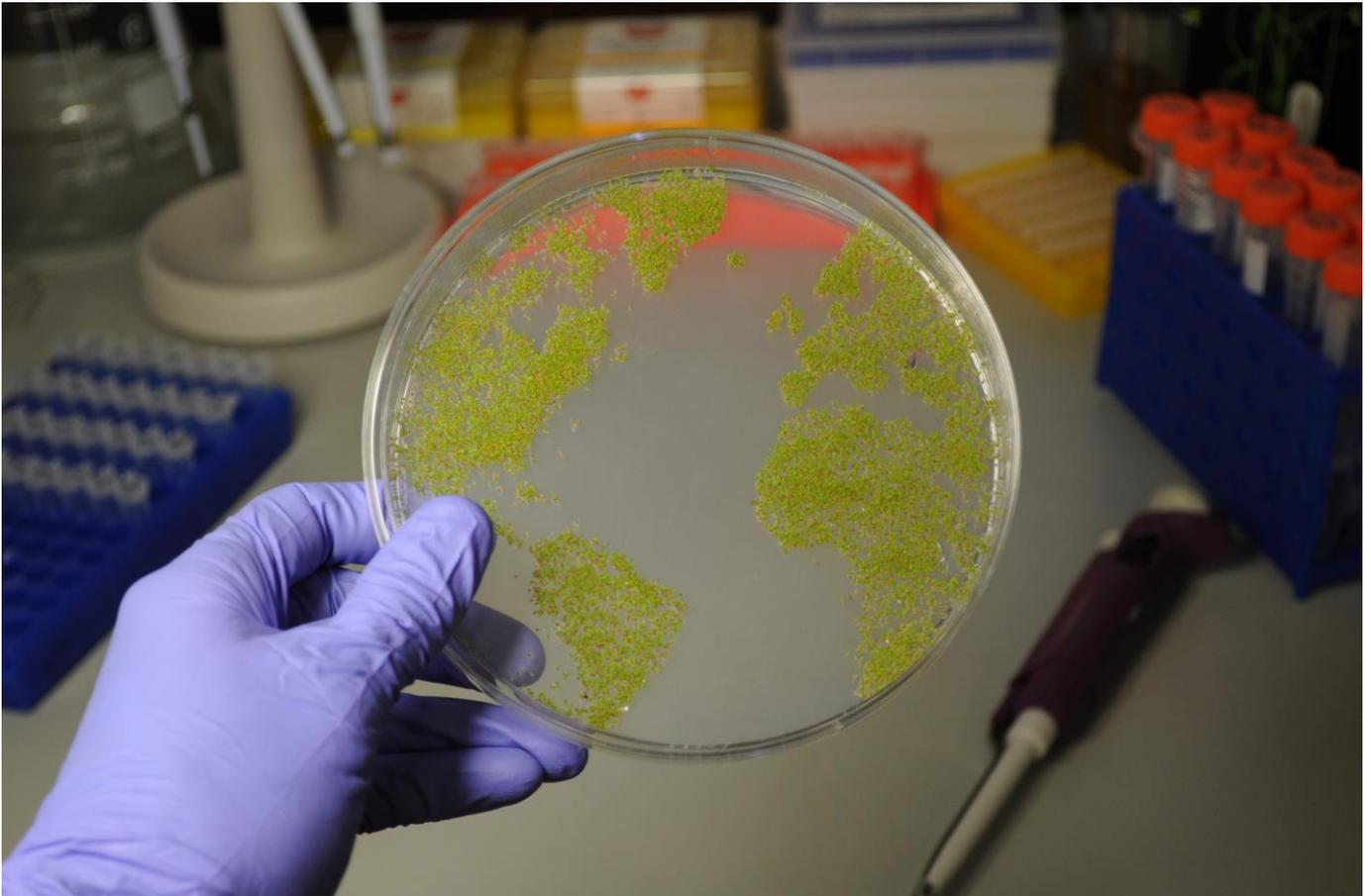
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Eye injury

Chloe Thomas, Doctoral Researcher, Institute of Inflammation and Ageing

Humans depend on vision for social and occupational interactions; loss of sight can be detrimental and debilitating. Light enters the eye through the pupil and is reflected onto specialised retinal cells at the back of the eye, including photoreceptors and retinal ganglion cells (RGCs). RGCs transmit the image as electrical signals through the optic nerve (made up of RGC axons) to the brain. The brain and spinal cord make up the central nervous system (CNS), which has minimal endogenous regenerative capabilities following injury. The retina and optic nerve are an extension of the CNS, thus possess similar properties and can be used to study CNS injury. This is represented in this image by the small brain within the pupil of the eye. RGCs that have degenerated cannot be replaced and their death results in potentially irreversible sight loss.

My PhD focuses on different direct and indirect models of eye / optic nerve injury and aims to characterise the mechanisms of RGC death in these models. If the pathways that result in RGC degeneration are established, then these proteins can be targeted and theoretically cell death prevented, thus protecting RGCs and preventing sight loss.





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Feeding the world with plant science

Chris Morgan, Doctoral Researcher, Biosciences

As Earth's population continues to grow, so too does the demand for sustainable food production. A large proportion of the UK's plant science research is aimed at generating plants with new beneficial characteristics, such as increased drought tolerance or higher yield. Translating these beneficial characteristics to crop plants, such as wheat and maize, will help to address some of the problems associated with ensuring future global food security.

This image shows seedlings of the model plant *Arabidopsis thaliana* germinating on an agar petri dish. We are using molecular biology to investigate how a special form of cell division called meiosis is controlled and regulated in *Arabidopsis*. By investigating meiosis we aim to understand how genetic material (DNA) is reshuffled and passed between parents and offspring in plants. We can then use this knowledge to inform and improve current plant breeding technologies, hopefully allowing plant breeders to generate novel crop varieties with desirable traits.





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(Re)presenting Ironbridge

Coralie Acheson, Doctoral Researcher, History and Cultures

Ironbridge Gorge in Shropshire is a World Heritage Site. It was there that coke was first used in the production of iron, which opened the door for the mass-production of the metal, without which the Industrial Revolution could not have taken place. At the heart of the site is the Iron Bridge, the world's first to be constructed of cast iron. My research explores the relationship between World Heritage values and the way in which tourists engage with the place. This image captures both the bridge and a representation of it on the side of a litterbin. The image of the bridge has become synonymous with the place, so much so that it is used as a symbol of Ironbridge across all elements of the site as it is encountered by tourists. However, as tourists actively reimagine and reconstruct places through their experience, the symbols communicated by managers may be reinterpreted and recontextualised. This image challenges the typical view of the bridge, highlighting the possibility of multiple contesting narratives of Ironbridge as a place.



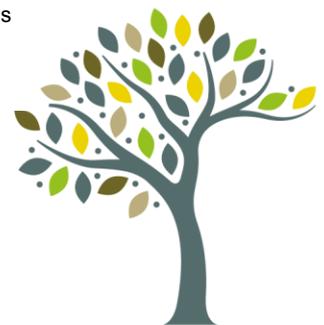


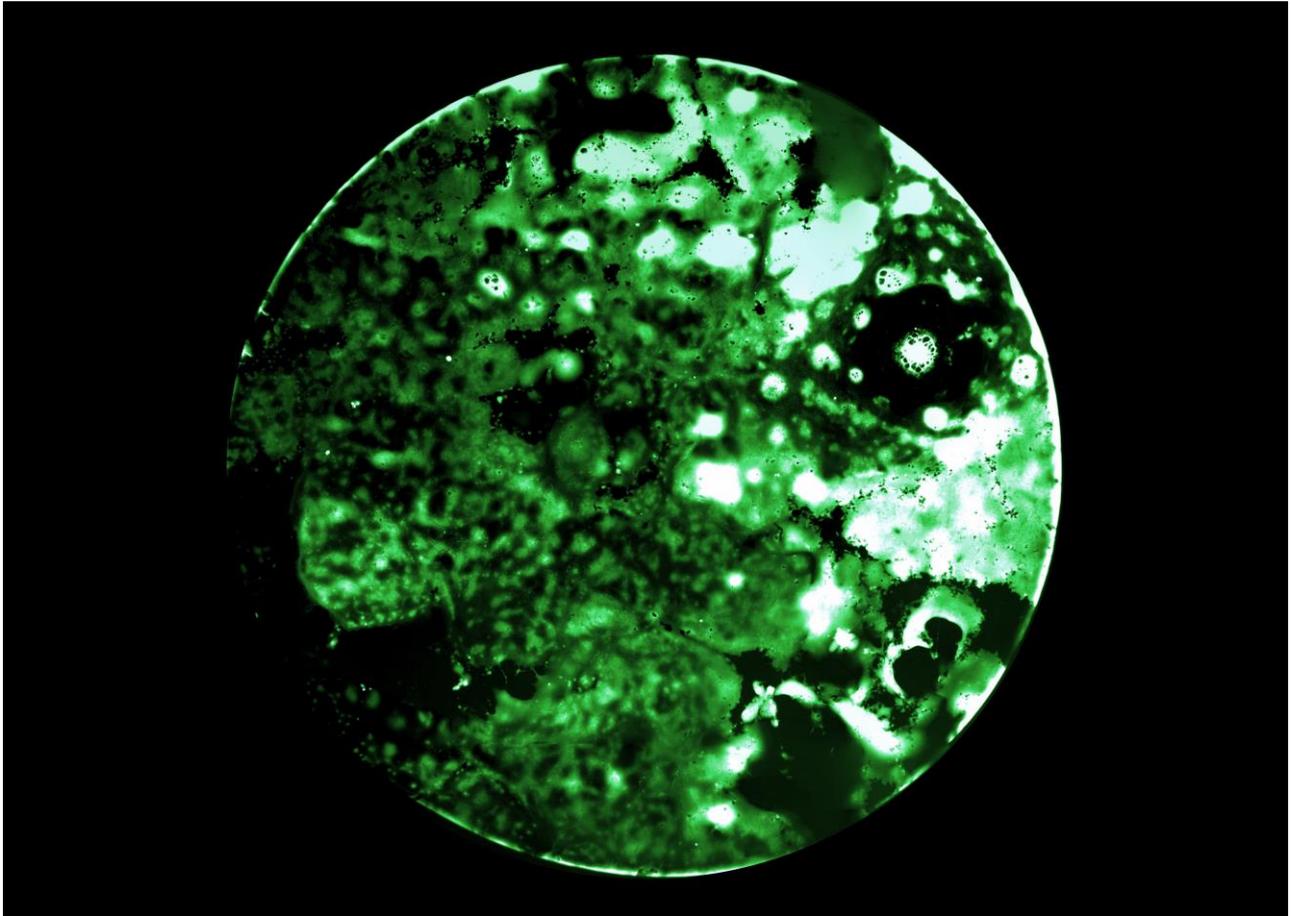
Three Hierarchs Monastery, Iași, Romania

*Cosmin Minea, Doctoral Researcher,
Languages, Culture, Art History and Music*

You wouldn't say the pictures show the same monument, the monastery of Three Hierarchs in North Eastern Romanian city of Iași. Although both were taken in a relatively short span of time, the left one in mid-19th century, the other at the turn of the century, the images couldn't be more different: in the first a religious procession passes through the baroque tower of the monastery and heads into the uncanny-looking church with its rather Oriental cupolas and intricate decorations on the facades. The man with the Turkish Turban on the left seems to continue the procession led by orthodox priests. In the second image though the church looks strikingly different. No trace of the Oriental cupolas, the façade is more geometrical in shape and the baroque tower has equally disappeared. We can further spot a French-looking building in the background and people driving in modern carriages, like in any other European city around 1900.

The picture illustrates how through restorations and reconstructions the architects managed in very short time to change the appearance of a former Ottoman territory to an independent European state. My PhD research explores this visual transformation of Romania's architectural monuments in the first decades of its independence.





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The dark side of infection

Daniel Goncalves Carneiro, Doctoral Researcher, Immunology and Immunotherapy

Measles virus is responsible for over 100,000 of deaths every year, especially among infants and young children. Despite a vaccine is in use, no specific treatment is available. During infection measles virus multiplies mainly in the lungs and the immune system, and it can spread from cell to cell by inducing the fusion of neighbouring cells.

We are interested in understanding how this virus “travels” from one cell to the other. To study this topic, we use a measles virus that was modified to produce a green fluorescent protein. When we infect a layer of cells, we can track how the infection progresses by using fluorescence microscopy: infected cells are shown in **bright green**, while uninfected cells remain in the **dark regions** of the picture. We can then evaluate how the virus induces the reorganization of the skeleton of the cell, as a giant multi-nucleated cell - called syncytium - is formed (bright “crater” in top right).





