



THE GUY FOUNDATION

NEWSLETTER

December 2023

**Welcome to the 6th edition of The Guy Foundation Newsletter.
We hope you enjoy reading it, do get in touch with any
suggestions for future editions.**

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Welcome



It's astonishing how quickly time passes. It is already more than five years since The Guy Foundation was registered as a charity. Today, we have 180 members and over 600 subscribers to our online lectures on YouTube. I am immensely proud of the work that we have undertaken together and I am delighted to have this opportunity to thank everyone involved.

For our first small gathering at Chedington Court in 2019, we had just two research studies underway, collaborations with Jimmy Bell at University of Westminster and with Stan Botchway at the Central Laser Facility, STFC-UKRI at Harwell in Oxfordshire. That meeting led to a new project with Philip Kurian at Howard University and to our discussing with Wayne Frasch the key role of his team at Arizona State University. Covid put paid to our thoughts of having such in-person meetings each year. But we quickly developed the educational, fun and inspiring online symposia - the Spring and Autumn Series - which attract a much larger and more diverse audience than would have been possible in person.

Fast forward to the last twelve months, and we have reached several key milestones. We merged physics with biology through the integration of our biophoton detection kit, hand-built by the Central Laser Facility team, into our life sciences Quantum Biology Laboratory at University of Westminster. We published our **own experimental data** through the Spring Series presentations and in peer-reviewed journals. In celebration of 100 years since biophotons were first identified we supported the '**Century of Biophotons**' conference at Stellenbosch University and awarded the **2023 Onion Prize** to Dr Nathan Babcock for his reinterpretation

of Gurwitsch’s original experiment. We attracted our first significant **donation** from an external funder – Picchio International. We co-convened a meeting on quantum biology and **cancer** with Cancer Research Horizons. Last but certainly not least, we stimulated vibrant interest in the topic of **space health** and are now engaging with space scientists and agencies globally, such are the fascinating questions that quantum biology poses for the health of humans in space. Thank you to our Space Health working group members for your valuable contributions and we look forward to continuing our work with you next year.

All this has been closely linked with more general progress in the QB field. The inaugural Gordon Research Conference (GRC) on Quantum Biology, which the Foundation was delighted to support, was a key moment for the growing community of scientists. We also welcome the fact that the 2024 American Physical Society conference will for the first time have a session dedicated to quantum biology.

The last five years have seen the field advance from asking whether there are quantum effects in biology to knowing that there are. Now we are collectively taking the first few strides in understanding them. There is thus a new energy directed towards teasing out the exact mechanisms by which quantum biology might contribute to new therapeutics and ultimately have a positive impact on health and wellbeing. That is a perfect fit with our purpose: to deliver public and tangible benefit for the world, to pursue worthy causes against the odds, and to bring others alongside to support this cause, encapsulated in our motto, “driving innovation in medicine through quantum biology”.

Behind the scenes, over these five years, we have also appointed an excellent **staff, advisor and trustee team**, established finance, governance and grant-making systems, written policies and procedures and built a **website** to serve as a resource for the QB community. For more information about our activities our annual reports are available [here](#).

The field of quantum biology is making excellent progress and I sense we are on the cusp of real change. It is your expertise, energy and enthusiasm which are driving it. On behalf of the whole Foundation team, I wish you a happy and peaceful holiday season and I look forward to seeing you in the New Year.

Professor Geoffrey Guy

Founder and Chairman, The Guy Foundation



From left to right: Alistair Nunn (Director of Science), Lord Waldegrave (Trustee), Geoffrey Guy (Chairman), Kate Guy (Trustee), Eric Dixon (Trustee), Nina Copping (Programme Director), Russell Bowyer (Treasurer), Jonathan Laughton (Trustee) and Richard Brass (Trustee) at the recent Board of Trustees meeting at Chedington Court, Dorset, UK.

NEW PUBLICATIONS FROM OUR RESEARCH PROGRAMME

The Foundation is very pleased to highlight two new publications from its experimental research programme.



