UNIVERSITY OF BIRMINGHAM | CHBH CENTRE FOR HUMAN BRAIN HEALTH

CENTRE FOR HUMAN BRAIN HEALTH

ANNUAL REPORT 2021

FOREWORD

Despite a challenging year for us all due to the COVID-19 pandemic, I have been happy to see that members of the CHBH have been able to keep up their spirits. In particular, we have been concerned about our international students and researchers who have less of a local network in terms of friends and family. The hope is that with the increase in vaccinations we should be allowed to socialise and travel sooner rather than later.

And it is not all bad. I am aware that many of the CHBH members have been able to use the time during the lock-down constructively to finish analyses and manuscripts as well as to develop grant proposals. Our operations team has been working hard at developing the H&S protocols that have allowed us to get back to the laboratories with few delays.

I feel that CHBH is in a good position to recover fast when things are getting closer to normal. We have state-of-the-art neuroimaging equipment as well as dedicated support staff. Most importantly, we share a strong and supportive community and I am convinced that by helping each other, we will be able to get our research plans back on track.

Professor Ole Jensen
Co-Director

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It's fair to say that this has been an unusual year that none of us saw coming (other than the evil genius leader of the bats of Wuhan, for whom none of this was a surprise!). The CHBH has been largely closed, and everyone has had to cope with the stress of creating a working environment among the children or in a shared house, compounded by uncertainty about when we might be able to get back to acquiring data. I know this has been most keenly felt by our early career researchers, and we will be doing everything we can to ensure that your research gets back on track as quickly as it can. My thanks go to our Operations, Events and Management Committees, and particularly to everyone who has learned much more about risk assessments than they ever wanted to. Thanks also to our PIs and researchers, who have been so understanding of the new constraints we have needed to impose to allow us to work safely. All being well, later this year we will finally have the barbecue that was cancelled last summer, at which point Ole will be sure to buy everyone a well-deserved drink of choice.

Dr Andrew Bagshaw
Co-Director

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The Centre for Human Brain Health (CHBH) has world-leading expertise in attention, memory, sleep, neuronal oscillations and multi-modal research.

The Centre works with industry partners on uncovering the fundamental mechanisms of the human brain as well as understanding how brain health contributes to wellbeing.

Contact us

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@theCHBH

CENTRE FOR HUMAN BRAIN HEALTH

The Centre for Human Brain Health (CHBH) is a leading interdisciplinary brain research facility established with the mission of understanding the fundamental mechanisms of the human brain as well as understanding what makes a brain healthy, how to maintain it, and how to prevent and reverse damage.

Our vision is to cross the boundaries of traditional academic and clinical disciplines to transform our understanding of the human brain. We recognise that to achieve the goal of personalised brain health we must first identify what constitutes a healthy brain and how lifestyle, developmental and societal factors interact and contribute to this endeavour.

~£27 million

of funding generated since CHBH's inception

The CHBH is an ever-growing neuroscientific community, which currently comprises 50 principal investigators; including 13 professors, five readers, 13 senior lecturers/research fellows and supported by groups of dedicated post-doctoral researchers and PhD students.

Since its inception, CHBH has generated ~£27 million of funding from a wide range of sources, including:

- The Academy of Medical Sciences
- Alzheimer's Research UK
- Baily Thomas Charitable Fund
- Biotechnology and Biological Sciences Research Council (BBSRC)
- BRIDGE – Birmingham-Illinois Partnership
- Early Postdoc Mobility
- European Research Council (ERC)
- Economic and Social Research Council (ESRC)
- European Commission Marie Curie Fellowships
- Facebook Enterprise
- Greater Birmingham Enterprise Partnership
- Guangzhou Municipal Hospital
- Jacobs Foundation
- James S. McDonnell Foundation
- Leverhulme Trust
- Medical Research Council (MRC)
- NIH-NINDS
- Research Council of Norway Research Grant
- The Royal Society
- Templeton World Charity Foundation
- The Waterloo Foundation
- The Wellcome Trust
- The Wellington Hospital – HCA Healthcare
- The Wolfson Foundation
- UK Quantum Technology Hub

Areas of specialism

The Centre is home to state-of-the-art brain imaging facilities, which are used to uncover the mechanisms supporting cognition in both the healthy and the dysfunctional brain. These include:

