



THE Darwinian



Machine Learning, Artificial Intelligence (AI) and Cyber-risk

Darwinians highlight how digital technology impacts us both globally and personally

Also inside:



Students lead Sustainability and Biodiversity Projects



Sporting Success for Darwin students



A look-back at the lives of Professor Arnold Burgen and Dr Abe Yoffe

A Message from the Master

Dr Mike Rands

Exciting Causewayside Purchase to Provide Housing for Students and Post-Docs

As this edition of the Darwinian goes to press, I have both exciting and sad news to share. I'll begin by expressing our deep sorrow at the death of Sir Arnold Burgen, our third Master and a distinguished physician and pharmacologist, who recently celebrated his 100th birthday. Sir Arnold championed the Darwin College Lecture Series as Master and raised the profile of the College through his role as Foreign Secretary of the Royal Society. He remained actively engaged with the College until the pandemic prevented him – along with many others – from joining us in person, but until recently, he was still happy to offer wisdom and guidance to me as one of his successors. I will always cherish his enthusiasm for Darwin and his sage advice.

I am delighted to report that Darwin College has just completed a major acquisition of accommodation – the largest since we purchased Gwen Raverat House in 1996 – comprising 44 flats known as Causewayside. A primary function of our College is to house, feed and fund our students. Since our foundation, when the College community comprised 12 Fellows and 12 Students, our student population has steadily grown. Today we aim to admit around 100 PhDs and 200 masters students each year. We offer accommodation to all students for their first year and have been gradually increasing and consolidating our housing stock closer to Silver Street. Soon we hope to be able to offer all our students a place to live for the duration of their time at Cambridge.

Causewayside, which is located on Fen Causeway adjacent to the River Cam and about 300 metres on foot from the main College buildings, provides us with a tremendous opportunity to increase both the amount and variety of accommodation we can provide to students and post-docs, and is especially suitable for college members with families. We are working to improve the environmental performance of Causewayside, along with other parts of our estate. It is a challenge, but one we relish as part of our wider plans to address sustainability.

On the subject of sustainability, I am really pleased to report that Darwin has been awarded a Platinum Green Impact Award 2022 by the University of Cambridge. My thanks go to our



Mike Rands (centre) at the Alumni Reunion dinner in June

students, staff and Fellows who have developed, championed and implemented various novel 'green' initiatives resulting in this recognition.

And last, but by no means least, I would like to say a huge thank you to all of you who contributed to our first Darwin College Giving Day in March. This resulted in raising nearly £50,000 for the College, including significant funds for student support and for 'Green Darwin'. We are deeply grateful to all those who contributed gifts and ideas for this event and to those who organised it so well.

Food, Glorious Food!



Dr Melissa Calaresu speaking on Food and Cultural History, DCLS 2022

The 2022 Darwin College Lecture Series took as its theme, food. As is the norm for these lectures, the topic was approached from a wide range of disciplinary perspectives drawing on climate science, archeology, history, economics, chemical engineering and veterinary science among other subjects. Each of our speakers also highlighted the importance and value of crossing disciplinary boundaries in research when addressing questions around food and, in several cases, brought together experience, knowledge and analytical tools from one discipline and applying them to another.

Several of the lecturers explored the interface between research, policy (and in some cases politics) and the practical actions and decisions made by individuals, governments and companies.

It was a fascinating journey, highlighting both enormous global challenges, but also great opportunities for innovation, individual actions and the vital role research can play in ensuring we can feed the world without destroying our planet.

This year our catering team took on the ambitious task of theming the Formal Hall dinners that follow the lectures to fit with each topic covered. We warmly thank Ivan Higney, Catering Manager, and his team for their innovation and ambition applied to creating a delicious and varied menu for us each week.

We are indebted to the organisers of this series: Dr Miguel Anaya – a physicist and Research Fellow at Darwin (who proposed the theme), Dr T J Young – a glaciologist at the Scott Polar Research Institute and Post-Doctoral Research Associate at Darwin, and Dr John Nilsson-Wright - Associate Professor in Modern Japanese Politics and International Relations and a Fellow of the College.

For the first time all the lectures were livestreamed, enabling a global audience to join us live. Of course, these lectures would not be possible without the help of a wide range of volunteers and staff, including the College Registrar Janet Gibson who is such a linchpin for the Lecture Series.

Finally we are most grateful to our audience – we do it for you and you make it worthwhile for us.

Missed the lectures? Go to our YouTube channel to catch up!

Darwin College Lecture Series Programme 2023:

Isolation

- 20 Jan: **Adrian Kent** *The Closeting of Secrets*
- 27 Jan: **Amy Nethery** *The isolation of asylum seekers*
- 3 Feb: **Anil Seth** *Isolating Consciousness*
- 10 Feb: **Jane Francis** *Antarctica: isolated continent*
- 17 Feb: **Philip Jones** *Isolation and trapping using optical tweezers*
- 24 Feb: **Arik Kershenbaum** *Are we alone in the universe*
- 3 Mar: **Heonik Kwon** *The self-imposed isolation of North Korea*
- 10 Mar: **Amrita Narlikar** *Isolation in International Relations*

Machine Learning, Artificial Intelligence (AI) and Cyber-risk

In this issue of the *Darwinian*, we are focussing on **Machine Learning, AI, and Cyber-risk**. The four articles that follow are written by Darwinians from every facet of our community – students, Fellows, and alumni. We look at ‘what is AI and why do we need it?’, ‘the opportunities and challenges of AI in the Global South’, ‘how the war in the Ukraine impacts on the prospects for cyber-peace’ and lastly ‘who cloud computing actually benefits?’

The articles highlight that society has yet to ‘catch-up’ with the speed that digital technologies are evolving and that these advances in computer technology are and will continue to impact us at a global level; they may well increase the discrepancy between the global south and north and will affect all of us on a personal level. →

The Evolution of Artificial Intelligence

Dr Catherine Breslin is an alumna of Darwin College (2003-08) and holds an MPhil and a PhD in Engineering. She currently works as a freelance consultant advising companies in the field of AI, with a focus on voice and language technology. Here, she discusses the evolution of AI and its current success.



Artificial intelligence (AI) has been making headlines. We've seen the announcement of AI systems across a range of industries tackling a range of different tasks.

Among other things, these systems have been able to successfully diagnose illness, drive cars, hold conversations, translate text, and create new images. But what is AI, and how has it evolved over the years?

For all the column inches that have been written about AI, a precise definition is hard to pin down. The term originates from a workshop held in Dartmouth in the summer of 1956. The original proposal said:

"An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves."

Perhaps then the best definition of AI is programming computers to show "human-like" intelligence - whether that's skill with language, speech & images, or interpreting the world around us in other ways.

Over the years AI has encompassed a wide range of approaches. Early approaches to AI revolved around machine-readable knowledge. Attempts were made to encode human understanding in a knowledge store and use search and logic to make inferences. For example, a system might know facts about the heights of buildings around the world. This information could be used with logical rules

to answer questions like "which is taller, the Empire State Building or the Eiffel Tower?"

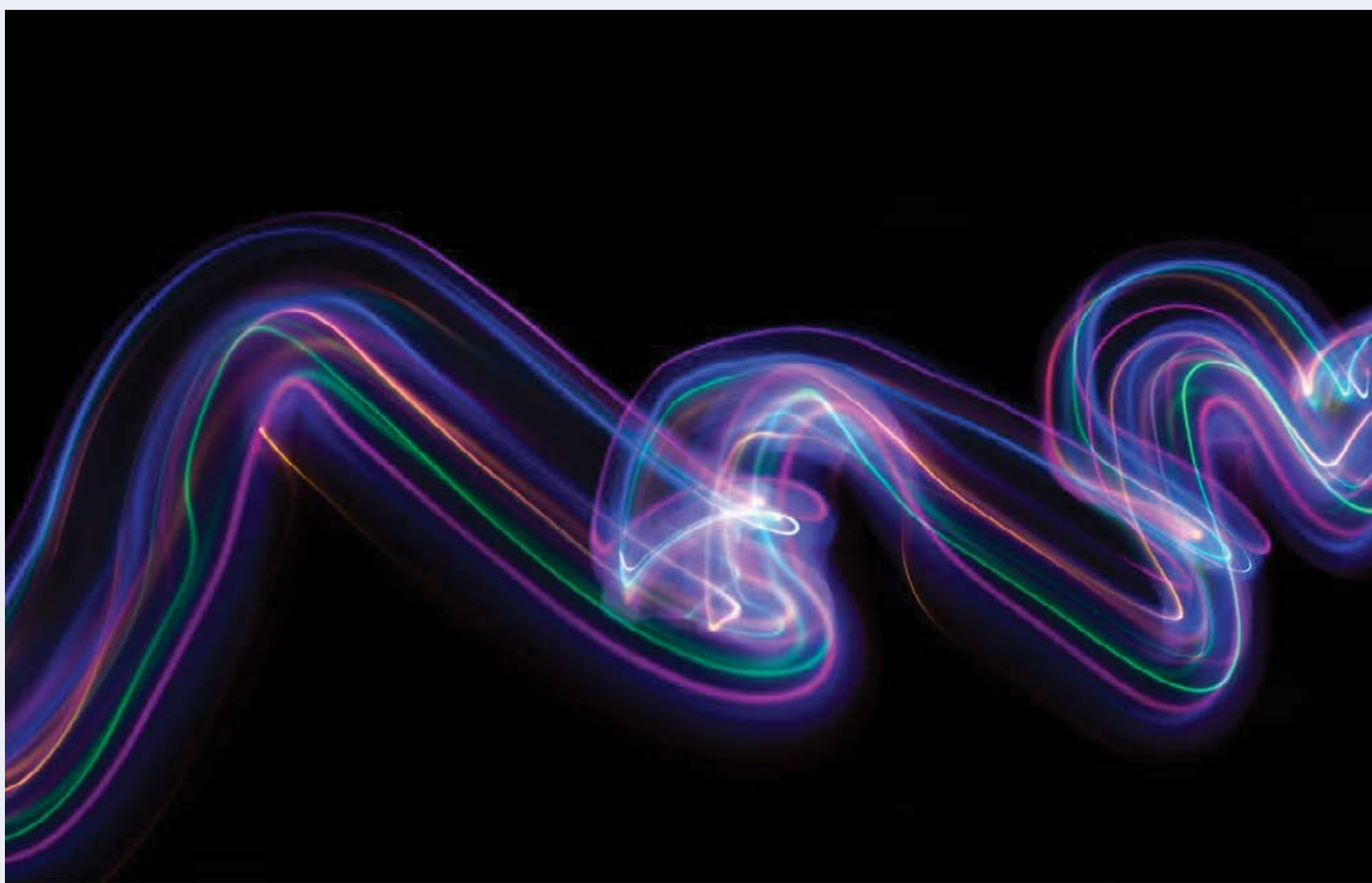
However, human knowledge is messy, ever-changing, and full of contradictions and ambiguity. These systems could work for small tasks, but ran into too many problems when trying to store large amounts of knowledge. **Knowledge bases are an essential part of some modern AI systems, but on their own are not enough to build truly human-level intelligence.**

Over time, a more popular approach became to learn a model of the world from data. The current wave of AI is driven by this idea, and in particular by the success of a group of algorithms under the umbrella of 'machine learning' (ML). These algorithms don't list out exactly the instructions that a computer should follow to complete a task, but they learn how to behave by being presented with a variety of data

and uncovering the patterns in that data, a process dubbed 'training'. A computer learning to transcribe audio would be trained on manually transcribed audio. A model learning how to identify topics in text would be trained on text data annotated with topic. These models could then be used to transcribe new and unseen audio, or categorise the topic of new text articles.