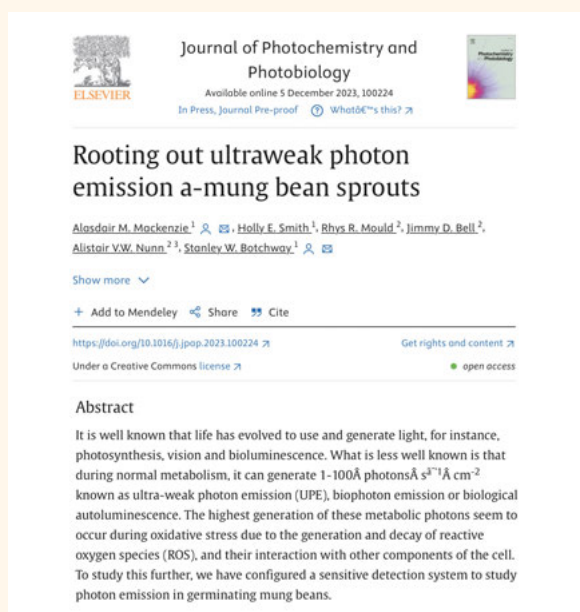
The paper **Non-chemical signalling between mitochondria** was published in *Frontiers in Physiology* and is a rigorous reinvestigation and extension of Alexander Gurwitsch's original report of non-chemical communication in biological organisms. The results demonstrate that stressing mitochondria, organelles central

to energy and signalling in cells, can alter the metabolic behaviour of adjacent isolated mitochondria. First author Rhys Mould, from the University of Westminster, commented that:



“ The experiment confirms the possibility that cells use light-based communication, opening a new frontier in our understanding of biological signalling. ”

Rhys presented his results at the 2023 Spring Series, you can watch his talk [here](#).



Gurwitsch was also the inspiration behind the second recent publication **Rooting out ultraweak photon emission a-mung bean sprouts**, published in the *Journal of Photochemistry and Photobiology*. The paper examines how biological systems generate and use light by measuring naturally emitted photons at different stages in

mung bean development from bean to leafy plant. The study was able to identify a new emission-causing event, that these photons are emitted from the roots as they grow, and that interventions such as the addition of hormones increased root growth and consequently emission. First author Alasdair Mackenzie, from the Central Laser Facility at Harwell, commented:



“ We have managed to design a robust approach to generating naturally produced emission from cells at high enough levels, such that we can start to assign where and when the light originates. Hopefully this will allow us in the near future to pin down why the cells have evolved this phenomena. ”

For details of other publications by The Guy Foundation team, including Proceedings and journal papers, visit the [website](#).



Alasdair Mackenzie's mung beans under the photon detector

CELEBRATING THE GURWITSCH CENTENARY – THE 2023 ONION PRIZE



As you know this year marks the centenary of Alexander Gurwitsch's seminal experiment on non-chemical communication between onion roots. To celebrate the centenary The Guy Foundation sponsored a competition aimed at reimagining Gurwitsch's original experiment. We are delighted to announce that the 2023 Onion Prize has been awarded to Dr Nathan Babcock for his fascinating reinterpretation of the findings of the original experiment. We hope you will join us in congratulating him on this achievement and we look forward to hearing Nathan present his work on this in 2024.

In addition to the Onion Prize competition the Foundation donated £5,000 towards the conference '**A Century of Biophotons**', which was held in Stellenbosch, South Africa in November.

DONATION FOR NEW RESEARCH STUDY ON FLUORESCENCE LIGHT ENERGY (FLE)

The Guy Foundation is delighted to announce a new research collaboration between our UK research teams - Jimmy Bell at University of Westminster and Stan Botchway at Central Laser Facility (STFC-UKRI) - and Princeton University's Gregory Scholes, as well as with collaborators at Picchio International, FLE International, FB Dermatology and Dr Giovanni Scapagnini at the University of Molise.