- **Magnetic resonance imaging (MRI)**, providing a range of options for stimulus delivery and physiological and behavioural recordings
- **Magnetoencephalography (MEG)**, which allows for continuous recordings of ongoing brain activity with a millisecond time resolution and advanced analysis tools to identify where in the brain the measured electrophysiological activity is generated
- **Electroencephalography (EEG)**, a high-performance EEG laboratory for accurate timing and application of auditory and visual stimulation (concurrently or separately)
- **Sleep laboratories**, equipped with 64-channel EEG amplifiers and peripheral equipment for experimental testing and stimulus delivery

Magnetic Resonance Imaging (MRI)

- **Functional Near Infrared (fNIRS)**, housing the Imagent (v2) system that allows non-invasive functional imaging of the brain
- **Optically Pumped Magnetometer (OPM)** laboratory, where we are developing new sensors to be used for magnetoencephalography (MEG) using quantum technology
- **Non-Invasive Brain Stimulation**, housing all the equipment required for both transcranial magnetic (TMS) and electrical (TES) non-invasive brain-stimulation experiments
- **Exercise Laboratory**, working across various modalities, studies examining acute and longer-term effects of exercise on brain health

Industrial partners

Our partners include HSBC, Facebook, P1vital, Neuroelectrics (Barcelona), Oculus, Obi-Robotics and Procter & Gamble Ltd.

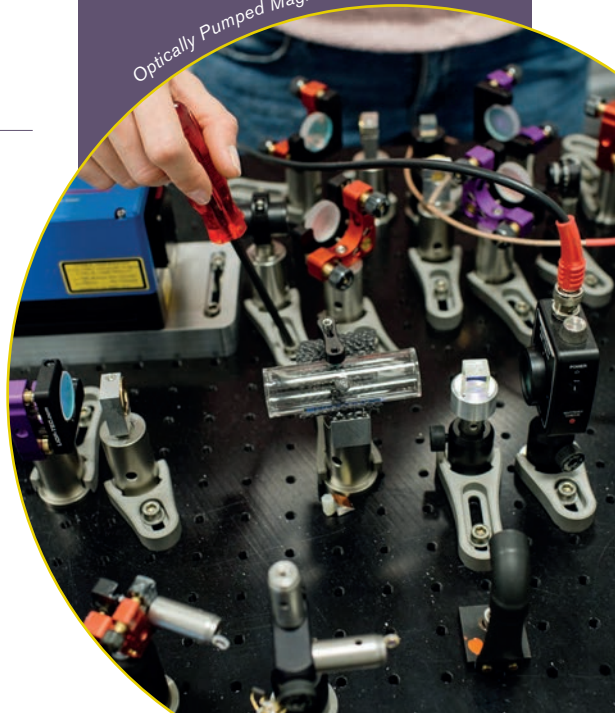
We have strong links with many hospitals, including: Queen Elizabeth Hospital Birmingham, The Barberry National Centre for Mental Health, Birmingham Women's and Children's, Moseley Hall Hospital, Royal Leamington Spa Rehabilitation Hospital, Wellington Hospital HCA Healthcare UK and Heartlands Hospital.

Our collaborations with local hospitals mean we're well placed to use our techniques and expertise to help develop fundamental insights into brain disorders, and a deeper understanding of what it means to have a healthy brain.

Dr Andrew Bagshaw

Quantum Hub Connection

The Optically Pumped Magnetometers (OPM) facility is based on a collaboration between the School of Psychology and the School of Physics and Astronomy. Furthermore, we are working with the UK Quantum Technology Hub for Sensors and Timing to maximise the potential economic benefit from our developments and aid the translation of the technology to UK industry. The Quantum Hub for Sensors and Timing provides an ideal pathway for applications, given the 70 industrial partners interested in developing and commercialising innovative quantum technologies.



Optically Pumped Magnetometers (OPM)

RESEARCH HIGHLIGHTS

PAST, PRESENT AND FUTURE RESEARCH IN THE CHBH

Dr Ali Mazaheri

Senior Lecturer (Associate Professor), Director of Undergraduate Studies, Programme Lead for BSc Psychology

We all experience pain after an injury such as a pulled muscle, a broken arm or a medical procedure such as surgery. This pain can often be managed by painkillers and goes away once the injury is healed.