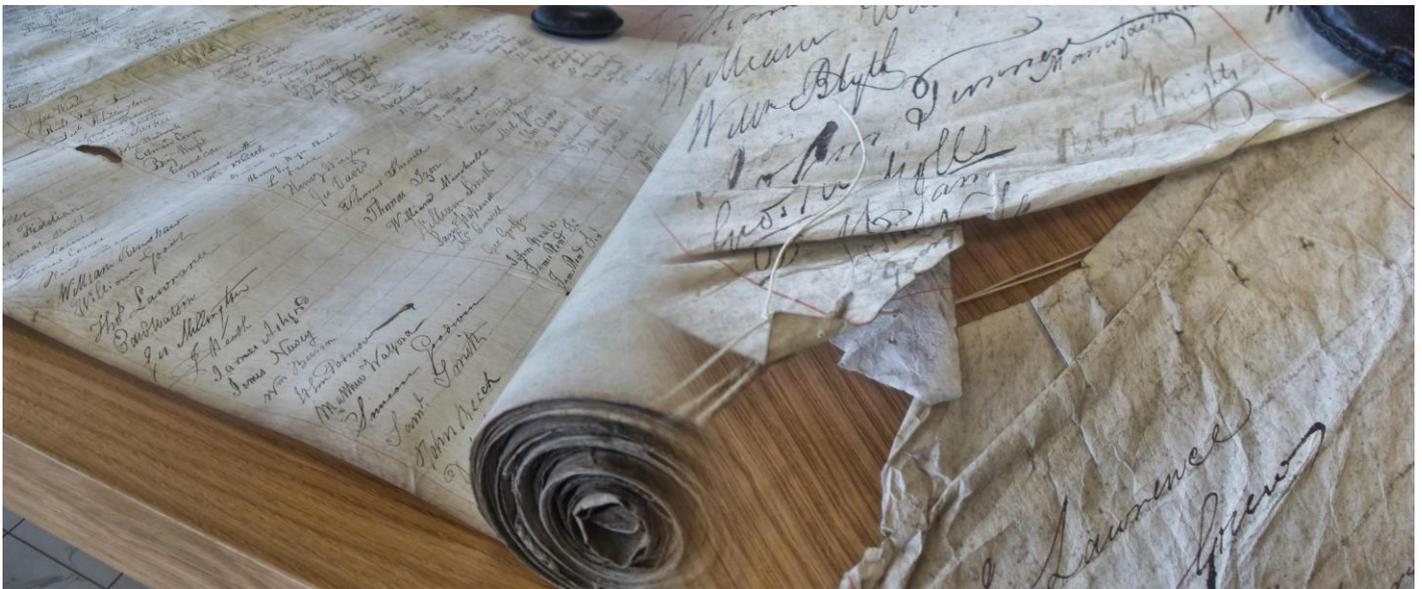
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Urban Pauses

*Deyala Altarawneh, Doctoral Researcher,
Geography Earth and Environmental Sciences*

The image shows a construction site of a mega project in the city of Amman, Jordan. In the past decade, the area witnessed a wave of investment opportunities promising skyscrapers, high end towers and a skyline of a metropolitan city. Instead, the city was left with holes of disappointment and projects literally on pause. The image is a representation of the current situation for many of the manifestations on hold which research argues have much potential yet to be fulfilled.

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‘We Your Petitioners...’

Donna Taylor, Doctoral Researcher, History and Cultures

Petition from the people of Birmingham requesting parliamentary representation, 1828. The image is intended to show one way in which regional communities in Britain interacted with national government in an attempt to bring about electoral reform. Two images have been merged in order to give a sense of how a petition was organised. Copies were made available for signature in various accessible locations in the town then stitched together and made into a scroll for delivery to parliament. This particular scroll was probably never submitted and remains in the Birmingham archives.

My research is a case study of the foundation of Birmingham town council in 1838 and how this is located in a more general understanding of popular protest and the so called ‘Age of Reform’ in the first half of the nineteenth century. During this time petitioning was an important mode of political activism in which whole communities would be invited to take part. Between 1800 and 1831 the number of petitions presented to parliament rose from around 200 per year to more than 5,000. It was the only legitimate means by which an unrepresented town could attract the attention of central government.





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Studying Microbes Doesn't Have To Be In Isolation

Elizabeth Benedikz, Doctoral Researcher, Immunology and Immunotherapy

The majority of research on microbes such as viruses and bacteria focuses on one at a time. At the start of my PhD we decided to study the effect of combining viruses, bacteria and human cells. This is important because the body is constantly encountering a wide variety of potentially disease causing microorganisms, so the chances are that in the moment that one infection takes hold there will be others waiting for their opportunity to as well. The more we know about these interactions between microbes and their host, the better prepared we can be to treat diseases.

This image shows the three components of my experiments waiting to be combined: human cells growing in a flask, bacterial cells growing on an agar plate, and viruses in a liquid medium. It also shows the University, from the vantage point of the Institute of Biomedical Research building. Carrying out a long, complex experiment can often feel isolating, so it has been wonderful to glance out of the window at the rest of the University and be reminded that I'm not alone.





American Law and Amish Order

Frédérique Green, Doctoral Researcher, Theology and Religion

This horse and buggy belong to a member of the Amish, a Christian plain group in North America. The buggy displays an orange slow-moving vehicle sign. This illustrates how American regulations encroach into the Amish culture. These regulations were initially opposed by Amish factions because it went against their religious practice of not accepting man-made signs and only relying on God's providence. Eventually the issue had to be settled in court between the authorities' demands for road safety and the religious freedom of the Amish which is covered by the First Amendment of the United States Constitution. Some groups have accepted this ruling, some very traditional ones remain recalcitrant.

My research focuses on the politico-legal interaction from the settlement of the Amish in America, in the eighteenth/nineteenth centuries, until today. The enquiry will advance the understanding of the ongoing negotiation between the two entities as well as exploring the power dynamic between the American State and religious minorities.





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Disabling Environment

Hikmah Kamarudin, Doctoral Researcher, Geography, Earth and Environmental Sciences

The social model of disability views that inaccessible built environment is disabling disabled people apart from their impairment (Oliver, 1986) while the impairment such as a defective limb is not the reason for a person with disability to be disabled. The image attempts to portray the view of the social model of disability that disability is caused by the society that creates disabling environment (e.g. when wheelchair users have to 'climb' staircase). The inability of society to make reasonable adjustment is the 'barrier' but not the disability. Concerning Oliver (1986) argument that inaccessible built environment is disabling disabled people, it is agreeable that public places and public buildings should be planned and designed based on the accessible manner to ensure that everyone could have access to the physical environment. Therefore, barriers need to be removed while facilitator such as the appropriate gradient of ramps for mobility impaired and wheelchair users should be provided. Cuthill (2010) points out that distribution of infrastructure and services must be underpinned by consideration of social justice and equity. As accessible and inclusive built environment contributes to social justice and equity; my research proposes that disabled people access should be empowered in order to achieve justice for all.





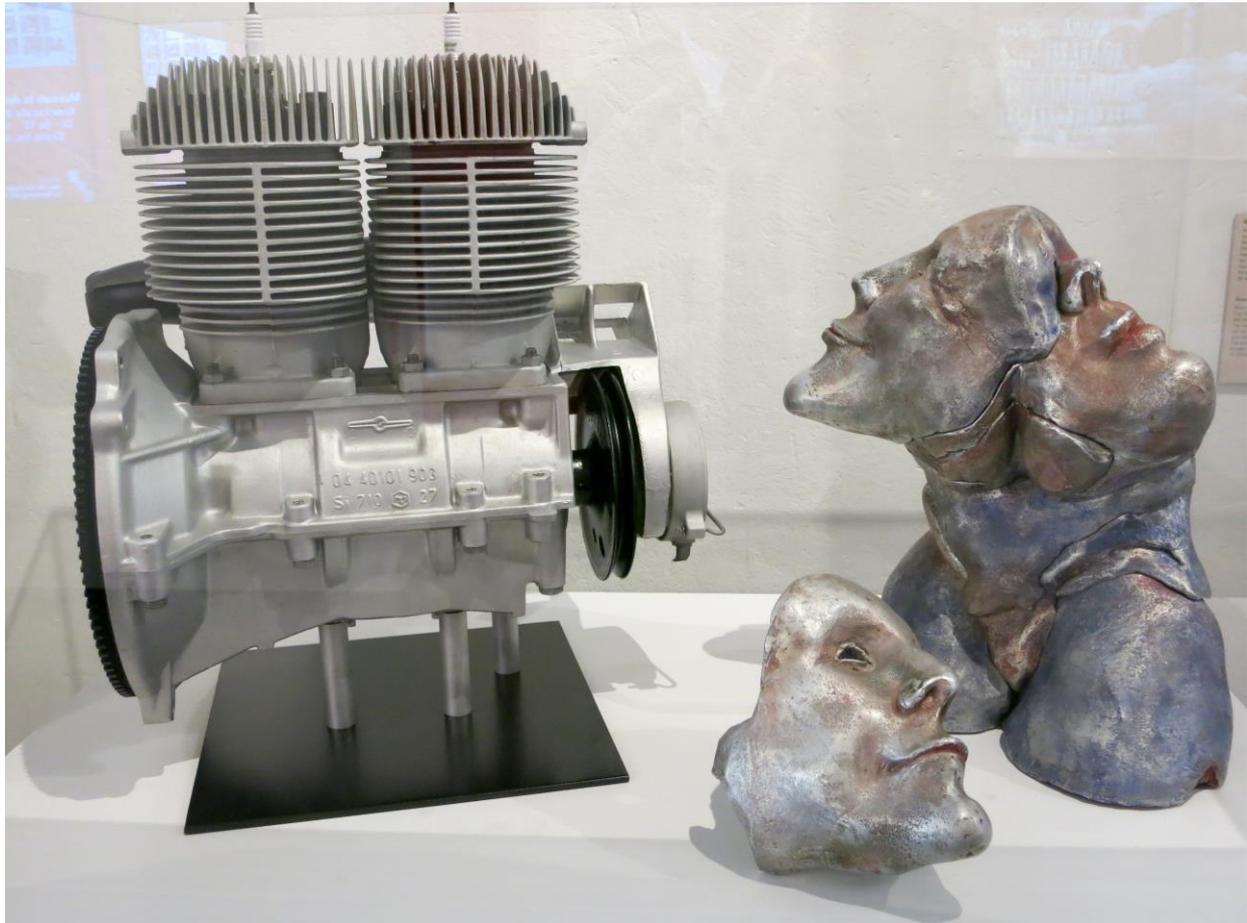
Ely Cathedral's Lantern: The Light that Guides the 'Ship of the Fens'

Ian Styler, Doctoral Researcher, History and Cultures

The Lantern of Ely Cathedral floods the interior of the building with light from its octagonal stained glass windows, representing the illuminating guidance provided to the community by Ely's revered saint, Æthelthryth, whose shrine acted as a beacon for nearly nine hundred years to pilgrims from across the country seeking cures, retribution or forgiveness. From the time that this virgin saint's tomb was opened in 695, whereupon her remains were found to be intact and undecayed and a tumour on her neck to be miraculously healed, until the Reformation in the sixteenth century, her relics were both a source of strength and guidance for those that visited them, and a symbol of Æthelthryth's protective and sometimes vengeful character on behalf of Ely's monastic community.

My research uses a combination of textual, archaeological, cartographic and other historical sources to build a complete picture of how the saint's remains, miracles and character were utilised by the Ely monks to publicise the shrine and increase Ely's significance and influence throughout the Middle Ages. Consequently, I am able to show how the foundation's fortunes through periods of both severe upheaval and relative calm are reflected through the portrayal of the saint and her actions.





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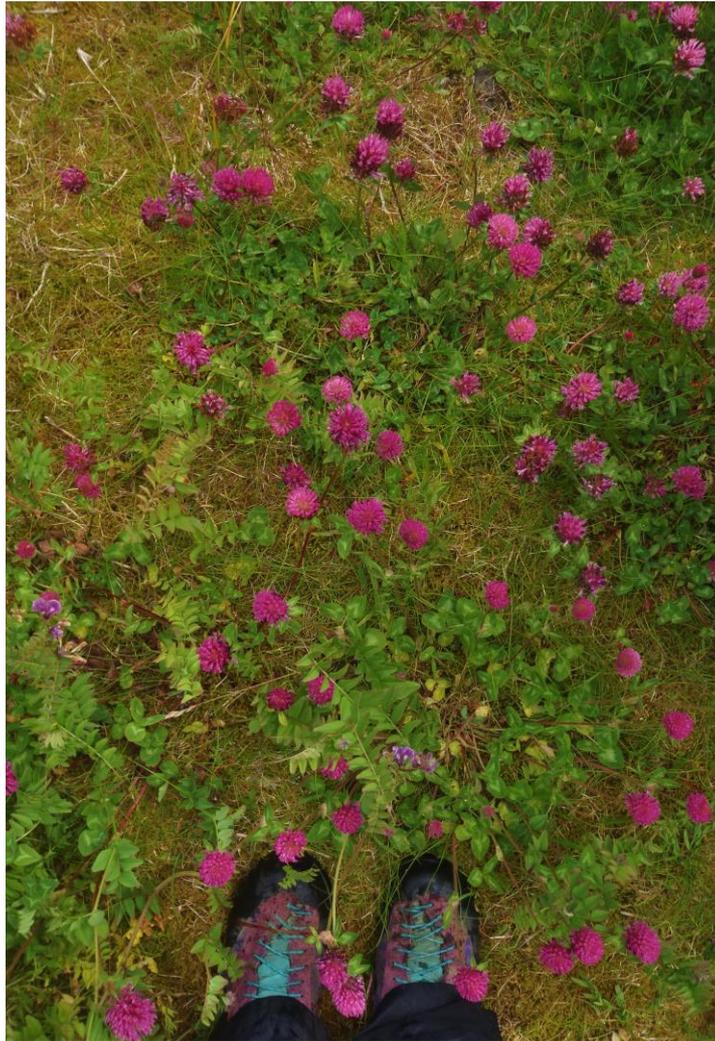
Ten Faces of Germany, 2016

Ivor Bolton, Doctoral Researcher, German Studies

My research project concerns how the German Democratic Republic (GDR) is represented through museums and memorials. It involves investigating how the socialist State is depicted through exhibition and display. To do this I have visited museums and memorials that re-present the GDR, interviewing heritage policy makers, influencers and implementers – directors and curators of museums and memorial institutions in Germany.

