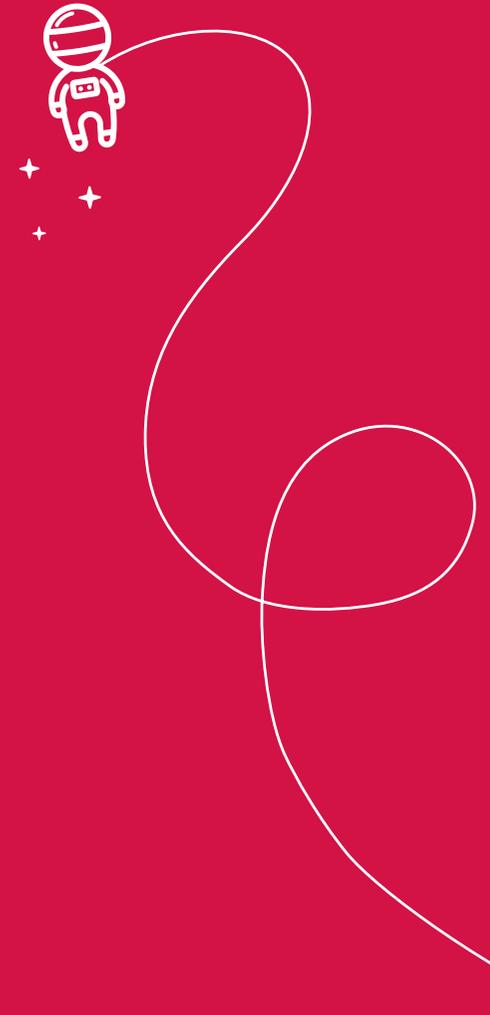


# SUMMER SCIENCE

EXHIBITION

EXHIBITOR CASE STUDIES



# The Summer Science Exhibition is a fantastic opportunity for early career researchers

## THE MATHEMATICS OF CANCER

Dr Paul Sweeney, University of Cambridge



“It is a really good experience and I think it’ll definitely stand you out of the crowd when it comes to applying for highly competitive funding.”

Dr Paul Sweeney, University of Cambridge

The mathematics of cancer exhibit gave Summer Science Exhibition visitors insight into the complex structure of tumours, which was brought to life through games and 3D imagery. The underlying research combines medical imaging and computation to generate 3D models of tumours, which enable further study and research to improve drug delivery in cancerous tumours.

Taking part in the Royal Society’s Summer Science Exhibition was instrumental in Dr Paul Sweeney’s career progression and personal development, and in particular, played a significant role in securing a recent fellowship at the University of Cambridge. “The Exhibition is a massive undertaking but also a massive opportunity”, particularly for early career researchers like Dr Sweeney. It gives researchers a valuable chance to gain a number of admin skills, which are typically not encountered in a research environment, such as project management, leadership, contingency planning and fundraising.

The Summer Science Exhibition is highly selective and Dr Sweeney thinks this “can only be of benefit to future grant or fellowship applications.” The experience is advantageous evidence of a successful proposal as well as a highly sought-after public engagement experience. “It is a really good experience and I think it’ll definitely stand you out of the crowd when it comes to applying for highly competitive funding” added Dr Sweeney.

The Mathematics of Cancer exhibit was developed and run by a team of mathematicians, physicists, biologists and engineers, many of whom were post-doctoral researchers or PhD students. “I think the event really highlighted the importance of public engagement in science for them, and sparked enthusiasm for them to do this sort of thing again in the future, whether it be volunteering to help with other people’s exhibits or applying themselves!” said Dr Sweeney.

“I think the unique thing about the Summer Science Exhibition is the sheer diversity of people that you talk to. During the day you could be talking to teenagers on a school visit and then, later that evening, be talking to Fellows of the Royal Society.” Dr Sweeney particularly enjoyed the Soirée evenings as they were a “fantastic opportunity to network with distinguished academics and other guests at the pinnacle of their careers.” Dr Sweeney thinks that the diversity of visitors to the exhibition requires you to learn how to pitch your research at a wide variety of levels very quickly, and added that this “certainly keeps you on your toes and is what makes the Summer Science Exhibition so exciting!”

# The Summer Science Exhibition is a unique event

## ART OF ISOLATION

Dr Ben Robinson and Professor Rob Young, Lancaster University



Dr Ben Robinson and Professor Rob Young are part of a team from Lancaster University who have exhibited at the Summer Science Exhibition in multiple years. Their most recent exhibit, the Art of Isolation, demonstrated how some of the most sensitive experiments in the world are performed and gave visitors the chance to explore aspects of quantum mechanics and nanotechnology.