One particular family of model known as 'deep neural networks' has had big success in the past decade. Neural networks have been around for a while, but it's only recently that there's been enough data and computing power to effectively take advantage of their power. A modern speech recognition model for example might look at hundreds of thousands of hours of audio data. A language model might be trained on billions of words of text. Training on such large amounts of data is only possible due to modern data





Below left: *Women in Tech Stock Image*; **Above:** *Abstract AI Image*. Photo Credit: Catherine Breslin; **Below:** *Digital Text Bubble*. Photo Credit: Jason Leung

storage and computing power. Deep neural networks have also been remarkably successful across different tasks - language, vision, audio - meaning that advances from one task can be rapidly applied to other tasks.

To get the large amounts of data needed for training the current generation of models, text and images are often scraped from the internet. But, data scraped from the web is not always representative of real life. A model trained on text collected before 2020 would know nothing of Covid-19 and all the changes it has brought to our lives. **Language evolves all the time as new events take place. Keeping up-to-date is a challenge.**

Web text also contains other biases. Wikipedia, for example, is an important source of text data for many machine learning models. Yet, biographies there



skew towards Western figures and less than 20% are of women. This impacts the kinds of patterns that models learn.

There's an ever-growing list of machine learning models learning and reproducing stereotypes from the data they're trained on. One example is sentiment analysis models associating African American names more strongly with negative emotions than European names. Another commonly cited example is machine translation models which

need to handle the translation of gender neutral language, such as in Turkish where the word 'o' means both 'he' and 'she'. The models are likely to fall back on skewed patterns of language that are present in the training data, leading to translations such as "He is a doctor, she is a nurse". Mitigating these kinds of biases is hard, and is a topic that's currently receiving a lot of attention.

Despite these issues, machine learning is behind many of the AI products we use today - virtual assistants, web search, fraud detection, face ID, post recommendations on social media, and much more. It's being used daily by large numbers of people around the world, and shows no sign of slowing down any time soon.

Inventing Artificial Intelligence in Africa

Alan Blackwell is Professor of Interdisciplinary Design at the Computer Laboratory in the University of Cambridge and an alumnus (m. 1995) and Fellow of Darwin College. He is also Director of the Crucible network for research in interdisciplinary design and co-Director of Research for the University of Cambridge Global Challenges Initiative. Here he talks about the opportunities and challenges of AI in the Global South.

Increasingly many aspects of our lives are influenced by, or even controlled by, Artificial Intelligence (AI) algorithms. But we wonder what benefits result from these algorithms, and who the benefits go to. Governments, health services, and even schools and universities can be enthusiastic about the savings that might be achieved by automating public services. But many of us are uncomfortably aware that these technologies are driven by the agenda of the companies that create them. These new public services (and even university research) are increasingly dependent on the tools and technical vision of companies like Google, Tesla, Amazon and Facebook.

As an AI engineer since the 1980s, who came to Darwin for a PhD studying human-computer interaction, my own research is dedicated to making AI research more human-centred. This has always required working across disciplinary boundaries, but in recent years two particular interdisciplinary initiatives have inspired a unique approach to understanding new opportunities in AI. One of these has been the work I have done with Darwin alumnus David Good and many other collaborators, developing *Cambridge Global Challenges*, a university-wide strategic research initiative that is focused on addressing the Sustainable Development Goals in partnership with researchers in the low and middle-income countries of the Global South. The other interdisciplinary initiative feeding in to this work is a fascinating series of workshops convened by previous Darwin Master Geoffrey Lloyd, who has extended his work in the history and philosophy of ancient science with anthropological and cross-cultural perspectives under the rubric *Science in the Forest, Science in the Past*.



Alan Blackwell with colleagues from the AI for Development group at the Bahir Dar Institute of Technology

These two activities, each very stimulating in themselves, demonstrate everything that readers will join me in appreciating about the interdisciplinary research community of Darwin. But beyond the pleasures of interdisciplinary curiosity, this mixture of activities has led me to ask why so much development and critique of AI technologies is concentrated on the problems and concerns of people who live in wealthy countries. I started to ask what AI would look like if it were invented by people in Africa, drawing on things I had learned from other Darwin alumni including anthropologists James Leach, Lee Wilson and Amiria Salmond.

An initial plan for a new ethnographic approach to AI was hatched at one of the Science in the Forest, Science in the Past workshops, and developed into projects in specific countries through contacts I had made in Cambridge Global Challenges. The year of sabbatical leave originally dedicated to this work has been interrupted by the pandemic, but I did manage to complete two fascinating periods of field research, including two months in Ethiopia at the end of 2019, and a month in Namibia in early 2020, before it became necessary to return to lockdown in Cambridge.

Although seriously interrupted by the pandemic, it has been possible to publish some findings from this research, co-authored with colleagues in Ethiopia and Namibia, and also with my wife Helen Arnold, a high school mathematics teacher with educational research experience (and known to some Darwin alumni as the soprano soloist on Darwin College choir tours to Portugal in the late 90's), who was able to work with collaborators in both countries.

The initial results of this research have been re-evaluating the mathematical concepts underpinning contemporary AI research, working from the perspective of teachers and students in these countries. For example, one of the real challenges for members of the public today is how to interpret and act on the outputs of machine learning and data science algorithms. The Covid pandemic has especially emphasised how data in itself does not seem sufficient for us to know how to "follow the science" as the UK government has advocated. A master's student is currently experimenting with teaching concepts of probability in relation to the risk of contracting Covid in Nigeria. In fact the mathematical principles of



Student Eden Melaku prototyping an Amharic language display at Biomaker workshop, Bahir Dar University. Image credit: Alan Blackwell

information and inference that underlie all current AI, machine learning and data science, as described in the classic book by Darwin fellow David MacKay, *'Information Theory, Inference and Learning Algorithms'*, are hardly taught in Western schools, let alone students in Africa. At the start of this project, we had the good fortune to meet with experts in the Cambridge Mathematics project who were revising the fundamental conceptual principles of future teaching in probability and statistics. To the extent that future populations are comfortable with AI, whether in Africa or the UK, it will be these aspects of the school curriculum that prepare them. Instead of assuming that new curriculum is always exported from the West to the rest of the world, why not start in places like Africa, where different ways of teaching and learning can enrich us all?

Findings from our research demonstrated how new concerns for international mathematics curriculum could be derived, not only from the skills needed in universities like Cambridge, but from the perspectives of students on the shore of Lake Tana in Bahir Dar, Ethiopia, or in Tsumkwe Senior Secondary School in the Namibian Kalahari. In both locations we met talented data scientists, very different in some ways to students in Cambridge, though also local AI researchers

developing their own tools and agendas, for example in Ethiopia's Bahir Dar Institute of Technology and the International University of Management in Namibia. We found it particularly interesting to work with the gifted senior high school students at the Bahir Dar STEM Centre, and the ancient data science traditions of hunter-gatherer Jul'hoansi people in the Kalahari. In both places, we saw opportunities for AI systems to be designed that built on the cultural strengths specific to a country, such as the traditional observational skills of hunter-gatherers, or the collaborative community of the Amharic tradition. More technical detail of these findings in relation to computer science literature and other disciplines is described in the publications mentioned below.

The original research programme was ambitious and wide-ranging, and very much continues at the time I write this. Current Darwin PhD student Joycelyn Longdon, who I supervise together with Jennifer Gabrys from the Cambridge department of Sociology, Adham Ashton-Butt from the British Trust for Ornithology, and Emmanuel Acheampong from Kwame Nkrumah University of Science and Technology in Ghana, is currently conducting fieldwork to understand how data science contributes to forest conversation. Joycelyn's PhD is the first

fieldwork-based social science project carried out in the Centre for Doctoral Training in AI for Environmental Risk, founded in 2019 by Darwin fellow Emily Shuckburgh.

Other students and researchers, including many Darwin members, are building on these results to learn from the Global South, understanding what kinds of technology will best equip all of us to address global challenges.

Acknowledgement

I am very grateful to my hosts and collaborators in Africa, especially Dr Tesfa Tegegne at Bahir Dar University, Ethiopia and Prof Nic Bidwell at the International University of Management, Namibia. Thanks also to the friends in those countries seen in these photographs, and to those listed as co-authors in the papers below.

Further reading

Blackwell, A.F. (2021). Ethnographic artificial intelligence. *Interdisciplinary Science Reviews* 46(1-2), 198-211, DOI: 10.1080/03080188.2020.1840226

Blackwell, A.F., Damena, A. and Tegegne, T. (2021). Inventing artificial intelligence in Ethiopia. *Interdisciplinary Science Reviews*, 46(3), 363-385. DOI: 10.1080/03080188.2020.1830234

Blackwell, A.F., Bidwell, N.J., Arnold, H.L., Nqeisji, C., Kunta, /K. and Ujakpa M.M. (2021). Visualising Bayesian Probability in the Kalahari. In *Proceedings of the 32nd Annual Workshop of the Psychology of Programming Interest Group (PPIG 2021)*.



Staff at the Tsumkwe conservancy office experimenting with probability spinners based on a concept from Charlie Nqeisji. Image credit: Alan Blackwell

How the War in Ukraine is Impacting the Prospects for Cyber Peace

Darwin alumnus Professor Scott Shackelford (mat: 2005) serves on the faculty of Indiana University where he is Cybersecurity Risk Management Program Chair along with being the Executive Director of the Ostrom Workshop. He is also an Affiliated Scholar at both the Harvard Kennedy School's Belfer Center for Science and International Affairs and Stanford's Center for Internet and Society, as well as a Senior Fellow at the Center for Applied Cybersecurity Research. Here he talks about Cyber Peace and the war in Ukraine.



Volumes will be written about the many impacts of Russia's invasion of Ukraine, but one underappreciated area in which the implications of the war are playing

out is on the future of cybersecurity norm building, and more broadly the drive for cyber peace. In April 2022, for example, Microsoft released a report detailing the multi-faceted cyber campaign being orchestrated by the Kremlin. In all, investigators were able to document 237 cyber operations, including a number of cyber attacks targeting civilians and civilian infrastructure, mirroring the indiscriminate kinetic attacks from Russian military forces. Indeed, some forty percent of the total observed attacks were targeting Ukrainian critical infrastructure, often in close coordination with kinetic attacks including broadcasters.

Thus, rather than being 'all quiet on the digital front' as many commentators had been arguing given the relative paucity of cyber attacks compared to the Russian government's cyber capabilities and demonstrated willingness to use them, cyber attacks appear to be an increasingly important aspect of the ongoing war. So far, though, Ukraine in close partnership with NATO and leading vendors has been able to safeguard Ukrainian systems from many of the most damaging attacks. Similarly, defenders – along with the U.S. intelligence community - has been more

successful than past operations in actively countering Russian disinformation and misinformation. In many ways, Ukraine has been at war since 2014 when Russia annexed the Crimean peninsula and began the clandestine invasion of Eastern Ukraine. It is also no stranger to cyber attacks, having been a regular target and testing bed for both Russian cyber and information warfare for years.

In a world beset by pervasive cyber insecurity along with an active shooting war in Ukraine, it may seem odd to discuss the prospects for cyber peace. From ransomware impacting communities around the world, to state-sponsored attacks on electrical infrastructure, to disinformation campaigns spreading virally on social media, we seem to have relatively little bandwidth left over for asking the big questions, including: what is the best we can hope for in terms of "peace" on the Internet, and how might we get there? Yet the stakes couldn't be higher, for Ukraine, but also the international community. McKinsey, for example, has argued that by 2022 "\$9 trillion to \$21 trillion of economic-value creation, worldwide, [will] depend on the robustness of the cybersecurity environment."