The image shows an engine from a defunct Trabant car – an ikon of the GDR – and a sculpture by Peter Unsicker entitled 'Torso Germania' (Body of Germany). This was cast in 1998 from metal in the engine of a Trabant car and West German traffic signs. It symbolises the process of unification between East and West Germany. The heads can be assembled in nine different ways to represent the different perceptions and perspectives of unified Germany. In the context of my research the display also represents the different views that are held of the GDR. The title of the image refers to the nine ways that the sculptured faces can be assembled plus the face of the GDR that is represented by the ikon but often ridiculed Trabant. The exhibition is 'Alltag der DDR' (Everyday life in the DDR), Berlin.





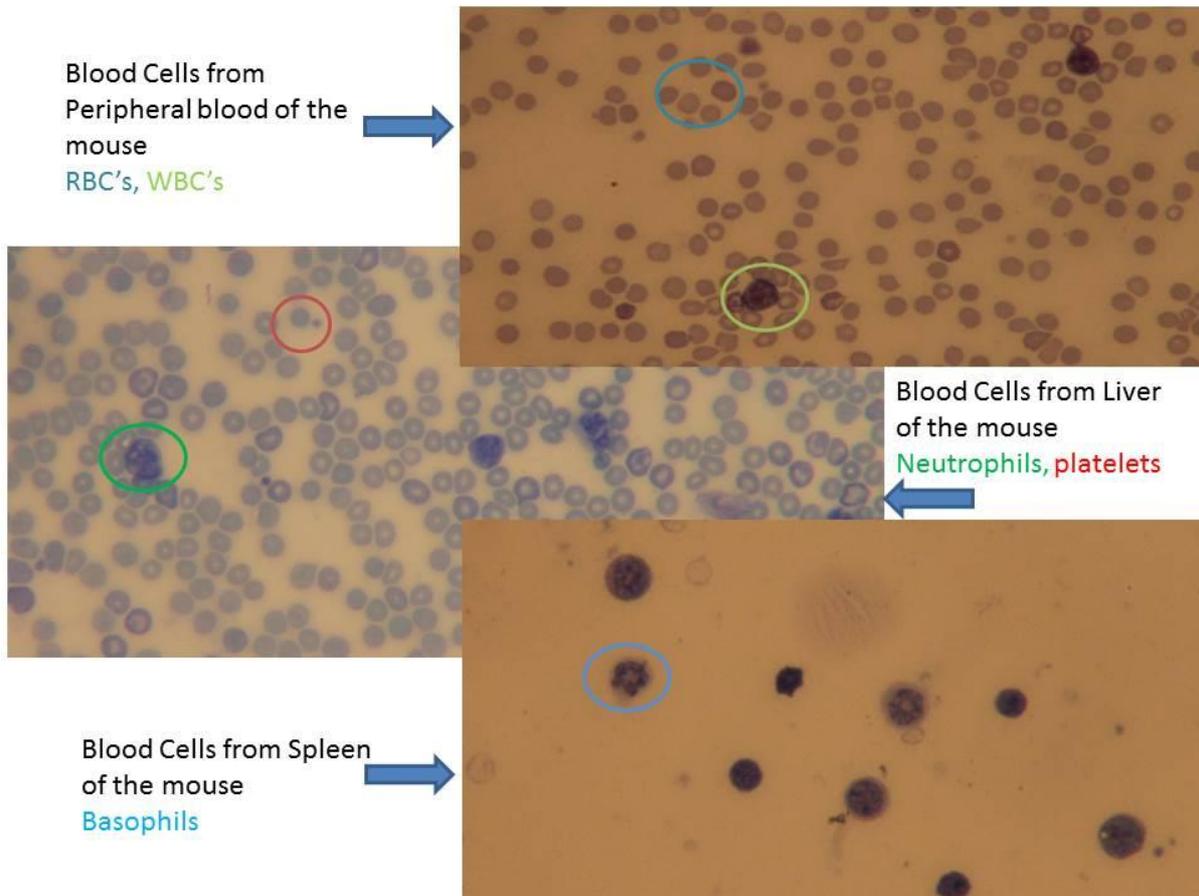
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**“A common man marvels at uncommon things:
a wise man marvels at the commonplace.”
Confucius**

Jade Phillips, Doctoral Researcher, Biosciences

Plants are common. There are over 350,000 plant species and we rely on about a dozen for our food. One of the most common species is the red clover (*Trifolium pratense* L.) seen in this photo. It is also one of the most widely used plants in the world. Okay, so you won't find red clover in the supermarket, but you will find cows and sheep eating it. It comes from southern Europe, which is known as its centre of origin. These areas are important as they contain a wide range of species and genetic diversity. The genes contained within populations of these species could be the key to adapting our agriculture to climate change. For example, populations in southern Europe are adapted to hot, dry environments, conditions that could become common in our farmer's fields. If we find, conserve and use these populations, via conservation of seeds and within protected areas, we can protect future food security. So, when you walk past a patch of grass and notice some clover, take a closer look and become a little wiser. (The red clover in the photo is found in Northern Norway, near Tromsø. This is the limit of its distribution, meaning the genes within the plants are especially important for farmers in the Arctic.)





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Blood smear stain of a leukemic murine model obtained from Peripheral Blood, Bone marrow, Spleen and Liver cells

Jidnyasa Gujar, Postgraduate Researcher, Cancer and Genomic Sciences

This beautiful image represents different types of cells found in the blood of a mouse which are similar in humans too. The blood system is composed of red blood cells that carry oxygen, white blood cells which fight against the foreign bodies by building up the immune system and platelets which are the smallest fraction but are very essential as they prevent bleeding. In normal humans, these blood cells are in a particular range but in leukemic patients, the number of these cells is seen to be fluctuating. I envisage by looking at these blood smear stains and understand the mouse hematopathologies as a part of my research. The image captured is of murine blood system as a representative in my study. The levels of WBC's and platelets are high which usually happens in leukemic conditions.

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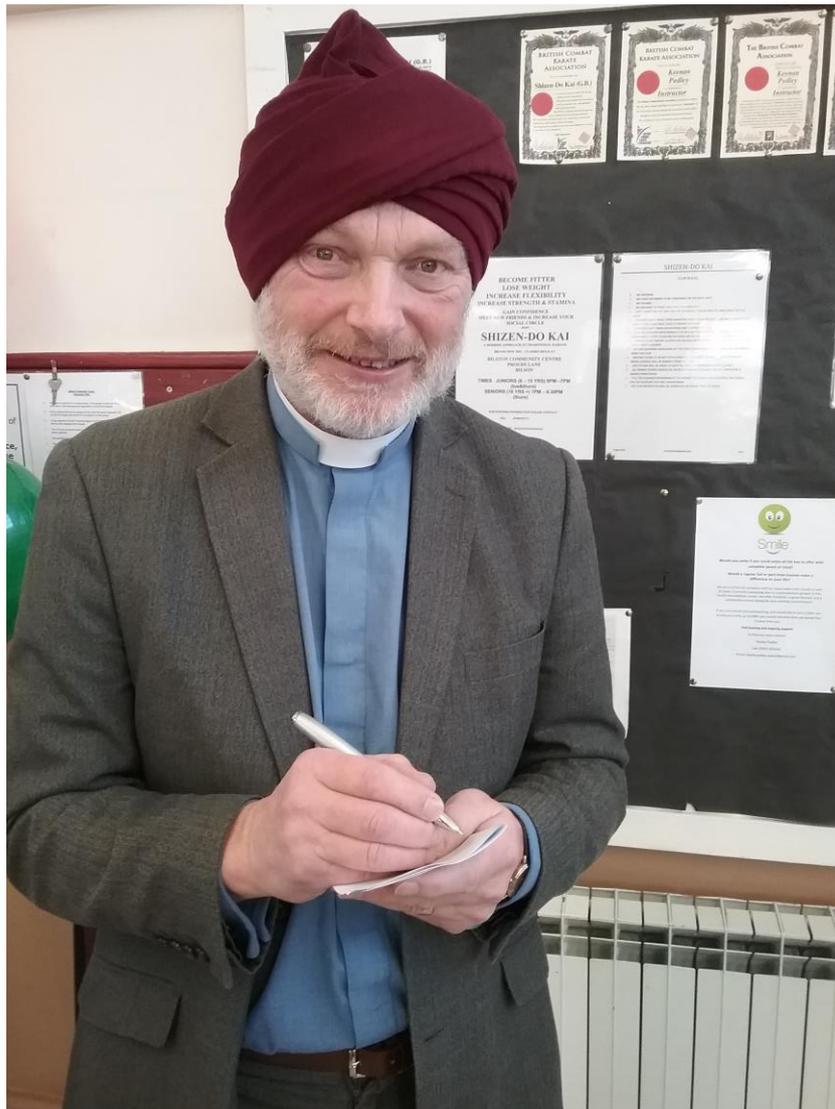


Eat what others eat

Jinyu Liu, Doctoral Researcher, Psychology

Recent NHS statistics show that 70% of adults have not met the recommendation of consuming 'five portions of fruit and vegetables a day' (2014). A novel approach to promote healthy eating is based on social norms - codes of conduct that provide a guide to appropriate behavior. Evidence suggested that social norms can influence food choice and food intake. So that's where my research come in. My PhD research is about how social identity affects how we respond to eating norms. My studies found that groups or individuals that people feel a strong connection with (e.g. family members and friends) could promote healthier eating behavior. Those findings are illustrated in this photograph which shows the food choices among three close friends before (upper picture) and after a period of time (bottom picture). When majority of group members choose salad, such a social norm message can encourage the person who eats burger to select much healthy food next time. The implication of my research is to use social norms to help people developing better dietary habits.





A Christian Sikh? How does that work then?

John Barnett, Doctoral Researcher, Philosophy, Theology and Religion

The picture shows the researcher, an Anglican priest and interfaith worker, at a celebration of the 50th Anniversary of Wolverhampton bus drivers winning the right to wear turbans at work. The researcher has had a turban put on by a Sikh friend. The research title is *What new and useful understanding of interreligious relations can be opened up by engaging in regular Sikh worship while continuing as a practicing Christian?* The researcher is recording his own experience of worshipping regularly in a Sikh gurdwara as well as continuing in regular Christian worship over a period of two years, trying to spend an equal time in both. The picture opportunity arose in a natural situation, but has been posed in such a way as to indicate the recording and reflective aspects of the research as well as the boundary-crossing field-work itself. What are the identity markers, overt and covert, that surround these religions? Are there any consequences, personal or communal, when that identity is blurred? What degree of challenge to their own identity is it appropriate and fruitful for Christian interfaith workers to accept in deepening engagement with other faiths?



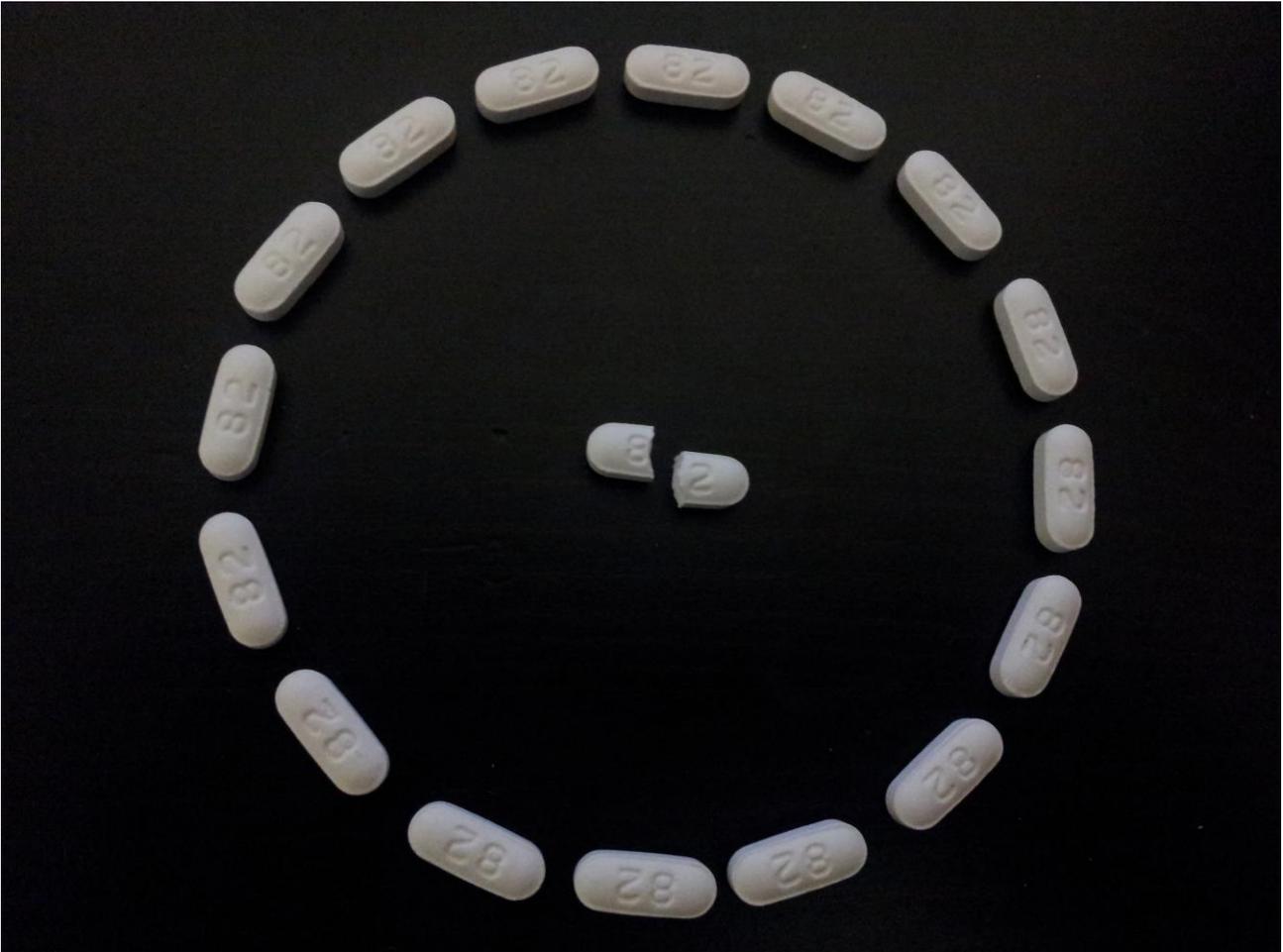


In search of East Asia's forgotten dynasty

Jonathan Dugdale, Doctoral Researcher, Medieval History

Dominating the Inner Mongolian landscape, these pagodas have stood for almost a thousand years. In the distance is the Daming Pagoda, an eighty-metre high testament to one of tenth and eleventh century East Asia's most powerful dynasties: the Liao. This dynasty, formed by the Kitan people in 907, covered massive tracts of land that would now occupy the majority of northern China, from the silk road oases to Korea. The Liao were the dynasty that founded Beijing as an imperial capital and whose ethnicity gave most of the western word its name for China for hundreds of years – Cathay. Despite these achievements, historical circumstance has left the Liao as a largely unexplored enigma. The Kitan written language is yet to be deciphered leaving the Liao without a voice in the historical record - doomed to become a small footnote in the 5000-year narrative of the Chinese nation. Their pagodas still remain though, with more than twenty Liao examples surviving to this day. It is the aim of my research to use these monuments as the basis for a new, Liao centred, narrative and explore the dynasty's political, religious and cultural position within the frameworks of the East Asian region.





