



Wolfson College
Cambridge

WOLFSON RESEARCH EVENT 2020

Event Booklet



Welcome to the WRE

Welcome back to a very different kind of Wolfson Research Event.

For those of you returning from previous year's you'll know that each year Wolfson College hosts a day-long conference showcasing the incredible and diverse research that is undertaken by the students of the college.

Now in its 9th year, we were incredibly excited to host all of our students, fellows, staff, alumni and of course, distinguished keynote speakers.

However, of course, the world had other plans, and we are nothing if not adaptable.

Therefore, for the first time in the history of the WRE we have moved to an online format. The new event series, spread across four days, allows all of our speakers from around the world to share their work, whilst still engaging in the conversation. As well as facilitating the discovery of the wide range of subjects which are represented at Wolfson, something that makes the WRE so special.

On behalf of the WRE Committee, I would like to thank you all for attending the seminar series that we have planned for you. I hope that you use the WRE as an opportunity to learn, exchange ideas and to support one another. I also hope that you connect with one another during the event and can meet, talk and create ideas once the world returns to a new normality. A special thanks to all of those speakers who despite the ongoing global crisis did not think twice about still offering their valuable time to speak at this wonderful event.

Ben Woodington
Chair, 2020 Wolfson Research Event

WRE 2020 Committee

**Ben Woodington, Chair**

Ben is a PhD student from the Sensor technologies CDT, developing flexible, electronic neural interfaces for sensing and stimulating the spinal cord, with a focus on pain and rehabilitation. Outside of academia, he co-leads NeuroTechX London and spends as much time as possible swimming, running, and cycling.

**Vassilis Gkoumas, Editorial Officer**

Vassilis is a first-year PhD student in Land Economy. His research interests lie at the intersection of behavioural economics and environmental protection. Prior to starting his PhD, Vassilis worked in the shipping industry, at the U.S. Commercial Agency and at Envolve Entrepreneurship in New York.

**Gia Kaisa, Logistics Officer**

Gia is a first-year PhD student interested in Cancer Biology. She has worked at GlaxoSmithKline and Oxford Biomedica in research and analytical roles and has been involved in science outreach and engagement activities. While at Cambridge, she has been able to indulge an interest in organisational psychology and business.

**Dr Antonina Kouli, Workshop Officer**

Antonina is a postdoctoral Research Associate at the Department of Clinical Neurosciences. She completed her PhD at Wolfson in 2019 and was then appointed as a Junior Research Fellow in 2020. Her research aims to better understand the role of the immune system in the pathogenesis and progression of Parkinson's disease.

**Florence Maskell, Programme Officer**

Florence is a PhD student in Structural Engineering, her research focuses on the safe and efficient design of structural connections for high performance concrete façade panels. In any free time, she enjoys film photography, baking and running the trails around Cambridge.

**Deena Newaz, Workshop Officer**

Deena is an MPhil Candidate in Education where her research focuses on social and emotional learning in refugee contexts. She previously worked as a program manager at WISE where she managed and evaluated education programs and mentored young social innovators working in the refugee education sector in Europe and MENA.

**Max Steuer, Editorial Officer**

Max is a Master of Law (LL.M.) candidate at Wolfson College and a research fellow at the Comenius University in Bratislava, Department of Political Science, where he received his PhD in 2019. He authored over a dozen peer-reviewed articles and book chapters on puzzles broadly related to democracy protection.

Meg Westbury, College Liaison to the WRE Committee
Wolfson Lee Librarian

Schedule

Friday, 19 June

- 13:00-13:10** Welcome from WRE Host
- 13:10-13:20** A Message from the Wolfson President
- 13:20-13:35** Oral Presentation: Allysa Czerwinsky
- 13:35-13:50** Oral Presentation: Anwaar Ali
- 13:50-14:05** Oral Presentation: Jeremiah Garsha
- 14:05-14:20** Oral Presentation: Daniel Sowood
- 14:20-14:45** Poster session

Friday, 26 June

- 13:00-13:05** Welcome from WRE Host
- 13:05-13:35** KEYNOTE: Sir David King
- 13:35-13:50** Oral Presentation: Julian Siebert
- 13:50-14:05** Oral Presentation: Wilson Lui
- 14:05-14:20** Oral Presentation: Ivan Simpson-Kent
- 14:20-14:35** Oral Presentation: Charles Prempeh

Tuesday, 23 June

- 10:00-10:05** Welcome from WRE Host
- 10:05-10:20** Oral Presentation: Brian Theng
- 10:20-10:35** Oral Presentation: Eric LeGresley
- 10:35-10:50** Oral Presentation: Kerenza Ghosh
- 10:50-11:05** Oral Presentation: Yang Qiu
- 11:05-11:20** Oral Presentation: Réka Mándoki
- 11:20-11:35** Oral Presentation: Juan-Pablo Robledo

Tuesday, 30 June

- 13:00-13:05** Welcome from WRE Host
- 13:05-13:35** KEYNOTE: TBC
- 13:35-13:50** Oral Presentation: Chunyan Fu
- 13:50-14:05** Oral Presentation: Anna Chaplin
- 14:05-14:20** Oral Presentation: Eric Petzoldt
- 14:20-14:35** Oral Presentation: Benjamin Remez
- 14:35-14:50** Oral Presentation: Kanya Kanchana