Thus, although cyberspace today appears to be anything but peaceful, there has been progress in the global drive for peace and security in cyberspace. For example, more than seventy-seven nations and over 600 companies have signed the Paris Call for Trust and Security in Cyberspace. This process is not unlike the multistakeholder

journey that culminated in the 2015 Paris Climate Accord. And progress has not stalled. In March 2021, for example, some 150 countries agreed, for the first time, on a draft set of cyber norms to guide state behavior in cyberspace. These norms were agreed to by Russia, China, the United States, and the European Union, and include protection for civilian critical infrastructure.

Digital conflict and military action are increasingly intertwined, and civilian targets – private businesses and everyday Internet users alike – are vulnerable, as we unfortunately see in Ukraine today. As the Global Commission on Stability in Cyberspace makes clear, "conflict between states will take new forms, and cyber-activities are likely to play a leading role in this newly volatile environment, thereby increasing the risk of undermining the peaceful use of cyberspace to facilitate the economic growth and the expansion of individual freedoms." So, is the peaceful use of cyberspace possible? "Cyber peace" is difficult to define; as difficult, if not more so than its offline comparator. The term "cyber peace" seems to have originated during a program "at the Vatican's Pontifical Academy of Sciences in December 2008," though it was being used before that date, indeed as early as 2005 as is explored by Professor Renée Marlin-Bennett in our new edited volume published by Cambridge University Press in 2022, *Cyber Peace: Charting a Path Toward a Sustainable, Stable, and Secure Cyberspace*.



“Cyber peace,” sometimes also called “digital peace,” is a term that is increasingly used, but still little understood. It is clearly more than

the “absence of violence” online, which was the starting point for how Professor Johan Galtung described the new field of peace studies he helped to found in 1969. Similarly, Galtung argued that agreeing on universal definitions for “peace” or “violence” was unrealistic; instead, the goal should be landing on a “subjectivistic” definition agreed to by the majority. In so doing, he recognized that as society and technology changes, so too should our conceptions of peace and violence (an observation that’s arguably equally applicable both online and offline). That is why he defined violence as “the cause of the difference between the potential and the actual, between what could have been and what is.”

Extrapolating from this logic, as technology advances, be it biometrics or blockchain, the opportunity cost of not acting to ameliorate suffering grows, as do the capabilities of attackers to cause harm. This highlights the fact that cyber peace is not a finish line, but rather is an ongoing process of due diligence and risk management. In this way, we define a positive cyber peace as a polycentric system that: (1) respects human rights and freedoms, (2) spreads Internet access along with cybersecurity best practices, (3) strengthens governance mechanisms by fostering multi-stakeholder collaboration, and (4) promotes stability and relatedly sustainable development. These four pillars of cyber peace may be constructed by clarifying the rules of the road for companies and countries alike to help reduce the threats of cyber war, terrorism, crime, and espionage to levels comparable to other business and national security risks. This could encourage the movement along a cyber peace spectrum toward a more resilient, stable, and sustainable Internet ecosystem with systems in place to “deter hostile or malicious activity” and in so doing promote both human and national security online and offline.

As we see in Ukraine a key issue remains regarding enforcement of norms such as through graduated sanctions, which are an important aspect of the Ostrom Design Principles for institutional analysis. The international community could focus some of the penalties being imposed on Russia in punishment for its indiscriminate cyber operations to help strengthen the eleven cyber norms and incentivize responsible state behavior in cyberspace. There could also be an effort to create a

series of Cyber Peace Goals, reminiscent of the Sustainable Development Goals, and even a Cyber Peace Index to help further operationalize core standards including defining “reasonable” cybersecurity. In short, Russia’s invasion of Ukraine sets back the movement for cyber peace, but also provides the international community with an opportunity to enforce these new rules of the road and in so doing help build a path toward a durable, lasting cyber peace.



Cyber Peace

Charting a Path Toward a Sustainable,
Stable, and Secure Cyberspace

Edited by Scott J. Shackelford,
Frederick Douzet and
Christopher Ankersen

Scott Shackelford 'Cyber-Peace' Book Cover

Amazon Web Services, Cloud Computing and Corporate Control

Alina Utrata is a PhD Candidate in Politics and International Studies at Darwin College and a Gates-Cambridge scholar. Her research examines how technology is impacting historic forms of state and corporate power. She received her MA in Conflict Transformation and Social Justice from Queen's University Belfast as a 2017 Marshall scholar, where she researched how technology impacted policing and the nature of state control in Northern Ireland.



Technological developments often lead to new types of control and power. However, it is worth asking *who*, exactly, this new technology empowers. Much

of the machine learning technologies have been deployed by corporations, and therefore individuals' relationship to this technology has been mediated by how these corporations chose to use it. In this article, I explore some of the ways in which cloud computing technology may be giving corporations increased power over individuals' property in the "cloud."

Corporations and their states

Corporations have been peculiarly under-theorized in much of the contemporary literature on political thought, international relations and history. Even when scholars do take corporations into account, however, most do not generally treat corporations as competitors to the state or an alternative type of political entity that may genuinely threaten states' power. Nevertheless, the history of corporations shows that they have always been political, and they are not always subservient to states.

Many prominent critiques of technology corporations have used American Gilded Age (1870-1900) monopoly corporations, such as Standard Oil, as a reference point, in part due to the current popularity of using an anti-monopoly approach to regulate Big Tech in the US and Europe. But while

these monopoly corporations may have been powerful at that time, they were puny in comparison when compared to corporations in larger historical context.

Company-states like the British or Dutch East India Companies, for example, waged wars or negotiated peace with other companies or sovereigns, even when explicitly against the interests and orders of their home state. In colonial America, other corporations effectively turned *into* states (or, at least, colonies that became states). And while the British East India Company was ultimately enveloped into the British state, ushering in the British Empire, the American colonies wrested themselves from British control and establish their own state. As Harold Laski noted, "corporations have a curious habit of attempting perpetually to escape from the rigid bonds in which they have been encased . . . like some Frankenstein, they show ingratitude to their creators."

Still today, however, the paucity of theory around the concept of the corporation has left us struggling to make sense of the enormous powers that corporations, especially technology corporations, wield and that states or other political entities may ultimately be unable to control.

Corporations in the Cloud

One area in which contemporary technology corporations are increasingly exerting new forms of power is "in the cloud." Cloud computing corporations effectively control individuals' property, and states have done very little to protect or regulate it.



Cloud computing is - essentially - using other people's computers. For example, an individual may use a service like Dropbox, Google Documents or Apple iCloud to host a digital file. The user thus owns the digital file, but it is stored or hosted on the physical servers of the cloud company and uses the internet to access their digital property. Industrial cloud computing companies like Amazon Web Services (AWS) or Alibaba's Aliyun allow entire corporations or organizations to store massive amounts of digital property in external data centres, which includes both discrete files (such as a word document) and the software and platforms necessary to host more extensive digital infrastructure (such as an email service).

One implication of this control is that cloud computing corporations could prevent you from accessing your property that is stored on their servers. For example, an individual who had been suspended from Facebook after his account had been misidentified as a bot told the New York Times that the inability to access his property in the Facebook cloud was devastating; all of his photos of his brother,



Google Data Centre. Photo Credit: Wikimedia

who had recently died, had been stored on Facebook. Similarly, when AWS suspended the alternative media site Parler from its services after it failed to regulate content on its platform in the wake of the January 6 attack on Capitol Hill, it effectively caused the entire site to “go dark.”

Individuals who use a cloud custodian to store their personal files may find it easy to export and transfer their property to alternate cloud custodians, such as Dropbox and Apple iCloud. However, larger institutions, such as businesses or governments, who use industrial cloud computing providers such as AWS or Microsoft Azure, may find that the cloud custodian’s infrastructure has become thoroughly integrated with their own digital property, resulting in “lock-in.” For example, if a company like Netflix contracts with AWS, they may use both AWS data

centres as well as an AWS platform, such as an operating system. Netflix may then use this operating system to build their own communications software, as an internal email service. Subsequently, Netflix may find it impossible to transfer their digital property to an alternative cloud custodian because what constitutes “their” property (the emails) has become enmeshed in the cloud custodians’ infrastructure (the operating system needed to run the email software). It may be impossible - or, at least, very difficult - for a cloud custodian to “give back” or release the digital property to its owners if requested because the property itself requires the infrastructure of the cloud to exist or be accessible.

Furthermore, while the cloud often hosts critical infrastructure and property of states’ citizens or corporations, it also hosts the infrastructure of the state itself.

Governments around the world have either fully or partially migrated operations to the cloud. While it is difficult to determine precise numbers, it is clear that Amazon’s AWS dominates government cloud computing, claiming to host over 6,500 government agencies including the CIA, NSA, NASA, FDA, CDC, and SEC. A recent cloud computing contract between UK spy agencies and AWS has raised concerns around “the potential risks of outsourcing critical elements of UK national security infrastructure to non-UK-based companies.” If companies like Target and Netflix are worried about using AWS, should state governments like the UK and US be worried about their dependency on cloud computing providers? If a cloud computing corporation hosts the property and digital infrastructure of a state’s agencies in the cloud, then they may certainly be “too big to fail.”

Sustainability and Biodiversity

Darwin College is putting environmental issues at the heart of its strategic and operational decisions and is proud to have received a Platinum University of Cambridge Green Impact Award. Here Darwin student and DCSA Green Officer Megan Groom, who has recently been awarded the University of Cambridge Green Impact Student Leadership Award, explains on-going exciting sustainability projects involving the whole Darwin Community.

Darwin College Green Week started in 2021, with the aim of engaging all members of college in sustainability. This year's Green Week took place from the 25th April; events included a student led workshop on identifying 'greenwashing' (where organisations invest in marketing or promotion to appear sustainable or ethical, rather than investing in actually being these things), gardening, a charity Boat Club Ergathon, kayak trips to Paradise Nature Reserve, an evening of Vegan fine dining with Darwin Kitchens and two themed formals (for DarWild and Project Second Life). The previous year included a talk series, Reforest Tea stand, launching of our RE.USE reusable takeaway boxes and sustainable beers at Darbar. As well as this annual week which concentrates the college's focus on green issues, we have initiatives running throughout the year. I would like to spotlight two of them here:

Darwild Project

In the Spring of this year, enthusiastic Darwin students from the Conservation Leadership MPhil initiated a plan: we wanted to use our experiences to monitor wildlife the College's gardens with motion activated cameras.

The *DarWild Project* was born! Perhaps we would capture a fox? Or some candid photos of our resident heron?



A fox and an otter caught on camera

Even within the first few camera checks, we had the excitement of a hedgehog enjoying the student vegetable garden! Hedgehogs are now on the UK Red List and it was wonderful to see it thriving. With some expert positioning of cameras, we were delighted and surprised to record an otter! As the terribly kept 'secret news' spread around college, we have used our project to raise awareness for conservation efforts supporting local wildlife.

We organised a well-attended charity hedgehog formal for Green Week, complete with hedgehog pinecones and hedgehog cheeseboards. For World Otter Day on the 25th May, we raised awareness of our sighting with a 'name the otter' competition on social media – the prize being a RSPB Otter soft-toy. The name voted by the Darwin community is Pebbles! An appropriately cute and scientific name as otters are known to hold and roll pebbles. Alongside our wildlife cameras we hope to monitor and support bats and birds too, supported by some of the money raised by the *Darwin College Giving Day 'Green Darwin' fund*. Swifts, wagtails, starlings, tawny owls and kingfishers have been identified as bird species that we could support.