Pill Panopticon

Katie Masters, Doctoral Researcher, Modern Languages

Pills are arranged in the formation of the panopticon. This 'perfect prison' consists of cells about a central watchtower, from where inmates cannot tell whether they are being watched at any given time. Thus, they behave as though they are being watched *all* of the time and effectively watch themselves. I employ the panopticon in order to describe the way in which women learn to self-monitor their behaviour/appearance and how this might manifest as social anxiety disorder.

Conversely, the outer pills represent society, watching, and the centre pill represents the socially anxious woman. This pill is halved to indicate the 'split' in her sense of self. This forms a 'real-self', which is who the woman feels herself to be, and a 'false-self': a mask which is adopted such that the 'real-self' is protected from negative evaluation and can thus function in society.

The pills are Sertraline, an antidepressant commonly prescribed for social anxiety disorder. Thus, the image also shows the socially anxious woman as being imprisoned *by* the pills. As critic of modern psychiatry, R.D. Laing, has said about the move from locked doors and straitjackets to psychotropic drugs: they place the 'bars of Bedlam [...] inside the patient.'



The Ancient Individual Model of Research
Egyptology

In Light of a Socio-historical Approach

Queen Tiye - The A.I.M. of Research

Kelee Siat, Postgraduate Researcher, History and Cultures

There has been a lack of a defined approach and method when carrying out research on ancient individuals in the field of antiquity and historical studies. My current research in Egyptology has defined a Socio-historical approach where I have developed the Ancient Individual Method (A.I.M.). The A.I.M. of research examines the social and private spheres of the ancient individual that is held within a complex matrix of connections and disconnections which often leads to conjecture based upon the perspective of the researcher or audience and their attempts to gain access to information about the ancient individual.

The model aims to acknowledge and examine leads, assumptions and what can be discerned about history through perspectives, objects, and theory regarding antiquity and its individuals. This is accomplished by identifying connections and gaps in the ancient individual's life story by giving recognition to the complex social, political and private realms and asserting possibilities and probabilities towards the extraction of potential biographical information. Through the examination of the Eighteenth Dynasty Queen Tiye, Great Royal Wife of Amenhotep III, this model is being showcased to find out 'who' Tiye was.





Pipetting into the spiral of doom

Lewis Cawkwell, Doctoral Researcher, Immunology and Immunotherapy

My PhD is in cancer research, an extremely rewarding area to study. However, working in the laboratory doesn't always go as well as expected! An integral tool of any biology student is the pipette. This rather inconspicuous device is used to transport precise measurements of liquids, a crucial part of any experiment. My painting shows a blue pipette, with a greatly exaggerated and elongated yellow tip. This elongated tip is actually never ending as it forms into a spiral, leading into a dark abyss. This spiral into the abyss represents a spiral of doom.

I went into my PhD thinking I would make life changing discoveries and help to cure cancer. Now that I am coming to the end of my studies, I'm happy to get any piece of insignificant data, even negative data, anything that can go into my thesis. Ultimately, this artwork represents a large portion of my PhD, where no matter what I did, experiments failed. This led to a lack of enthusiasm to do more experiments, causing my PhD to fall deeper into the spiral of doom. A word of advice to escape that spiral... don't be afraid to change project, it's YOUR PhD!





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Sarajevo: where atrocity meets modernity

*Louis Francis Monroy Santander, Doctoral Researcher,
International Development*

The photograph, located in Sarajevo's thriving city centre, depicts the contrast between the modern architecture put in place by Bosnia's post-war reconstruction and a reminder of one of the most tragic events of the Bosnian war (1992 to 1995): The Srebrenica genocide, representing a meeting point between modernity and atrocity. This is a visual representation of the existing clash between the efforts at national and international level to achieve a sustainable peace in Bosnia, the unresolved issues and concerns regarding past atrocities committed and their relation with transitional justice initiatives to deal with these.

My PhD research focuses on the understanding of "reconciliation" in peace processes and the way such understanding becomes a frame for implementing processes of truth, justice, social repair and post-war reconstruction. Local and international views about the Bosnian war often generate a clash with projects on truth-telling, justice initiatives and social reconstruction between agents at various levels (international, national, local, community) which complicate the understanding and achievement of sustainable peace. In particular, the Srebrenica Genocide, which saw the extermination of over 8,000 Muslims in Bosnia, remains a divisive issue for its population, its political leaders and the people working in peace-building operations in the country.





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Good Grief

Magdalena Antrobus, Doctoral Researcher, Philosophy, Theology and Religion

This is my pastel painting (soft pastels on pastelpat, A3) illustrating my current research in Philosophy of Psychiatry. I investigate whether there might be any benefits related to depression. Depression is associated with significant psychological costs: low mood, anhedonia (lost ability to experience pleasure), insomnia (sleeplessness), low self-esteem, etc. Meanwhile, it seems to be only part of the wider picture. The evidence coming from empirical research show that low mood may be related to more accurate judgement with regards to self, higher levels of empathy and creativity.

People suffering from depression are often capable of making better, more rational decisions than optimists. The picture presents white birds (symbolising emotions) which come out of dark space (symbolising depression) – some of them look lost in space and do not look so good. Others, however, find their ways to the light and salvation.



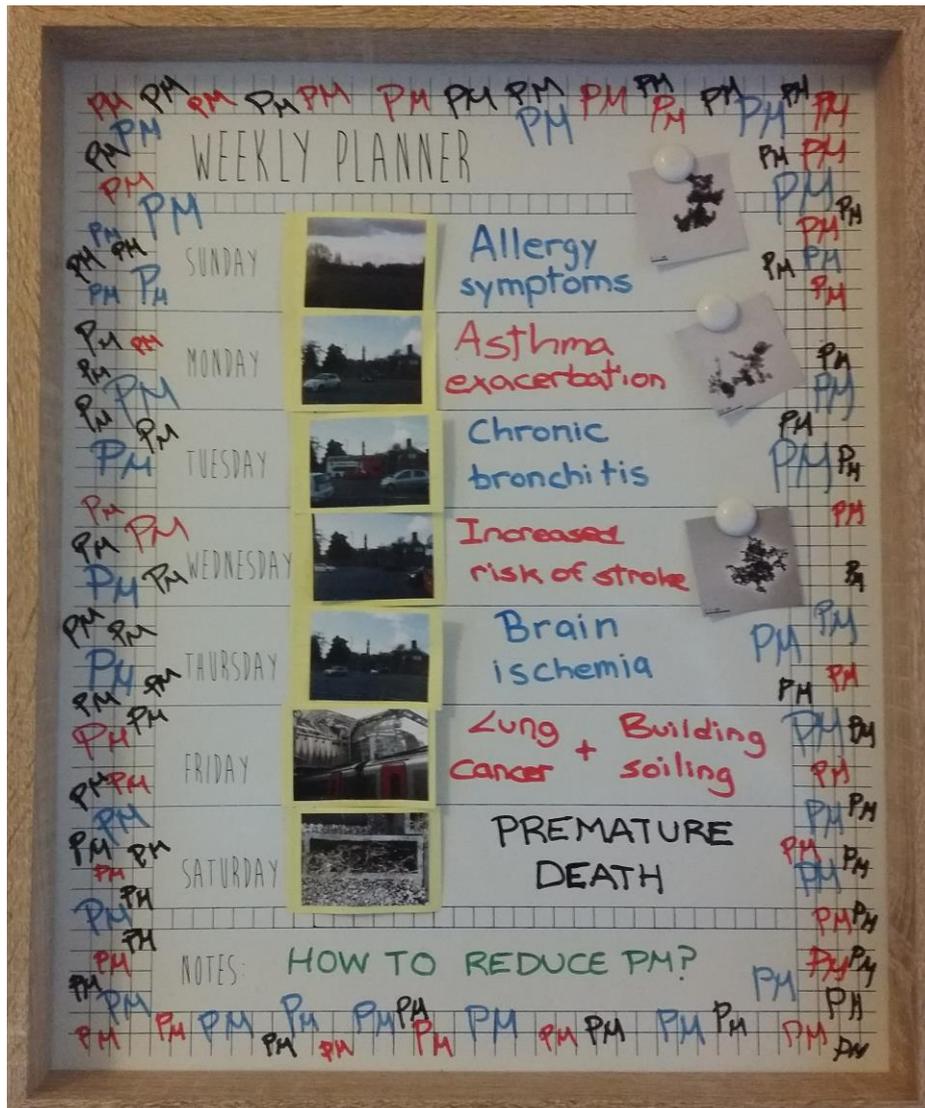


The composer of ideas

Mai Khanh Tran, Doctoral Researcher, Business School

People have predominantly seen art and science with strict binary divisions viewing “art on one hand and science on the other”. However, this perspective has been recently challenged by the shift of study of the interplay between art and science within the field of marketing. Interested in product innovation and unconventional emergence of inter-disciplines, I am conducting a research on adopting a musical mind in generating ideas for new products and services. Whilst new ideas are critical in distinguishing a genuine product from copy-cats, the journey of creativity is not so clear cut and new recipe of novel ideas is unfound. Research on music composition, on the contrary, has provided valuable findings including pathway of idea development and positive psychological impact of music on creativity. By immersing myself into real project initiated by renowned organisations, one is a city symphony orchestra and the other is a world leading technology corporation, I develop my research to see how blending aesthetic and technological expertise can enhance the journey of idea development, spark new ideas, and offer intrinsic values for consumers. This ongoing study is expected to enhance personal creative minds and assist each person to be a composer of ideas.





Daily exposure to Particulate Matter

*Maria Bogarra-Macias, Doctoral Researcher,
Mechanical Engineering*

What does PM stand for? Many people will instantly think of the afternoon, Project Manager or even Primer Minister. However, for me, PM is a synonym of Particulate Matter, a highly toxic pollutant emitted during the combustion of different fuels. The harmful effects of PM are well known. The International Agency of Research on Cancer has classified PM as carcinogenic to humans. PM is linked to higher risk of stroke, asthma or other respiratory-system illnesses and premature death. It was estimated by the European Environmental Agency that 87% of Europeans were exposed to unhealthy levels of PM on 2013.

In addition, PM deposition is the primary cause of building soiling amongst other negative effects on the environment. The aim of my research is to characterise the physical properties of PM in order to find ways to reduce its final emission to the atmosphere. PM can be reduced through the optimised control of the engine parameters, fuel reformulation or aftertreatment systems (i.e. particulate filter). This image represents how I feel everyday on my way to University, same route but different vehicles and drivers who are not probably aware of the consequences of PM on pedestrian's health.





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“What would you say to a cup of tea?”

*Marianne Cronin, Doctoral Researcher
English Language and Applied Linguistics*

Mrs Doyle (the housekeeper) offers Father Jack (an elderly priest) a cup of tea:

Mrs Doyle: And what would you say to a cup?

Father Jack: Feck off, cup!

(Audience laughs for 5.2 seconds)

You might already be familiar with the Irish swear word ‘*feck*’. The word first gained public attention when it was used in British-Irish sitcom *Father Ted*. Elderly priest Father Jack was known for sitting in his filthy armchair and shouting it at his fellow priests. But why does the audience laugh when Father Jack is impolite to Mrs Doyle? And why are so many sitcoms full of impoliteness? Using scripts from Channel 4 sitcoms *Father Ted*, *Black Books* and *The IT Crowd*, my research aims to do three things: 1) to show that impoliteness is common in sitcoms, 2) to prove that there is a relationship between impoliteness and audience laughter and 3) to explore the types of impoliteness that are used to make us laugh.

My photograph depicts the impolite term ‘*feck*’ as the focus of investigation and the ornate frame represents the cultural significance afforded to the word, with its fixed association with humour, impoliteness and the popular sitcom *Father Ted*.