Chronic pain is different. This is a type of pain that keeps persisting months to years after an injury has healed and can't be treated by painkillers. The only way to deal with it is to prevent it from developing in the first place by reducing the pain experienced immediately after an injury.

We have uncovered a simple test using electroencephalography which can be used to predict the pain-sensitivity of a person and possibly the likelihood that they will develop chronic pain. We believe this test can be used by clinicians to offer alternative treatment options to patients who are at high risk of developing chronic pain. We are now testing how sensitive this test is in identifying patients at high risk of chronic pain after lung surgery, a very painful procedure with a high prevalence of chronic pain.

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Seminowicz, D.A., A. Mazaheri, and A.J. Furman, Method for Predicting Pain Sensitivity, https://patents.google.com/patent/US20200253540A1/en. (2020). Furman, A.J., et al., Sensorimotor Peak Alpha Frequency Is a Reliable Biomarker of Prolonged Pain Sensitivity. *Cerebral Cortex* (2020).

Dr Matthew Apps

Senior Research Fellow in Cognitive Neuroscience, Head of the Motivation and Social Neuroscience Lab

How do you decide to switch from doing something in one location and travel to find rewarding things to do elsewhere?

We designed a computer-based task, based on the kinds of problems animals have to solve when they collect food in the wild, and tested whether humans make decisions similarly. People did the task twice, once on a placebo, and once having taken a drug that temporarily manipulates their levels of dopamine – a brain chemical linked to Parkinson's Disease, Impulse Control Disorders and other clinical conditions.

We found that decisions to leave are made by humans in similar ways to how animals make choices, but changing people's dopamine levels influenced their decisions. Boosting dopamine made people move on more quickly in a 'grass is greener' way, even though everything in the experiment was the same.

Knowing how our brains evolved to make decisions is crucial for understanding the healthy brain, and for helping those with the many neurological and psychiatric conditions linked to dopamine dysfunction.

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Le Heron, Campbell, Nils Kolling, Olivia Plant, Annika Kienast, Rebecca Janska, Yuen-Siang Ang, Sean Fallon, Masud Husain, and Matthew AJ Apps, Dopamine modulates dynamic decision-making during foraging. *Journal of Neuroscience* (2020).

RESEARCH HIGHLIGHTS
(CONTINUED)

Dr Anna Kowalczyk

Research Co-Investigator – OPM Lab

Magnetic signals in the brain can be measured by magnetoencephalography (MEG), where highly sensitive magnetic field sensors are used to detect small changes in the magnetic field outside the head caused by the current flow in the nerve cells. In our multidisciplinary lab, we are developing a new type of super-sensitive magnetometer based on interactions of atoms with laser light. Optically Pumped Magnetometers (OPMs) employ polarised light to detect changes in the orientation of the spin of atoms when they are exposed to a magnetic field. These quantum sensors will allow us to investigate connectivity in the human brain.

Recently, we have successfully tested with human subjects a new type of OPM. Our sensor, compared to commercially available sensors, is more robust in detecting the brain signals and distinguishing them from the magnetic noise in the background. Our results will have an impact on the use of MEG for diagnosis and treatment, as the MEG testing can be extended outside of a specialised unit and in the future, perhaps in a hospital ward. The outcome of our project will help to understand brain connectivity and will advance stimulation treatment schemes in patients with specific neurological disorders such as dementia. We are already working with clinicians at the Queen Elizabeth Hospital to exploit the potential use of our sensor for detecting traumatic brain injuries.

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Kowalczyk, A.U., Bezsudnova, Y., Jensen, O., Barontini, G. Detection of human auditory evoked brain signals with a resilient nonlinear optically pumped magnetometer. *NeuroImage* (2021).

Dr Patricia Lockwood

Senior Research Fellow in Cognitive Neuroscience, Head of Social Decision Neuroscience Lab

The processes our brains use to avoid harming other people are automatic and reflexive – and quite different from those used when avoiding harm to ourselves. We designed an experiment that involved scanning the brains of a cohort of 36 participants, while they were asked to make a series of decisions. Participants had to learn which decisions would lead to a painful electric shock being delivered either to themselves or to another person.