Geoffrey Guy said:

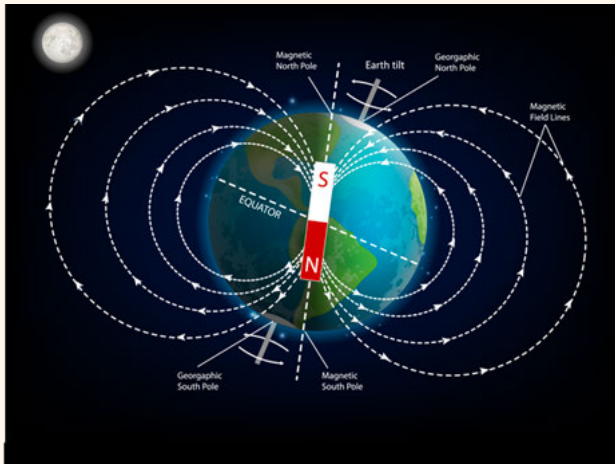
“ We would like to thank Dr Francesco Bellini and the team at Picchio International for their generous donation of £261,709 towards the project costs, which we are teaming with funding and scientific support from The Guy Foundation to create and build this exciting new collaboration. ”

Dr Bellini said:

“ We sincerely look forward to the collaboration with The Guy Foundation and the experienced individuals involved. We genuinely wish great success for this unique endeavour and really look forward to embarking on the project. ”

The 2-year study will aim to understand the mechanism of photonic modulation of metabolism, inflammation and angiogenesis using the proprietary gel-based fluorescence system being advanced by FLE International as a healing technology. With photomodulation being at the core of its function, the Foundation believes this system could serve as a powerful tool in the study of quantum phenomenon in biology and medicine. We look forward to updating you with our progress.

2023 AUTUMN SERIES AND THE SPACE HEALTH PROGRAMME



Earth's magnetic fields

The **2023 Autumn Series on space health** concluded with a vigorous and highly engaging roundtable discussion, where many important and fascinating questions were raised and debated. The lectures in this series led us through from astronaut health, to the more established fields of research

such as radiation and microgravity, to new directions, such as the effects of weak magnetic fields and even a consideration of quantum gravity.

The series built on the success of our **space health symposium** earlier this year and the subsequent establishment of a space health working group to assess important questions around the health of astronauts and the future of space travel using insights from quantum biology. We have published the Proceedings, which are available [here](#), and videos of the presentations are available on our website or The Guy Foundation **YouTube channel**.

We are updating the space health working document with the learnings gained from the Autumn Series and will circulate this to the working group in the New Year. If you are interested in joining the group, please contact Nina Copping n.copping@theguyfoundation.org.

2024 SPRING SERIES ON AGEING

We have already turned our thoughts to the 2024 Spring Series, which will be on the theme of ageing. Confirmed speakers include well known experts Professor Joao Pedro Magalhaes from the University of Birmingham and Dr Ken Raj from Altos Labs Cambridge Institute of Science. Topics will range from classical theories of ageing through to considerations of the insights that quantum biology can bring to this subject.

The Spring Series commences on **Wednesday 6 March** and the closing roundtable will be on **Wednesday 22 May**. See [Dates for your diary](#). We look forward to sharing the programme and calendar invitations with you. If you know of anyone who would also be interested in attending, please ask them to contact Nina Copping to register - n.copping@theguyfoundation.org.

QUANTUM BIOLOGY AND CANCER MEETING

The Guy Foundation was pleased to co-convene a Quantum Biology and Cancer Meeting with Cancer Research Horizons in October, at the Cancer Research UK head office in London and online. The meeting was arranged to explore the possibility that advances made in understanding quantum effects in biology might be successfully applied to cancer research.

The meeting began with a series of short talks that acted as a quantum biology primer. Alistair Nunn and Nathan Babcock provided an overview of quantum biology and an introduction to electromagnetic fields, with reference to cancer. Nick Lane talked

on the importance of metabolic processes such as the Krebs cycle and the balance of energy and biosynthesis in different biological contexts. Payam Gammage's talk presented intriguing evidence that mutations in mitochondrial DNA are a common factor in many cancers. Wendy Beane and Mike Levin's talks identified the need to understand cancer from an electromagnetic perspective. The role of bioelectricity and membrane potential, which is a growing field of interest in regenerative biology, is equally applicable in the context of tumour growth, as are results that demonstrate the influence of magnetic fields on stem cell proliferation.