Keynote Speakers



Professor Sir David King

26 June, 2020

Professor Sir David King is Emeritus Professor of Chemistry, University of Cambridge; Founder and Chair of the Centre for Climate Repair in the University; an Affiliate Partner of SYSTEMIQ Limited; and Senior Strategy Adviser to the President of Rwanda. He served as Founding Director of the Smith School of Enterprise and the Environment at Oxford University, 2008 – 2012, Head of the Department of Chemistry at Cambridge University, 1993 – 2000, and Master of Downing College Cambridge 1995 – 2000. He was the UK Government Chief Scientific Adviser, 2000-2007, the Foreign Secretary's Special Representative on Climate Change, 2013-2017, and Chair of Future Cities Catapult, 2012-2016. He has travelled widely to persuade all countries to take action on climate change. He initiated an in-depth risk analysis approach to climate change, working with the Governments of China and India in particular, and initiated a collaborative programme, now known as Mission Innovation, to create a £23bn pa research and development international exercise, which involves 22 countries and the EC, to deliver all technologies needed to complete the transition into a fossil-fuel-free world economy. He was born in Durban, educated at St John's College Johannesburg and at Witwatersrand University, graduating in Chemistry and a PhD in physical chemistry. He has received 23 Honorary Degrees from universities around the world.

As Govt Chief Scientific Adviser he raised the need for governments to act on climate change and was instrumental in creating the British £1 billion Energy Technologies Institute. He created an in-depth futures process which advised government on a wide range of long term issues, from flooding to obesity. He was Member, the President's Advisory Council, Rwanda, and Science Advisor to UBS, 2008-12

He has published over 500 papers on surface science and catalysis and on science and policy, for which he has received many awards, medals etc. and 23 honorary degrees from universities around the world. Elected Fellow of the Royal Society in 1991; Foreign Fellow of the American Academy of Arts and Sciences in 2002; knighted in 2003; made "Officier dans l'ordre national de la Légion d'Honneur" in 2009.

Keynote Speakers

Second keynote speaker TBC



Presenters

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Presenters

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Oral Presentations

Anwaar Ali

Effective governance of community mesh networks by blockchain

Blockchain technology enables decentralised and trusted peer-to-peer digital value transfer interactions. It has the potential to go beyond its first manifestation namely Bitcoin. However, issues such as lack of governance, scalability, and adaptability of blockchain-based solutions remain in the way of it becoming a mainstream technology. Therefore, my doctoral thesis is to study an effective and trusted governance framework for blockchain-based solutions. I study the design of an efficient blockchain-based governance framework for the use case of economic sustainability of community mesh networks. These networks are a result of a local set of community volunteers which provide Internet access to the remote, often still disconnected parts of a geographic region. The set of community volunteers usually contains mutually non-trusting entities. In such a scenario blockchain provides a trustless (where peers of a network do not have to trust each other) platform for these volunteers to work together to effectively manage a community network. This use case provides a good substrate to test my hypothesis and can be considered as a miniature form of the Internet itself. The insights and experimental results of my thesis could pave the path for the standardisation of blockchain-based solutions.

Timeslot: Friday, 19 June

Presenter bio: Anwaar Ali is a Computer Science PhD candidate at the Department of Computer Science and Technology, University of Cambridge. His research interests include smart contracts, communication networks, and algorithmic implementation of laws and policies.



Anna Chaplin

Childhood adversity and depression: a missing link?

In Europe, almost one in ten children experiences sexual abuse. Not only is sexual abuse deeply traumatic, it is one of the most important and widely recognised risk factors for depression. There is some evidence suggesting that changes to the immune system play a role in the development of depression following abuse. Using the UK Biobank, we examined the potential causal relationship between childhood sexual abuse and depressive symptoms during adulthood. We also investigated the role of C-reactive protein (CRP), an important component of the immune system, and body mass index (BMI) in the association between sexual abuse and subsequent depressive symptoms. Sexual abuse was strongly associated with depression in both men and women. At the symptom level, the largest associations were observed for feeling suicidal, appetite/weight changes, and concentration difficulties. CRP and BMI partially explain the association between sexual abuse and later depression, suggesting that sexual abuse increases depression risk by influencing adiposity and inflammation.

Timeslot: Tuesday, 30 June

Presenter bio: Anna is a second year PhD candidate in the Department of Psychiatry. She studies early life risk factors for depression, with a particular focus on the role of inflammation. Anna uses large cohort data and employs a range of observational and genetic epidemiological techniques to investigate this area of research.



Allysa Czerwinsky

Entering “ugly virgin loser” territory: A deep dive into the Incel Community on Incels.is

This project aims to address the lack of research on the male involuntary celibate (incel) community by collecting and qualitatively analyzing archived content from one of the community’s most used online spaces, the Incels.is website. Using a mixed-methods approach of virtual ethnographic observation and thematic analysis, this study provides a rich description and analysis of the most frequent themes found in 578 discussion threads on Incels.is to determine the most important aspects of the incel identity and experience.