We found a striking difference between decision-making processes for themselves and others. Individuals made automatic, efficient choices when learning to avoid harming others. However, when learning to avoid harming themselves, choices were more deliberative. We were also able to identify specific areas of the brain that are involved in these different decision-making processes. We found that the thalamus – a small structure located just above the brain stem that has a role in pain processing – was more active when people were successfully avoiding harm to others.

These findings could ultimately shed light on disorders such as psychopathy where individuals experience problems learning or making choices to avoid harming others. More broadly, they could help us understand how the healthy brain makes adaptive decisions to avoid harming other people.

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Lockwood, P. L., Klein-Flugge, M. C., Abdurahman, A. & Crockett, M. J. Model-free decision making is prioritized when learning to avoid harming others. *Proceedings of the National Academy of Sciences* (2020).

FUTURE **RESEARCH**

Dr Sarah Aldred and Dr Vivian Lee

Reader in Exercise Biochemistry and Postdoctoral Researcher

Adopting a Mediterranean-style diet and undertaking regular exercise is suggested to be beneficial in maintaining cognitive function and reducing the risk of dementia. Our study, funded by Alzheimer's Research UK and in conjunction with the Universities of Newcastle and East Anglia, investigates the feasibility of a 24-week intervention to help individuals at risk of dementia.

The study commenced in September 2019 and measured dietary intake and physical activity using questionnaires and activity tracking throughout the pandemic. We adapted the study to continue cognitive tests virtually through video calls and collecting blood spots onto analysis cards instead of venous blood samples. Unfortunately, brain imaging and vascular function measures could not take place.

We found a substantial decrease in physical activity in response to lockdown, especially in overweight and obese individuals. This is of concern, as reduced physical activity level is strongly correlated with increased risk of infectious diseases, such as COVID-19.

We are currently analysing the dietary and physical activity behaviour data and will soon commence a new spin-off study to validate and compare face-to-face cognitive assessments, with those undertaken virtually. This should then allow us to examine any changes in cognitive function that may have changed through the intervention.

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Dr Katrien Segaert, Dr Sam Lucas and Dr Foyzul Rahman

Lecturer in Psychology, Senior Lecturer in Exercise and Environmental Physiology, Postdoctoral Research Fellow in Psychology

Language function, a key aspect of our cognitive abilities, is affected by age. As we get older, our language becomes slower, less fluent, and subject to failures in word-finding such as tip-of-the-tongue moments. Physical exercise has previously been shown to reduce age-related decline in some aspects of cognition but nothing is known yet about whether exercise can also help us become better and more fluent communicators.

We have begun a home-based exercise intervention study with healthy, older adult participants, measuring the associated changes in brain structure and function as a result of exercise. We are working in conjunction with researchers at the University of Agder in Norway, who are looking at the impact of exercise on bilingual adults.

Previous research suggests that bilingual adults have slower and less fluent speech than monolinguals and thus might experience even greater benefits from an exercise intervention programme.

Together, we will identify the key protective components of language profile and fitness allowing us to optimise our use of regular physical activity and language learning to combat cognitive decline in older age.

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LAB WORK DURING **COVID-19**

EEG AND COVID-19: RESEARCHING REWARD DURING A PANDEMIC


Jaclyn Dell

Every day, the brain must sort out complex visual scenes at a rapid pace. Visual attention must prioritise some objects to process at the expense of others. How do we make these decisions? One way is that when items are deemed as rewarding, they receive visual priority.

In my study, I use electroencephalography (EEG) to investigate the impact of financial reward on selective processing of objects presented in real-world scenes. I began collecting data at the beginning of 2020, which was put on hold in March due to the emergence of the COVID-19 pandemic. Due to requirements such as social distancing, and the fact that EEG requires close proximity to the participants, we developed a health and safety protocol which involved personal protective equipment (PPE), cleaning procedures and a screening process for participants. This process added roughly 50% to our time investment for data collections but enabled us to continue research during the pandemic.

