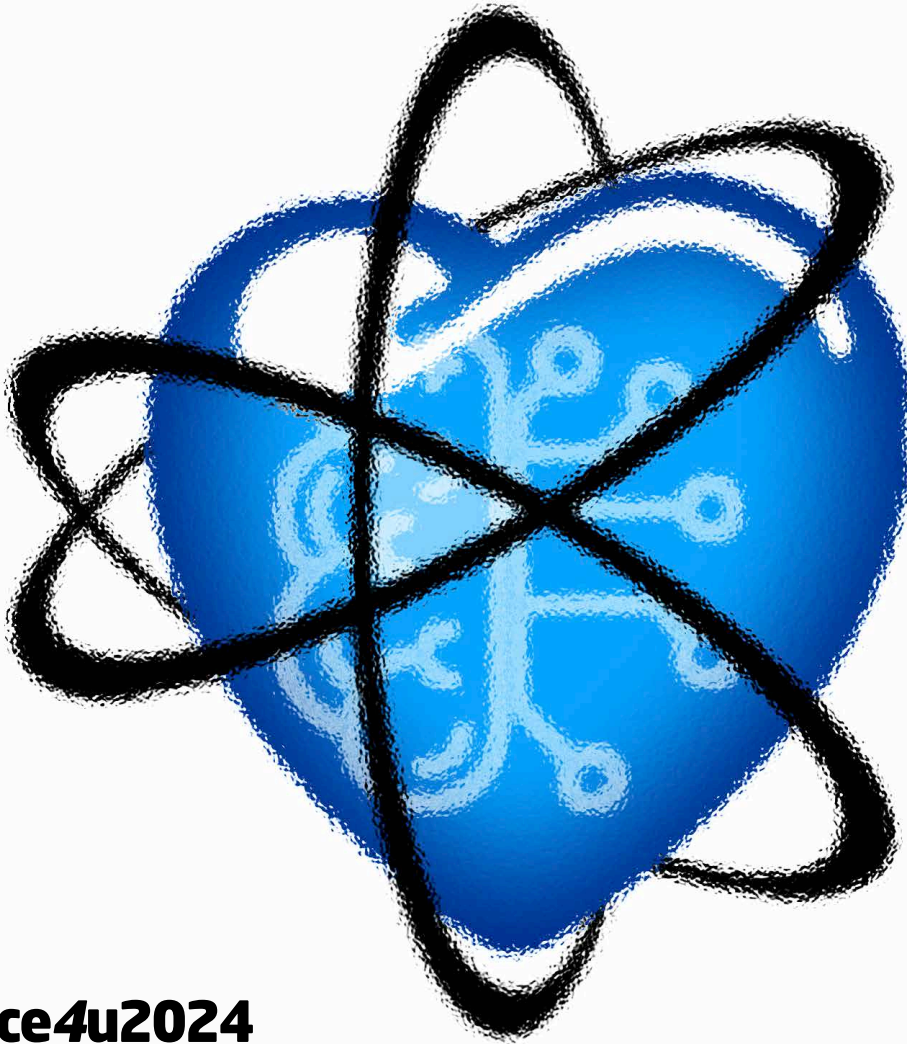


24th April 2024

**science4**  
**Artificial**  
**Intelligence** **AI**  
*showcasing exciting careers in science*



**#science4u2024**

The 21st annual Schools Science Conference  
Presented by science4u.info  
in collaboration with University of Westminster

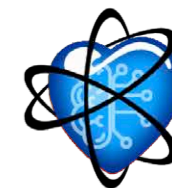
**Science for AI**

The 21st annual Schools Science Conference | Presented by science4u.info in collaboration with University of Westminster | 24th April 2024