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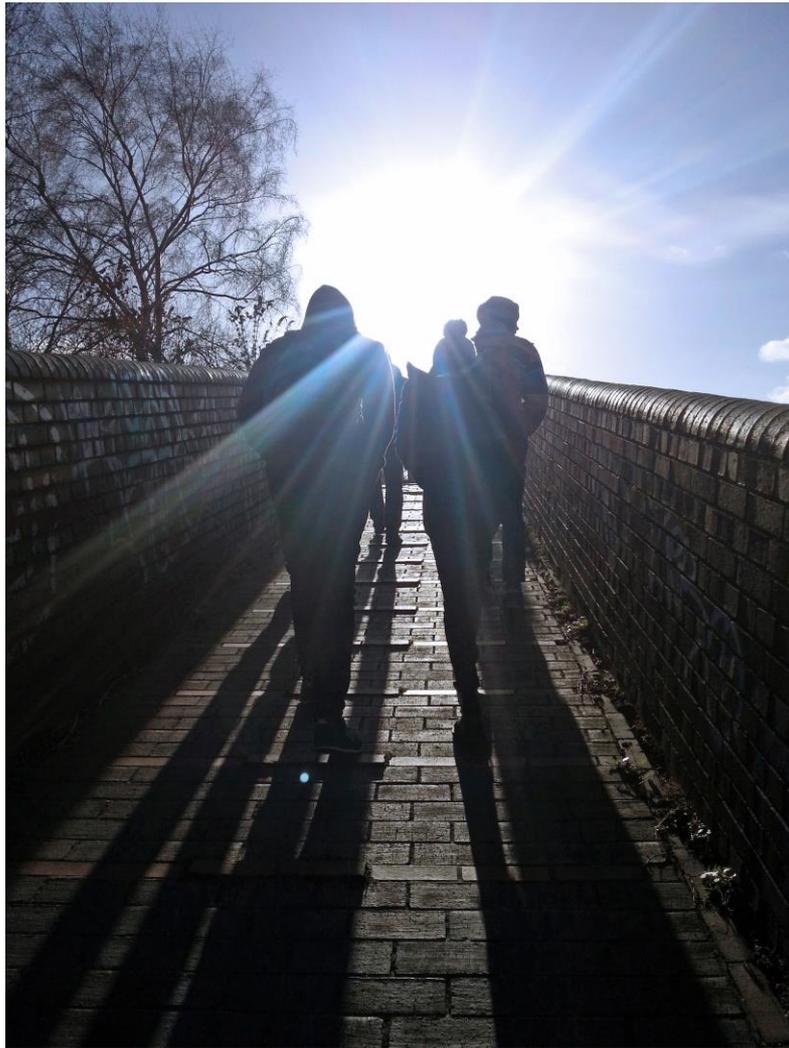
Nottingham Tram Extension – Learn lessons from Past to Build the Future

*Mohammad Reza Zolfaghari, Doctoral Researcher
Civil Engineering*

The author studies had shown that the modern British tramway development schemes are not mostly in time and to the estimated budget. This issue has significantly affected the reputation of the tramway network as happened in Beeston project and potentially led to remarkable waste in time, budget and human resources. Hence the author proposed a PhD research study in order to identify the causes of the mentioned issues and find the existing gaps in knowledge, technology and management of the modern British tramway development schemes.

As part of the study, the author focuses on programme management strategies to enable projects to learn lessons from previous projects to avoid the same mistakes and optimise construction and maintenance cost and time. This photo tries to inspire this concept in a single frame, to highlight the importance of existing a holistic construction documentation in urban railway construction projects.





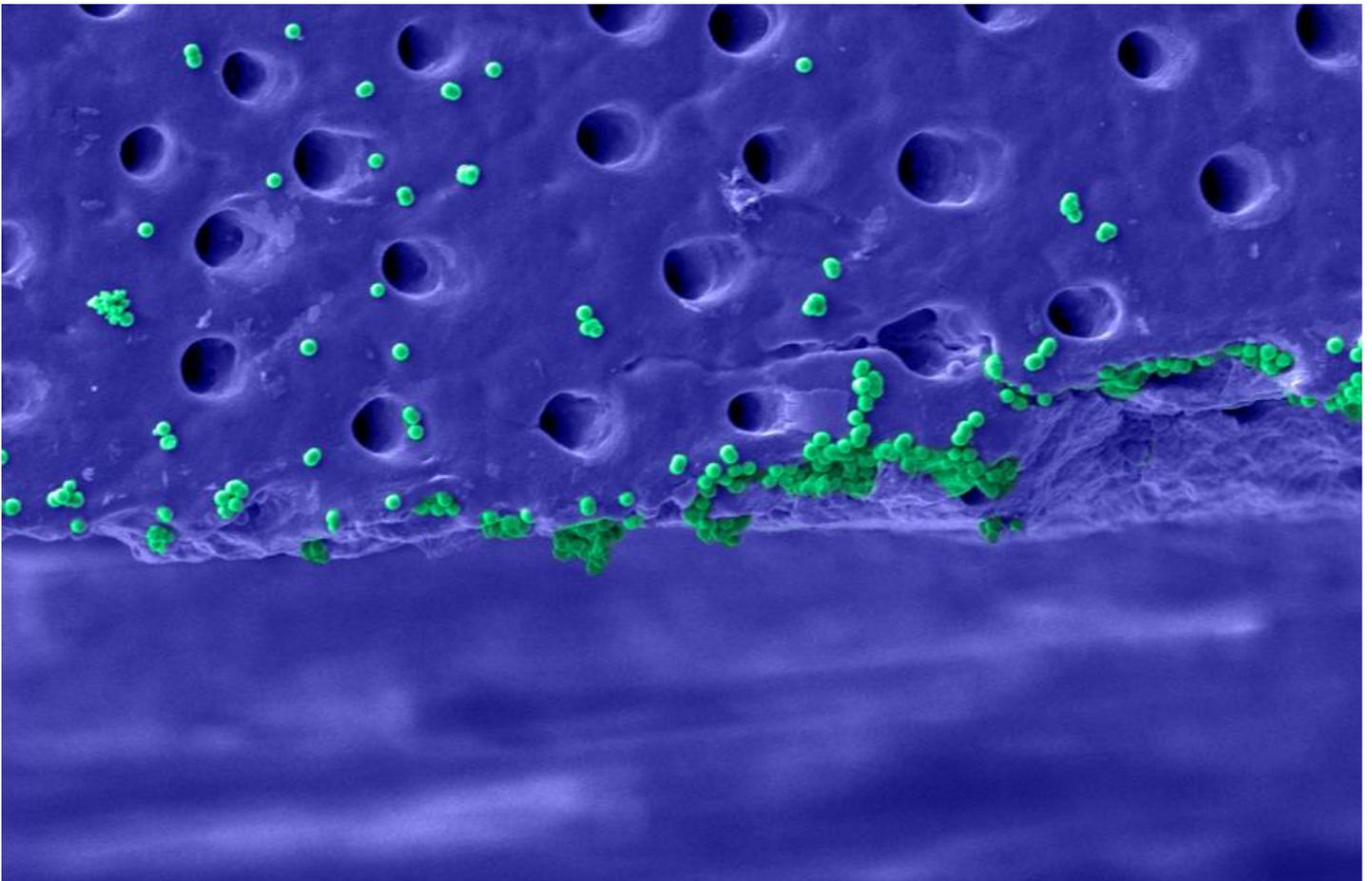
Walking for quality healthy ageing life

*Naeemah Yusof, Doctoral Researcher
Geography, Earth and Environmental Sciences*

Recently, many scholars encourage a shift from car use to walking and cycling for short journeys in the urban areas. Walking and cycling can help to reduce traffic congestion in the urban area. Prior studies support that walking produces a lower environmental impact, increase social and recreational value, and promotes mental and physical health in a city. Therefore, this study will promote walking environment not only for the youth but also for the least advantaged group of people such as elderly. Understanding of the elderly need for physical activities and social interactions is crucial. With that, it leads to the purpose of this study, to recommend the city authority to encourage elderly interactive participation by providing walking environment in its planning.

This study uses the theory of spatial justice and theory of walkability to identify factors that could improve the city planning. The contributions of this study are expected to lead towards proposing a spatial justice model for encouraging elderly interactive participation into city planning. The image shows that walking offers a bright potential for future later life; quality healthy ageing life. Symbolically in the image, walking needs to have a purpose, border, guide, attitude, companion and supporting built environment.





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Repairing diseased teeth using nano-dentistry

Nina Vyas, Doctoral Researcher,
PSIBS Doctoral Training Centre EP/F50053X/1

This is a false colour electron microscope image of sub-micron silica particles, about 800 nanometres small, on the surface of a human tooth. At the University of Birmingham are investigating how antimicrobial particles can be put into teeth to kill bacteria that invade the tubules during dental decay, thus preventing further damage to the tooth.

I am researching a new way to push nano-particles and sub-micron particles further into the channels, using the large forces generated by cavitation bubbles. These are bubbles that implode on themselves and generate high speed microscopic jets and shock waves. We have shown that the sub-micron particles can be delivered into the tubules after just a one second application of cavitation bubbles, and more research is being done into how to improve the efficiency of this process. This could lead to a novel way of treating dental disease using nano-dentistry.





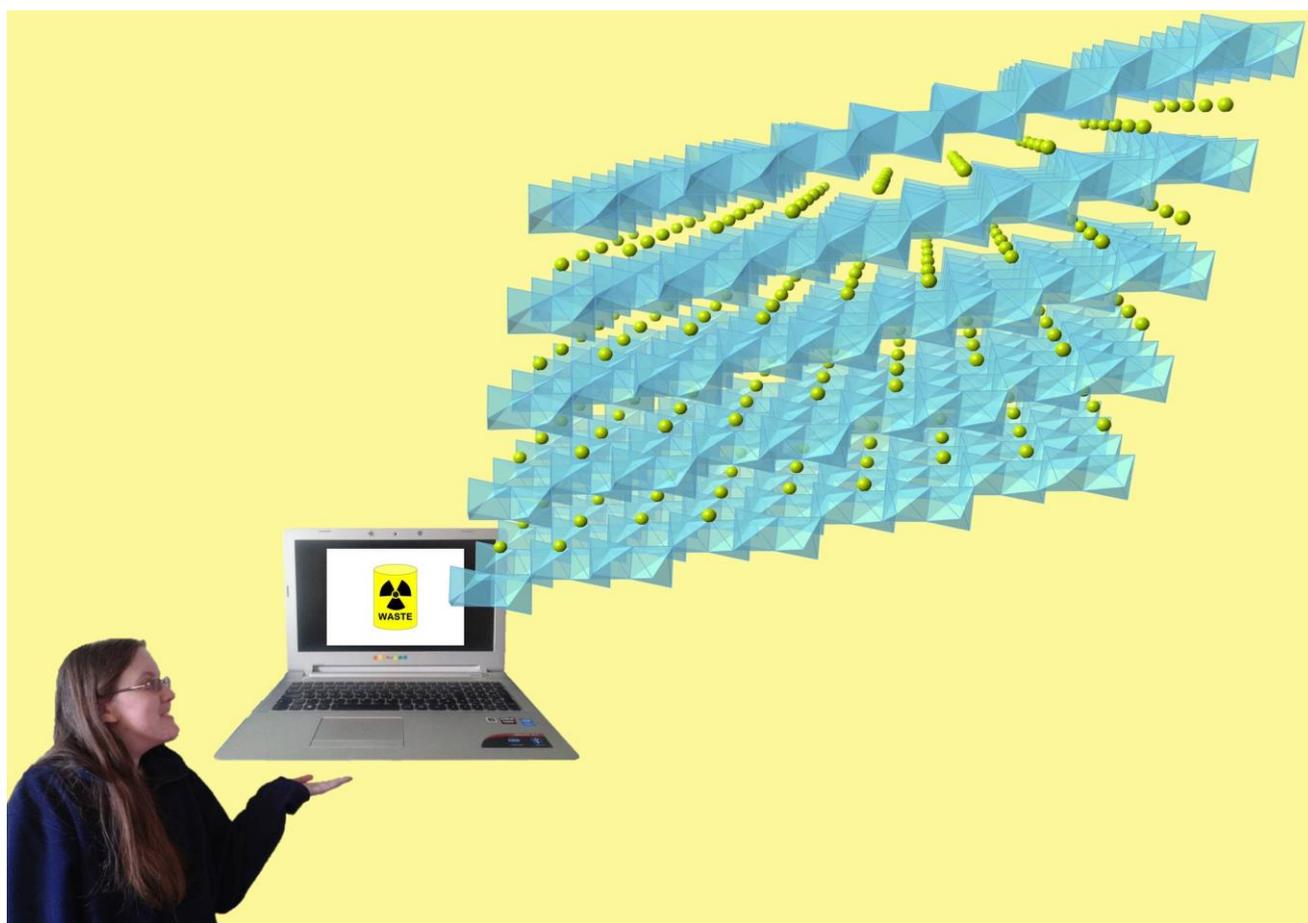
From Waste to Product via Rome

Peter Keeley, Doctoral Researcher, Chemical Engineering

The UK produces large volumes of hazardous wastes, from processes such as the incineration of household waste, which are often sent directly to landfill sites. This waste is a financial burden on the producers but also a burden on the environment. The hazardous waste can however be treated at high temperatures and converted into a glassy material which is no longer hazardous by a process known as vitrification. This material is suitable to be used as a cement replacement for the construction industry.