There are definite changes to how we now run an EEG session. Participants are screened before they enter the CHBH, they can no longer wash any EEG gel out of their hair before leaving the premises, and they must wear a mask. Operators must wear full PPE (apron, mask, visor, gloves) and ensure the cleaning procedure is followed, which includes thoroughly washing and sanitising the cap and electrodes as well as wiping down all contacted surfaces with alcohol wipes. Our ability to interact with participants is hindered by the necessary social distancing of two metres, however, I was grateful to be back testing in the lab and finding ways to do so safely. Participants were also happy to have the opportunity to get involved in research and were more than willing to oblige the new safety protocols. It may take a bit more time, but the ability to conduct research responsibly is one of our main priorities. I am so pleased to work with an organisation that treats health and safety as such a high priority.

Jaclyn Dell,
PhD student, Motivated Cognition Lab

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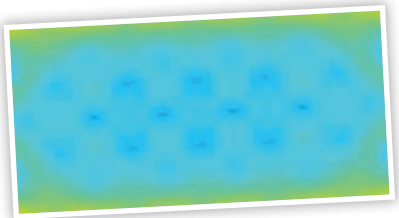
NIRS LAB: INFRARED LIGHTS, CAMERA, ACTION!

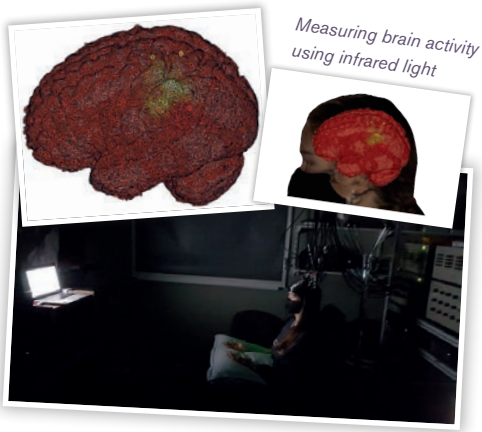
Medical Imaging PhD researcher Guy Perkins is studying how shining light into people's heads (near infrared spectroscopy) can assess if they have traumatic brain injury.

Following a trip to Poland to meet fellow near infrared spectroscopy (NIRS) researchers in March 2020, I was raring and ready to get into the CHBH's NIRS lab. Sadly, a small thing called coronavirus put a stop to all that, and it wouldn't be until August 2020 that I would be able to enter the CHBH again. Lockdown wasn't totally wasted though; I was able to test a lot of my ideas and simulations on my computer at home, ready for when the CHBH reopened.

During August and September, I was able to complete a small amount of NIRS equipment testing at the CHBH, this involved usage of a 'phantom', an object which aids the calibration of imaging equipment. There are only so many measurements you can take this way, however, but I used this time to become deeply familiar with the hardware and software of the NIRS kit. I had also managed to test theories I'd developed over the summer. Then, another lockdown was called.



Simulating measurements of the infrared light imaging system



Measuring brain activity using infrared light

When the CHBH opened again in winter, I was desperate to ditch the phantom(!) and collect data on people. Thankfully, the staff at the CHBH were very supportive with regards to the COVID-secure paperwork I had to complete (risk assessments I am looking at you) before I could test on participants. Prior to the festive break and lockdown 3.0, I managed to collect data on five people. This was invaluable as it allowed me to test out theoretical work I had written into a paper over the summer, and it has provided me with lots of data analysis since then, keeping me busy during the third lockdown!

Even though 2020 was terribly challenging at times, it has made me appreciate the more normal times when I was able to come into the CHBH. I also feel very well-versed in public hygiene and got to wear some dashing PPE!

Guy Perkins

Guy Perkins,
PhD student in
Medical Imaging

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MEG LAB: BRAIN PONG AND THE PANDEMIC

Dr Alexander Zhigalov and I are working on a brain-computer interface which tracks attention in real-time by measuring individual brain activity through magnetoencephalography (MEG), allowing us to instantaneously adapt visual information displayed on a screen to a person's momentary state of attention. To illustrate this technology, we programmed a game: 'Brain Pong!', in which the individual's direction of attention controls a moving bar, which prevents a ball from reaching a restricted area. This tool could ultimately be applied to clinical, gaming and research applications, eg, adapting an experiment to an individual's brain-state.

When the pandemic hit, our study was abruptly halted and so began five months of confinement, however, this led to some unexpected realisations: I missed the peaceful minutes I spent on my bike commuting to work; the colleagues that greeted me warmly at the Centre; the joyful lunch breaks; the reason to get up early in the morning and a new love-hate relationship with digital meetings!