- Healthcare scientists are a diverse and specialised community within the NHS, using their knowledge and expertise to develop, design, and deliver patient care.
- They carry out over 1 billion diagnostic and scientific investigations and interventions every year.
- There are over 56,000 people that make up the healthcare science workforce in England.
- They work in over 150 service areas across pathology and laboratory science, physiological sciences, data science, bioinformatics, medical physics and clinical engineering.
- The healthcare science professionals who deliver these services are a unique and specialised workforce.
- Healthcare scientists are fundamental to clinical decision making and ensuring patients receive timely, high quality, cutting-edge care. >>

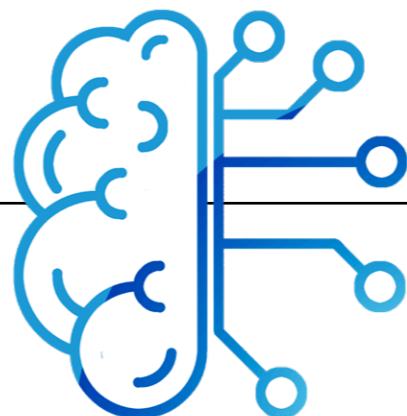
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## Introduction



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### Welcome to our electrifying 21st annual Schools Science Conference Science for Artificial Intelligence

Get ready for an exhilarating day packed with interactive displays, captivating talks, and hands-on workshops. Scientists and Healthcare Professionals from London and beyond have curated a dynamic program to ignite your passion for science. They're eager to share their insights, discoveries and what they find fascinating about science and their profession; so don't hesitate to bombard them with questions. By the end of the conference, we aim for you to be inspired and equipped with a deeper understanding of the vast array of captivating careers in the realm of science. Who knows, you might even be enticed to join us on this thrilling journey!

A massive thank you to the **University of Westminster** for graciously hosting our **science4u** conference yet again. Their facilities and staff have provided us with an immersive university experience that's bound to leave you buzzing with excitement.

We also extend our heartfelt gratitude to all our program volunteers, sponsors, and supporters. Without their unwavering support, this unique event would not be possible.

This year's theme, **Science for AI**, plunges us into the fascinating world of Artificial Intelligence (AI). While AI has recently captured headlines it has actually been around for a while and is already being used in some areas of the NHS. One example is with histopathology, where AI has been used to aid analysis of tissue sections and help work through the backlog of cases created by the pandemic. In addition AI is being investigated as a tool with genetic analysis within the NHS and many other areas are now looking to engage with AI. As we navigate this brave new world of AI, let's harness its potential while treading cautiously to avoid its pitfalls. The future is here, and together, let's seize its boundless opportunities while ensuring a responsible and ethical integration of AI into our lives.

The conference will be an action-packed day where every minute counts! Following the schedule to a tee will ensure a seamless and thrilling experience.

As you navigate the exhibits, there will be some goodies to collect. And keep your fingers crossed for the chance to snag some awesome prizes.

Just a heads up, while the equipment is there for you to experiment with, not everything is up for grabs, so be sure to ask before taking anything.

Join the excitement of winning prizes! **Remember to submit your completed evaluation form before the Keynote Speech to enter the Prize Draw.**

Your feedback is invaluable for enhancing our events and securing future sponsor support to keep them free. Thank you for your participation!

But the excitement doesn't end there! After the event, dive into the conference website at [science4u.info](http://science4u.info) for an immersive post-conference experience:

- Explore the **Virtual Laboratory** and learn more about science
- Engage in the **Battle of the Devices** workshop to determine the top medical innovation
- Tackle the Conference **Quiz** to test your newfound knowledge, and
- Relive the highlights through captivating conference **Photographs**

Oh, and here's a mind-blowing tidbit: did you know that the world of science boasts over 150 diverse and dynamic careers? From mathematicians to AI specialists, geneticists to gene therapists, the possibilities are endless. Science welcomes individuals from all walks of life, regardless of background, ethnicity, or creed.

So, whether you're eyeing university or seeking alternative paths, there's a science career with your name on it. Don't hesitate to inquire about the myriad routes available.

We are beyond excited to embark on this thrilling journey with you and hope you find the day both enriching and utterly delightful!

