GERF 2025

1851der Tent report

BIG IDEAS

Introduction

Over the weekend of Saturday 7 and Sunday 8 June 2025, 55,000 visitors attended The Great Exhibition Road Festival (GERF).

This year the 1851der Tent was situated outside the Imperial City and Guilds Building on Great Exhibition Road pulling in visitors all weekend. Co-curated by the Royal Commission award holders and Big Ideas, the tent housed three interactive exhibits:

- **Rube Goldberg** - a celebration of design with *Lucy Tam*
- **Lungy** - a breathing visualisation product with *Luke Hale*
- **'Quantum Corner'** - marking the International Year of Quantum in 2025 with *Freya Johnson* and *Giulia Rubino*

Christmas Workshop

On Wednesday 11th December, Big Ideas hosted an introductory workshop ahead of the 1851 Christmas Drinks Reception for all of the attending Fellows, introducing them to the 1851der Tent and the opportunities to participate in public engagement in the next six months.

Some fellows already knew they wanted to exhibit at GERF and had ideas to discuss with the team, for others the presentation from Big Ideas provided a basis for idea generation - selected responses demonstrate the creativity of participants -

Phosphorescent peanut butter

Maybe use bubbles or something else kid friendly

Maybe something about DNA sequencing and the double helix

Using a "machine" cause and effect with marbles and gravity

How do you explain something you can not see? Quantum is only quantum until you look at it!

Fellows completed a short survey provided by Big Ideas, expressing an interest in participating in public engagement activities over the next few months, in schools and at GERF. Half later volunteered in the 1851der Tent as a volunteer or exhibitor.

1851der Preparation

In the following months, Big Ideas worked with Fellows to choose the three exhibits which would be showcased in the 1851der Tent at GERF 2025.

A combination of Zoom and in person meetings with each exhibit team were held to keep projects on track during a busy time for the Fellows. Tailoring the type of meeting and regularity of sessions was important for each exhibiting team.

The development of signage for the 1851der Tent required input from the Fellows. Information about the product design of Lungy, or the scientific language linked to Quantum Physics was essential when generating text to support each of the exhibits. The Fellows were proactive providing Big Ideas with copy and support digesting the content for the general public.

1851der at the Great Exhibition Road Festival

The 1851der Tent was busy throughout the two days of the festival. Each interactive exhibit was hosted by 1851 Fellows who spoke knowledgeably about their research and gave further insight to the general public on their speciality.

The Fellows who exhibited and volunteered this year were exceptional at public engagement, warmly welcoming members of the public and adjusting their level of explanation for the audience they were interacting with. All 1851 volunteers were enthusiastic, engaging and approachable making the tent welcoming and exciting.

Quantum Corner

How do you explain something you cannot see?

Fellows Freya Johnson and Giulia Rubino worked together to devise the design for this exhibit. Freya and Giulia are working with quantum technology to drive the development of quantum computers. The 'buzzwire' game idea was translated the complex world of quantum into a tangible exhibit that was accessible for the public and an opportunity to interact and start a quantum conversation.

When we 'look' at quantum, or try to measure it in any way, it stops being quantum altogether and behaves like a 'classical' system. Which begs the questions - how do you explain something that you cannot observe?

Visitors were tasked with sending a 'quantum signal' down the wire using the wand, if they touched the wire then the buzzer would sound and the 'quantum signal' would be lost. To make this even more challenging, visitors could wear a special pair of glasses that were opaque, making the game extremely difficult. Only when the wire was touched and the buzzer sounded would the glasses become transparent - allowing the player to 'see' the wire, but losing the quantum signal.

1851 Fellow Freya has taken the Quantum Buzzwire to use for future public engagement activities.

"I will definitely be using the quantum game for outreach again."

Jacob Wellsbury, 1851 Fellow Alumni, worked with Gilia, Freya and Big Ideas to take the Quantum Buzzwire off the page and into reality. Having previously built the TrAPs Pinball Machine used at GERF 2023, Jacob understood how robust the game needed to be to withstand a weekend of activity.