Specifically, my analysis focuses on discussing anti-women and anti-feminist speech; discourse that romanticizes women; discussions of mental health, body image, and physical attractiveness; racist speech; ethnic users’ experiences with racial prejudice and shadeism; and violent discourse. In addition, my analysis explores how users’ discursive portrayals of geek masculinity allow them to subvert traditional notions of masculinity while still reinforcing male hegemony by subjugating women. As this project is one of the first to empirically assess the language and text used within the modern male incel community, it serves to address the gap in the manosphere literature about the incel experience and identity.

Timeslot: Friday, 19 June

Presenter bio: Allysa Czerwinsky is pursuing an MPhil in Criminological Research at the University of Cambridge and holds a BA Honours in Criminology and Criminal Justice from Carleton University, Canada. Her research interests include online extremism (specifically the alt-right, incels, and other male-dominated subcultures), revenge porn, and gender-based violence in online spaces.



Chunyan Fu

Image and Gesture: The Emergence of a Modernistic Vision in the Late Nineteenth and the Early Twentieth Centuries

This research introduces the issue of gesture into reflections on the emergence of a modernistic vision, through case studies of the city photography of Otto Umbehr (Umbo) and Walter Ruttmann’s Berlin, Symphony of a Great City (1927). Incorporating bodily movement and gestural culture with city landscapes, the works of Umbo and Ruttmann offer a signature perspective to observe and reflect on the new vision generated by modernity. Drawing from Walter Benjamin’s and Giorgio Agamben’s remarks on the potentialities of gesture in the dialectics of interruption and repetition, this research explores how modern city life changed people’s visual perception and how photography and cinema in the late nineteenth and the early twentieth centuries, as an attempt to recover the lost gestures, display the potential of actualising movement and what Benjamin calls a messianic, kairological time. I argue that the gesture, as itself a dialectical image, not only enables the emergence of a modernistic vision of time and movement and influences the artistic creation of visual representation, but also moves beyond the pure realm of aesthetics and reaches the field of ethics and biopolitics by exhibiting its own mediality, thus realising the potentialities of the moving image.

Timeslot: Tuesday, 30 June

Presenter bio: Ms Chunyan Fu is studying MPhil in Film and Screen Studies at the Faculty of Modern and Medieval Languages and Linguistics. She comes to Cambridge after receiving her BA in Philosophy at Nanjing University, China. Her academic interests include film aesthetics, continental philosophy, media theory, and art cinema.



Jeremiah Garsha

The Head of Chief Mkwawa: A History

How does one write the history of a single body part? This talk showcases my PhD research on the history of Chief Mkwawa's head, using postcolonial theory to rehumanise Mkwawa and decolonise his skull. In its 125-year afterlife, the head has undergone transnational and transformative journeys, which this presentation unpacks. His head was displayed as a 'trophy' before becoming a specimen as it entered entangled streams of collections in Europe to support the creation of racial sciences. The history of reparation is explored with the skull's inclusion as a clause in 1919 Treaty of Versailles, where Mkwawa was orientalised as 'Sultan Mkwawa' and the skull ornamentised as tool for imperial control. In 1954 the British governor of Tanganyika repatriated a substitute skull in an attempt to stall decolonisation. Using literary theory, I also examine the way the skull has been a narrative device in a pro-war 1940s American film, the title of a German anti-war novel, and the topic of a postcolonial Dutch comic book. Mkwawa's head continues to be objectified, as it currently sits on display in a museum owned by the Tanzanian government to generate tourist revenue.

Timeslot: Friday, 19 June

Presenter bio: Jeremiah J. Garsha is a postgraduate researcher in the Faculty of History. He researches the cultural history of violence with an emphasis on material cultures of colonialism and anticolonial resistance in African history. He specialises in the history of repatriation of human remains and artefacts.



Kerenza Ghosh

Children's Playful Responses to the Visual Text *Super Happy Magic Forest* by Matty Long

Children's engagement with visual texts including comics, picturebooks and videogames suggests that these multimodal platforms occupy a firm place in children's popular culture. Despite this, or perhaps because of it, adults do not always approve of children's interactions with these visual modes, which have come to be associated with 'lowbrow' culture and are seen by some as a hindrance to literacy development. However, I argue that what may initially be discounted by teachers or parents as frivolous, inconsequential texts can in fact require complex levels of engagement. In this presentation I share findings from an empirical research project in a primary school with four children aged 9 and 10, who read *Super Happy Magic Forest*, a picturebook which draws on comics, videogames and popular culture. I observed their responses to the central playful elements within this visual text: genre, humour, layout and games. The arts-based methods I adopted were designed to support children's engagement with key features of this picturebook, including colour, illustration and text placement. Through group discussion, playdoh modelling, drawing and writing, the children developed playful and sophisticated responses to this visual text, which I argue demonstrates the potential value of such texts in classroom settings.

Timeslot: Tuesday, 23 June

Presenter bio: Kerenza is studying MEd Critical Approaches to Children's Literature. She has a published book chapter entitled *Who's Afraid of the Big Bad Wolf: Children's Responses to the Portrayal of Wolves in Picturebooks* (2015). Her dissertation is about using visual texts to engage children in posthuman discourse, specifically human-animal relations.