The afternoon session of the meeting was dedicated to therapeutic modalities. While light has conventionally been contraindicated in the context of cancer, Michael Hamblin demonstrated how photobiomodulation has shown therapeutic potential. Martyn A Sharpe gave a presentation on early work to examine rotating magnetic fields as a treatment for aggressive glioblastoma and Phuoc T Tran spoke on tumour treating fields, a modality that aims to exploit the electromagnetic properties of cells as a means to target tumours.

Geoffrey Guy, Chairman of The Guy Foundation said:

“ Quantum biology is a new area for many scientists. We were very pleased to engage with the Cancer Research Horizons team to present on this topic and discuss how these principles may help progress our understanding and treatment of cancer. Thank you to all the speakers who contributed to this excellent meeting. ”

Steve Wedge, Chief Scientific Officer, Therapeutic Innovation, Cancer Research Horizons said:

“ This was an enjoyable day in which we examined a broad cross-section of research to explore potential relationships between cellular energetics, biological responses and quantum effects. We thank The Guy Foundation for convening an interesting meeting. ”

We look forward to publishing selected information from the meeting on The Guy Foundation [website](#) (Our publications page) in the New Year.



Steve Wedge and Geoffrey Guy at the Quantum Biology and Cancer meeting in October 2023

BOOKS & PAPERS

JOURNAL CLUB

For this issue's journal club, Alistair Nunn and Betony Adams have picked four thought-provoking papers that have been recently published. They all have relevance to our research programme as they link inflammation, mitochondrial function and thus ageing, including cognition. This contributes to our understanding of the underlying accelerated ageing pathophysiology that seems to afflict astronauts. We are of course also thrilled that two experimental papers from our own funded research programme have also been recently published, for details see the [new publications](#) article on pages 5-6.

While the SARS-CoV-2 pandemic appears to have passed its peak, COVID-19 has left many people with the lingering, debilitating symptoms of long COVID, a condition that recalls established post-viral syndromes such as myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) - which may well, as we have speculated, have a significant mitochondrial component. Due to the wide variety of symptoms that may fluctuate over time, conditions such as ME/CFS have proved notoriously difficult to diagnose, causing patient frustration and hindering treatment. Critically, a recent paper published in *Advanced Science* - [Developing a Blood Cell-Based Diagnostic Test for Myalgic Encephalomyelitis/Chronic Fatigue Syndrome Using Peripheral Blood Mononuclear Cells](#) - reports an exciting development in this field of research. The paper documents the development of a new diagnostic test for ME/CFS that utilises Raman spectroscopy and artificial intelligence to

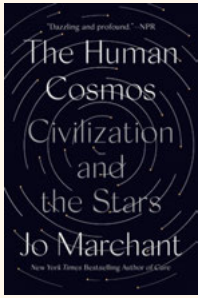
accurately distinguish blood cells from healthy individuals, disease controls, and ME/CFS patients. The test is also able to differentiate between severity of ME/CFS. This could prove a breakthrough for diagnosing similar conditions such as long COVID. For a summary of the results read the [news article](#) here.

The Guy Foundation has long been interested in the role of inflammation in disease and ageing. Quantum biology directly addresses the role that quantum spin may play in inflammatory pathways, through the modulation of reactive oxygen species. As such, it may be of interest that a new paper published in *Nature Molecular Psychiatry* - [Integrative transcriptome- and DNA methylation analysis of brain tissue from the temporal pole in suicide decedents and their controls](#) - further supports emerging data that inflammation “subjugates the brain”, controlling behaviour and thus that inflammation plays an important role in mental health, in particular suicide. The study found that brain tissue from suicide decedents compared to controls showed significant differences in the regulation of genes involved in neuroprotection and inflammation. In addition to this inflammatory dysregulation, pathways linked to neuronal development were suppressed. Excitotoxicity and oligodendrocyte function were also identified in brain samples from suicide decedents. Suicide is an increasing cause of mortality. These results suggest a possible biomarker and therapeutic avenue to identify and mitigate suicidal behaviour.