Project Second Life

Though the garden is a significant attribute to the Darwin experience, our commitment to sustainability stretches beyond our biodiversity projects. Last year, two ambitious students launched *Project Second Life* at our college. The key idea is to bridge the gap between students moving out and arriving, to allow more previously used items to be rehomed and reused and redirected from landfill. This is achieved with designated collection days, where donations are received and stored over the summer, followed by trash-to-treasure sales during the Welcome Week in October, where students can 'pay what they feel' and take home household items. Project Second Life was explained in more detail in our Giving Day article. The support from the Darwin community was fantastic, and the enthusiasm of donors and receivers was infectious. This is another project that will benefit from the kind support of the *'Green Darwin' fund*. We aim to cement the collection days and trash-to-



Clockwise from top-left: Catering Manager Ivan Higney demonstrating vegan cookery; Students collecting Second Life items; Ivan Higney and Megan Groom celebrating the Platinum Impact Award; Students working on their allotment

treasure sales into the Darwin calendar and share our project blueprint with other colleges. By sharing the blueprint, other colleges can read about lessons learnt and Darwin's solutions to common problems like storage.

Both projects are student led, visible and fun, sending a strong message about Darwin's culture.

Sustainable Impact

Understanding the impact of these projects, and capturing the efforts of staff, students and Fellows is not only important to give due recognition but also for governance. This year, the first *Darwin Departmental Sustainable Impact Report* was collated to do just this with nine College departments contributing reflections on how Darwin can run on a more sustainable basis. The report covered a breadth of actions, from best practices in offices, to supporting PhD research, and to

strategic net zero planning. This cross-college engagement is also reflected in our College Green Impact Award success and our annual Green Week. The Green Impact Awards are run each year by the University's Sustainability Team, with a workbook where evidence can be submitted to score points, and this year Darwin College achieved Platinum, the highest award possible. In previous years, the college has also received special commendations: Catering Manager Ivan Higney for his commitment to sustainability and for the Darwin Community Fridge, for reducing food waste and tackling food poverty.

I hope that this brief introduction to the student and staff-led initiatives happening at Darwin, supported by donors and alumni, convinces you of the on-going commitment of the Darwin community to sustainability.

If you have any ideas of how the Darwin community can further its efforts towards sustainability, please email alumni@darwin.cam.ac.uk and we will forward your feedback.

Looking Forward to the Darwin College Diamond Anniversary Year

In 2024 we will celebrate 60 years of Darwin College. It is a time when we as a College can look back with pride at our beginnings, and how we have managed to evolve and grow without losing those quintessentially "Darwin" values - of informality, of interdisciplinarity, and of distinction in research.

It is also a time to look forward to the future, where our ambitions will require additional resources. As Development Director, I will be leading efforts to increase the amount of philanthropic support to Darwin.

During the course of 2024, we will be holding special events around the world, in College, and online. A particular aim is to connect with as many alumni and other members of the Darwin Community from the 1960s as possible.

As ever, the College is most grateful to all its supporters and well-wishers. To all those who have donated, **thank you:** your support is invaluable and makes a real difference to the life of the college and its students.

Sam Venn, Development Director

We would like to collate an on-line memory book with reminiscences from our first students, so if you have memories of being a student at Darwin in the 1960s we would love to hear from you. Please email alumni@darwin.cam.ac.uk.

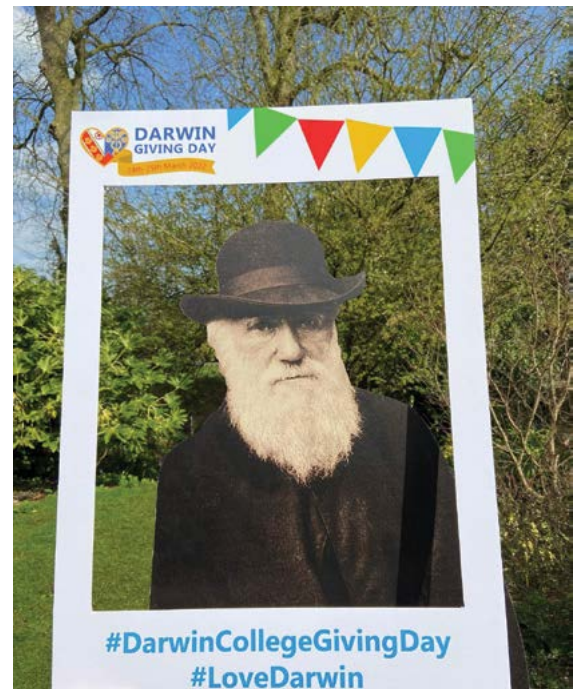
Darwin Telethon 2022

Between 7th and 19th September 2022, we are hoping that the Darwin community will be inspired to unite once again, and consider making a regular gift to the College in support of scholarships, or for much needed student hardship support.

A group of dedicated Darwin student callers will reach out to alumni, to share news from College today, find out what being at Darwin used to be like, and seek advice on life and opportunities after College.

The Darwin Telethon offers us a chance to connect Darwinians, past and present, and share the different ways that we support our students, and the success we have achieved to date thanks to the generosity of our alumni community.

We are committed to looking to the future, and ensuring that the most talented students can study here regardless of their financial circumstances. With the support and generosity of the wonderful Darwin community, we hope to make this the most successful College Telethon yet. Look out for further information over the summer.



Giving Day Thanks

On the 24th and 25th March 2022, Darwin College held its first ever Giving Day, bringing together Darwinians from all over the globe to raise £50k in just 36 hours.

Taking place on-line and in person, the Giving Day created an exciting opportunity for us to forge renewed relationships with alumni, and engage with Darwinians in a whole new and more informal way. We were absolutely thrilled by how many members of the Darwin community – alumni, staff, students and Fellows, joined in with the spirit of the day and gave their support.

The money raised through the Giving Day went towards our fundraising targets for Student Support, Darwin's environmental and sustainability projects (Green Darwin), and Student Wellbeing. We couldn't have achieved this without your enduring support, for which we are incredibly grateful.

Giving Day 2023 will be bigger and better, and we look forward to sharing more details with you in the next issue of The Darwinian.

Darwin Community Appointments and Awards Darwin College Appointments:



Professor Elizabeth Robertson MA PhD ScD FRS FMedSci has been appointed an **Honorary Fellow of Darwin College**, and has also been conferred an honorary Doctor of Science degree from the University of

Cambridge. Elizabeth is a developmental biologist who uses mouse genetics to study the cell interactions that underpin development and immune recognition. Her early work helped to demonstrate that genetically altered embryonic stem cells in mice could be passed down to successive generations, allowing for the creation of mutant mice strains for research purposes. She also studies the role that the TGF- β signalling pathway plays in mouse embryo development and cell fate determination. One particular success in this area involved her discovery of Nodal, a protein that plays an important part in setting out the early body plan in vertebrate embryos.

Ms Jacqueline Cox has been appointed as **Darwin College Archivist**. She is Keeper of the University Archives.

Above: The Master, Mike Rands and Honorary Fellow, Elizabeth Robertson in the College gardens.

Appointments and Awards throughout our Community:

Professor Paul Lehner FMedSci FRS, Darwin Fellow has been elected as a **Fellow of the Royal Society**. Paul is Professor of Immunology and Medicine at the Cambridge Institute for Medical Research. He studies virus-host antagonism and how our genome is defended from invasion by RNA-derived retroelements such as HIV.

Professor Angelos Michaelides FRS, Darwin Fellow has been elected as a **Fellow of the Royal Society**. Angelos is the 1968 Professor of Chemistry, Yusuf Hamied Department of Chemistry. His work involves the development and application of theoretical methods to better understand contemporary problems in chemistry, physics, and materials science

Professor Emily Shuckburgh OBE, Darwin Fellow and Director of Cambridge Zero, has received an honorary Doctor of Science degree from Keele University.

Miss Megan Groom, Darwin College student (PhD in Physics, mat: 2020) has won the **Cambridge University Green Challenge Sustainability Special award for Student Leadership**. The Green Impact Special awards recognises individuals and teams who have gone the extra mile in their Green Impact journey. The projects and initiatives nominated for these awards have made a difference above and beyond the requirements of the standard Green Impact actions.



Help for Ukranian Academic and Family

Among the millions of displaced Ukranian citizens as a result of the Russian invasion are many university academics. Following an application by the University to The Council for At-Risk Academics (CARA) Researchers at Risk Fellowship Scheme two Ukranian scholars and their dependents will be funded and housed in Cambridge for up to two years.

Under this scheme, we are delighted that Darwin College has been able offer accommodation to an academic from Ukraine in a house that was bequeathed to the college by César and Celia Milstein, themselves both political refugees from the upheaval in Argentina during the mid 1960's.

CARA is a NGO founded in 1933 by Britain's foremost academics and scientists, in response to Hitler's decision to expel hundreds of leading scholars from German universities on racial grounds. Their founders defined their goal as 'the relief of suffering and the defence of learning and science'. To find out more about CARA, visit their website on www.cara.ngo.

Emeritus Fellow, Dr Abe Yoffe (1919–2022)

Darwin College Founding Fellow Abraham Yoffe died aged 102 earlier this year. He was an explosives expert, a research physicist at Cambridge University's Cavendish laboratory, and latterly an Emeritus Fellow of Darwin.

Abe was born in Jerusalem to Haim Yoffe, a rabbi, and his wife, Leah (nee Kreindal). He lived in Australia as a child, attending Melbourne high school. He studied chemistry at the University of Melbourne, graduating in 1941, and stayed for a masters.

In 1942, Abe joined the Australian Council for Scientific and Industrial Research to investigate the causes of unpredicted explosions, which could completely destroy explosives factories. Within a remarkably short period, Abe and his colleagues showed that, if tiny bubbles were present in liquid nitroglycerine, its sensitivity to mechanical impact increased, leading to greater risk of explosion.

In 1944, he moved to Cambridge, where he completed his PhD in 1948. Following three years as a senior scientist in physical chemistry at the Weizmann Institute in Israel, Abe returned to Cambridge, and in 1958 was appointed Assistant Director of Research of the Physics and Chemistry of Solids Group (PCS), part of the Cavendish laboratory. In 1961 he became a Doctor of Science and in 1968 he was appointed to a Readership in physics.

In 1964, when Darwin College was founded, Abe became one of the first 12 Fellows, and he remained a Fellow for 58 years, contributing to the welfare of the college by attracting many talented postgraduates, Research Fellows and scientists of international reputation.

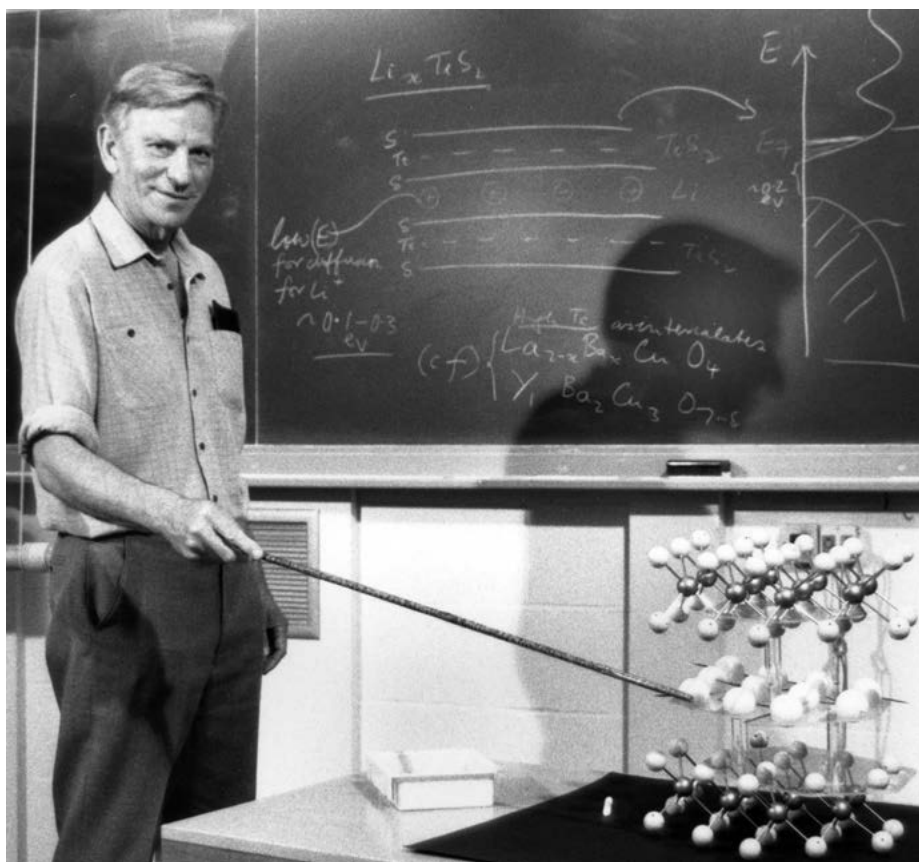


Abe was appointed head of PCS in 1981 until his retirement in 1987. He then became a member of the optoelectronics group, researching the physics of quantum confined materials.