Dr Marion Brickwedde

When the Centre reopened, I was eager to return to familiarise myself with the COVID-secure procedures and ultimately, to get back to the lab! For testing sessions, we had to wear enhanced personal protective equipment (PPE) (gloves, apron and face visor). The difficulty of using sticky tape, which is a staple in the MEG, increases significantly when wearing gloves! Undoubtedly, the most intensive change was the new cleaning process following testing sessions. Every surface we touched or breathed-on had to be wiped with disinfectants. It took some practice to remove PPE after cleaning without compromising any other surfaces.

The new COVID-secure procedures and processes were worth it when I finally got to play Brain Pong in the lab itself, it's a challenging and fast-paced game, and I can't wait until it's safe again to test it on other people!

Dr Marion Brickwedde,
Postdoctoral Researcher,
Neuronal Oscillations Group

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Melanie Lafanechere

MRI LAB: BRAIN STIMULATION AND PANDEMIC PROBLEMS!

As Research Associate in the Fernandez-Espejo Lab, I am part of a team running a study that investigates the potential for transcranial direct current stimulation, applied to the cerebellum, to change the way specific brain regions communicate with each other. Our study involves testing a participant every day for a week, which includes MRI scans and behavioural sessions with tDCS.

The preparation for returning to work during the pandemic included familiarity with, and adherence to, the new risk assessments, inductions, training and the purchasing of PPE.

It is not hyperbolic to say that working during the pandemic has created challenges for everyone. For me, it meant a seven-month long furlough, increased admin associated with recruitment and organisation of participants in adherence to CHBH and National COVID-19 guidelines, as well as ensuring participants complied with the new measures.

Whilst this made testing more laborious and stressful, these difficulties are trivial compared to those faced by the others around me, including funding uncertainty, access to equipment and changes to projects and additional concerns regarding PPE plastic pollution and its environmental impact.

Thankfully, it is not all doom and gloom! My participants have been incredibly accommodating and always in good spirits, which I am grateful for. It is also clear that everyone who is still working at CHBH wants to continue the collaborative spirit of academic discussion. Comfortingly, online lab meetings are concerned with mental wellbeing and there is a focus on everyone remaining actively connected in socially distant ways. Whilst we may be separate and distant for the wellbeing of the population, I do not feel alone.

On a personal note, I am eager to get back to 'the new normal', whatever that may look like when we eventually get there (hopefully). In the meantime, I urge everyone to stay at home, keep safe, and use reusable face masks whenever they can!

Melanie Lafanechere
Research Associate, Fernández-Espejo Lab

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BRAIN FUNCTION AND COVID-19

Scientists have long suspected a link between inflammation and cognition, but it is very difficult to be clear about the cause and effect. For example, people living with a medical condition or being very overweight might complain of cognitive impairment, but it's hard to tell if that's due to the inflammation associated with these conditions or if there are other reasons.

In our recent work, we induced very mild inflammation in healthy young males through a vaccine, and found very specific aspects of brain function related to reaching and maintaining an alert state were affected. Impairments in these processes lead to what is commonly called 'brain fog'.

In some patients, the coronavirus (COVID-19) has been found to cause cognitive symptoms including brain fog for months after the infection has gone. The underlying cause of this syndrome sometimes referred to as 'long COVID', is still a mystery. We are currently investigating the specific changes in the brain function of long-COVID patients accounting for their symptoms.

Balter, L. J., Bosch, J. A., Aldred, S., Drayson, M. T., van Zanten, J. J. V., Higgs, S., ... Mazaheri, A. Unique Neurophysiological Vulnerability of Visual Attention Networks to Acute Inflammation. *bioRxiv* (2019)

Dr Ali Mazaheri

Dr Ali Mazaheri
Senior Lecturer (Associate Professor), Director of Undergraduate Studies, Programme Lead for BSc Psychology

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The researchers who have been able to return to campus to facilitate their projects during the pandemic have been excellent in keeping to the new, strict, COVID-secure regimens. I cannot thank them enough for the efforts they've put in to keep themselves, and the rest of us, safe in the CHBH labs, as we continue to navigate research in these challenging times.

