



# Royal Holloway Science Festival

## Discover Science Day

Saturday 15 June 2024  
10am-4pm

A day of science exploration and discovery at  
Royal Holloway, University of London

[royalholloway.ac.uk/sciencefestival](http://royalholloway.ac.uk/sciencefestival)



ROYAL  
HOLLOWAY  
UNIVERSITY  
OF LONDON

# Welcome!



Welcome to Royal Holloway Science Festival. We have run our hugely popular annual Science Open Day for over 25 years, celebrating science and attracting large audiences each year.

We have a thriving science community here at Royal Holloway, with world-class pioneering research taking place, so this is a great opportunity for everyone to come along and discover some of the exciting things that we are up to.

In an evolving world, science is at the heart of our future, and it's vitally important that we continue to engage the next generation in these subjects and make it fun.

Through the range of activities at Royal Holloway Science Festival, we will be able to demonstrate the wide-ranging impact of science and explore the latest technological advances together.

We look forward to meeting you  
Julie

**Professor Julie Sanders**  
**Vice-Chancellor and Principal**

For more details visit our website:  
[royalholloway.ac.uk/studying-here/schools-and-colleges](http://royalholloway.ac.uk/studying-here/schools-and-colleges)

 Follow us on Twitter @RHULScience

## Science at Royal Holloway

Royal Holloway is one of the UK's leading universities, with a distinguished history of internationally excellent research.

Royal Holloway Science Festival invites you to be inspired by the wonder of science and experience some of our world-changing research first hand.

Royal Holloway co-ordinates a broad range of outreach activities for local schools, and sixth form and FE colleges as well as the wider public, presenting a varied programme of talks, demonstrations, visits, and hands-on workshops. We also provide a point of contact and resource for anyone working in education to inspire the teaching of science.

We hope you enjoy today's event!

## Exhibition Zone

From our origin, we have been at the forefront of promoting social change and inclusion. We are proud to have become a forward thinking University which not only delivers world class research but also a global community dedicated to changing the world for the better. Find out how we're developing our new strategy, RH2030s - a strategy that embraces our core values and prepares our community for the challenges and opportunities of the next decade.

### **D** Davison Building

Our science departments have received Athena SWAN awards recognising best practice as a community dedicated to the principles of equality, diversity and inclusion for all.



# Today's programme

| Discover science at today's special talks and shows                                |   |                             | Location |
|--|---|-----------------------------|----------|
|    | Listen to your heart and your head!           | 10.30-11am                  | S        |
|    | Are we running out of food?                   | 10.30-11am                  | W        |
|    | Colliding black holes*                        | 11-11.30am                  | S        |
|    | The Unexpected Maths of Juggling*             | 11.15-11.50am               | W        |
|    | Missions to asteroids                         | 12-12.30pm                  | S        |
|    | Listen to your heart and your head!           | 1-1.30pm                    | S        |
|    | Machine dreams:<br>The future of music and AI | 1.30-2pm                    | W        |
|    | Colliding black holes*                        | 2-2.30pm                    | S        |
|    | The Unexpected Maths of Juggling*             | 2.15-2.50pm                 | W        |
|    | Darker reaches of the Periodic Table*         | 3-3.45pm                    | W        |
| Activities running all day   |   |                             | Location |
|    | How steam railways work                       | Steaming throughout the day | BH       |
|   | Cryogenic demos                               | Drop in talks               | T        |
|  | Wiggly Wild Show                              | Drop in activity            | W        |

These events marked with a \* require free tickets to help us manage seating. Tickets are available on a first come first served basis, from the Windsor Building information point. Children under 12 must be accompanied by an adult.

## Science Festival Passport

### A treasure trail for younger visitors

Hunt for a letter at each main venue to complete your science passport then find the hidden word. Bring your completed passport back to the Windsor Building information desk to collect a small prize.



Pick up your passport leaflet from today's information point. Good Luck!

# General information

## Windsor Building

### **W** Windsor Building

Our main information point today is located at the Windsor Building foyer for:

- Tickets and passport prizes
- Campus guides
- First Aid by Face 2 Face Medical
- Lost property
- Lost children meeting point

Toilets are located in each building.



## Refreshments

A wide range of food and drink will be available throughout the day:



**C** **Café on the Square 9am-4pm**  
Starbucks coffee, cakes and sandwiches

**B** **Boilerhouse Café 10am-4pm**  
artisan style coffee, cake bar, vegan and veggie

**S** **Union shop open all day**  
snacks, drinks, fruit etc

**X** **Students' Union 11am-4pm**  
Hot food market with tastes from around the world

Picnic areas by the Students' Union Building and at Founder's Square.

See map for locations on page 10

## Interested in studying here?

Visit our stand at the Windsor Building foyer and pick up a Royal Holloway prospectus.