After retiring he enjoyed skiing and tennis. He loved football and spent many happy days watching Cambridge City, Cambridge United and occasionally Tottenham Hotspur. He also loved cycling around Cambridge and over the fens to Ely.

Abe married Elizabeth Mann in 1949. She died in 2014. He is survived by their children Deborah, Gideon and Susan, his 13 grandchildren and 11 great-grandchildren. Another son, Jonathon (Jay), died in 1988.

This is an edited version of an obituary which was first published in The Guardian on 21st April 2022



Abe giving a lecture at the Department of Physics in Cambridge

Professor Sir Arnold Burgen, Third Master of Darwin College

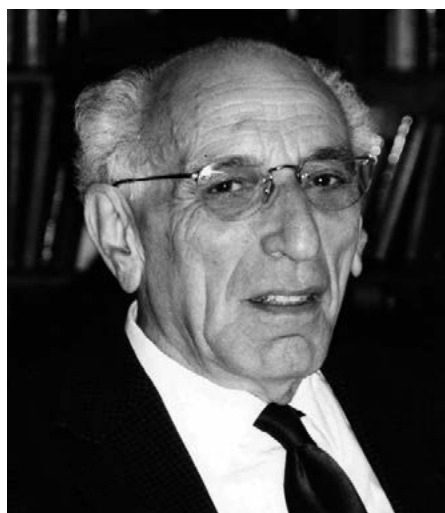
(1922–2022)

Sir Arnold Burgen, the third Master of Darwin College, sadly passed away on 28th May 2022 at the age of 100. His funeral was held eleven days later, beautifully led by Professor Fiona Karet, a Vice-Master of Darwin, in the presence of family, friends and College representatives, including three Masters who followed in Sir Arnold footsteps, Sir Geoffrey Lloyd, Professor Mary Fowler and Dr Mike Rands.

Sir Arnold was an eminent pharmacologist and physician who served as Master of Darwin College from 1982 to 1989 and as Deputy Vice-Chancellor of Cambridge University from 1985 to 1989. He was elected an Honorary Fellow of Darwin in 1989.

Arnold was born in Clapton, East London and grew up in Finchley. He attended Middlesex Hospital Medical School during World War II to study Pharmacology and stayed on to work as an Assistant Lecturer afterwards. He later moved to Canada to work as Professor of Physiology at McGill University, during which time he also worked as Deputy Director of the University Clinic at Montreal General Hospital. He was subsequently awarded Honorary Degrees from McGill, Zurich, Liverpool, Surrey, Utrecht, and Leeds Universities.

He was elected as a Fellow of the Royal Society in 1964 and later served as its Foreign Secretary. He became a Fellow of the Royal College of Physicians in 1969, was knighted in the 1976 New Year Honours and was elected a Foreign Associate of the National Academy of Sciences of the United States in 1987. He was the founding President of Academia Europaea. As Director of the National Institute for Medical Research (NIMR) Arnold conducted groundbreaking research on the molecular interactions with drugs that are involved in the nervous control of biological systems. He pioneered the use of molecular kinetics and Nuclear Magnetic Resonance (NMR) in pharmacology, used to study receptor activity.



Although trained as a medically qualified pharmacologist, Arnold Burgen's contributions to science were much wider than this. His broad interests led the Medical Research Council to appoint him as Director of the prestigious National Institute for Medical Research based in Mill Hill, London. As a subsequent member of the MRC Council, he ultimately became Chairman of the MRC's Tropical Medicine Research Board which again demonstrated his polymath skills in encouraging and assessing a range of health research topics of particular importance for developing countries.

Although at times he could seem a hard task manager, throughout his career he has always been regarded as 'firm but fair'. With such skills it was perhaps inevitable he would be appointed to senior positions at the Royal Society and the Academia Europaea and eventually as Master of Darwin College.

Emeritus Fellow, Roger Whitehead was instrumental in Arnold Burgen's appointment process:

Towards the end of Moses Finley's (Master, 1976-1982) term of office, I heard that Sir Arnold Burgen, Director of the National Institute for Medical Research and current Foreign Secretary and Vice-President of the Royal Society, was about to leave his Medical Research Council post and return to Cambridge. I was asked to explore if he might have any interest in Darwin College. My opportunity occurred when Arnold inspected

our nutritional research programme in the isolated rural village of Keneba in The Gambia. During a relatively informal evening gathering, Arnold was understandably keen to quiz me about the tropical research programme, but I kept on steering the conversation back to Darwin and to the fact we were beginning the search process for a new Master. He must have realised there had to be method in my madness for he suddenly said that of all the colleges in Cambridge being part of Darwin would suit him the most. I reported back to the Chair of the Search Committee and the rest is history.

For a man with his background an appointment as Master of Darwin College it was understandable. He would be increasingly attracted to a concept being discussed with Andy Fabian for a multi-disciplinary series of public lectures based on an important topic. These deliberations became the acclaimed Darwin Lecture series that were to play such an important part in ensuring a relatively young college like Darwin was to become well-known and respected not only within the University but in the City of Cambridge as a whole.

Joyce Graham served as Arnold's Secretary during his time as Master and remembers: *When Sir Arnold Burgen arrived, he was Foreign Secretary of the Royal Society and during that time we had a succession of British Ambassadors and Consuls visiting for scientific briefings prior to taking up their foreign postings. Arnold, together with Andy Fabian, instituted the DCLS, bringing into the college specialists in so many fields and attracting both local sixth form students, who did projects around the series, and senior members of the university.*

On retiring as Master in 1989 Arnold was made an Honorary Fellow of the College. He had a passion for and great knowledge of Classical Music.

Sir Arnold is survived by his wife Olga Kennard OBE FRS, also an Honorary Fellow of Darwin. Olga is a scientist who specialises in crystallography and is and founder of the Cambridge Crystallographic Data Centre.

Rugby Blues for Darwinians Hilde Schneemann and Sonia Ubong

Darwin students Hilde Schneemann (mat: 2019) and Sonia Ubong (mat: 2021) both won a blue for being on the winning side in the Cambridge Women Rugby Varsity Match against Oxford University in April. Hilde relates her experiences here.

It is an immense privilege as a rugby player to get the opportunity to play at Twickenham... twice! My first varsity at Twickenham was marked by a last-minute victory thanks to Scottish international Coreen Grant scoring the winning try about 3 minutes before the final whistle. Then well, we all know what 2020 was like... and in 2021 measures were just relaxed enough that we could train up in a mere 12 weeks to play the varsity match at Leicester rugby stadium, which was again victorious.

My expectations then going into this year's varsity were high, boosted by our skilful, fast and strong team which also included fellow Darwinian Sonia Ubong.

On the day, we got cheered off by the men as we got into the bus. As we got closer to Twickenham, the stadium appeared in the distance. Surreal.

Then, everything moved fast: changing, warming-up, final briefing from the coaches, I looked around the circle as we embraced each other in the Twickenham changing room, all nervous, all excited, all ready to go. And then, it kicked off.

It all started well, we played in their half and had lots of possession. Inching closer and closer to their try line, but not quite making it across. One commentator remarked we might as well apply for council tax in the Oxford 22... But eventually it happened, as Hetta Friend put it over the line to bring in our first 5 points. A great start, but now came the

challenge to remain vigilant and not give any easy opportunities away. We dominated in the forwards, particularly with our scrum, but the Oxford backs were particularly dangerous making a few too many line-breaks that could have been tries if it weren't for some narrowly forward passes earlier on. Just before the end of the first half, Oxford managed to break through our defence and secure a tie.

The second half saw another try from Oxford early on. Now things were starting to get really tense. Fortunately, we had some incredibly strong players still on the bench that were ready to pump some fresh energy into the game. About 15 minutes into the second half, I got substituted for tackling queen Cara Prowling. Now it really came down to trust.... it was nerve-wracking having to watch the rest of the second half from the side line.

In the meantime, time was running out and Oxford were still ahead on the scoreboard. We again had most of the possession, but it just wasn't paying off until fellow Darwinian Sonia Ubong, determined to stay on her feet, managed to break through the line, undeterred by several Oxford defenders hanging from her limbs, until just meters before the try line. This time, we didn't let the opportunity slip away and our highly experienced Mexican prop Vianney Gomezgil Yazpik made the equalizing try: 10-10.

This was just the boost we needed and in the final minutes we were again looking dangerous. When the referee's whistle blew, it felt the game had not really finished, and that this could not be the end. Somehow, none of us had considered that we could end in a tie. In fact, this was the first tie in the history of the women's varsity match.

Thanks to our victory in the previous year, we retained the trophy, but of course it wasn't quite the same. After greeting our friends and family, including lots of Darwin supporters (Thank you!!!), we had dinner together with the Oxford women. Their captain, Jessica Abele, was the perfect person to speak some words before we parted ways. She actually started her rugby career in Cambridge, joining CURUFC at the same time as me, indeed we played together, before she moved to Oxford for her PhD. She thanked the coaches from both sides, the Cambridge coaches teaching and making her fall in love with the game and the Oxford ones who prepared their team for this confrontation.

As each side went their separate way, we ventured into London nightlife, and with our light blue rugby family we danced the night away.

#GDBO

Opposite, clockwise from top-left: *The Women's Rugby Team arriving at Twickenham; Sonia Ubong in training; Cambridge Women Lining up. Photo Credit: Chris Fell; Celebrations for the victorious side; Hilde Schneemann in the Line-Up*



Blondie Win at the Oxford Cambridge Boat Race

Darwin Student Nicole Molina (MPhil in Economics) helped secure the Cambridge women's reserve team a win in Blondie Boat at the 2022 Oxford Cambridge Boat Race. Here she explains the pain and elation that made it such a life-changing experience.

My year at Cambridge began to feel real at Darwin's Welcome Dinner, where a speaker sagely advised that we enrich our academic endeavors with activities that we could look back on, so as not to have tired, stressed, late nights in the library as our sole memories of our time at Cambridge.

My experience with CUBC (Cambridge University Boat Club) as a member of the Blondie crew will forever be something that I remember fondly, despite the tired

mornings on my bike to catch the 5:57 train to Ely, the wet, cold hikes back from the station to my morning classes, the late-night social events missed, and the physical demands on my body.

Several times I questioned my ability to balance everything--school, sleep, rowing, and mental sanity--but not once was I able to seriously consider not being a part of it all. And thank goodness I saw it through. *Being the first person to cross the finish line in the 2022 Women's Reserve Boat Race is something I cannot explain, a thrill and sense of fulfillment like no other.* I am so incredibly thankful for my coaching, my squad mates, and most importantly my crew, for such a life-changing experience.