This photograph shows a Romanesque figure made from vitrified hazardous waste. The glassy material undergoes a reaction similar to that which the Romans took advantage of as they were constructing their cities when they mixed lime and gypsum with volcanic ash. The volcanic ash which underwent what is known as a “pozzolanic reaction” where the ash reacted with an alkaline solution to produce a strong and solid material suitable to be used in structural applications. The glassy material produced by vitrification will also react with an alkaline solution producing a strong material similar to that material which gives concrete its strength and so creates a useful and environmentally friendly material for construction and, of course, Roman statues.





A Ceramic, My Laptop and Me: Envisioning a Safer, Sustainable Future

Rebecca Bird, Doctoral Researcher, Chemistry

Nuclear power plants use the energy released during the fission (splitting) of the nuclei of the Uranium fuel to generate electricity. Spent nuclear fuel is reprocessed in order to reduce waste volumes and extract the unused Uranium; the resulting High Level Waste (HLW) contains most of the radioactivity associated with nuclear power and must be immobilised in a stable material to prevent damage to the environment. Currently the material of choice is borosilicate glass, but it does not accommodate all HLW constituents. As such, ceramic oxide materials – particularly those with mineral analogues – are being considered as an alternative.

One such ceramic that is receiving attention with regard to HLW immobilisation is cerium brannerite. Here, I can be seen considering its structure, with my gaze passing through my laptop – which signifies the computational modelling techniques I use in my research: I am channelling experimental data into a robust model of cerium brannerite; this will be used to predict the defect, ion transport and surface properties of the ceramic; further the radiation damage that results from HLW loading will be predicted. Overall, the aim of my research is to assess, computationally, the suitability of cerium brannerite as an alternative HLW immobilising material.





The Three Four Crowns of Florence

Rommany Jenkins, Doctoral Researcher, Italian Studies

Many people have heard of Dante Alighieri, author of the Divine Comedy, a poem which depicts the author's journey through Hell, Purgatory and Heaven. Dante, together with Boccaccio and Petrarch, make up what are commonly referred to as the Three Crowns of Florence. Far fewer people will have heard of Guido Cavalcanti, highly influential poet and philosopher of Florence and Dante's earliest influence. My thesis is part of a current trend of re-evaluation of Cavalcanti's work and aims to play a part in re-establishing Cavalcanti's position as the first of the Four Crowns of Florence.

Cavalcanti was regarded by contemporaries as an outstanding poet-philosopher and indeed acted as a poetic inspiration to the younger Dante. However, the divinely inspired philosophy of love which Dante ultimately develops stands in stark contrast to Cavalcanti's corporeal examination of the physical experience of love. It is Dante's vision which ultimately triumphs, while Cavalcanti is silenced. My thesis explores Cavalcanti without the distorting lens of Dante by taking a pre-histories approach, examining the innovative use of medical literature and the earlier poetic tradition which can be seen in his poetry.





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Seeing is not feeling

Rosalind Baker, Doctoral Researcher, Psychology

This image represents the diverse and complex activity inside children's minds when they encounter emotion-provoking stimuli. Five children show a flurry of intense and complex neural processes, whilst one child showed much less, when watching a violent encounter. Children and adolescents have increasing access to digital media, which has led to concerns over potentially inappropriate material (e.g. violence) negatively affecting children's perceptions and behaviours. My PhD uses neuroimaging to look at neural activity in emotion processing circuits in the brain when children are presented with negative emotions, including fear and anger.

I am specifically looking at whether callous/unemotional (CU) traits in children are associated with reduced activation in emotion processing areas of the brain. CU traits encompass restricted empathy, a lack of guilt, unconcern about others' feelings and a lack of reactivity to emotion provoking stimuli. High levels of CU traits in children predispose psychopathy and antisocial personality disorder in adulthood. The child who showed much less neural activity in emotional areas of the brain in response to the violence displayed on the television may have high levels of CU traits, and is more likely to develop psychopathy in adulthood.





Coding interviews by hand

Ruth Gallagher, Doctoral Researcher, Law

Having spent many years working as a human rights practitioner I have always been unable to separate the theory of human rights from the daily lived reality for many people. Despite a robust regime of human rights protection in Ireland, it is shocking to learn that Irish Traveller men live an average of 15 years less than the rest of the population.

Nomadism is a distinguishing feature of Traveller life and has a direct effect upon housing or accommodation. My PhD research explores the operationalisation of the right to culturally-appropriate housing, attempting to understand why this right is so poorly realised.

As part of my research, I gathered empirical evidence in one-to-one interviews. For various reasons, I discovered the usual data analysis software packages were not going to work for me and I set out to analyse my interviews by hand instead. This task was not as easy as it looked and took me three attempts, over a period of several weeks, before I felt happy with the final version. In this colour-coded analysis, 'red' marked every time an interview participant spoke of the 'barriers' to the effective realisation of the right. It was no surprise that I ran out of red tabs many times during the coding process.





Sui Generis Leadership in the Turkish District Administration

Saban Akca, Doctoral Researcher, Government and Society

The image shows a leader [a governor in this case] is among the people and shaking hands as if he is an equal individual member of his society. However, in his inner world or in his undisclosed perception he is not an equal citizen of the country like anyone else. He thinks that he is rather a premier and entitled to order and declare what is wrong and what is right for the general public.

In my research, I have studied district governors' leadership behaviours across Turkey in 2015. The findings have disclosed that Turkish district governors utter that they value discourses of followers and members of society. Nonetheless, their decision making processes have never revealed that they pay attention to all partakers' thoughts, including their members of staff. Governors' narratives have evidenced that they rather employ more paternalistic approaches in their leadership practices. Therefore, this image reflects governors' apparent leadership attitudes in the public eye whereas governors' dreams and actions in their mind show quite the opposite of what is being shown in the public sphere.





Back of a fag packet archiving

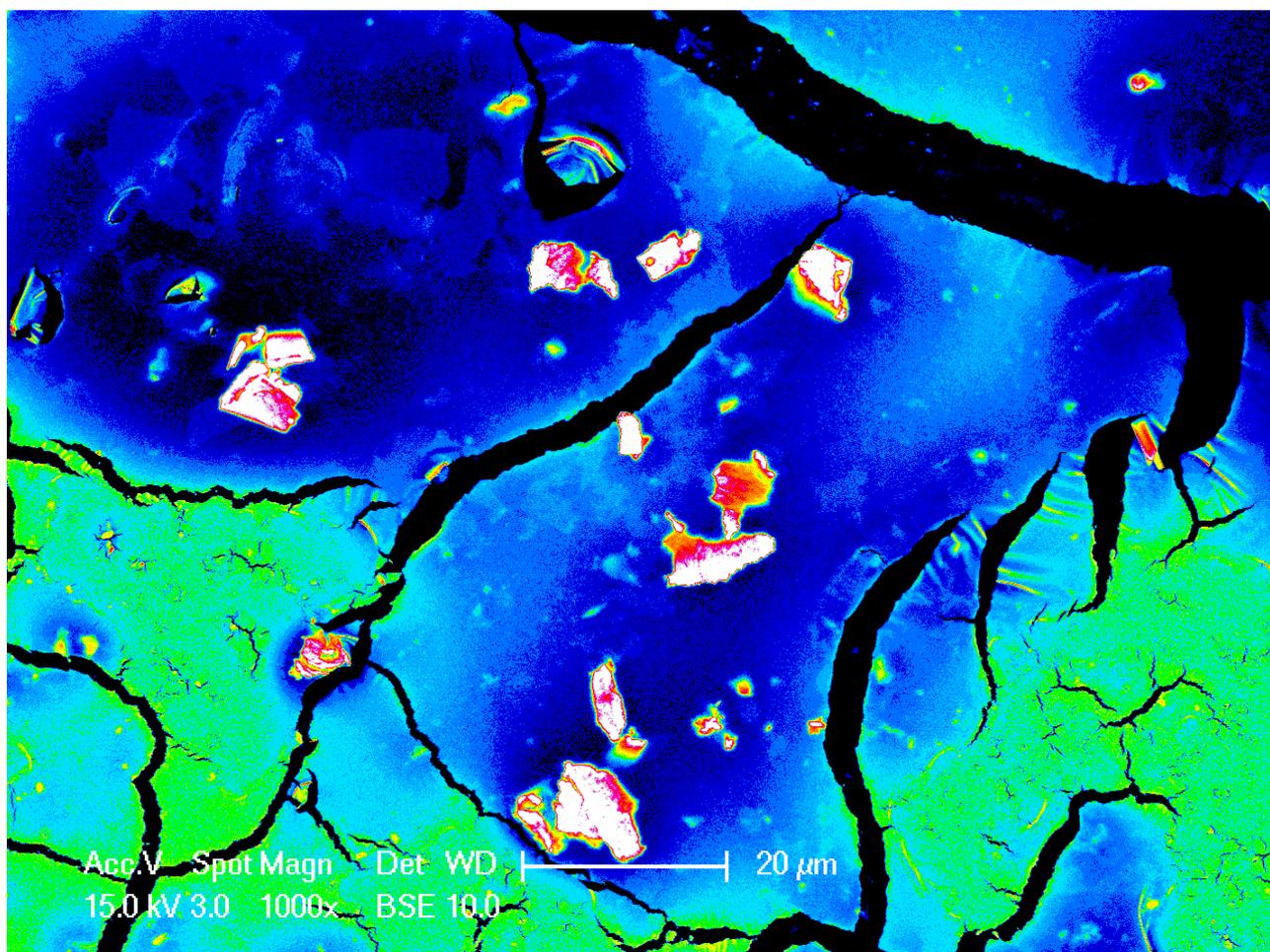
*Samantha Paul, Doctoral Researcher
Classics, Ancient History and Archaeology*

Since the growth of rescue archaeology in the 1960's, archaeological fieldwork within England has increased and so has the rate at which archaeological archives are produced. This exponential growth has led to a serious storage crisis for many museums nationally, and recorded underuse of this significant resource has led to the assertion by some that these archives are not worth the space and time they take up within museum stores.

While it is archaeologists that produce this material it is museums that bear the cost of their future curation, and many are suggesting disposal as a collection management tool. Many archaeologists explicitly reject the de-accessioning of exiting archives as short-term and poorly conserved, however evidence that that **all** archaeological material should be *kept in perpetuity* has yet to be demonstrated.

Many museums are struggling to see this material's future value as either public assets or museum collections because unfortunately, the old adage that archaeologists used to record on the *back of a fag packet* is sometimes true!



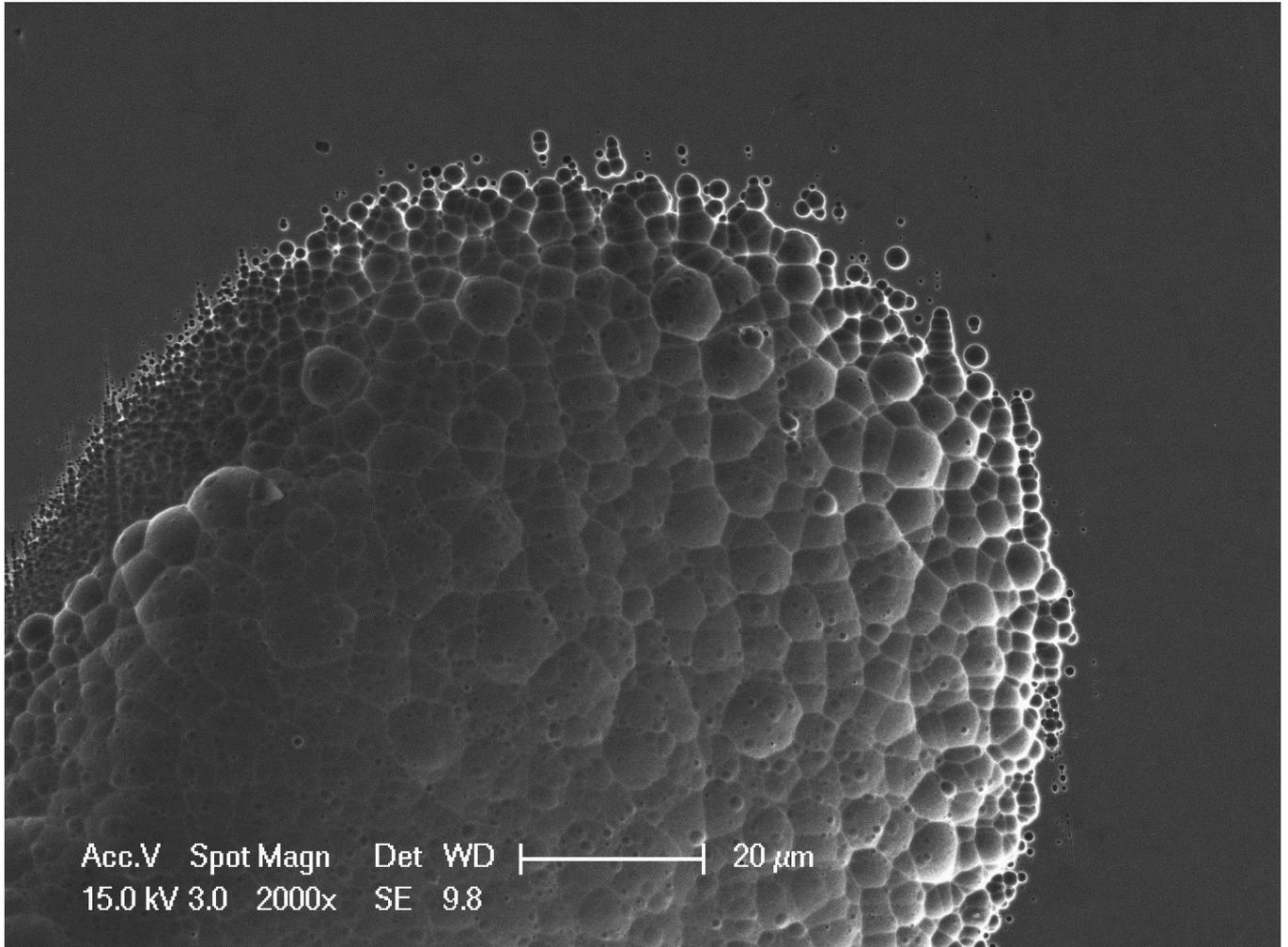


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Silver night sky

*Sayed Rassul, Doctoral Researcher,
PSIBS Doctoral Training Centre EP/F50053X/1*

The image is an electron microscope image of silver-DNA wires extended on a glass slide. Part of my project is about using Silver to view the world from the inside out, by using interactions with the building blocks of life such as DNA.