The Exhibition is a great opportunity for self-development and personal growth, and results in longlasting benefits for the whole Exhibition team. Both Dr Robinson and Professor Young have noticed a difference in their approach to outreach events – “I wouldn’t be able to do any of the other outreach that I do now anywhere near as well, without applying everything that we got from the Summer Science Exhibition” said Dr Robinson. The team also involved a number of undergraduate volunteers, as well as PhD students, who “benefited a huge amount, especially in learning how to distil down a scientific message into its key points and explain it in a general way which anybody can understand,” added Professor Young. “I think that will be reflected in the way they write papers, their theses and ultimately, one day, fellowship and grant applications.

Both were incredibly grateful for the level of support they received from the exhibition team throughout the process and highlighted how this makes the Exhibition stand out from other events.

“[The Royal Society team] want us to do the best job that we can do and we get so much support and so much encouragement that it’s a real pleasure to do it” said Dr Robinson. “I don’t think we’d have had the success that we’ve had from these events, and gotten what we have, from these events without that support and training.”

Over the years, the team have had input from a number of industrial partners, which included loans of demonstration materials and equipment, resulting in highly engaging displays but their industry colleagues were also keen to get involved during the Exhibition week. Dr Robinson added that having industrial collaborators really helps you emphasise the impact of your cutting-edge research in people’s daily lives.

The Exhibition is a fantastic opportunity to share your research with a massive audience through the media. Over the years, the exhibition has led to a range of press opportunities for Dr Robinson and Professor Young, including interviews on BBC Breakfast, Sky News and BBC Radio 4, all of which wouldn’t have been possible without the Royal Society press team. Professor Young added that “the ability to reach over a million people with one article or interview and to influence and inform that many people is very special, you don’t get that coming along often.”

# The Summer Science Exhibition strengthens interdisciplinary collaborations

## TIMBER TOWERS OF TOMORROW

Professor Michael Ramage, University of Cambridge



“[Being able to understand the multifunctionality of wood from] not just an engineering properties or architectural application perspective, but how a biologist or plant scientist looks at it has been really valuable.”

Professor Michael Ramage,  
University of Cambridge

Professor Michael Ramage and his team exhibited their research on the development of sustainable wood-based alternatives for building at the Summer Science Exhibition in 2019. Visitors explored the science behind timber buildings at the cellular level and the engineering involved in designing and building the timber skyscrapers of the future.

The research began as a collaboration between the departments of architecture and chemistry, but quickly grew and expanded to culminate in the Exhibition team comprising architects, engineers, biochemists, chemists, physicists, plant scientists, mathematicians and materials scientists. Professor Ramage admitted that working across such a broad range of subjects did prove challenging to begin with, as it took a while for the team to find a “common language.” However, he added that the experience has been highly beneficial as it has enabled “a much better understanding of how other disciplines proceed in their research” and being able to understand the multifunctionality of wood from “not just an engineering properties or architectural application perspective, but how a biologist or plant scientist looks at it has been really valuable.” This has proved a long-term benefit since the Exhibition and enabled more effective collaboration across his research team.

The team had existing collaborations with practising architects and engineers from firms based in London and Chicago, and these partners were also involved in the Exhibition. These collaborations were crucial, not only in their kind donations of architectural models and building materials (wood, of course!), but in providing valuable feedback during the exhibit design process and volunteering architects to take part during the Exhibition week.

Professor Ramage was encouraged in his research by “how receptive members of the public were to very largescale timber buildings” and remembers being asked a host of great questions by visitors. He noted that “everybody [on the team], myself included, got tremendous experience and benefits out of interacting with interested, non-specialist members of the public and school students. We all really enjoyed that and I think we’re all probably better at engaging with people now.”

The training provided by the Royal Society was extremely valuable for the Timber Towers of Tomorrow team, and Professor Ramage felt that the process of sharing the training outcomes with his wider team worked very well in preparing everyone for the Exhibition. He praised the support from the Royal Society team in that “anything and everything we had questions about, somebody was ready to help – even if there wasn’t an answer, there was help with how to get an answer.”

# The Summer Science Exhibition is an investment for future engagement events

## TAKE A BITE OUT OF CLIMATE CHANGE

Professor Sarah Bridle, University of Manchester



“There’s an incredible buzz and so many lightbulb moments [from the visitors] that give you a huge sense of achievement, and really makes you feel like you’re doing something useful.”

Professor Sarah Bridle,  
University of Manchester

Professor Sarah Bridle is an astrophysicist working on cosmology and, more recently, has become interested in how we can reduce greenhouse gas emissions from our food choices. Her exhibit at the Summer Science Exhibition in 2019 covered areas such as food production, processing and consumer choices and highlighted examples of innovations which improve sustainability in these areas. Being relatively new to the topic, one beneficial outcome of the experience for Professor Bridle was to create a network across the UK and foster “team spirit which has continued to this day.”