Inflammation, as it is tightly integrated with ageing, was the subject of another paper - [Reappraisal of the Concept of Accelerated Aging in Neurodegeneration and Beyond](#) - that caught our eye. Published in the journal *Cells*, the paper called for a reappraisal of the concept of accelerated ageing, particularly in the context of

neurodegeneration. Accelerated ageing is the term used to describe a situation in which the biological age of a subject exceeds their chronological age. The authors of this study sought to look more closely at the concept of accelerated ageing in order to determine its strengths and weaknesses. To do this they reviewed a large number of review papers on the physiology of brain ageing and neurodegeneration. Among other insights was the fact that it is difficult to apply accelerated ageing as a blanket concept, due to the fact that organs of different systems age at different rates. The paper concluded that accelerated ageing as a concept requires some updating to overcome its current limitations.

Circadian rhythms, or body clocks, are a growing topic of interest in quantum biology, particularly given the important roles that not only light, but potentially also gravitational oscillations, play in the entrainment of circadian mechanisms. The topic is a relevant one in space research as well, with evidence for the disruption of these clocks in space. There are still many questions regarding exactly how circadian entrainment responds to changes in local environments, although changes in light, feeding patterns, magnetic fields and potentially lunar induced gravitational oscillations, have all been reported to play a role. A recent paper - **Mechanical loading and hyperosmolarity as a daily resetting cue for skeletal circadian clocks** - in *Nature Communications* adds mechanical loading and hyperosmolarity as tissue niche-dependent physiological time cues, in particular for skeletal circadian clocks. Circadian rhythms have been shown to be disrupted in astronauts, this research offers an additional explanation for how conditions beyond earth translate into disrupted circadian cues.



Book corner

For this issue's book corner, Betony Adams has written a review of *The Human Cosmos: Civilization and the Stars*, published in 2020.

THE HUMAN COSMOS: CIVILIZATION AND THE STARS, BY JO MARCHANT

In *The Human Cosmos: Civilization and the Stars*, author Jo Marchant reflects, among other things, on the evolution and controversy of the field of chronobiology, as indicated above in the paper on circadian rhythms. Indeed, the term that has come to represent this area of research – circadian, meaning “about a day” – was first coined as an oblique insult aimed at the US biologist Frank Brown, who had rocked the field by suggesting that our internal clocks are in fact coupled to environmental cues, including gravitational fields. Marchant goes on to write:

“The disagreement reflected a deeper, philosophical split regarding the relationship that living creatures have with our planet and the wider cosmos. Are we autonomous, self-running machines, or is life in constant, subtle communication with the Earth, sun, moon, and even stars?”

Circadian rhythms are fundamentally important to the proper function of biological systems and human physiology. They can change how we respond to infection or medicine. Indeed, there is some evidence that the month in which we are born may affect our risk of diseases such as dementia, multiple sclerosis and schizophrenia. As we enter an era in which it is possible, for the first time in human history, to conceive of travelling to and settling on

other planets, we need reminding that we are intimately coupled to the rhythms and conditions of the environment in which we evolved: the Earth. Marchant's book eloquently describes the many ways in which this coupling unfolds, physiologically but also in our systems of meaning, the monuments and artworks that mark us out as uniquely human. We have looked towards – and wondered about – the sun and stars since we first began to question our place in the cosmos.

This reminder seems very timely in light of The Guy Foundation's space health programme, which aims to tease out exactly how biology has adapted to its terrestrial environment and what this may mean for future space travel and settlement. Alongside the sense of wonder that these new horizons elicit are a number of critical questions that remain to be answered.

CONFERENCES & MEETINGS

The Guy Foundation website includes a page dedicated to quantum biology related conferences and meetings, both online and in person. For more information [see our website](#).