Right: Blondie coxswain Dylan Whitaker is lifted in celebration at the finish line. Photo Credit: Nordin Ćatić



Nicole Molina (centre with cup) and the entire CUBC women's squad celebrates Boat Race victories with head coach Patrick Ryan and assistant coach Autumn Mantell. Photo Credit: Nordin Ćatić

VISITOR

The Right Honourable Lord BURNETT of MALDON (Ian Duncan), Lord Chief Justice of England and Wales

MASTER

Michael Russell Wheldon RANDS BSc DPHIL; (2020)

VICE-MASTERS

Fiona Eve KARET PhD FMedSci; (2014); Professor of Nephrology, Cambridge Institute for Medical Research

Sara BAKER PhD; (2012); Professor of Psychology and Education, Faculty of Education

DEAN

Duncan James NEEDHAM PhD; (2013); Associate Lecturer, Faculty of History

DEPUTY DEANS

Matthew Russell JONES PhD; (1992); Professor of Information Systems, Judge Business School

Simone Nicole WEYAND PhD; (2016); Group Leader, Department of Biochemistry

BURSAR

John Tannatt DIX LLB MA; (2014)

COLLEGE SECRETARY

Julian Graham EVANS MA; (2014)

COLLEGE PRAELECTOR

Christine VAN RUYMBEKE PhD; (2015); Ali Reza and Mohamed Soudavar Professor in Asian and Middle Eastern Studies

DEVELOPMENT DIRECTOR

Samuel Oliver VENN BA MA; (2017)

OFFICIAL FELLOWS

Simon John SCHAFER MA PhD; (1984); Professor of History of Science, Department of History and Philosophy of Science

Andrew Mawdesley PITTS PhD; (1990); Professor of Theoretical Computer Science, Department of Computer Science and Technology

Carol Elspeth Goodeve BRAYNE CBE MSc MD FRCP FFPH; (1995); Professor of Public Health Medicine, Cambridge Institute of Public Health

Anne Carla FERGUSON-SMITH PhD FRS FMedSci; (1997); Arthur Balfour Professor of Genetics, Department of Genetics

Christopher Michael BISHOP PhD FRS FRSE; (1998); Director, Microsoft Research Cambridge

Torsten KRUDE PhD; (2000); Associate Professor, Department of Zoology

Alan Frank BLACKWELL PhD; (2001); Professor of Interdisciplinary Design, Department of Computer Science and Technology

John Harold NILSSON-WRIGHT PhD; (2001); Associate Professor, Faculty of Asian and Middle Eastern Studies

Emily Fleur SHUCKBURGH OBE PhD; (2001); Director, Cambridge Zero

Mark Edmondus Jan DE ROND DPhil; (2006); Professor of Organisational Ethnography, Judge Business School

Dénes SZÜCS MA PhD; (2007); Reader in Cognitive Neuroscience and Psychology, Department of Psychology

Carl Edward RASMUSSEN PhD; (2008); Professor of Machine Learning, Department of Engineering

Russell COWBURN PhD ScD FRS; (2011); Director of Research, Cavendish Laboratory

Thomas Jeffrey MILEY PhD; (2011); Lecturer in Political Sociology, Department of Sociology

Chris Guy SANDBROOK PhD; (2011); Senior Lecturer in Conservation Leadership, Department of Geography

Jonathan Luke HEENEY PhD ScD; (2012); Professor of Viral Zoonotics, Department of Veterinary Medicine

Jan Dietrich Karsen LÖWE PhD FRS; (2012); Director of MRC Laboratory of Molecular Biology

Paul Stuart ANDERSON PhD; (2013); Associate Professor in Middle Eastern Studies, Faculty of Asian and Middle Eastern Studies

Jane Elisabeth FRANCIS DCMG PhD; (2013); Director, British Antarctic Survey

Paul Joseph LEHNER PhD FRCP FMedSci FRS; (2013); Professor of Immunology and Medicine, Cambridge Institute for Medical Research

Eric WOLFF PhD FRS; (2013); Royal Society Research Professor, Department of Earth Sciences

Julia M DAVIES MA PhD; (2016); Professor of Stress Signalling; Head of Transport Group, Department of Plant Sciences

Timothy Nicholas MILNER MA; (2016); Ceremonial Officer, University of Cambridge

Aylwyn Olav SCALLY PhD; (2016); Associate Professor, Department of Genetics

Angela Mary WOOD MA PhD; (2016); University Lecturer in Biostatistics, Department of Public Health and Primary Care

Maha ABDELRAHMAN PhD; (2017); Professor of Development Studies and Middle East Politics, Faculty of Asian and Middle Eastern Studies

Alexandra BRINTRUP PhD; (2017); Associate Professor in Digital Manufacturing, Institute of Manufacturing

Paolo CAMPANA PhD; (2017); Associate Professor in Criminology and Complex Networks, Institute of Criminology

Daniel Haskell WEISS PhD; (2017); Polonsky-Coexist Senior Lecturer in Jewish Studies, Faculty of Divinity

James Benedict ROWE PhD; (2018); Patrick Sissons Fellow, Director of Cambridge Centre for Frontotemporal Dementia and Related Disorders, Department of Clinical Neurosciences

Jennifer Mary SCHOOLING OBE PhD FICE; (2018); Director of the Centre for Smart Infrastructure, Department of Engineering

Thorsten Edwin BOROVIAK PhD; (2019); Principal Investigator, Laboratory for Primate Embryogenesis, Department of Physiology, Development and Neuroscience

Ioannis KONTOYIANNIS PhD; (2020); Professor, Chair of Information & Communications, Department of Engineering

Angelos MICHAELIDES PhD FRS; (2021); 1968 Professor of Chemistry, Department of Chemistry

Lin PENG PhD; (2021); Visiting Professor, Director of Research, Faculty of Economics

Jacqueline COX MA; (2022); Keeper of the University Archives, University Library

Annouchka Cassandra BAYLEY PhD; (2022); Chair of the Arts and Creativities Research Group, Faculty of Education

VISITING FELLOWS

Heather Ruth WOLFE PhD; (2021); Munby Fellow, University Library

Darwin College Register 2022

RESEARCH FELLOWS

Miguel ANAYA PhD; (2018); Research Fellow in Optoelectronics, Leverhulme Early Career Fellow, Cavendish Laboratory

Hong GE PhD; (2018); Research Fellow in Machine learning, Senior Research Fellow, Department of Engineering

Alexandra Kerstin SCHNELL PhD; (2018); Research Fellow in Behavioural Ecology, Royal Society Newton International Fellow, Department of Psychology

Anna BELCHER PhD; (2019); Research Fellow in Ecological Biogeochemistry, Postdoctoral researcher, British Antarctic Survey

Katharine Elizabeth CRISWELL PhD; (2019); Research Fellow, Department of Zoology

Thomas Stefan GRUNER PhD; (2019); Research Fellow in Design, Synthesis and Physics of Quantum Materials, Research Associate, Cavendish Laboratory

Raphael Bezerra de Silva Raphael UCHÔA PhD; (2019); Adrian Research Fellow in History & Philosophy of Science, Research Fellow, Faculty of History

Jan BEHRENDTS PhD; (2020); Research Fellow in Physics, Postdoctoral Researcher, Cavendish Laboratory

Tatiana Claudine Danielle BUR PhD; (2020); Research Fellow, Faculty of Classics

Samuel James COBB PhD; (2020); Research Fellow in Chemistry, Leverhulme Research Fellow, Yusuf Hamied Department of Chemistry

Jasmin TAUBSENSCHMID-STOWERS PhD; (2020); Charles and Katherine Darwin Research Fellow in Life Sciences, Babraham Institute

Nathaniel ANDERSON PhD; (2021); Charles & Katharine Darwin Research Fellow in Cancer and genomics, Postdoctoral Fellow, Wellcome Sanger Institute

Rajesh Kumar BHAGAT PhD; (2021); Research Fellow; Leverhulme Early Career Fellow, Department of Applied Mathematics and Theoretical Physics

Adrien HALLOU PhD; (2021); Research Fellow in Cell biology and physics, Herchel Smith Research Fellow, Gurdon Institute

Arthur Samuel Dan HARRIS PhD; (2021); Lloyd-Dan David Research Fellow in Ancient science, Needham Institute

Chloe KATTAR PhD; (2021); Research Fellow in History, Research Fellow Faculty of History

Sophie Leanne MORRISON PhD; (2021); Research Fellow in Engineering, Researcher, Department of Engineering

Sandra PETRUS-REURER PhD; (2021); Research Fellow in Surgery, Postdoctoral Research Associate, Saeb-Parsy Laboratory

Tamsin Joy SAMUELS PhD; (2021); Research Fellow in Genetics, Herchel Smith Research Fellow, Department of Genetics

Finn Edward STIRLING PhD; (2021); Research Fellow in Biochemistry, Postdoctoral Researcher, Department of Biochemistry

Jess Emma THOMPSON PhD; (2021); Research Fellow in Archaeology, Research Associate, McDonald Institute for Archaeological Research

HONORARY FELLOWS

Geoffrey Ernest Richard LLOYD PhD FBA; (1985)

Jeffrey William EDINGTON PhD DSc; (1998)

Amartya Kumar SEN CH MA PhD (Hon) LITTD FBA FRSE; (1998)

Michael Charles SHEPPARD MA DPhil; (2000)

Charles Antony Richard HOARE DSc FRS; (2001)

Ekhard Karl Hermann SALJE PhD FRS; (2002)

Robert RAYNE; (2004)

Martin John REES OM PhD (Hon) ScD FRS; (2004)

Bernard Michael de Lerrison CAZENOVE; (2005)

Jean Olwen THOMAS DBE MA ScD FRS FMedSci; (2007)

Robert Hughes JONES PhD; (2008)

Simon Hastings BITTLESTON PhD; (2013)

Alan Roy FERSHT PhD FRS FMedSci; (2014)

Nicola Margaret PADFIELD MA DIPCRIM DES; (2014)

Gregory Paul WINTER CBE PhD FRS FMedSci; (2014)

Robin Wayne CARRELL PhD FRS FMedSci FRSNZ; (2015)

Olga KENNARD OBE (Hon) ScD FRS; (2016)

Janet ROSSANT CC PhD ScD FRS FRSC; (2017)

Elizabeth Helen BLACKBURN AC FRS FAA FRSN; (2018)

Simon Douglas KEYNES PhD FBA; (2018)

Eric Stark MASKIN PhD ScD; (2018)

Jane Valerie GOODALL DBE PhD (Hon) ScD; (2019)

Sally Claire DAVIES DBE FRS FMedSci; (2020)

Philippa Jane ROGERSON PhD; (2020)

Heather Jane HANCOCK LVO DL; (2021)

Amrita NARLIKAR PhD; (2021)

Euan NISBET PhD; (2020)

Elizabeth Jane ROBERTSON MA PhD ScD FRS FMedSci; (2022)

EMERITUS FELLOWS

Reginald Frederick William GOODWIN MA PhD MRCVS; (1966)

Bruce Anthony NEWTON ScD FRCPATH; (1968)

George Thomas GÖMÖRI MA BLITT; (1969)

Elisabeth Somerville LEEDHAM-GREEN MA PhD; (1973)

Roger George WHITEHEAD MA PhD CBE FIBIOL; (1973)

Peter Furneaux FRIEND MA PhD; (1974)

Nicholas JARDINE MA PhD; (1975)

Dean Ullathorne HAWKES MA PhD RIBA; (1976)

Richard HENDERSON CH PhD FRS; (1981)

Ronald Alfred LASKEY PhD CBE FRS; (1982)

Janine Delysia BOURRIAU MA FSA; (1983)

Nicholas James Bertram Alwyn BRANSON MA PhD; (1983)

Andrew Christopher FABIAN OBE MA PhD FRS; (1983)

Harshad Kumar Dharamshi Hansraj BHADESHIA PhD FREng FRS; (1985)

Leopold Eftimios Anagnostis HOWE MA PhD; (1986)

Adrian Thomas GROUNDSD DM FRCPsych; (1987)

Mohammad Munawar CHAUDHRI PhD; (1990)

Kathleen Michelle WHEELER PhD; (1990)