Let's dive in and unleash the full potential of science together!

**Kimberly Gilmour & Stuart Adams**

Chairs of the Organising Committee  
science4u

# Introduction

# Introduction



The **University of Westminster** is very excited to welcome you.

The world has transformed radically since 1838, when the **University of Westminster's** predecessor, the Polytechnic Institution, first started showcasing innovative technologies and educating our scientists. Many thousands have passed through the University on their way to careers that improve the world we live in, having benefited from a place where new things are constantly being discovered.

The very essence of science is creativity, innovation and regeneration which are driven by the diversity of scientists, leading to new and exciting discoveries.

We hope that you will discover many exciting scientific insights and careers at the event and will be inspired to continue to learn science and the endless possibilities that it offers.

Please enjoy the day and keep in touch.

**Sarah Whitaker**

UK Student Recruitment and Outreach Manager  
University of Westminster

**UNIVERSITY OF WESTMINSTER**



• If you've received a diagnosis in the past few years, there's a very good chance that a Healthcare Scientist contributed to it in some way.

• That's because approximately 80% of all diagnoses in the UK are reached with a contribution from

Healthcare Scientists and many therapeutic and rehabilitation interventions also rely on our work.

• Healthcare Scientists have embraced AI to support diagnosis and disease monitoring. Examples include >>>

• In data analysis, Natural Language Processing (NLP) algorithms are empowering healthcare scientists to extract invaluable insights from the vast sea of

unstructured clinical data. By deciphering electronic health records and clinical notes, clinicians can make more informed decisions and provide superior patient care. >>>

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# Programme

## science4 Interaction

hands-on interactive sessions

**Interactive workshop**  
Presented by The Royal Institution

### Ethical AI



Join us for an exciting adventure with Dan Glaser and Arianna Manzini as we explore why STEM alone isn't enough for creating ethical AI.

Get ready to dive into lively discussion groups led by experienced facilitators, where we'll dissect and question what we've learned.

As the passion grows, you'll be urged to share your own insights, sparking a vibrant exchange of ideas that will reshape the complex landscape of innovation and ethics.

Each group will share their thoughts with a comprehensive summary, capturing the essence of our collective insights.

**Facilitator: Dan Glaser**  
Director of Science Engagement, The Royal Institution  
**Speaker: Arianna Manzini**  
Research Scientist, Google DeepMind



**Interactive exhibits**  
Meet the Scientists and Healthcare Professionals

### Science in Practice



Hands-on interactive sessions where you meet scientists, try out some scientific equipment, undertake scientific assessments, answer questions for prizes and learn how science is applied to healthcare. AND don't forget to ask scientists what they do and why they love their jobs.

See the **Big Quiz** on subsequent pages and ask these questions as you meet appropriate experts.



## science4 Experimentation

science project and presentation

**Competition**  
Young Scientists present their own work competing for the

### Don Henderson Award



Prior to today's event we asked you to undertake a research project that you will present to the other schools in your group. All presentations will be competing for **The Association for Laboratory Medicine Trophy for the Don Henderson Award**.

The award will be presented at the end of the day.



## science4 Inspiratation

keynote speech

### What is AI and why does it matter?



**Find out ...**

- what artificial intelligence is
- what interesting things can it do
- how AI might be important in our future lives, and
- how you can get involved

Chris is a research scientist working in Google's Health AI team to apply artificial intelligence to health problems. Prior to joining Google, he completed a PhD in medical imaging at King's College London.

He continues to practise as a paediatrician on the neonatal intensive care unit at St Thomas' Hospital, London. As a clinician, he created an award-winning smartphone app called NeoMate, used worldwide to support doctors and nurses looking after sick newborn infants.

Alongside medicine, Chris previously founded two internet start-ups that were both acquired, and is an active angel investor in technology start-ups.