A CENTURY OF BIOPHOTONS CONFERENCE REPORT



The Century of Biophotons conference took place in Stellenbosch, South Africa, from 19 – 22 November 2023. The conference, funded by the [National Institute of Theoretical and Computational Sciences \(NITheCS\)](#) and The Guy Foundation, was hosted by Francesco Petruccione and Adriana Marais from Stellenbosch University.



Back row: Ilya Volodyaev, Rhys Mould, Alasdair Mackenzie, Vahid Salari, Betony Adams, Abbas Hassasfar, Yaseera Ismael, Tjaart Krüger.

Front row: Masaki Kobayashi, Adriana Marais, Pavel Pospíšil, Eduard van Wijk.

It was remarkable to have the pioneers of the biophoton research field together to mark the centenary of Alexander Gurwitsch's first observation of non-chemical communication and his hypothesis that light was involved in this signalling. Indeed, the conference was attended by Ilya Volodyaev, the PhD student of Gurwitsch's grandson, Lev V Belousov. Ilya is also the current custodian of Gurwitsch's archive. In addition to this sense of history, the conference showcased just how rigorous experimental biophoton research needs to be in order to rule out other light-matter interactions such as delayed luminescence.

In addition to the donation of £5,000 towards the conference costs, The Guy Foundation had two research team members, Rhys Mould and Alasdair Mackenzie, attend and present their research. Rhys commented that:

“ While the conference deepened my understanding of the mechanisms, detection, and roles of biophotons, the true value for me was in meeting and forming connections with established biophoton researchers, whose life's work we have studied, referenced, and used in our research. I feel that our team and our work have been welcomed into the fold, and a new feeling of community in biophoton researchers will enable and facilitate some exciting collaborations. ”



Rhys Mould, Alasdair Mackenzie and Betony Adams in Stellenbosch

The lectures will be available on the [NITheCS website](#) as soon as they are edited. In the meantime you can watch an introduction to the subject by conference organiser [Adriana Marais](#). The aim of the meeting was to produce a review article co-authored by the attendees and based on the lively discussion at the workshop. This review will hopefully contribute to increased research interest in the field of biophotons, including the physical properties of biophotons, their role in biological regulation, as well as applications in medical therapy and diagnosis. Adriana concluded:

“ We were delighted to host the world's leading experts on the topic of biophotons in Stellenbosch in November, and would like to thank both NITheCS and The Guy Foundation for making this historical event possible. ”



A Century of Biophotons conference dinner

QUANTUM EFFECTS AND MEASUREMENT TECHNIQUES, JANUARY 2024

The Quantum Effects and Measurement Techniques in Biology and Biophotonics conference will take place from **27 January - 1 February 2024** in San Francisco, California. This SPIE Photonics West conference will be co-chaired by Clarice Aiello. For more information visit the [website](#).

APS MEETING, MARCH 2024



Next year marks the first time there will be a dedicated Quantum Biology Focus Session at this cornerstone conference for physicists, attended by 13,000 researchers and students from across the world.

This session will be organised by Clarice Aiello and Christoph Simon, with assistance from Betony Adams. The in-person meeting will take place in Minneapolis in **March 2024**; for more details, visit the [website](#). The meeting is now closed for abstract submission.

MITOX CONFERENCE, APRIL 2024

Next year's MitOX conference, organised by Karl Morten and colleagues at the Nuffield Department of Women's & Reproductive Health, will take place on **12th April 2024** in Oxford and online. Details will be available [here](#).

SQUABLS CONFERENCE, DECEMBER 2024

The Symposium on Quantum Applications in Biology and the Life Sciences - SQUABLS24 - will take place on San Cristóbal Island, Galápagos, Ecuador from **2-8 December 2024**. This will be the first edition of the conference, in a location that is synonymous with the generation of new ideas in the biological sciences. The conference aims to provide an overview of current research in quantum biology, showcasing the work of established scientists as well as students, while fostering communication and collaboration.

While more established topics in the field – such as photosynthesis, magnetoreception and enzyme function – will be well represented, the conference topics include more speculative subjects such as consciousness and evolution. For more information visit the [website](#).