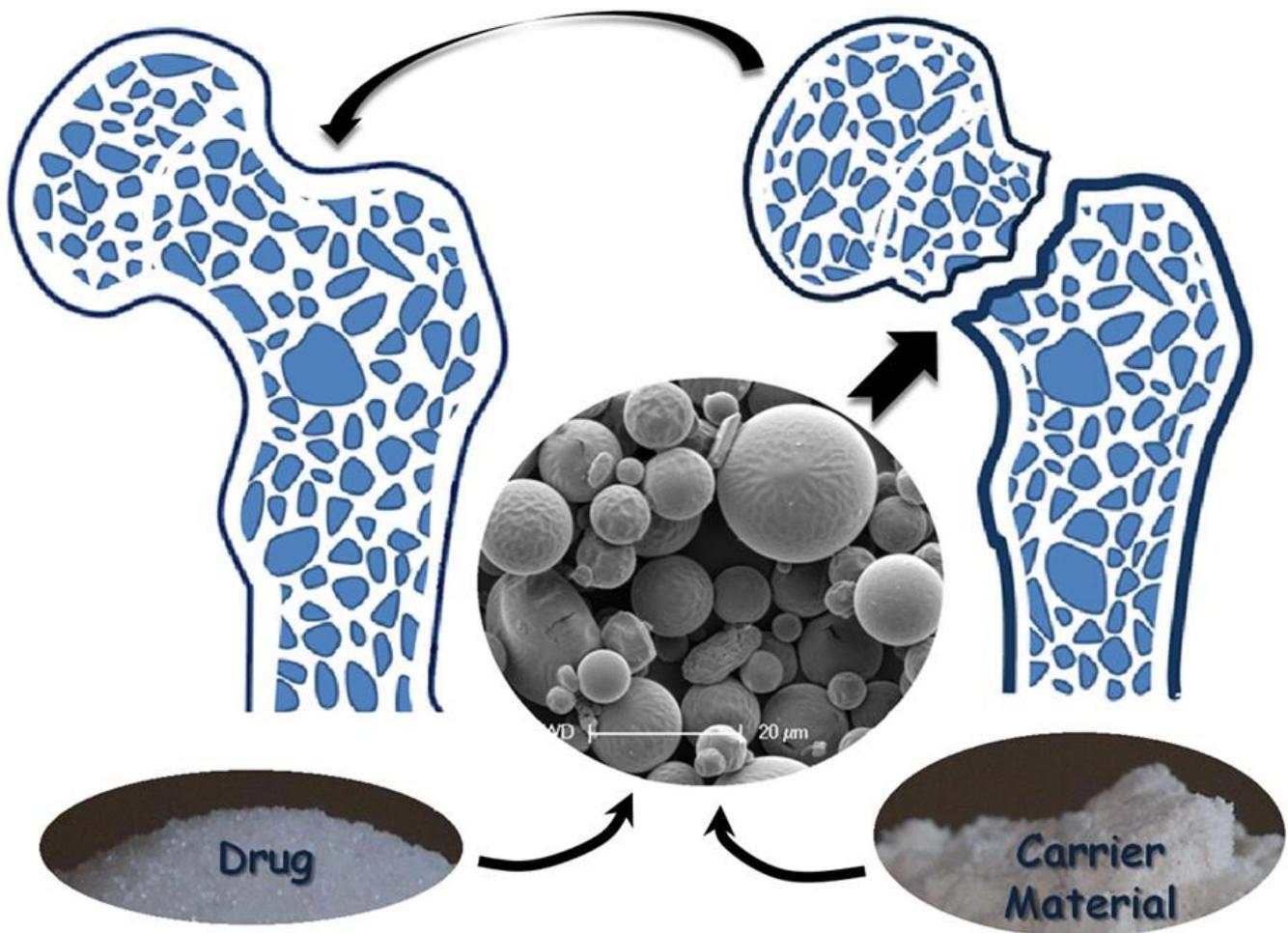
Blossom – An art by Corrosion

Shaojun Qi, Doctoral Researcher, Metallurgy and Materials

This is a micrograph of the surface of a stainless steel after staying in a solution of sodium chloride – the main ingredient of table salt. Corrosion initiated in the form of small pin holes, which have been growing, connecting and propagating since then, and finally presents this blossom to us. Note that every single cell in the pattern is not convex, but concave in perspective.

A steel can never keep stainless, even though it is commercially called so. Stainless steel is proud of its excellent resistance to general corrosion in wet environments, owing to the thin passivation film formed on surface. However the passivation film is highly vulnerable to attacks by chloride element, which leads to pitting corrosion. Is there any chloride barrier available? Yes, graphene could work. It is a carbon sheet of merely one-atom-thick, however impermeable to small molecules and ions. A research project here in Metallurgy and Materials has found that a graphene coating of a few nanometres can protect metals such as stainless steel from corrosion effectively. It is so thin that one could not even recognise its existence; however as a consequence we will not see this art by corrosion, neither.





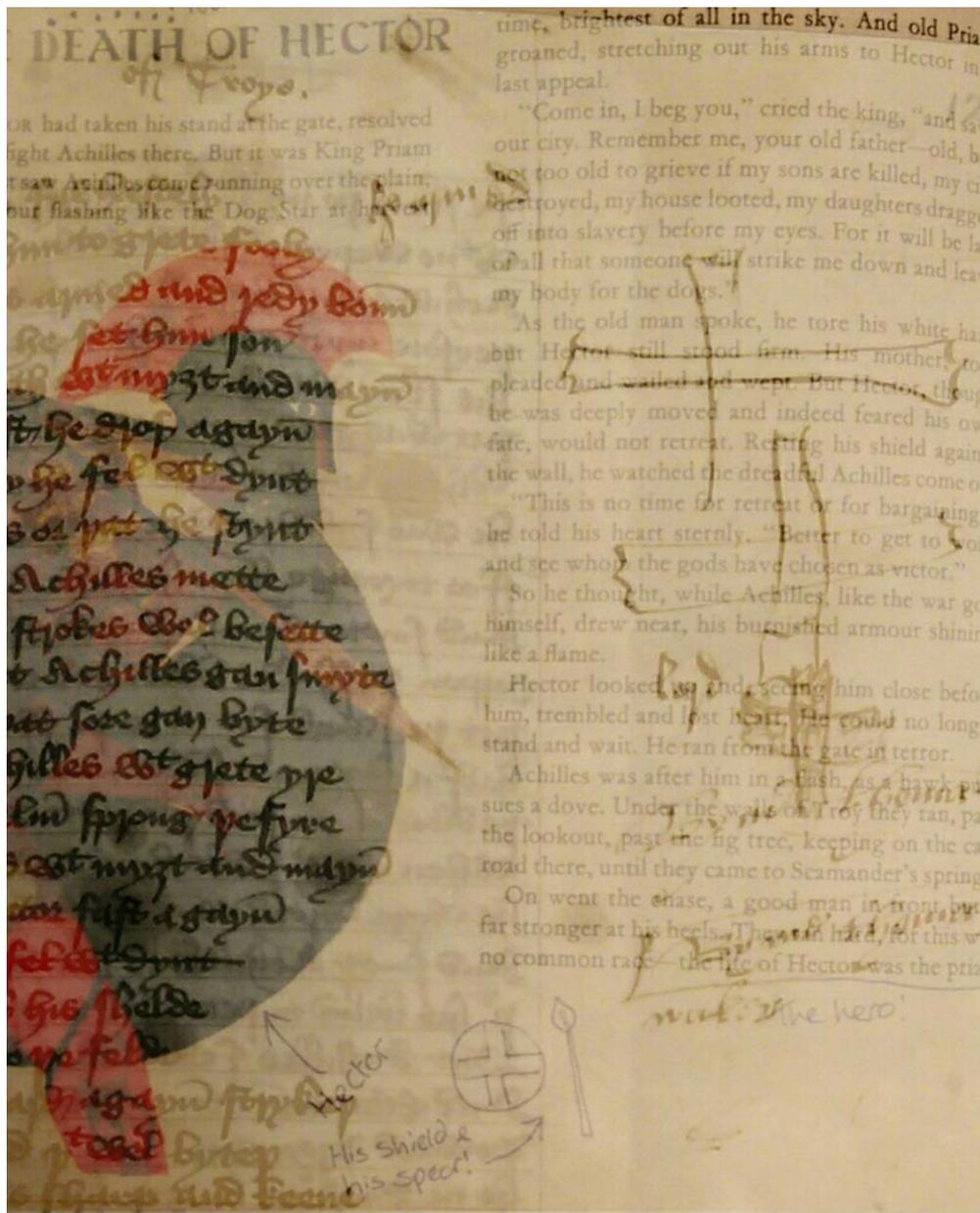
Drug Delivery Systems

Sofia Matrali, Doctoral Researcher, Chemical Engineering

The needs of our aging population create new challenges for pharmacotherapy and demand the formulation of more effective and specialized therapeutics. This has led to the development of diverse drug delivery carriers through the exploitation of a great variety of materials: synthetic polymers, proteins, liposomes etc.

In our research we work on the development of microsized structures for the efficient delivery of pharmaceuticals. This image summarises the journey of simple chemical compounds from the laboratory to the clinical practice and their effect on the human body. The use of microscopic beads allows the controlled delivery of a therapeutic agent thus limiting the side effects that arise for example when the 'nude' drug is given orally. Our research aims to improve the characteristics of such a delivery system with ultimate goal their use in clinical practice to improve healing of bone fractures.





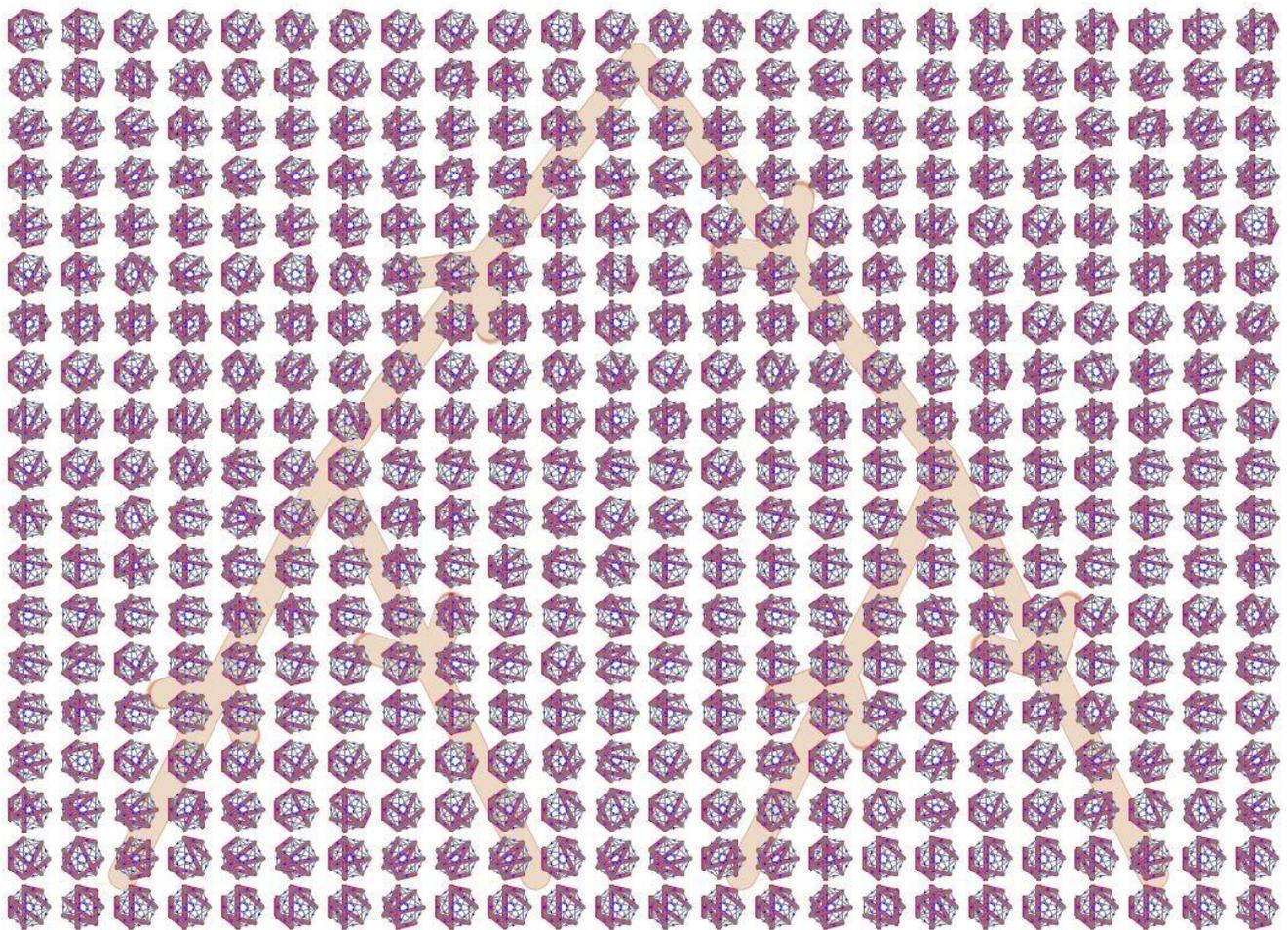
Reading Troy through the ages

*Stephanie Dorricott, Postgraduate Researcher
English, Drama and American and Canadian Studies*

My research considers the Trojan War, one of the longest surviving legends, and its tradition in medieval literature. The range of audiences this tale has reached must be immense. I first encountered it in primary school 'storytime' and history lessons. Many will know it from blockbuster movies. In the Middle Ages the story was also famous and a vast number of surviving medieval manuscripts attest to this, many written in Middle English, the vernacular language of late medieval England. I am examining one Middle English version of the Trojan story, the early 14th century *Seege or Batayle of Troye*, and the four manuscripts it survives in to explore the story's popularity across the period, the kinds of audiences to read and interact with it, and how it reached them.