Karalyn Eve PATTERSON FRS FMedSci FBA; (1991)

Margaret M CONE PhD; (1992)

John Robert COOPER PhD; (1993)

Francois Andre PENZ PhD; (1995)

Richard Anthony COX ScD; (1999)

Peter John BRINDLE MA MPhil FCI FINSTD; (2001)

Peta Margaret STEVENS MA; (2001)

Felicia Adina HUPPERT PhD; (2002)

Ian MCCONNELL MA PhD MRCVS FRCPATH FRSE; (2003)

Christopher CULLEN MA PhD; (2005)

Michael Edwin AKAM DPhil FRS; (2006)
Philip Alexander DAWID MA ScD FRS; (2007)
Lawrence William SHERMAN PhD; (2009)
Martin Kenneth JONES PhD; (2011)
Christine Mary Rutherford FOWLER MA PhD FRAS FGS FRCGS; (2012)

BYE-FELLOWS

David Alan FRIEDMAN PhD; (2017)
Catherine Morag Elisabeth HOWIE; (2018)
Arokia NATHAN PhD; (2018)
Alec BUCHANAN PhD MD; (2021)

DISTINGUISHED ASSOCIATES

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Mr Edward Graham Mellish CHAPLIN, CMG OBE
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Professor Sheila Tayback LEATHERMAN, CBE
Dr William Hall JANEWAY PhD
Dr Weslie Resnick JANEWAY
The Right Honourable Lord JUDGE (Igor), Commissary of the University
Dame Barbara Mary STOCKING, CBE

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Ms Saumya BALSARI; Author
Dr Nigel BOWLES; Centre for Financial History
Dr Davide CHIARUGI; Wellcome-MRC Institute of Metabolic Science
Dr Alberto COCA; Centre for Data-Driven Discovery
Dr Daniel FAZAKERLEY; Medical School
Prof John GABBAY; Cambridge Institute of Public Health
Prof David GANZ; Darwin College
Dr David GERSHLICK; Cambridge Institute for Medical Research

Dr Angela GONCALVES; Wellcome Trust Sanger Institute
Dr Stefan GRÄF; Department of Medicine
Dr Guillaume GUILBAUD; MRC Laboratory of Molecular Biology
Dr Inanna HAMATI-ATAYA; Centre for Research in the Arts, Social Sciences and Humanities
Dr Anthony HOTSON; Centre for Financial History
Prof Nick HUMPHREY; Darwin College
Dr Harriet HUNT; Department of Archaeology
Dr Daniel JONES; British Antarctic Survey
Prof Adrian KENT; Department of Applied Mathematics and Theoretical Physics
Prof Andreas KONTOLEON; Department of Land Economy
Dr Richard LANGFORD; Cavendish Laboratory
Ms Noelle L'HOMMEDIU; Darwin College
Dr Ruodan LU; Emmanuel College
Dr Eyal MAORI; Cambridge Infectious Diseases
Dr Derek MATRAVERS; Open University
Dr Seán Ó HÉIGEARTAIGH; Centre for Research in the Arts, Social Sciences and Humanities
Dr David PEARSON; Darwin College
Dr Anna PETRUNKINA; Department of Medicine
Dr Gloria PUNGETTI; Chair Darwin College Alumni Society
Dr Nebojša RADIĆ; University of Cambridge Language Centre
Dr Daniel WUNDERLICH; School of Arts, Humanities and Social Sciences

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Dr Pablo ALCON; MRC Laboratory of Molecular Biology
Dr Randolph ALTMAYER; Department of Applied Mathematics and Theoretical Physics

Dr Diana ARSENI; MRC Laboratory of Molecular Biology
Dr Leah ASTBURY; Department of History and Philosophy of Science
Dr Maryam AZIMI; Department of Computer Science and Technology
Dr Joshua BATTIS; Faculty of Asian and Middle Eastern Studies
Dr Daniele BIASCI; Department of Medicine
Dr Sumit BIRWA; Cavendish Laboratory
Dr Alexander BRADLEY; David Mackay Research Associate, Cambridge Zero
Dr Luke BRIDGESTOCK; Department of Earth Sciences
Dr Angie BURNETT; Cambridge Zero
Dr Chrispin CHAGUZA; Wellcome Sanger Institute
Dr Dora CANO RAMIREZ; Department of Plant Sciences
Dr Si CHEN; Department of Applied Mathematics and Theoretical Physics
Dr Stephanie DIEPEVEEN; Department of Politics and International Studies
Dr Eleanor DRAGE; Centre for Gender Studies
Dr Michael EDWARDS; Centre of South Asian Studies
Dr Maud FORMANEK; Sainsbury Laboratory
Dr Heye FREYMUTH; Department of Earth Sciences
Dr Avishai GILKIS; Institute of Astronomy
Dr Or GRAUR; Department of Astronomy
Dr Georgios HADJIDEMETRIOU; Department of Engineering
Dr Tobias JACKSON; Department of Plant Sciences
Dr Katy JORDAN; Faculty of Education
Dr Nanna KAALUND; Scott Polar Research Institute
Dr Sanne KAALUND; Department of Clinical Neurosciences
Dr Luke KEMP; Cambridge Zero

Dr Monika KREITMAIR; David Mackay Research Associate, Cambridge Zero
Dr Emma LAWLOR; MRC Epidemiology Unit
Dr Michela LEONARDI; Department of Zoology
Dr Xuan LIANG; Department of Physiology, Development and Neuroscience
Dr Francesco MUIA; Cavendish Laboratory
Dr Min-Yen ONG; Faculty of Music
Dr Sonia PASCOAL; Department of Zoology
Dr Matishalin PATEL; Department of Zoology
Dr Laura PELLEGRINI; MRC Laboratory of Molecular Biology
Dr Lara PÉREZ; British Antarctic Survey
Dr Sabin ROMAN; Centre for the Study of Existential Risk
Dr Edwin ROSE; Department of History and Philosophy of Science
Dr Souvik ROY; Department of Chemistry
Dr Manu SASIDHARAN; Department of Engineering
Dr Helene SCOTT-FORDSMAND; Department of History and Philosophy of Science
Dr Trishant SIMLAI; Department of Geography
Dr James SMITH; David Mackay Research Associate, Cambridge Zero
Dr Julia SNYDER; Faculty of Divinity
Dr Enric STERN-TAULATS; Department of Materials Science and Metallurgy
Dr Jason Qianchen SUN; Department of Engineering
Dr Stefanie ULLMANN; Centre for Research in Arts, Social Sciences and Humanities
Dr Kavyaa VENKAT; MRC Laboratory of Molecular Biology
Dr Hantin YANG; MRC Laboratory of Molecular Biology

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Dr Tun Jan YOUNG; Scott Polar
Research Institute
Dr Joseph ZHANG; Department
of Chemistry

GRADUANDS PRESENTED **JULY 2021 – MAY 2022**

PhD:

Asian and Middle Eastern Studies:

Lilong XU
*Chinese null and covert arguments
and their behaviours in L2 Chinese
grammars.*

Applied Mathematics and Theoretical Physics:

Alexis BELLOT
*Hypothesis testing and causal
inference with heterogeneous
medical data.*

Antranik Awedis SEFILIAN
*Secular dynamics of self-gravitating
debris discs.*

Architecture:

Dena Abdul Qader QADDUMI
*Post-Arab Spring Tunis:
materializing revolution in the city.*

Astronomy:

Catriona Alexandra SINCLAIR
*The effect of bombardment by
small bodies on the evolution of
atmospheres on terrestrial bodies.*

Bioscience:

Mohamed Ali Atij Majed ALMARRI
*Insights into the genomic histories
of diverse human populations
using whole-genome sequencing
analysis.*

Dhoyazan Mohammed Ali AZAZI
*The evolutionary genomics of CTCF
binding and functional signatures
in mouse.*

Elissavet KENTEPOZIDOU
*Insights into transcriptional
regulation from natural and induced
variation in closely related species.*

Aleix LAFITA MASIP
*Computational discovery and
modelling of tandem domain
repeats in proteins.*

Tim NIERHAUS
*The bacterial actin-like cell division
protein FtsA forms antiparallel
double filaments upon binding of
FtsN.*

Biochemistry:

Kaiqiang LI
*Regulation of mitochondrial
function by histone acetylation and
mitochondrial acetyl-CoA levels in
Saccharomyces cerevisiae.*

Marta WYLOT
*Monitoring apoptosis in intact cells
by high-resolution magic angle
spinning 1H NMR spectroscopy.*

Paul Jannis ZUREK
*Exploring protein fitness landscapes
with new high-throughput
technologies.*

Bioscience:

John Henry BLACKWELL
*Visible-light-mediated synthetic
strategies for the synthesis of
α-tertiary amine derivatives.*

Lavinia Grace DUNSMORE
*Strategy for controlled protection of
redox-cycling ortho-quinones with
self-immolative linkers.*

Marton KELEMEN
*Modelling human complex traits
with regression and neural-network
based methods.*

Donatas ŽMUIDINAVIČIUS
*Computational studies of
transmembrane protein structure
and function.*

Clinical Neurosciences:

Rohitashwa SINHA
*An investigation of cognitive
deficits related to surgery for
glioblastoma using a computerised
assessment tool.*

Computer Science:

Dionysios MANOUSAKAS
*Data summarizations for scalable,
robust and privacy-aware learning
in high dimensions.*

Economics:

Nikolas KUHLEN
*Essays on probabilistic machine
learning for economics.*

Education:

Elisa IZQUIERDO ACEBES
*Towards a characterisation of
science teachers' pedagogical
content knowledge of scientific
explanation: an exploratory
multiple case study.*

Deborah Eleanor AITKEN
*Generational differences in
perceptions of medical student
experiences of clinical attachments
in surgery: an ethnographic study.*

Engineering:

Alan Joseph CHARLES
*Development of a multi-objective
optimization capability for
heterogeneous light water reactor
fuel assemblies.*

Matti COLEMAN
*An integrated design framework
for future nuclear fusion power
reactors.*

Daoming DONG
*Improving the computation
efficiency for computer-generated
holography.*

Dylan FESTA
*A rate-based model of memory
storage in neural circuits.*

Sarah Kate NELSON
*Accelerating the delivery of climate
targets: technology and behaviour
in the road to net zero.*

Girish Venkata NIVARTI
*The bending effect in turbulent
flame propagation.*

Francesca O'HANLON
*Rainwater harvesting and
community water security in south-
west Uganda.*

Christopher WILKES
*Modelling tremie concrete
placement in deep foundations.*

Xuanyu ZHAO
*Improvements of MPM and its
applications in modelling rapid soil/
water movements.*

English:

Timothy Friday OGENE
*Old affinities and new itineraries in
contemporary African writing.*

History:

Lucia Juliette LINARES
*German politics and the 'Jewish
question', 1914-1919.*

History and Philosophy of Science:

Karoliina Julia PULKKINEN
*Values in action: simplicity,
completeness, and carefulness
in the development of the
systematisations of the chemical
elements.*

Management Studies:

Ignacio PEREZ HALLERBACH
Information Systems

Materials Science:

Yan WANG
*Electrical contacts on two-
dimensional transition metal
dichalcogenide semiconductors.*

Medical Science:

Thomas Patrick GLEESON
*Genetic characterisation of the
Drosophila Mitochondrial Calcium
Uniporter in physiological and
neurodegenerative contexts.*

Martin LAW
*Curtailed phase II binary outcome
trials and adaptive multi-outcome
trials.*

Beverley Jo McCANN
Mitochondrial genome engineering in the murine germline using designer nuclease technology.

Yingcan WANG
Mechanisms of spoken word recognition and memory encoding studied through competitor priming.

Medicine:

Stefan WINZECK
Methods for data management in multi-centre MRI studies and applications to traumatic brain injury.