Kanya Kanchana

Through a Word Darkly: Twilight Language in Early Tantra

Hindu and Buddhist tantric traditions that originated in South Asia are part of a vast, 1500-year-old text- and practice-based phenomenon that embraces diverse philosophical, religious, and sociocultural aspects. Many tantric texts employ a special kind of language – a polysemic, multivalent, often erotic lexicon called sandhābhāṣā, 'intentional language', or sandhyābhāṣā, 'twilight language'. Primarily used to hide esoteric information in plain sight where only initiates can access it and perhaps to project the initiates into paradoxical states of consciousness, this controversial linguistic code continues to intrigue and fascinate. How did it originate and perpetuate? Who had access to such knowledge and who did not? If things are not always as they seem, what 'upside-down' interpretations are we missing? By investigating the origins of what appears to be a secret code embedded within an apparently democratic, egalitarian – and therefore antinomian for the times – system, I hope to throw light on the early inner workings of a movement that turned out to be powerful and influential. Placing it within the historical and philosophical context of esoteric communication in tantra, my research aims to study such coded language in situ using Sanskrit and Tamil primary sources, with the help of secondary sources, and attempts some insights.

Timeslot: Tuesday, 30 June

Presenter bio: Kanya Kanchana is engaged in practice, teaching, and philological research at the intersection of tantra and yoga and is currently doing her MPhil in Sanskrit Studies.



Eric LeGresley

Unravelling the strange drug binding properties of BET proteins

Bromodomain and Extra-Terminal motif (BET) proteins are important in properly decoding the genome. Recently, several drugs which inhibit BET proteins have entered clinical trials for the treatment of various cancers and metabolic disorders. BET proteins contain 2 highly structurally similar regions/domains called BD1 and BD2. Unexpectedly, these nearly structurally identical domains bind inhibitors in vastly different ways. Previous studies indicate that despite very similar 3D structures and binding affinities for inhibitors, the thermodynamic contributions (enthalpic and entropic) to inhibitor binding are wildly different for BD1 vs. BD2. Second, structural studies indicate that while the clinically important BET inhibitor RVX208 binds BD1 and BD2 in the same conformation, the nearly identical compound RVXOH has radically different binding conformations in each domain. Computational molecular simulations (MD) identify two essential amino-acid loops as singularly important in determining the unexpected thermodynamics properties. Secondly, MD simulations of BET – RVX208/OH protein-drug complexes disagree with existing structural data (from X-ray crystallography) and suggest an intriguing alternative explanation for the binding conformation anomaly. These MD results highlight the importance of protein dynamics in drug design and our fundamental understanding of protein-drug interactions. They also throw further doubt on the reliability of traditional X-ray crystallography in modern drug design.

Timeslot: Tuesday, 23 June

Presenter bio: Eric LeGresley is a 1st year medic at Wolfson College. He has an undergraduate degree in Biochemistry from the University of Oxford. His main research interest is computational bioinformatics, particularly applications in drug design, drug-protein interactions, and vaccine design. He also has experience in genetic engineering, immunology, and organic chemistry.



Wilson Lui

Language rights in bilingual and multilingual legal environments

Under the emerging interdisciplinary field of language and law, the notion that law should protect languages through ‘language rights’ has attracted increasing attention. This study focuses on the issues and difficulties of languages and language rights in various components of bilingual and multilingual legal environments. These include: first, the creation of multilingual legal texts through drafting and translation; second, the interpretation of such multilingual legal texts in courts; third, the status of languages and language speakers in legal processes; and fourth, the legal protection afforded to languages and linguistic minorities. This study shows that the language rights and linguistic equality that these bilingual and multilingual legal environments claim to uphold are not well defined and protected. Rather, they are subject to legislative and judicial discretion, which might be viewed as arbitrary, and a wide range of historical, political, social and cultural factors. This study mainly considers the situation in Hong Kong, a bilingual jurisdiction, but also brings in comparative perspectives from other bilingual and multilingual legal environments, including Canada, Ireland and the European Union. It concludes by suggesting ways forward in developing the language rights regime in these legal environments, exploring approaches to better serve justice through a linguistics lens.

Timeslot: Friday, 26 June

Presenter bio: Wilson Lui ACI Arb is Research Assistant at the University of Hong Kong and Associate Editor of Archbold Hong Kong. He was previously Chief Editor of Hong Kong Journal of Legal Studies. He is pursuing an LLM at the University of Cambridge, before starting an MPhil at the University of Oxford.



Réka Mándoki

Socially conscious mass-manufacturing of residential buildings

Currently, the construction industry is facing numerous challenges. On the one hand, we are running out of time to deal with climate change, but on the other hand, we are not able to build enough dwellings to end housing crises. As an answer to these problems, more and more attention is being paid to the concept of mass-customising building elements to create such widely-applicable systems that are fully prefabricated, easy to assemble, and use as little material as possible. This research examines the social aspects of the mass-production of residential buildings to help ensure that future solutions will be better than the previous attempts. The presentation will not only include results from a survey that investigated the preferred uniqueness of one’s own dwelling but an overview of the related literature, and multiple examples from various industries to present the possible ways of mass-customising residential buildings. The conclusion will define both possible approaches and practical limits to the mass-production of homes. With our results we hope to contribute to the policymaking related to the mass manufacturing of residential buildings and investigate how parametric design and advanced manufacturing tools could be implemented to improve productivity and to create resilient solutions.