To engage younger audiences, a less complex and less delicate buzzwire game was hired for the weekend. Hiring the game for the weekend generated the least waste, making the tent more environmentally friendly, an important consideration for all parties [GERF, the Royal Commission and Big Ideas].

A visitor from CERN told us that the signage written for younger visitors was the clearest explanation of quantum that they had read, and commented that it should be displayed at CERN.

Lungy

Dr Luke Hale brought Lungy to the tent this year, a product that he has been developing throughout his 1851 Fellowship. Lungy is an app that can be used to reduce stress and anxiety. The app takes users through daily breathing exercises supporting the user to control their breathing, using your smartphone's microphone to recognise and respond to your breathing to produce real-time audio and visuals. The visualisation of breath in Lungy appears as a tiny collection of molecules breaking apart, or fabric blowing in the wind.

Luke is currently developing Lungy as an app for asthma, supported by the National Institute of Health Research and Asthma + Lung UK.

Using a combination of iPads and reconditioned iPhones, visitors were able to 'see' their breath on the many screens. Stands were provided so visitors didn't handle the devices, which were wiped down with antibacterial wipes throughout the weekend.

Visitors were interested to see a product that was about to be brought to market. Adapting this exhibit from its practical delivery to become an exhibit was a smooth translation. Luke was able to create special stands for the festival weekend which he will use moving forwards in future public engagement events.

Rube Goldberg Machine

Several Fellows put forward the suggestion of building a 'Rube Goldberg' machine at the pre-Christmas Workshop. Rube Goldberg was an American designer, engineer and cartoonist who became famous for his humorous and absurd drawings of machines which completed simple, everyday tasks in complicated and convoluted ways - in the spirit of Heath Robinson!

A group of IDE students led by Lucy Tam worked together to create this exhibit. The students chose to create the machine out of found objects and recyclable materials to reduce the amount of waste created by this exhibit. The intricate design combined contributions from many different students, showcase a love to design and a celebration of play.

The exhibit was a hit with the general public, engaging young and old in the chain reaction. Lucy and the team added in elements of interaction, for example, where a visitor needed to wave their hand over a sensor. The visitors really enjoyed these interactive elements of the exhibit and being able to contribute to the complex Rube Goldberg machine.

Activity Table

In previous years, the children's table in the 1851der tent has centred on colouring. Visitors have coloured in a template to be used in an interactive exhibit, or drawn themselves as an engineer/ scientist of the future. This year, to tie in with the Rube Goldberg Machine, visitors were invited to become engineers and design their very own chain reaction machine. A variety of resources were placed on the tables for visitors to use - creating some wonderful inventions, both large and small. Some visitors were engrossed in the activity for large periods of time.

"We have these sorts of things at home! It's great that we can continue with this activity using things around the house."

The Royal Commission and Big Ideas agreed that an activity table was more engaging that a colouring table and that this should be considered in future years of GERF. Having 1851 Fellows on hand who were excellent engineers/designers made the table even more engaging - Fellows shared their expertise and ideas with the visitors creating an exciting atmosphere.

New This Year

Printed Brochures

For the first time, printed brochures were handed out to visitors to the 1851der Tent. These brochures mirrored the information featured on the banners in the 1851der Tent which can be obscured due to the high number of people on the 1851der Tent over the festival weekend. The brochures were a useful tool to welcome visitors into the 1851der Tent and to give to people who were passing the tent to tempt them back in later on.

The inside spread showcased the 1851 Fellows who were volunteering in the 1851der Tent over the weekend. Each fellow provided a short bio and a 'Talk to me about...' sentence inviting the general public to talk to them about their specialism.

On the back page were some activities for children, including a list of tasks to complete around the tent and a wordsearch. The tasks were devised with Angela Kenney of the Royal Commission to encourage visitors to explore all of the exhibits and engage with the Fellows in the tent.

T-Shirt Tick Boxes

Everyone volunteering in the tent over the weekend was given a t-shirt to identify them to the public. This year, the 1851 Fellows had different t-shirts to set them apart from the Big Ideas staff as scientists, engineers, designers and researchers. Fellows ticked boxes on the back of their t-shirts relevant to their area of study / research so the general public could approach them to ask questions about specific fields.