Jonathan Winter, MEG Support Technician

Detecting metal prior to MRI scanning

MRI scanning resumes amidst the pandemic

EVENTS **SPOTLIGHT**

BUILDING A VIRTUAL CHBH COMMUNITY

Over the course of the pandemic, the whole CHBH network has come together in planning, hosting and attending CHBH events of varying formats, encompassing academic lectures, collaborative outreach seminars, research discussions, careers workshops, mental health sessions (yoga, meditation), online socials, seasonal arts and craft competitions, PhD award opportunities, charity events, a Christmas 'Wrap-Up' party and, of course, a few inevitable Zoom quizzes, complete with a CHBH twist: KahZoom anyone?!

Although many challenges have been faced in facilitating such activities virtually, including the pre-event dread of wondering whether anyone will actually turn up(!), and the now endemic 'Zoom fatigue', the array of events and activities that have been executed virtually have been vital to ensure research dialogue continues and to provide welcome boosts in the absence of socialising in the corridors of the CHBH.

There have also been definite wins from moving to solely virtual platforms, our academic events (such as the monthly CHBH Seminar Series) and collaborative events (Sao Paulo Sleep Institute and IMH Self/Other Outreach Workshop), have all seen a big boost in attendance, as the digital potential of remote working greatly minimises time differences and distance, and engagement with international audiences to CHBH events in this respect have received a never-before-seen boost!

With all this in mind, however, we are all eager for the pandemic to end, so we can safely return to our offices and labs, and forever put to bed the tedious phrases '*you're on mute*', '*we can't see your screen*', '*have we lost them?*'!

Details of recorded CHBH academic events can be found at the bottom of the CHBH Events Page here: **bit.ly/eventsatchbh**

Event poster

MMIN POSTGRAD CAREERS SERIES

In July 2020, the CHBH partnered with the Midlands Medical Imaging Network (MMIN) to host a month-long series of Zoom lunchtime talks aimed at, and hosted by, early career researchers (ECRs), with a focus on non-academic career pathways. The event was aimed at Masters students, PhD researchers and postdoctoral researchers, all of whom had the opportunity to hear from current industry professionals who have made the academia-to-industry transition in their own lives.

The CHBH Events Committee, as well as Jierong Luo and Dr Jay Bhalodiya, MMIN representatives from the University of Warwick, hosted a wealth of speakers over the course of July, including representatives from Oculus, Brain Products, Johnson & Johnson, WSP Global (management and consultancy services), Office for National Statistics, British Psychological Society, Tessella, Evidera, University of York, University of Leeds, Philips Healthcare, and Codemasters. The roles of the representatives varied from Augmented Reality Science and Game Development to Imaging/Neurovascular Sales and Support, Performance Psychology, Logistical and Statistical Analytics and Medical Application Technical Support.

MI
NETWORKS
MMIN

The 115 ECR and PhD attendees had the opportunity to listen to the speakers' experiences, learn from their mistakes, as well as prepare for potential challenges that may be encountered on the road to a non-academic career. Questions and networking with the speakers during the event were also greatly encouraged, through live Q&As as well as the opportunity to retrospectively ask questions directly to the speakers after the events. Over 70 questions were asked throughout, and invaluable fledgeling networks between ECRs and the speakers were made.

The recordings and resources for the event itself can be found by visiting the CHBH at **bit.ly/chbh2020careers**

MMIN ECR keynote presentation

CELEBRATING OUR PHD STUDENTS

In 2020, we held the first annual CHBH PhD Paper of the Year Award, inviting nominations for any PhD researcher who is part of the CHBH community and has had a paper published in 2020 as a first-author. The winner and runners-up were selected by the CHBH Management Committee in December 2020.

WINNER

Awarded a £100 shopping voucher

LEAH BANELLIS
Skipping a Beat: Heartbeat-Evoked Potentials Reflect Predictions During Interoceptive-Exteroceptive Integration
Cerebral Cortex Communications, September 2020

Leah's comments on winning:
'I'm ecstatic to win the CHBH PhD paper prize, especially for the first paper of my PhD! Studying heart-evoked potentials is an evolving field, therefore, a lot of hard work has gone into ensuring the paper accurately measures cross-modal integrated predictive processes. Damian Cruse has massively contributed towards the paper and congratulations should be extended to him! The extensive control analyses are thanks to suggestions from Catherine Tallon-Baudry whilst on placement in Paris, and extremely useful and constructive reviewers, so thank you to them also!'