Timeslot: Tuesday, 23 June

Presenter bio: Réka Mándoki is a first-year Ph.D. student in the Future Infrastructure and Built Environment Programme. She graduated in Architecture from the Budapest University of Technology and Economics and worked in the industry before starting her Ph.D. Her research investigates the social limits of mass-manufacturing residential buildings.



Eric Petzoldt

The 3rd International Jazz Festival of Agadir - Intercultural Dialogue in Morocco, and Beyond

Held every year since 2017 under the auspices of the French Embassy, the international Jazz Festival of Agadir, Anmoggar N Jazz, has become one of the key music festivals in Southern Morocco offering spaces for cultural exchange. The festival's founder Franck Patillot, the former director of l'Institut Français d'Agadir, and his team aim for meetings of international jazz musicians with local artists, workshops and debates around themes related to jazz, its teaching and its artistic practice. The festival's objectives portray a set of values usually linked with jazz such as freedom of opinion, open-mindedness, sharing, tolerance, peace and mutual understanding. Drawing on participant observation, volunteer work and interviews, I examine how jazz is used to create intercultural dialogue at the 2019 edition of Anmoggar N Jazz. Mainly, I focus on two examples of intercultural dialogue through jazz, (1) the collaboration between the French ensemble The Only New Jazz Band and the Taroudant-based musician Youness Lachguar and (2) the performance and journey of the festival's music competition winner Aymane Kochaina, who not only opened Anmoggar N Jazz, but won a trip to play at the Jazz à l'Étage Festival in Rennes, France, in March 2020..

Timeslot: Tuesday, 30 June

Presenter bio: Eric Petzoldt is a PhD student and member of the ERC-funded research group 'Past and Present Musical Encounter Across the Strait of Gibraltar', which is based at the Faculty of Music, University of Cambridge. In his PhD project, he explores jazz in Morocco, intercultural dialogue and music diplomacy.



Charles Prempeh

Pro-English policy and gender relations in a Ghanaian Pentecostal Christianity: The case of the Church of Pentecost

The goal of my presentation is to deploy the socio-philosophy of language to analyse how the introduction of English as a medium of church service in some branches (assemblies) of the Church of Pentecost (CoP) has contributed to (re)shaping Pentecostal cultures and defining the boundaries of gender relations. The CoP is the largest Pentecostal denomination in Ghana, West Africa. In the 1980s, the church embarked on a pro-English policy. The policy exemplified the entrenched importance of English as an index of 'civility' and social status. Also, English is a language of power and prestige. Significantly, the policy sits in a long history of the retention of English in postcolonial Anglophone nations as part of the attempts at routinising elitism and as a nation-building strategy to keep the nascent nations from degenerating into 'nativism'. The pro-English policy in the CoP led to major reforms in the church in 2010 to endear the church to 'modernity'. These reforms highlighted the discursive logics of gender relations in the church. Depending on fieldwork in 2019 and my positionality as a member of the CoP, I argue that the introduction of English challenged the pervasiveness of Pentecostal holiness theology that informed church orthopraxy about female.

Timeslot: Friday, 26 June

Presenter bio: Charles Prempeh had his B.A. and M.Phil. degrees in African Studies from the University of Cape Coast, Ghana, and University of Ghana, Legon, respectively. He is currently a PhD candidate at the Faculty of Divinity, University of Cambridge. His research interest is in religions in contemporary Africa.



Yang Qiu

Collaborators' Forgotten Legacy? Wang Jingwei Collaborationist Regime and the Abolition of Extraterritoriality in China 1943

This paper focuses on the Wang Jingwei Regime, a Japanese-sponsored collaborationist government during the Second World War, and its effort to end extraterritoriality (the exemption of foreigners from Chinese jurisdiction), which is regarded as the symbol of Western imperialism in China. Current Chinese literature on the abolition of extraterritoriality emphasizes the importance of either the Chinese Communist or the

Nationalist Party, which linked to the political claims of both parties for the leadership of 'national resistance' against foreign imperialism and their legitimacy to rule Chinese nation. Similarly, the Anglophone works on the topic only focused on the US and the UK as the principal actors of the process. However, few focused on the Wang Regime: the moral stigma of wartime 'collaborators' gave difficulty to provide an accurate account of the regime. By providing an account of how the elites from the collaboration regime sought to re-interpret the Pan-Asianist ideology to persuade the Japanese occupiers to end extraterritoriality, this paper argues it is necessary to forgo the distinction between the righteous resistance and morally fallible collaboration. To do so, this draws multilingual sources from archives of newspapers, memoirs, and Wang Regime's archival materials, which are ignored by the existing literature.

Timeslot: Tuesday, 23 June

Presenter bio: Yang Qiu is current undertaking an MPhil programme in World History. He completed his undergraduate studies in Politics at University of Edinburgh. He is interested in wartime collaboration in China under Japanese occupation during the Second World War and Japanese Pan-Asianism.