This photograph uses double exposure to combine two images of pages narrating the death of Hector of Troy; one from a modern illustrated children's book and the other from a 14th century manuscript (London, British Library, MS Egerton 2862). Both have been annotated by readers clearly excited by the character of Hector and his armour. Together they represent Troy's literary transmission and reception through the ages.





Universal patterns

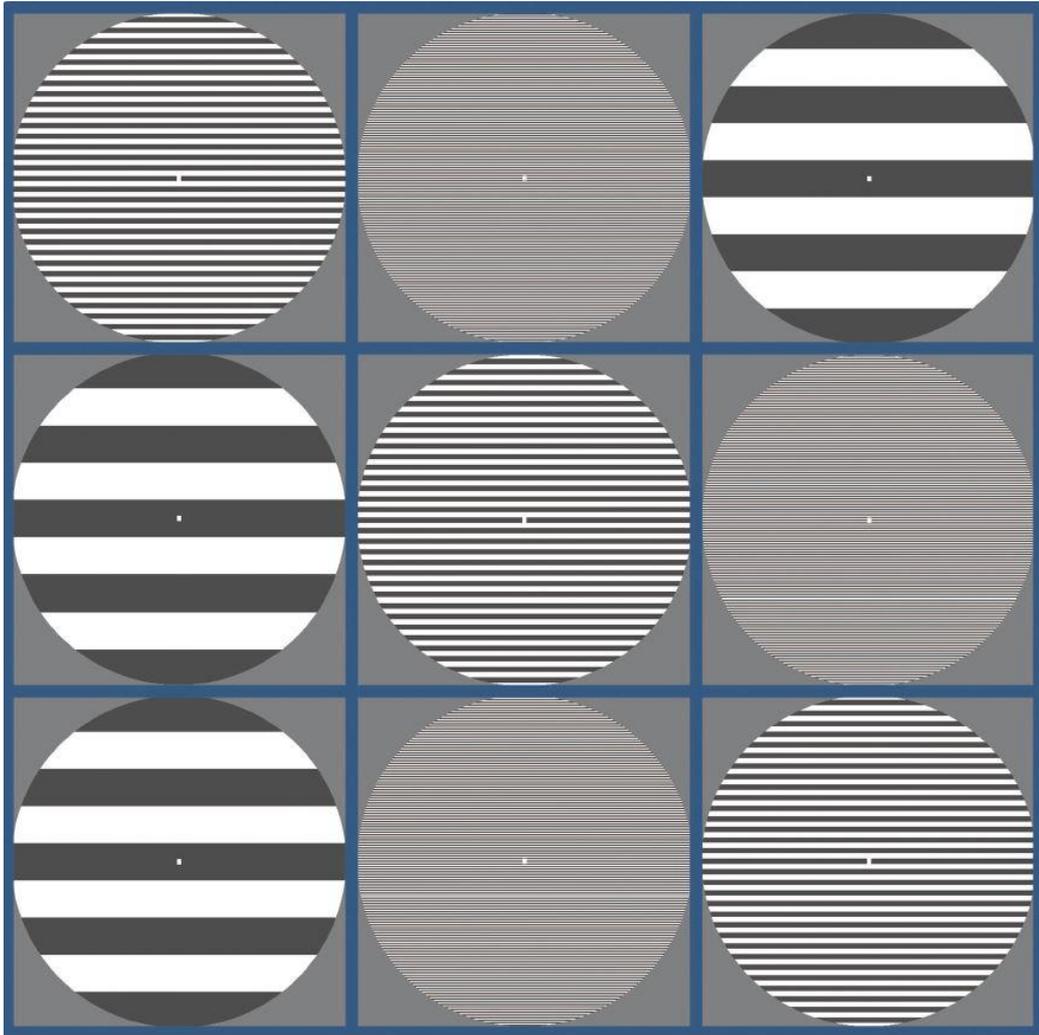
Tássio Naia dos Santos, Doctoral Researcher, Mathematics

Which patterns are unavoidable? Suppose a sequence of choices is made randomly (say by flipping a coin). Is it true that some patterns must emerge? The answer is **yes**.

The image depicts an example of such phenomenon, each circle being the possible outcome of a tournament where all 7 players face one another and no ties are allowed. A particular structure involving all players is highlighted: no matter what the results of the matches are, **it will always be there**.

Unavoidable as they might be, it is difficult in general to find these structures. The sheer number of possible tournaments renders inspection infeasible. Building on recent developments in the field of combinatorics, (the study of discrete structures), our research has shed light over a large family of universal structures. This reinforces the field's motto, "complete chaos is impossible".





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A quick test for Hyperexcitable brain!

Terence Chun Yuen Fong, Doctoral Researcher, Psychology

Instructions:

****If you have a history of epilepsy or seizures, please DO NOT play this game****

1. Stand approximately 1 metre away from the image.
2. Concentrate on the image for 5 to 10 seconds.
3. Pick THREE most irritating gratings from the board.
4. WIN the game if your choices are in a row!

The image is formed by three types of striped-pattern in different spatial frequency (High, Medium and Low). People, who experience particularly strong visual discomforts (e.g. dizziness, headache, eye strain) and distortions (e.g. illusory stripe, colour, shimmering) from the Medium frequency pattern compared to the High frequency pattern, are more likely to have a “hyperexcitable” visual cortex and win this game. This is called Pattern-glare effect.

Our research aimed to investigate whether having a hyperexcitable visual cortex leads to more anomalous experience. This “pattern-glare” task is a behavioural measure to identify people with a more aberrant brain. Our currently findings indicated that people with out-of-body experience, migraines or photosensitive epilepsy showed stronger “Pattern-glare” effect.





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End of the Line

*Thomas Aspin, Doctoral Researcher
Geography, Earth and Environmental Sciences*

My photograph shows the last surviving members of a community of leaf beetles (*Chrysomelidae*) desperately seeking refuge from rising water levels in an artificial stream channel in Hampshire. My research uses an outdoor stream laboratory to simulate the impacts of drought and flow recovery on macroinvertebrates.

The leaf beetle population exploded during the drought experiment, as large parts of the streams dried and terrestrial plants colonised. I took the photograph at the moment when the channels were re-flooded, signalling the end of the drought and the return to an aquatic environment. Terrestrial insects- among them the leaf beetles- found their available habitat shrinking fast. The only escape was to climb.





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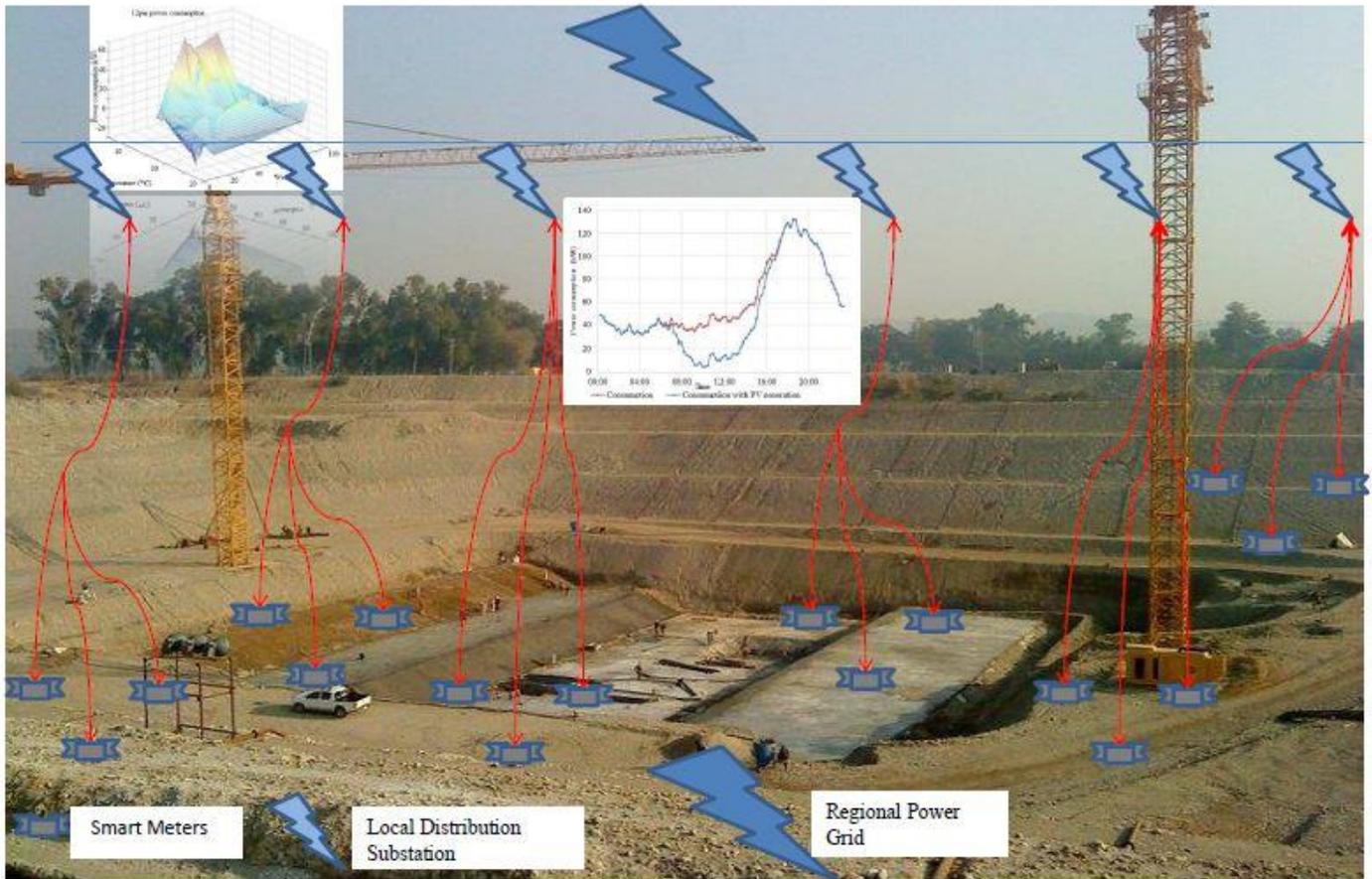
My prejudice, Your right and Our Justice

*Tippala Gamage Perera, Doctoral Researcher
Geography, Earth and Environmental Sciences*

This photograph, taken in suburban Birmingham, depicts the initial reservations of existing (housed) communities over newly planned development for communities in need of housing. It portrays the anxiety of existing communities about planned development overlooking their homes alongside their *prejudices* concerning negative development impacts, a fear of social problems, change in the rural character of their habitus and loss of property values. The communities yet to be housed on the other hand have a *right* for sustainable and affordable locales to meet their housing needs. Communicative planning requires a compromise to provide *justice* for both communities, in creating sustainable and affordable housing outcomes.

The bigger picture of the research focuses on how communicative planning can be used to deliver sustainable and affordable housing outcomes. Grappling with housing pathways, the research discusses the change of directions in residents' sustainable affordability stances whilst eliminating the taken-for-granted contention of NIMBYsm. Accordingly, the image elaborates the tensions between the planning and communities and the controversy of situatedness among the communities in the housing pathways.





POWER SYSTEM, WHERE BOTTOM CHANGED THE TOP

Power System, where bottom changed the top

*Zafar Ali Khan, Doctoral Researcher
Electronic, Electrical and Systems Engineering*

The picture shows construction site of a hydroelectric power plant. The changes in electricity supply system have changed the power generation from bulk generating station (a centralized system) like these to a decentralized system. For example, solar panels installed on top of ones home with smart metering system to record import or export of electricity is decentralized power generation system. Addition of these renewable energy sources (RES) has changed the power requirements of consumers which they were getting from the grid. So the bottom (consumer) changed the entire system.

The picture also shows a hierarchical structure of power system from smart meters to regional grid showing how power transfer occurs from grid to meter and vice versa. The graph shows how consumer power demand changes with and without solar system installed. The 3-d view shows power consumption at 12pm against temperature and week days. My research focuses on usage of smart meter data to forecast total system load in an environment where RES are present. Normally power grids predict load using the historic load of substations but in my research I will use the consumers load history to predict the load on the entire grid.



We hope you enjoyed the Images of Research 2016 catalogue.

Special thanks to our doctoral researchers who shared their images with us.

For more information about the Images of Research 2016, please contact [Dr. Eren Bilgen](#)

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