QUANTUM BIOLAB MEETINGS

Philip Kurian's group, The Quantum Biology Laboratory (QBL) at Howard University, organises a number of interesting online lectures in the quantum sciences. The talks range from the intricacies of quantum theory, such as the quantum measurement problem and Wigner's friend thought experiments, to the possibilities of quantum biocomputing with slime molds. To watch recordings of past talks, visit the [QBL website](#) and to sign up for future events, write to quantumbiolab@howard.edu with your name, affiliation, and interest. The QBL also organises fascinating lectures on the topic of [decolonising knowledge](#) and what this means for the future of scientific and technological research.

BIG QUANTUM MEETINGS

The Big Quantum weekly online meetings jointly organised by the Leverhulme Quantum Biology Doctoral College Training Centre (QB-DTC) and the Quantum Biology Tech (QuBiT) Lab at UCLA continue to provide an excellent forum for the QB community to come together. The current programme runs until 29 February. Details are available [here](#) and we have listed forthcoming sessions in '[Dates for your diary](#)'.

QIS AND QUANTUM SENSING IN BIOLOGY INTEREST GROUP

The NIH's QIS and Quantum Sensing in Biology Interest Group meets regularly, with the latest talk given by Wendy Beane, Western Michigan University on "Investigating Stem Cells as Quantum Sensors" earlier this week. To see details of forthcoming meetings visit the [website](#).

DATES FOR YOUR DIARY



THE GUY FOUNDATION

2024 SPRING SERIES

Session 1

Wednesday 6 March 2024

Professor Joao Pedro Magalhaes

University of Birmingham

Session 2

Wednesday 20 March 2024

Dr Ken Raj

Altos Labs Cambridge Institute of Science

Session 3

Wednesday 24 April 2024

TBC

Session 4

Wednesday 8 May 2024

TBC

Session 5

Wednesday 22 May 2024

Professor Alistair Nunn

The Guy Foundation

followed by roundtable discussion

All sessions 15:00hrs – 17:00hrs UK-time on Zoom
Please contact n.copping@theguyfoundation.org to register

**BIG QUANTUM BIOLOGY MEETINGS
HOSTED BY UCLA AND UNIVERSITY OF SURREY**

14 Dec Electron tunnelling in ferritin and associated biosystems
Ismael Díez-Pérez and **Chris Rourk**, King's College London and citizen scientist

2024 DATES

4 Jan Biological separation of rare Earth elements for energy technologies

Buz Barstow, Cornell University

11 Jan The modelling of the mechanisms through which proteins sense and respond to light

Benedetta Mennucci, University of Pisa

18 Jan From chrono- to quantum biology: about cellular clocks, hypoxia and spins

Margit Egg, University of Innsbruck

25 Jan TBC

Ashok Ajoy, University of California, Berkeley

1 Feb Revealing mechanism of DNA loop extrusion by structural maintenance of chromosomes (SMC) motor proteins

Eugene Kim, Max Planck Institute of Biophysics

8 Feb Studies of local conformations, conformational disorder and dynamics of excitonically-coupled (iCy3)₂ dimer-labeled DNA constructs at and near functional binding sites for proteins that drive genome expression

Andy Marcus, University of Oregon

15 Feb TBC

Libai Hwang, Purdue University

22 Feb Deciphering the vibrational structure of biomolecules in photosynthetic systems toward quantum bio-inspired photosynthesis

Keisuke Goda, University of Tokyo

29 Feb Electron tunneling in photosynthesis: How the electron chooses its way

Marilyn Gunner, City University of New York

See the Big Quantum meetings [website](#) for the Zoom details

JOB OPPORTUNITIES

JOB TITLE: SENIOR POSTDOCTORAL FELLOW IN QUANTUM BIOLOGY

Location: [Wake Forest Institute for Regenerative Medicine](#), Winston Salem, NC, USA

This is a full-time job for a postdoctoral fellow who is expected to contribute to the development of a new quantum biology laboratory. The postdoctoral fellow is expected to develop procedures and techniques using a variety of physical, chemical, or biological tests.