Benjamin Remez

Collective Quantum Matter: Physics of the Many, Not the Few

The twentieth century saw the discovery of extraordinary materials such as superfluids and superconductors, which possess striking properties like frictionless flow, resistanceless electrical conduction, and magnetic expulsion. Today they underpin modern technologies including MRI machines, maglev trains, particle accelerators, and fledgling quantum computers. Yet the theoretical understanding of such exotic materials remains elusive decades after their discovery, out of the reach of conventional

chemistry and material science. This is because the complete knowledge of simple building blocks, like atoms and molecules, does not fully predict the richness of the structures into which they can be assembled. This principle is known as "emergence": a whole is much greater than the sum of its parts. In this talk I will give a brief introduction to the concept of emergence and illustrate how it is a central paradigm in contemporary physics and the field of collective quantum matter.

Timeslot: Tuesday, 30 June

Presenter bio: Benjamin Remez is a Reuben Scholar and PhD candidate in physics at the Theory of Condensed Matter group of the Cavendish Laboratory, University of Cambridge. His research focuses on the collective many-body dynamics of strongly correlated electron systems.



Juan-Pablo Robledo del Canto

Musical improvisation enhances interpersonal coordination in subsequent conversation: Motor and speech evidence

Human beings communicate through speech, but also through music. Both communicative domains certainly differ in their specifics; nevertheless, they share a necessary element – mutual coordination between interactants. Furthermore, both domains can be conceived of as largely-overlapping manifestations of an underlying, universal human communicative ‘toolkit’ that draw on common underlying cognitive and behavioural mechanisms.

According to this conception of the relationship between music and language, improvements in coordinative skill acquired in one domain (e.g. music) should quickly manifest in the other domain (e.g. speech), regardless of previous musical training. Hence, in this study we explored whether musical interaction between non-musician interactants unknown to each other would promote greater mutual coordination, both motoric and spoken, in subsequent conversational interaction than would a non-rhythmic cooperative task. The study produced two main findings. We confirmed our main hypothesis: musical interaction does seem to promote greater interpersonal coordination in subsequent conversational interaction than does a non-rhythmic cooperative task. We also found partial convergence between the motoric (measured through a motion capture system) and linguistic (measured through phonetic tools) dimensions of the effect of musical interaction on subsequent conversational interaction. Together, these findings contribute to a more comprehensive and integrated understanding of human communication.

Timeslot: Tuesday, 23 June

Presenter bio: Juan-Pablo Robledo del Canto’s interest in the grey areas between non-verbal communication and music led him to the university’s Centre for Music and Science, where he completed an MPhil and recently approved his PhD. He is currently also a fixed-term lecturer in Psychology at the Université de Lorraine, France.



Julian Siebert

Fair Speech and Language Disorder Screening for Multilingual Children

Around 1.4 million children in the UK experience speech and language disorders; an estimated 60% of them do not receive appropriate interventions because their needs were never detected (Bercow Review Advisory Group, 2018). Further, more than one million children in UK primary schools speak English as an additional language; this further complicates the screening effort. This presentation addresses both of these issues by assessing Howell et al.’s (2017) Universal Nonword Repetition Test as a

screening tool for speech and language disorders among linguistically diverse 5- to 7-year-olds. Nonword repetition—the prompted repetition of nonsense syllables—has been shown to identify symptoms of speech and language disorders regardless of children’s language background. Specifically, I show my evaluation of how precise the measure is and how well it flags speech disorder risk (N = 259). Further, I explain my investigation of the effects of children’s sociodemographic and linguistic background on test scores (n = 114). I conclude that the measure has sound measurement accuracy and good diagnostic accuracy for all. It has the potential to tackle the often underestimated, yet pressing issue of undetected speech and language disorders among the many linguistically diverse children in the UK’s education system and globally.

Timeslot: Friday, 26 June

Presenter bio: Julian completed his MPhil in Education at Wolfson in 2019. Currently a PhD student at the Graduate School of Education at Stanford University, he returned to Cambridge as a visiting student in Theoretical and Applied Linguistics (MMLL). His research focus is on linguistic fairness in verbal assessment of multilingual populations.



Ivan Simpson-Kent

'Bridges' in-between brain and cognition? A multilayer network analysis of intelligence in struggling learners

Over the past decade, network science has become an increasingly prevalent analysis paradigm in psychology, most recently intelligence research. In this framework, general intelligence, the ability to perform well on many cognitive tasks, is best conceived as a complex system composed of nodes (e.g. vocabulary & memory) that influence each other to varying degrees. In this study, we used network analysis to investigate brain-behaviour relationships underlying intelligence in a large (N=800), developmental (ages 5-18) sample of struggling learners. We performed network analysis on a set of cognitive abilities including memory, reasoning ability and vocabulary. We found statistical evidence of specific interactions among measures, specifically verbal abilities, which had the greatest influence within the network. Next, we incorporated a set of neural measures (grey & white matter brain structure obtained from MRI scans) to explore the connections between the brain and behaviour. We found a complex pattern of brain-behaviour mappings suggesting 'bridges' in-between brain and cognition. This implies that certain brain networks and cognitive behaviours have greater contributions to intelligence than others, and provides new insights into cognitive development during childhood and adolescence.