Look out for our university mascot Colossus the friendly polar bear!



Please note that professional filming and photography will be taking place throughout the day on Saturday 15 June. Footage and images will be used as part of Royal Holloway promotional materials including our website and social media channels. For children under 16, we endeavour to seek permission from parents or guardians wherever possible. Programme correct at time of publication 06/24.

# Highlights

Some of today's shows have limited spaces and require free tickets for entry\*.

## The Unexpected Maths of Juggling



Special guest Dr Colin Wright proves Maths is fun by skillfully juggling to demonstrate elementary mathematics! (7 years and over, \* ticketed)

**W Windsor Auditorium**

Two performances, 11.15am and 2.15 pm

## A Guided Tour of the Darker Reaches of the Periodic Table



Special guest Hal Sosabowski, Professor of Public Understanding of Science (\*ticketed)

**W Windsor Auditorium, 3pm**

## Colliding black holes

Dr Greg Ashton discovers colliding black holes and what they can tell us about quantum gravity. (7 years and over, \* ticketed)

**S Shilling Building Auditorium**

Two performances, 11am and 2pm

## Are we running out of food?

What are scientists doing to safeguard crops and global food security? Dr Laszlo Bogre.

**W Windsor Auditorium, 10.30am**

## Listen to your heart and your head!

Dr Steve Alty and Dr Clive Cheong Took show how engineers help medical doctors make diagnoses. (7 years and over)

**S Shilling Building Lecture Theatre**

Two performances, 10.30am and 1pm

## Missions to asteroids

Why bother sending sample-return missions to asteroids? Planetary Geologist, Dr Queenie Chan

**S Shilling Building Auditorium, 12pm**

## Machine Dreams: The Future of Music and AI

The last few years have seen groundbreaking advances in AI-generated music, but what do they mean for the musicians of the future? Dr Zubin Kanga from the Music Department

**W Windsor Auditorium, 1.30pm**

## All day activities



## How Steam Railways work



Live steam engines presented by the Gauge 1 Model Railway Association Surrey

**BH Boilerhouse Theatre**



## Wiggly Wild Show



Explore the world of minibeasts, bugs, reptiles and creepy crawlies! Get to meet a giant millipede or make friends with a bearded dragon.

**W Windsor Building 004**

Please note age ranges for talks are for guidance based on appropriateness of content. \*Free tickets are available from the information point at the Windsor Building.

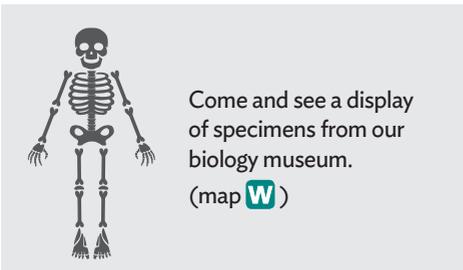
# Discover Science



## Biological Sciences

- **Feeding the world** - Flowers, crops and food security (activities linked with 'Are we running out of food' talk at 10.30am)
- **VR Biology** - study protein/drug interactions close up
- **Discover amazing seeds** and their dispersal and morphology
- **Foldscopes** - see nature from a different perspective
- **Vertebrate development** – fish, snakes, bats, monkeys and humans
- **Busy Bees** in a portable display hive, bumblebee hive and live colony
- **Human physiology** – how our brain, heart and body functions
- **Scientific Scissors (BioChem Society)** - the application and ethics of genome editing – good or bad?

**W** Windsor Building 002-003



Come and see a display of specimens from our biology museum.  
(map **W**)



## Computer Science

“Any sufficiently advanced technology is indistinguishable from magic.” Arthur C. Clarke

All day drop in activities demonstrated by students including projects developed and built as part of their Robotics project.

- **Rubik's Solver Robot:** There's 43 quintillion ways to mix a 3x3x3 Rubik's cube. Watch our little robot solve any of them in less than 10 seconds.
- **Connect 4 Robot:** Are you a Connect 4 expert? Try to beat our robot.
- **Mind Reader:** Pick a card ... any card ... The magician always knows.
- **The Clairvoyant:** A psychic sees into the future to predict the outcome of a shuffled check of cards.
- **Magic Box:** No sensors but it knows what you are doing! What's the secret?