Minimum acceptable qualifications: PhD and 1-2 years of post-doc research experience in quantum biology with specialisation in medical physics, cellular biology, biochemistry, or chemical engineering. Inquiries should be addressed to Dr G. Almeida-Porada galmeida@wakehealth.edu.

OTHER OPPORTUNITIES

Two recently established quantum biology groups are also looking to hire. For more details see Aarat Kalra's group [The Protein Electronics Research Group](#), based at the Centre for Biomedical Engineering, Indian Institute of Technology, Delhi and Onur Pusuluk's group [q-Delocalized Information Systems & Correlated Dynamics \(q-DISCorD\)](#). To read more about these groups see our Community News below.

COMMUNITY NEWS

EXPANDING NETWORKS

For our Community News we thought it would be interesting to look at where the quantum biology community is expanding to, having heard from several new groups. To view a list of quantum biology research groups around the world, see our [website](#). If your centre isn't listed, please let us know and we will add your details.

INDIA

The Guy Foundation was pleased to read about Aarat Kalra's new group. We first encountered Aarat through his pioneering work on [microtubules](#), a subject of much interest to the Foundation. Aarat



Aarat Kalra in the laboratory. Photograph by C. Todd Reichart, reproduced from the group website with permission.

was a postdoctoral researcher in the Department of Chemistry at Princeton University in the research group of Gregory Scholes and has published with a number of high-profile quantum biology researchers such as Sir Roger Penrose. Aarat now has his own group, [The](#)

[Protein Electronics Research Group](#), based at the Centre for Biomedical Engineering, Indian Institute of Technology, Delhi. The group aims to build a precise map to understand how electric and magnetic fields interact with biological cells, with an emphasis on

proteins. Their experimental expertise includes techniques from impedance spectroscopy, in vitro biochemistry and microscopy. They are also aiming to leverage this expertise towards optimising therapeutics based on electromagnetic stimuli. Aarat's research has also been featured in the scientific magazine *The New Scientist*, read the article [here](#).

TURKEY

Onur Pusuluk has recently established a new research group at Kadir Has University, a boutique institution in Istanbul. To read more about the q-Delocalized Information Systems & Correlated Dynamics (q-DISCorD) Team see their [website](#). The group is active in the fields of quantum biology, quantum thermodynamics, and quantum information, and their intersections. In addition to their strong theoretical background, the group shares a research laboratory with Göker Arpağ and his [group](#). To read some of Onur's recent quantum biology research, see the preprint [Boosting Biomolecular Switch Efficiency With Quantum Coherence](#) which investigates quantum correlations in photoisomerization, which plays a role in vision. It is really exciting to see the expansion of the quantum biology community and the group looks forward to the possibility of future conferences hosted in Turkey.



Onur Pusuluk (second from left) with members of the group.
Image reproduced with permission from the website

SWEDEN

Sweden has a new **Quantum Life Science Centre**. Based at the **Karolinska Institutet, Department of Clinical Neuroscience** the centre includes a consortium consisting of individuals/patients, academia, healthcare, and industry, with representatives from the Wallenberg Center for Quantum Technology, AstraZeneca, IBM, Karolinska Institutet, SAS Institute and Swelife. Their website expresses an interest in quantum sensing and computing solutions with the hope of achieving “more information at better detail, in near real-time”. These precision technologies can then inform bioimaging as well as future health applications. The QLS Centre aims to be a base for national and Nordic collaboration in the Quantum Life Sciences, to promote and accelerate the future development and application of the field.

We hope you've enjoyed this edition of the newsletter. If you have some news that you'd like to share, comments on the newsletter or would like to unsubscribe, please email n.copping@theguyfoundation.org



Frodo, the Foundation's faithful friend enjoying the frost.
Snow at Chedington Court.



We wish you a happy, healthy and peaceful holiday season
and we look forward to seeing you in the New Year
The Guy Foundation team

www.theguyfoundation.org



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