Timeslot: Friday, 26 June

Presenter bio: Ivan is a 3rd year PhD student in Medical Science. He uses statistical models to understand how the brain and behaviour interact during childhood and adolescence to produce intelligence. He hopes to apply insights from his research to help guide education policy, especially for disadvantaged youth struggling to learn in school.



Daniel Sowood

The Future's Bright: Towards a Better Understanding of Third Generation Organic Light Emitting Diodes

18% of the UK's electricity is used for lighting. The development of more energy efficient light sources therefore presents a fantastic opportunity to reduce society's environmental impact. As the fluorescent lamp replaced the incandescent bulb, so the light-emitting diode (LED) is beginning to replace the fluorescent lamp as the gold standard of high-efficiency lighting. An LED can produce light with minimal heat losses, and without the necessity for toxic mercury. One of the most promising developments in the field of 'organic electronics' (devices based on carbon-containing materials, rather than silicon) is that of the organic LED (OLED). Being cheaper to manufacture and compatible with flexible or wearable devices, they have already found their way into high-end TV displays. This talk focusses on 'third-generation' OLED materials, a very active field worldwide. The central challenge is always to maximise efficiency and lifetime: turn as many electrons into photons of light as possible, for as long as possible. These 3rd-gen materials address this problem using a 'reservoir' of electronic states that do not emit light. This talk outlines current work on understanding the mechanism underlying the remarkable performance of these materials.

Timeslot: Friday, 19 June

Presenter bio: Originally from Uxbridge in Middlesex, Daniel read Chemistry at St John's College, Oxford and graduated in September 2018. Shortly thereafter, he commenced his PhD in Physics in the Cavendish Laboratory Optoelectronics Group under the supervision of Prof Neil Greenham. He is funded by the EPSRC Centre for Doctoral Training in Photovoltaics.



Brian Theng

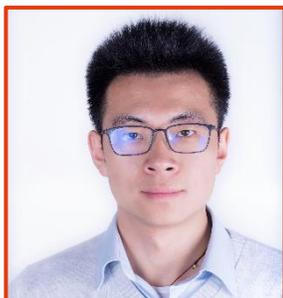
Embeddedness in the social sciences and the Roman economy

The currently-prevailing theoretical approach in the study of the ancient Roman economy is the New Institutional Economics (NIE). In focusing on formal institutions (the state and law), and economic performance (GDP or quality of life), NIE neglects to consider the role of social networks and cultural norms in shaping ancient mentalities and financial transactions. Embeddedness, a fundamental tenet of the New Economic Sociology (NES), fills this gap in the NIE approach. In its most holistic conception, embeddedness refers to the inseparability of economic action from our cognitive limitations, culture, and social and political structures. I explore in detail Letter 1.24 of Pliny the Younger, a 1st-century to 2nd-century AD Roman senator. In this letter, Pliny mediates a property sale between his friend and another contact. By analysing the role of social structure and cultural norms in shaping Pliny's and his friends' actions in this transaction, I hope to show that embeddedness makes it possible for us to fully appreciate the nature and effectiveness of their strategizing. While those party to the sale leverage their social connections to reduce information costs, Pliny creates a chain of open-ended commitments based on the cultural norm of reciprocity, thus assuring his long-term security.

Timeslot: Tuesday, 23 June

Presenter bio: Originally from Singapore, Brian Theng is a MPhil in Classics candidate. He has a BA in Literae Humaniores from The Queen's College, University of Oxford.

Poster Presentations



Jiaru Bai

Knowledge Graph Approach to Automation of Combustion Mechanism Development

To tackle climate change, academic researchers and industrial practitioners have been working on promoting an energy transition towards sustainable resources. Despite the potential of electrification of energy supplies, combustion is expected to remain a key player in the foreseeable future. This has generated a push towards biofuels which offers a reduction in pollution. Different type of biofuels must be assessed carefully to ensure sensible decisions, which requires accurate chemical models that able to simulate their combustion processes. Presently, this work is undertaken by researchers in a manual fashion with heavily borrowed sub-mechanism from each other. It is not only time consuming, but also lacks trace between different works. Such a process can be automated with the help of knowledge graph. Such a linked-data format ensures the consistency between different data entries before it can be trusted. The J-Park Simulator (JPS) is an integration of real-time data and autonomous agents, offering new ways of solving classical engineering problems. The scope of this work covers the automatic development of combustion mechanisms. Proven the developed mechanism outperformed the existing ones, this framework servers as an additional component of JPS to facilitate its overall aim of decarbonisation.

Timeslot: Friday, 19 June

Presenter bio: Jiaru is a first-year PhD student in Chemical Engineering at the Computational Modelling (CoMo) group. His research focuses on solving chemical engineering problems applying machine learning and semantic web technologies.