JOINT RUNNERS-UP

Each awarded a £20 shopping voucher

MATT WEIGHTMAN
Targeted tDCS selectively improves motor adaptation with the proximal and distal upper limb
Brain Stimulation, May–June 2020

DR RUTH PAULI
Positive and Negative Parenting in Conduct Disorder with High versus Low Levels of Callous-Unemotional Traits
Development and Psychopathology, June 2020

Leah Banellis – CHBH PhD Paper Prize Winner

IMPACT ON **EDUCATION**

The Brain Imaging and Cognitive Neuroscience MSc is the flagship programme affiliated with the CHBH and is delivered by in-house staff and postgraduate students.

The Brain Imaging and Cognitive Neuroscience MSc is integrated with the teaching programmes of the School of Psychology. The School has an excellent track record in attracting Masters students and providing high-quality training. Sixty to seventy students graduate annually, half progressing to PhD level, while others have moved on to employment with companies including Google, a variety of Research and Development roles, and not-for-profit organisations including the Stroke Association.

Dr Pia Rotshtein
CHBH Educational Lead
Lecturer in Psychology

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HOW TO SURVIVE AN MSC DURING A GLOBAL PANDEMIC

MSc Brain Imaging and Cognitive Neuroscience student Lucy Palmer shares what she's learnt from studying at home during the course of the pandemic:

1) Adapt and accept the uncertainty that comes with working remotely.
During the lockdown restrictions, both the University and I were required to adjust to online lectures; video calls; breakout rooms and dodgy Wi-Fi connections, but it is surprising how quickly this became the norm. In fact, during the holidays, I really missed the routine of logging on to Zoom to see familiar lecturers and peers! The Research Practical lead even managed to convert our lab experience into a virtual set of exciting and valuable workshops.

2) You get out what you put in.
It can be tempting not to sign up for events or societies because they are not in-person, or will be different to 'normal', but online events allow for opportunities to attend talks and meetings which otherwise would be impossible to juggle. I can attend a 'hot-off-the-press' CHBH seminar, immediately followed by a British Neuroscience Association Symposium (which last year was in Dublin), without leaving my room!

3) The fascinating content.
Thanks to the hard work and creativity of the lecturers at the University, I've learnt how to code, critique and create, as well as analyse data, advance my knowledge and acquire practical research skills, all from the comfort of my own home. I even found out that statistics can be really fun (yes, you read that right!).

4) You can still feel part of the team, without physically being on campus.
Both staff and students have worked incredibly hard to create the best experience possible during the pandemic, which I am very grateful for. The staff at the CHBH have provided excellent support, from weekly coffee meetings with my new lab team, to advice and guidance in pastoral meetings, which have helped foster a sense of community despite the physical distance.

Following completion of her MSc, Lucy hopes to pursue a career in research. Her interests include functional, structural and resting-state Magnetic Resonance Imaging, consciousness and the Default Mode Network.

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Lucy's 'Work from Home' setup

PSYCHOPHYSICS AT HOME WITH BETH RICHARDS

Beth Richards, a BSc Psychology student and BPS Undergraduate Research Assistantship Award recipient, is investigating the importance of non-verbal social cues in daily interactions.

Under the supervision of CHBH Researchers Dr Ana Pesquita, Dr Geoffrey Brookshire, Professor Ole Jensen and Dr Wieske van Zoest, Beth gained valuable experience in online experiment design and execution, participant recruitment, and statistics and computer coding.

The team are currently in the data collection stage of the full experiment, with hopes that the project will better understand the link between attention and social skills.

Beth writes about her experience: *'working alongside the vast network of international researchers at the CHBH was incredibly valuable for my personal development as a researcher...'*.

Beth continues to be a valued member of the CHBH team as a Research Assistant on another project, using COVID-secure data collection using the CHBH's magnetoencephalography (MEG) lab. Following completion of her BSc, she hopes to pursue postgraduate study.

Beth's full article, '*Psychophysics at home*', on her first-hand experiences of facilitating participant research during the pandemic, can be found on the British Psychological Society's magazine '*The Psychologist*': **https://thepsychologist.bps.org.uk/psychophysics-home**

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