**B** Bedford Building, lower ground floor

**Steam Trains** - See live steam model railways and learn how steam locomotives work at the Boilerhouse.



- **Gauge One Model Railway Association presents *The Surrey Oval*** - a large scale live steam model railway.
- 3D printing - see how low-cost 3D printers can be used to make items for modellers

**BH** Boilerhouse Theatre



## Earth Sciences

- **Be a time traveller in Earth Sciences** – see our mineral and geologic samples
- **Explore the subsurface mystery** – understand how sands turn into rock
- **Hit the ground to reveal its secrets** – get seismic with a sledgehammer
- **Hold a piece of meteorite in your hands!** – touch a piece of the moon, a piece of a planet's core, and learn about meteorites
- **Glorious mud** – what can mud tell us about Earth's ancient past?
- **The Road to Net Zero** – how can you help reduce Greenhouse Gas Emissions?
- **Painting Pebbles with The Lyell Society** – help spread the message about protecting our planet Earth
- **VolcanLab Hazard Predictors** – volcano eruption (11am and 1pm, weather dependent)

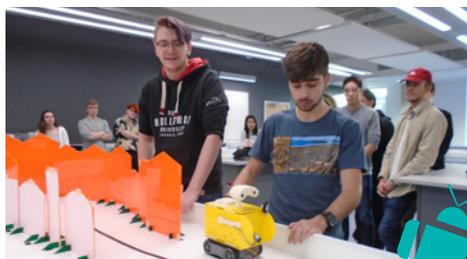
**Q** Queen's Building

## Talks

### Missions to asteroids

Why bother sending sample-return missions to asteroids, when we know there's no little green men on them? Planetary Geologist, Dr Queenie Chan

**S** Shilling Building Auditorium  
12-12.30pm



## Electronic Engineering

All day drop-in and have a go activities demonstrated by our staff and students in Electronic Engineering.

- **Electronic Connect4:** See what goes inside an electronic game and see who will be the champion! (6 years and over)
- **Hot wires:** Let's have fun with electronics and build circuits! (6-11 years)
- **Line follower:** Build a robot that follows a line on the floor (6-10 years) (Shilling Creative Thinking Room)

**S** Shilling Building first floor

## Talks

### Listen to your heart and your head!

Discover how engineers help medical doctors make diagnoses and how electrical signals can help us better understand the inner workings of the human body. Dr Steve Alty and Dr Clive Cheong Took (7 years and over)

**S** Shilling Building Lecture Theatre  
10.30am and 1pm



## Geography



- **Climate Time Capsules** – Create a time-capsule of climate change and preserve it.
- **Volcanic hazard mapping:** learn about volcanic hazards on Tenerife using our 3D printed models and samples of lava and ash.
- **Drones display** – come and see the drones we use to research our environment!
- **Royal Holloway Geography Society** – kids-can you beat your parents at our geography quiz? Find out from our students what training to be a professional geographer is like.
- **Stones and Bones** – Make your own stenciled cave art surrounded by ancient fossils and stone tools. (Activity links with exhibition see below).

### **Q** Queen's Building

## The Cave Hunters and the Truth Machine

Journey back in time with Professor Danielle Schreve, through the cave earth to reveal the remains of Ice Age animals. The light they shed on their world helps us predict future impacts of the climate and biodiversity crises in ours.

### **D** Exhibition Space, Davison Building

Exhibition open all day, 30 minute guided talk and tours at 11am, 1pm and 3pm.



## Mathematics



Discover marvellous magical mathematics through our hands-on activities

- Mathematical puzzles and games
- Mathematical arts and crafts
- Soap bubbles, balloons and a self-made harmonograph

### **W** Windsor Building 105



## Health Studies



- Posters and activities focusing on healthy people and environments.
- Ultra processed food
- Tax on sanitary products
- Health benefits of skipping
- Children's colouring in
- Short talks on health-related subjects

### **W** Windsor Building 104



## Physics



- **Imagine, invent and inspire through Physics** - Get hands on with experiments and watch impressive demos at the Physics Lab!
- **Visit our astrodome** and see how students measure the properties of the sun. (On request from the Physical lab, unfortunately access is not suitable for those with limited mobility or small children).
- **Cryogenic demos** - Join the coolest demo on campus! Physics presents cryogenic shows with liquid nitrogen. Room T125

### Special guest:

Exhibits from the National Physical Laboratory.

### The wonder of optical technology demonstrations

**T** Tolansky Building

## Talks

### Colliding black holes

Discover colliding black holes and what they can tell us about quantum gravity. Presented by Dr Gregory Ashton

**S** Shilling Building Auditorium  
11am and 2pm



## Psychology

Experience a variety of topics in Psychology and some of the research we conduct:

- **Using Virtual Reality** to explore the mind - how people pay attention, remember and feel when exploring different worlds
- **Noticing nature** and linking it with wellbeing
- **Recognising emotions in faces**
- **Never trust your eyes** - demonstrations of visual illusions
- **How many books do you know?** quiz
- **Do subtitles help children learn to read?**
- **Hey, did you catch that?** how hearing can be measured and changes with age

### Psychology guided tours

Guided tours of our sleep lab and the MRI scanner (please sign up for afternoon time slots from Windsor 102)