Charlie Barty-King

Towards the production and application of biocompatible, cellulose-based, photonic materials

This project focusses on a cellulose-derived material that displays vibrant structural colouration and iridescence in water. The observed colour is due to the inherent nanostructure of a material itself, not as the result of any dyes or pigments, hence the term structural colouration. Interestingly, you can alter the material nanostructure in predictable ways by controlling its environment, allowing a dynamic control over the colour you observe. For example, by applying a pressure, altering the temperature, or adding/removing water, the colour of the material is changed, making it well-suited for sensing applications that are easy to interpret at a glance. This ability to control colour using pressure is termed mechanochromism, is a relatively rare phenomenon, and is the principal focus of my PhD. The material I use is fully biocompatible (also edible), cheap, industrially-scaled and sourced from cellulose – the most abundant naturally-occurring polymer on Earth. Due to its dynamic colouration and biocompatibility, applications include: sustainable, low-cost and low-barrier-to-understanding environmental sensors, ‘smart labelling’ for food packaging and novel food aesthetics. Through research I hope to move this material from one of fundamental science, to applied science, incentivising development of sustainable materials to compete with the disastrous petrol-chemical products we humans rely on.

Timeslot: Friday, 19 June

Presenter bio: Charlie is a final year PhD student in the Nanomanufacturing research group of Dr Michael De Volder (Institute for Manufacturing), in close collaboration with the Bio-inspired Photonics research group of Dr Silvia Vignolini (Department of Chemistry). Charlie’s work is funded by the Engineering and Physical Science Research Council, EPSRC.



Jennifer Spindler

Inclusion as Acceptance & Belonging: A Transformative Case in Inclusion Schools

Originally addressed on a global scale at a UNESCO conference in 1994, inclusion is defined as a policy meant to integrate children with special educational needs into all classrooms. Twenty-five years later, inclusion is interpreted as an educational policy that ensures all children receive a high-quality education. Worldwide, special education students are placed into “mainstream” classes under the assumption that integration, also referred to as “inclusion”, creates more opportunities for student participation in a school’s academic and social activities. My research aims to understand how Pupil Referral Units (PRU’s) fit into England’s inclusive discourse, as national data demonstrates young people who are excluded from mainstream schools are increasingly matriculated into PRU’s. Through Zoom interviews and observations I gathered the perspective of various educators about inclusive school processes such as mainstreaming, social emotional learning and family support. I ask the question, do educators believe that the ultimate goal of PRU’s is to re-integrate these young people into the mainstream system? I hypothesize that current PRU policies promoting social emotional learning are essential for inclusion to become a positive experience of acceptance and belonging for young people in mainstream schools.

Timeslot: Friday, 19 June

Presenter bio: Jennifer moves with the desire to absorb new ideas and participate in innovative education projects. Her five year tenure as a public school educator in New York City and various experiences in global education programs encouraged her to develop her research skills through the Education, Globalization and Development MPhil program.



Alifa Starlika

Tackling Housing Affordability in the United Kingdom

In recent years, workers in England and Wales need to work out eight times their annual income to buy an average house, underlining how unaffordable house purchasing has become in the United Kingdom (UK). The situation is worse for young adults, who are significantly less likely to own a home. Most scholars have interpreted this as a longstanding failure of housing supply to keep up with rising demand. Drawing on 650 parliamentary constituencies data sets of the UK from the House of Commons Library, we run an Ordinary Least Square (OLS) Regression to evaluate the argument aforesaid. The paper also uses this measure to assess demand-side policies - immigration cap and the government-subsidized mortgages- which policymakers might refer to in stunting house prices growth and increasing the rate of house ownership for the young generation (population below 40 years old) and first-time buyers. Across a wide sample of constituencies in the UK, lending government-subsidized mortgages helps to stimulate the demand of the young generation and make a switch from renting privately to owning a house. Plausibly, the UK housing market crisis is a confluence of demand and supply-side factors, rather than a solely supply shortage problem.

Timeslot: Friday, 19 June

Presenter bio: Alifa Starlika is an MPhil Public Policy, where her primary interest revolves around digital economy and energy policies. Nowadays, she is juggling her time between interning in Energy UK and finishing her master thesis, constructing a regional digital readiness index in Indonesia. Previously, she worked as an Enterprise Account Manager for Banking in IBM and graduated with the third-highest GPA in Economics from the University of Indonesia.

Wolfson Green Society

Getting to a Zero Carbon Future at Wolfson College

Wolfson College, like all others, is urgently evaluating its Carbon footprint to understand the true priorities that affect daily lifestyle and experience during the transition to a sustainable future – our future. College utility data tracked consumption of gas, electricity and water. This was used by the Carbon Reduction Committee in summer 2019 to track Wolfson's CO₂ emissions explicitly. Findings were then disseminated, and advice given, to the College Council on necessary actions to meet Greenhouse Gas targets well before 2050. Further validated data and CO₂ emissions values were provided to the Sustainability Committee and WCSA representatives for comments before any general release of research at the WRE2020. Our trend analysis has (and will further) provoke future research studies covering, among other topics: impact on residential and office areas, holistic waste streams, carbon footprints from travel, buildings & estate strategies, environmental priority focussing, boiler replacement guidance, gardens, and wider sustainability action. How all this can be achieved is an open question, as is whether this can be done comprehensively or in part. There should be little doubt that Wolfson, and all who live, work and study here, will be involved to achieveably address this challenge.

Timeslot: Friday, 19 June

Note: The poster will be presented by David Izuogu on behalf of the Green Society.