The effort that the team put into developing their exhibit materials and resources for the Summer Science Exhibition has proved to be a great investment for other events. A key member of their team, Dr Alana Kluczkovski, recently took some of the models, tools and materials she had developed for the Exhibition to Bahia in eastern Brazil and delivered a series of workshops to teachers, in order to support an ongoing sustainable school meals project. The data and materials, previously compiled for the Exhibition, had great impact in demonstrating how the schools’ efforts could help reduce climate change, and are thought to have reached over 30,000 students. The team have also employed their materials from the Summer Science Exhibition at a wealth of other events, schools and workshops around the UK as well as in Myanmar, The Gambia and India.

Professor Bridle has recently written a book on her work, aimed at informing the public about how food and diet choices can impact climate change. A number of the topics which form part of her book were also key messages of the *Take a bite out of climate change* exhibit and the experience of explaining these concepts to a wide-ranging audience at the Exhibition was really helpful in her writing. The Exhibition enabled her to work out the existing level of understanding amongst the public as well as getting a sense of which facts people find most interesting and how best to explain the underlying scientific concepts. Professor Bridle added that she made several valuable contacts during the Exhibition and Soirée evenings who were highly enthusiastic about her research and the book, and later, kindly wrote some fantastic book endorsements for her.

Professor Bridle was first invited to the Summer Science Exhibition as a Royal Society University Research Fellow, and was so in awe that she has wanted to take part ever since. “It’s a lot of work but it’s a week you’re never going to forget! There’s an incredible buzz and so many lightbulb moments [from the visitors] that give you a huge sense of achievement, and really makes you feel like you’re doing something useful.”

# The Summer Science Exhibition is a great team building opportunity

## LIGHTING THE BRAIN AFTER BIRTH

Dr Ilias Tachtsidis, University College London



“[The nurses] really feel engaged and involved with the research, rather than [feeling as if they were acting] in a supportive role.”

Dr Ilias Tachtsidis,  
University College London

Dr Ilias Tachtsidis leads a team of engineers, scientists and clinical staff in the research and development of a novel light-based techniques to enable cot-side diagnosis and monitoring of brain injury in newborn babies. In 2019, he set up a mock neonatal intensive care unit at the Summer Science Exhibition to demonstrate this technology and its importance in the treatment of premature babies to the public.

Dr Tachtsidis’ research depends heavily on a team of clinicians at University College Hospital and he was very keen to involve these colleagues in the Exhibition, alongside the physicists and engineers who developed the technology. He believes that giving visitors the chance to engage with doctors and nurses as well as scientific researchers during the Exhibition brought a unique element to his exhibit.

Dr Tachtsidis thinks that the Exhibition provides a great opportunity for team building, and especially for his interdisciplinary team, as it provided a rare chance to all come together and work in one environment, as in their day-to-day research, the team are split between the hospital and their labs on the UCL campus. The group really enjoyed the experience and “it was very important for the research and the whole team.”

Dr Tachtsidis added that the Exhibition was a valuable extracurricular and professional development opportunity for the clinical staff involved in his research, and, in particular, gave the nurses a chance to “really feel engaged and involved with the research, rather than [feeling as if they were acting] in a supportive role.” He also felt it was very important that the younger generation, namely his PhD students, were heavily involved in delivering the exhibit and he encouraged them to take the lead in engaging with the visitors during Exhibition week.

Taking part in the Summer Science Exhibition was the pinnacle of a larger public engagement project for Dr Tachtsidis and his team, one which they built up to. However, Dr Tachtsidis believes that the central London location and breadth of the audience really sets the Summer Science Exhibition apart from the other events he took part in. Through this experience, he learnt that you have to be “very flexible to address all the different age groups and backgrounds [of the visitors].”

Dr Tachtsidis feels that the press coverage he received around the Exhibition has helped a lot more people understand what his research is setting out to achieve. If you are considering submitting a proposal, he concluded that the Summer Science Exhibition is an “excellent event to build the dynamics of your team, to make your team stronger and, importantly, to expose your research.”



The Royal Society is a self-governing Fellowship of many of the world's most distinguished scientists drawn from all areas of science, engineering, and medicine. The Society's fundamental purpose, as it has been since its foundation in 1660, is to recognise, promote, and support excellence in science and to encourage the development and use of science for the benefit of humanity.

The Society's strategic priorities emphasise its commitment to the highest quality science, to curiosity-driven research, and to the development and use of science for the benefit of society. These priorities are:

- Promoting excellence in science
- Supporting international collaboration
- Demonstrating the importance of science to everyone

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