



Waynflete Presentation Evening - Round One - 7.30pm

Brine, Tom: Could there be a canine solution to lung cancer detection?

Dogs' incredible sense of smell is well documented. The theory behind the argument of dogs being able to detect cancers is that malignant tumours emit Volatile Organic Compounds (VOCs) which the dogs can be trained to detect using this system. The project also explores the potential of other detection methods - Circulating Tumour (CT) DNA and (CT) Cells – and evaluates which line of research would be best to pursue further.

Camilleri, Harry: Did Thatcher and Blair undermine cabinet government?

In this project, I examine the extent to which Margaret Thatcher and Tony Blair moved away from a system of collective cabinet responsibility and towards a more centralised model of government. I view their various interactions with their cabinets through the prisms of various case studies: the Falklands War, the Iraq war and the Westland affair. I also look at the proliferation of the 'Special Adviser' through this period and examine its implications for the future.

Castella McDonald, Isaac: Homosexuality and the Bible

The debate around gay marriage has become an issue over which conflict between progressive and conservative churches has crystallised in recent decades. I investigate the field of hermeneutics, the formal study of interpreting the bible, and delve into the biblical passages surrounding this contentious issue. The way we treat these passages has implications for the study of other texts and the authority of scripture, and also for the limitations of language as a communicative mode.

McKnight, Liam: Can computers understand meaning in language?

While it is becoming easier to process the syntax and word structure of many languages computationally, processing semantics is still an area where humans far outperform machines. In this project, I investigate ways in which computers can model, or even imitate, the human intuition about the meanings of words through machine learning techniques, and how these models can be applied in areas such as machine translation.



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Tucker, Flora: How does the fairy tale enchant and affect all ages?

I look into how fairy tales have been branded towards different age groups, and the differences between these methods throughout history. I ultimately come to the conclusion that the fairy tale remains attractive to children by nature of its form, and afterwards for its links to our childhood and the mirror it holds up to reality.

Walsh, Eoin: Quantum cryptography: a friend for the future

Cryptography is fundamental to the way we live. We rely on it for everything from online bank transfers to WhatsApp messages. But the methods of cryptography we use now are not wholly secure, and with the advent of new technology, messages we send today will be broken in the future. Quantum cryptography, however, offers a totally secure line of communication. Join me to see how it works, how it can practically be implemented and why it will protect the privacy of our future.

Williams, Rowan: Liberty and the first Boer Republics

While many people are familiar with the apartheid system of 1948-94, the developments of the 19th century that helped build modern South Africa are far less well known. In this project I investigate the history of the Boer people, the Dutch-speaking 'white tribe of Africa', focusing specifically on the importance of individual liberty within Boer culture, Boer politics and in the context of race relations.

Yang, Marie: Alternative medicine in treating autism

As current mainstream treatments for autism are often insufficient, parents may resort to complementary and alternative medicines (CAMs). This project assesses the extent to which CAMs are suitable for children with autism. It explores the reasons behind CAM usage and the potential dangers, as well as examining the quality of clinical studies as the basis of CAM research. Only one of eight CAMs was identified as both safe and effective.



Waynflete Presentation Evening - Round Two - 8.00pm

Ader, Matthew: What are the most pressing emerging security risks to the West?

The West faces a broad range of security threats to both its domestic and foreign interests. This presentation addresses four such threats; terrorism, hybrid warfare, anti-access/area denial and cyberwarfare; to understand which pose a new, serious threat to the West.

Arden, Ellie: Female appropriation of the sonnet form

I explore the tradition of the sonnet: moving from Dante and Petrarch to the work of selected female sonneteers and their appropriation of this typically 'male' form, ranging from the 17th to 21st Century. Starting with Lady Mary Wroth, I then analyse poems by Elizabeth Barret-Browning, Edna St. Vincent Millay and Moira Egan, discovering the gradual liberation in terms of form and content.

Doorly, Matthew: The civilian impact of the Spanish Civil War

The Spanish Civil War is often discussed as a military struggle between the two sides, without consideration of its impact, and legacy on the civilian population. In this study I look at two towns that were under Republican control for the majority of the war and, using some original testimonies, analyse the civilian suffering both during the war and after, under the Franco dictatorship.

Innes, Joseph: Inflammation in the development of depression

The 'inflammatory hypothesis of depression' proposes that inflammation has a role in the development of depression – from this, it may follow that anti-inflammatory drugs are effective in treating the condition, thus alleviating its significant human and economic impact. My project evaluates the inflammatory hypothesis from a clinical and mechanistic perspective, concluding with an assessment of the potential for anti-inflammatory drugs to treat the condition.

Lloyd, Annie: Does transhumanism affect human nature?