**W** Windsor Building 102-103

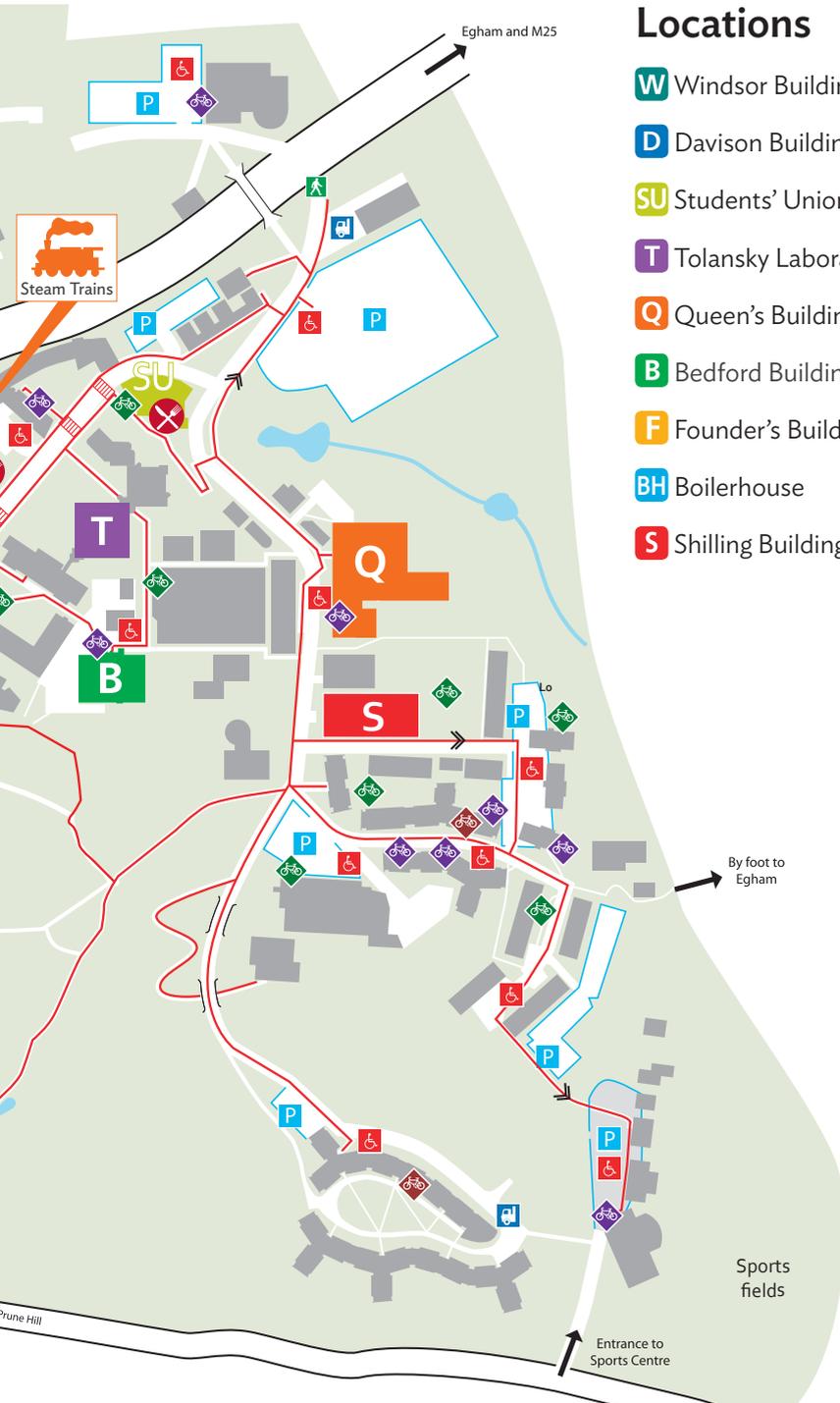
### Acknowledgements

We would like to thank all our visitors and guest contributors for joining us at Royal Holloway Science Festival 2024.

With many thanks to the staff and student volunteers who provide invaluable support and help to make the Science Festival a success.

Details are correct at time of going to print and we reserve the right to change the programme if necessary.





## Locations

- W** Windsor Building
- D** Davison Building
- SU** Students' Union
- T** Tolansky Laboratory
- Q** Queen's Building
- B** Bedford Building
- F** Founder's Building
- BH** Boilerhouse
- S** Shilling Building

# Open Days

Our Open Days are a great way to get a feel for life at Royal Holloway. Look around the campus, meet our students and teaching staff, and find out more about studying and living here.

Our next event is taking place on Saturday 5 October 2024.

Highlights include:

- Full programme of talks at each academic department
- Chance to chat individually with academics, students and support teams
- Campus tours led by our friendly and knowledgeable ambassadors
- Accommodation visits
- Drop-in sessions, activities and performances

**Find out more and register to attend at [royalholloway.ac.uk/opendays](https://royalholloway.ac.uk/opendays)**



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