Feedback from Public

The 1851der Tent has been in the same spot on Great Exhibition Road for 5 years and has retained an audience that comes back year after year.

> "Returned having visited in previous years, always find it interesting and interactive"

One child came back to the festival wearing badges she was given in the tent last year.

The exhibiting Fellows and volunteers who facilitated the 1851der Tent this year were of an extremely high standard. Visitors to the tent mentioned how brilliant the staff in the tent were:

"Very nice people running the stall, my son had great time there thank you"

One parent mentioned that his primary school aged son was doing a presentation on Quantum in school in the coming week. The father and son spoke at length with Giulia discussing Quantum, valuing the expertise available in the tent and being able to engage with a Quantum Physicist.

A group of D/deaf visitors who had attended an interpreted show inside Imperial dropped into the 1851der Tent on Sunday. A member of the Big Ideas team has BSL Level 4 and was able to explain the activities and exhibits in the tent to the visitors. The parents really appreciated that their children could access guidance for activities through sign language, not just reading the signage.

Feedback from Fellows

Fellows were asked for feedback about their experiences volunteering at GERF, three case studies can be found below.

Gareth Hart | Industrial Fellowship, Volunteer

Volunteering at the Great Exhibition Road Festival was a real joy. The Big Ideas team brought a great deal of energy and enthusiasm and this was welcomed by tent visitors and Fellows alike. From my observations, all visitors to the tent left with a smile and learned something new about science or engineering.

Being present at the Festival as a volunteer for the first time sparked ideas and conversations on how to showcase my own research at the Festival next year: big bubbles to represent the formation of gases from the reaction of water with the electrocatalysts that I make in the lab! I am looking forward to volunteering again and being even more actively involved with the planning this time!

Freya Johnson | 2025 Fellowship, Exhibitor

Volunteering at the festival was fantastic, I thought it was very rewarding to explain my research and the world of quantum to a diverse audience. I felt like I gained a lot from the experience. Last year I was volunteering on a stand that wasn't anything to do with my research, so I found it more exciting this year as I was more invested and could think of more topics to discuss and ways to explain.

The quantum steady hand game and the posters are my physical takeaways and I will definitely be using them again, and encouraging others to take part in the exhibition road festival.

Zayna Ahmed | Industrial Design Studentship, Volunteer

I really enjoyed working in the tent. I love working with kids... I think it's always fulfilling doing creative things with kids. Especially when we used really simple materials that are easy to replicate at home. I like how the parents saw how engaged their kids were with such a simple but challenging activity.

I always find it really interesting talking to parents at these kinds of events. I think parents are more aware of the wide variety of new subjects and opportunities that are available for young people these days so many of them are very open-minded when looking at something like design engineering.

Reflections

Activity table is more engaging than a colouring table

Recommendation: Invite a group of IDE students to design and run the activity table at GERF next year. With their enthusiasm and expertise they can run an engaging activity playing to the strengths of the Fellows.

Tick boxes on T-Shirts are a good conversation starter

Recommendation: Continue with this design next year. Big Ideas staff to reuse t-shirts from 2025 to be environmentally friendly.

Roadside exhibit drew visitors into the tent

Recommendation: Have an eye-catching exhibit on the street to draw visitors into the tent - Gareth Hart is keen to exhibit at the festival next year including bubbles in his exhibit - a brilliant draw for young people and families. For the 175th special anniversary we are also looking at bringing the 3D printed Crystal Palace back onto the street.

Exhibit research and products going to market to show breadth of the work of the Royal Commission

Recommendation: Reflect the priorities of 1851RC awards by focusing areas of the 1851der Tent on Research, Product Development (Industrial Fellowships) etc. Being able to show Lungy, a product going to market, alongside Freya and Giulia's research into quantum technologies showcased the wide range of support that the Royal Commission offers and will aid visitors understand the role of the Royal Commission today.

Exhibits were finished on the opening day of GERF

Recommendation: Where possible, start working with Fellows in January to create their exhibits. Exams and deadlines in the Summer Term put pressures on Fellows who are keen to exhibit but have prior commitments.

Find out more www.big-ideas.org