Pharmacology:

Zhen DU
Probing the protein homeostasis mechanisms in long-lived naked mole-rats.

Philosophy:

Benjamin MARSCHALL
Carnap and the ontology of mathematics.

Physics:

Matthew ANDERSON
A quantum light source for quantum information applications in the telecom C-band.

Callum COURT
Magnetic and superconducting materials discovery: employing data science, natural language processing and machine learning.

Mark JOHNSON
Accelerating vibrational free energy calculations for anharmonic crystals.

Dean KOS
Biasing plasmonic nanocavities.

Plant Sciences:

Ioannis TAMVAKIS
Auxin and the nodule.

Lewis WATT
Interactions between Cucumber mosaic virus proteins and host proteins.

Polar Studies:

Hannah Charlotte CUBAYNES
Whales from space: Assessing the feasibility of using satellite imagery to monitor whales.

Psychiatry:

Tanya L PROCYSHYN
Effects of oxytocin on the social brain in autistic and typical women.

Psychology:

Joanna Louise LYSONS
Families created by identifiable egg donation: family functioning in early childhood.

Pure Mathematics and Mathematical Statistics:

Torben SELL
Advanced Bayesian Monte Carlo Methods for inference and control.

Radiology:

Julia Carlota CARMONA BOZO
PET-MR imaging of hypoxia and vascularity in breast cancer.

Sociology:

Valentina AUSSERLADSCHEIDER
From economic neo-liberalism to economic nationalism: ideational change in the economic programme of the Austrian Freedom Party, 1956-2017.

Eliran BAR-EL
Positioning the intellectual: Žižek as a sociological phenomenon.

Daniel TANNIS
Corruption and policy capacity.

Surgery:

Thomas David ADAMS
Examining the regional physiology of the transplant kidney during normothermic machine perfusion.

Veterinary Medicine:

Andromachi KARACHALIOU PRASINO
Using mathematical models to evaluate and inform immunisation strategies with MenAfriVac in the African meningitis belt.

Zoe Yasmin PATERSON
Characterising embryonic stem cell-derived tenocytes and determining the changing role of scleraxis during tendon development.

LLM:

Law:

Vrinda AGGARWAL
Muhammad Faheem Sajjad DHARIWAL
Darshan Harshad PATANKAR
Deepanshu PODDAR
Carlos Fernando LANDA ALEJANDRO
Karishma Anjani RAO
Vincent ROY
Christie Chang Ching WILSON

MACC:

Accounting:

Nana Akyaa KWAPONG

MAST:

Applied Mathematics:

Joao Luiz DE OLIVEIRA MADEIRA
Alexey ERMAKOV
Peter NAGYMATHE

Mathematical Statistics:

Kulunu DHARMAKEERTHI
Lola Chloé Chiara DUHALDE

Executive MBA:

Finn Faure ANDERSON
Charlotte Mary DEWAR
Zigeng DU
Aileen FISHER
Dylan KENNETT
Christos PHOTIADES
Reina Victoria RODRIGUEZ REQUEJO
Natalia Helena SABLEWSKA

Mihriban TUNA CLARKE
Linlin WANG

MBA Business Administration:

Sophie ATALLA
Jeffrey Robert Lee BLAYLOCK
Robert Charles CANN
Mackenzie CHAPMAN
Yi-kai CHIU
Kayla DEVON
Aaron Anthony Jose Hasan D'SOUZA
Sonia Aurélie GUGGENHEIM
Alexandra Nicole HICKS
Johanna Frederique HOOGLAG
Yijing HUANG
Maria ICHIZAWA
Matias Ignacio INFANTE ORTEGA
Tomomi ISHIDA
Shyam Pankaj KAPADIA
Akansha KHARE
Shruti Arvind KUMAR
Madeline Grace LANDUYT
Kathryn Doris LANE
Matthew Alvin LISONBEE
Jiawa LU
Tarek MOSFI
Rishikumar NADARAJAH
Pankaj NANDA
Van Trang NGUYEN
Melanie Margaret O'SULLIVAN
Yashaswini PALLETI
Abhishek PANIGRAHI
Brian Christopher PARHAM
Arjun Singh RANDHAWA
Roberto Mario RESTREPO CAMPO
Jose David RODRIGUEZ AVENDANO
Mana SAKURAGI
Sheena SARAF
Simon Gregory SCHWARTZ
Willem Abraham VAN SCHALKWYK
Ankita YADAV
Jie ZHANG

MEd Education:

Hannah Kathryn SHUTER

MFin Finance:

Yipin CAI
Liangyue PAN
Juan Carlos QUINZANOS TAVANO

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MMus Music:

Thomas Allen Peter EDNEY

MSt:

Applied Criminology and Police Management:

Stephanie Denise CALNE

Entrepreneurship:

Diana SUKAILO

Social Innovation:

Rosie Alys WRIGHT

MPhil:

Advanced Computer Science:

Wyatt Sebastian CARPENTER

Jun EEO

Sotirios VAVAROUTAS

Maleakhi Agung WIJAYA

American History:

Mark Carl PARKER

American Studies:

Mathilde Anny Madeleine

AUPETIT

Anglo-Saxon, Norse and Celtic:

Andrew SMITH

Archaeology:

Athina KONSTANTARA-

KYPRIANOY

Archaeological Science:

Braden Welsh CORDIVARI

Architecture and Urban Design:

Irene CARLUCCI

Xiuchun LIANG

Joseph Humphreys MARCHBANK

Biological Science:

Boshra Mohammed J H ALSULAITI

Joel Michael ELKIN

Elizaveta KARMANNAYA

Calum George MANEY

Marta MATUSZEWSKA

Josefina WEINEROVA

Computational Biology:

Christopher BLAXLAND-KAY

Ciara JUDGE

Conservation Leadership:

Mrunmayee AMARNATH

Alexandra Claire Trevena

SEBRIGHT

Criminological Research:

Christian AUSTIN

Sophie Natasha PATON

Criminology:

Ioannis ALMAS

Kirsten Zoe LASZLO

Ha Tung Romy NG

Basma SALAMA-PAUL

Development Studies:

Baptiste ALBERTONE

Juliette Marie Colette GAUTRON

Alexander James JUDGE

Linnea Emilia LAGERQVIST

Economic and Social History:

Jannik Joseph EGGERMAN

Economic Research:

Luke APPLETON

Economics:

Shuying HE

Brian Anthony O'CONNOR

Xiaomeng LI

Zhijun ZHU

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Bethany Therese DAVIES

Lisa FAN

Kaixuan GONG

Amanda Elise Carina LANDEGREN

Yoon Young SHIN

Amy STILL

Energy Technologies:

Linda BRODNICKE

Maaik Elisabeth HAKKER

European, Latin American and Comparative Literatures and Cultures:

Francesca Kate HOPKIRK

Sergio MARTINEZ REY

Eduardo PAREDES OCAMPO

Film and Screen Studies:

Madeleine Caroline Marie DE

CHAISEMARTIN

Wanqi LI

Ashley ROOHIZADEGAN

Finance:

Madeline CHOU

Finance and Economics:

Yimeng LIU

Pengguang LU

Benjamin James RYAN

Geographical Research:

Ashley Layo MASING

Health, Medicine and Society:

Karlijn Petronella Martina VAN

VLERKEN

Heritage Studies:

Philippa Lucy PRIOR

History and Philosophy of Science and Medicine:

Alexander Michael AIZENMAN

Cédric BLAIS

Erinn Elizabeth Rose Watson

CAMPBELL

Friedrich KLEFFMANN

Mary Alice Eileen MACEDA

James Richard MAMANA

Katherine MOAR

Holocene Climates:

Ciara Claudine GREAVES

Human Evolutionary Studies:

Liam TAYLOR

Industrial Systems, Manufacturing and Management:

Maria Alejandra GONZALEZ LEOZ

Aisha Adilla Syah INDRA

Rasmus KOLB

Weronika Maria LIPIEN

George Johannes MELMAN

David SCHAFFT

Leonidas Aris ZIROOS

Innovation, Strategy and Organisation:

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International Relations and Politics:

Charles JUBB

Land Economy Research:

Soraya GEORGE

Latin American Studies:

Steven ELLIOTT

David Juan ISERN

Machine Learning and Machine Intelligence:

Tyler Alexander MARTIN

Management Studies:

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Helen Ziqing LIAO

Jinzhao LIU

Medieval and Renaissance Literature:

Kanak SHAH

Medieval History:

Sammie Anne CUNNIGHAM

Micro and Nanotechnology Enterprise:

Matthew John CAIRNS

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Dominic BENNETT

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Sigismond Endel OSTIN

Modern South Asian Studies:

Um-E-Ayem BABAR

Maya PADAMSEE

Hanut SINGH

Multi-Disciplinary Gender Studies:

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Philosophy:

Emma APTHORP
Benedict JOOSTE-JENNINGS
Luca Alberto PASSI

Planning, Growth and Regeneration:

Nino AVREYSKI
Vasil KOSTADINOV
Brian LONGOBARDI

Political Thought and Intellectual History:

Yuezhen LI

Primary Care Research:

Yanfeng CHANG

Public Policy:

Stephanie Ross METZGER
Sofia Andrea SANCHEZ

Real Estate Finance:

Hong Minh BUI

Scientific Computing:

Jianou JIANG

Social Anthropology:

Greta Simone MEGROFF
Thomas Pierre Marie QUEMERAIS

Sociology:

Ollie Linnea GRADIN
Fangyuan LIU
Jacob Liam MERKELL
Alvaro Ruben PAREDES
VALDERRAMA

Technology Policy:

Tatsuhiro NAMBA
Darius SULTANI

Theology, Religion and the Philosophy of Religion:

Samuel John STEWART

Theoretical and Applied Linguistics:

Abigail Louise DUTTON

World History:

Sophia Xuezhao GUO

MRES:

Connected Electronic and Photonic Systems:

Peng BAO
Jacek Rafal BUDZISZEWSKI
Peng DONG
Bin FU

Future Propulsion and Power:

William Lloyd PURSER
Florian Yoan Alexis VILLAIN

Mathematical Genomics and Medicine:

Trevor COUSINS

Medical Science:

Yilin LI
Joycelyn LONGDON

Sensor Technologies and Applications:

James Timothy MEECH
Edward Harry WILLS

Below: Darwin Graduands Processing on King's Parade, June 2022. Photo credit Andrzej Bugajski





Events in 2022

We are pleased to be hosting alumni dinners and garden parties in College once again. It is hoped that later in 2022 and in 2023 the Master and Development Director will be able to travel to visit alumni around the world – we will email when events are organised.

Our popular Zoom Events Series will re-start in the Autumn and run alongside in-person events. These will be advertised on our website, social media and via email. If you would like to take part as a speaker, please email development@darwin.cam.ac.uk.

Alumni Events 2022/2023:

All alumni are welcome back to College at any time. You can book a Formal Hall dinner for you and two guests. Or, if you are in Cambridge, just pop in for lunch. The Punt Club also has punts that you can hire. Please email the Alumni Office giving us as much notice as possible, and we will be happy to book you a punt or reserve spaces for Formal Hall (alumni@darwin.cam.ac.uk).

Sunday 10th July:	Alumni Garden Party
Friday 4th November:	Alumni & Fellows Guest Night
Friday 17th March:	DCS and Fellowship Reunion Dinner
Friday 12th May:	Reunion Dinner (1975–87 & 1997–2007)
Friday 19th May:	Combined Former Fellows Dinner & Guest Night
Friday 16th June:	DCS & Fellowship Reunion Dinner
Sunday 9th July:	Alumni Garden Party

Editors: Sophia Smith, John Dix, Samuel Venn, Emily Rigby

The editors especially welcome short articles, pictures and news from all alumni.

Correspondence to: darwinian@darwin.cam.ac.uk