In less than 50 years from now, our world might be unrecognisable, with the people even more so. Ever searching for improvement, scientists seek to redefine what it means to be human by taking control of evolution and playing with perhaps the most puzzling collections of particles ever borne from the universe. I investigate the impact of transhumanism on human nature and discover the unnerving reality behind enhancement's alluring appearance.



Waynflete Presentation Evening - Round Two - 8.00pm

Maier, Freddie: Physics beyond the Standard Model

The Standard Model of Particle Physics is undoubtedly a triumph of modern theoretical science, successfully predicting the existence of antiparticles and the Higgs boson. However, phenomena such as neutrino oscillations and the problems they cause for the Standard Model may mean that amendments or, indeed, new models entirely will have to be made; whether this is true forms the central question of my presentation.

Monaco, Nick: Treating schizophrenia with behavioural therapy

In my project, I explore the effectiveness and issues of emerging treatments for schizophrenia: CBT and avatar therapy, in contrast to antipsychotic medication. Furthermore, I examine other key aspects of schizophrenic treatment research such as early detection and intervention, and genetic based treatments, discussing their importance in aiding current treatments and their potential in the future. In existing literature, there is no double blind, direct study comparing effectiveness of antipsychotics drugs and CBT on improving schizophrenic symptoms. Therefore, my research aims to compare the different treatments, question how they should be used, and ask what can be done better in the future.

Shan, Charlie: Replacing digital storage systems with DNA

In such a data-driven society, demand for a way to store data reliably and compactly will only increase with time. My project explores a new method of storing data as an alternative to digital storage by using DNA. I evaluate the viability of such a technique in the foreseeable future, and also propose solutions to some of the shortcomings preventing this technique from entering the mainstream today.



Waynflete Presentation Evening - Round Three - 8.30pm

Birch, Daisy: Gothic literature and architecture

The 'Gothic' is an elusive genre, which evades a unanimously agreed definition while still managing to pervade art across time. Within my project, I examine the features of Gothic space in order to explore the relationship between the Gothic architecture of the High and Late Middle Ages and the Gothic literature which originated in the late Eighteenth Century, looking at why the two are connected across the centuries by this obscure, and yet prolific, aesthetic mood.

Edmiston, Thomas: Viral DNA in the human genetic code

When the human genome was sequenced for the first time in 2003, it was discovered that at least 10% of our DNA is viral in origin. It turns out that viruses have been colonising our genome for tens of millions of years, but only now are we uncovering the remarkable physiological and pathological implications of their presence. In this presentation, I explore the impacts and potential uses of these genomic invaders in the struggle against HIV and other modern afflictions.

Green, Oriane: Did China's one child policy affect economic growth?

I became interested in the extent to which factors had effects on such large economic outcomes, more specifically, the impact of the population changes under the One Child Policy on economic growth in China. According to models and theories, it would seem as though a decrease in the working age population would not lead to economic growth. However, this was not the case in China as its economy grew at a staggering rate. This is what led me to carry out this project.

Lee, Ryan: Solving impartial games

Combinatorial impartial games – symmetric, two-player games that must resolve a winner. I consider whether, and which player, has a winning strategy at any position – “solving” a game. I study the simple game of Nim, and its associated operation, Nim addition. By the Sprague-Grundy Theorem, every impartial game is equivalent to a “sum” of many Nim games, which makes them considerably easier to solve. I conclude by examining Octal games.



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McIntyre, Catriona: Did WWI change attitudes to mental health?

Throughout history, mental health has been consistently overlooked and oversimplified, the mentally ill bearing the brunt of this through abuse and malpractice. It is generally considered that the turning point in changing this was World War One. I look primarily at 17th to early 20th century views to deconstruct and assess this stance and argue that, in reality, the majority of the changes are better attributed to the Victorian era.

Penrose, Max: Did WWII produce the equivalent to a modern computer?

My project looks at the mathematical underpinnings of computation using 'computable functions'. These are defined by simple theoretical machines (such as Lambda Calculus or Turing Machines), which have the ability to evaluate algorithms in a comparable way to a modern computer. Remarkably all are equivalent in ability, and can evaluate the same set of algorithms. It is finally shown that these methods were realised physically by the Z3, an advanced calculator, in 1941.

Shadbolt, Alex: The weaponisation of artificial intelligence

Artificial Intelligence (AI) is a technology developing at an extraordinary rate. AI has rightly been seen as a great boon for humanity, but also as a potential threat. Many are concerned about the prospects of AI being fitted on a wide range of weapons platforms. This talk will review the history and prospects for weaponised AI, how we should understand the challenge around the ethical use of such systems, and their use in warfare.