**Christopher Kelly**  
Research Scientist, Google Health AI

## science4 Educators

CPD teachers' workshop

### STEM Learning



**Discover the incredible impact volunteers can have on enriching STEM learning and shaping future careers through the exhilarating STEM Ambassadors Programme!**

Uncover a treasure trove of resources that will ignite curiosity, spark innovation, and empower students to reach for the stars. Unlock a world of possibilities and take home invaluable tools to inspire the next generation of STEM superstars!

**Paula Bull**  
Science Learning Partnership Lead for South London, Computing Hub Lead for London, Surrey and West Sussex

**Anna Stoten**  
Project Coordinator on the STEM Ambassadors Programme for London, STEM Learning

# Programme



AI's groundbreaking pattern recognition capabilities are transforming healthcare as we know it. From peering through the lens of a microscope to unravel the mysteries of

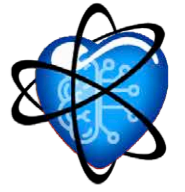
abnormal cells, to delving deep into the intricacies of DNA sequences to detect mutations, AI is at the forefront of revolutionizing diagnostics and patient care.

Healthcare scientists are harnessing the power of AI algorithms to dissect and analyze medical images with unprecedented precision. From X-rays to MRI scans, AI's

discerning eye aids in the swift detection of abnormalities, providing invaluable assistance to radiologists in making accurate diagnoses, thereby enhancing patient outcomes.

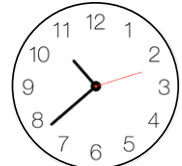
But AI's impact doesn't stop there. With the advent of AI-powered predictive analytics, healthcare scientists can now forecast patient outcomes and identify individuals at high risk

of developing specific conditions. This proactive approach enables tailored interventions and personalized treatment plans, ushering in a new era of precision medicine. >>



# Programme Timetable

## Smooth running



Please consult the program schedule to ensure a seamless flow of the day's events.

A dedicated member of our organizing team will be on-hand to assist you as you navigate the venue and guide you to the designated areas.

# Timetable

## Red Group



10:00 **Welcome & Introduction**  
Large Lecture Theatre Level 2

10:05 **Science for Experimentation**  
Large Lecture Theatre Level 2

10:45 **Science in Practice - A to D**  
1.109 to 1.112 Level 1

11:25 **Lunch**  
Lunch break - **The Refectory** Lower Ground

11:50 **Science in Practice - E & F**  
C1.15 / C1.16 & C1.18 (Pavilion) Level 1

12:35 **Ethical AI**  
C1.03 & C1.04 Level 1

13:15 **Evaluation**  
Large Lecture Theatre Level 2

13:25 **Keynote Speech**  
Large Lecture Theatre Level 2

13:45 **Round-up & Prize Giving**  
Large Lecture Theatre Level 2

13:50 **Close**

## Green Group



10:50 **Welcome & Introduction**  
Large Lecture Theatre Level 2

10:55 **Science for Experimentation**  
Large Lecture Theatre Level 2

11:35 **Science in Practice - A to D**  
1.109 to 1.112 Level 1

12:15 **Lunch**  
Lunch break - **The Refectory** Lower Ground

12:40 **Science in Practice - E & F**  
C1.15 / C1.16 & C1.18 (Pavilion) Level 1

13:25 **Ethical AI**  
C1.03 & C1.04 Level 1

14:05 **Evaluation**  
Large Lecture Theatre Level 2

14:15 **Keynote Speech**  
Large Lecture Theatre Level 2

14:35 **Round-up & Prize Giving**  
Large Lecture Theatre Level 2

14:40 **Close**

## Purple Group



11:40 **Welcome & Introduction**  
Large Lecture Theatre Level 2

11:45 **Science for Experimentation**  
Large Lecture Theatre Level 2

12:25 **Science in Practice - A to D**  
1.109 to 1.112 Level 1

13:05 **Lunch**  
Lunch break - **The Refectory** Lower Ground

13:30 **Science in Practice - E & F**  
C1.15 / C1.16 & C1.18 (Pavilion) Level 1

14:15 **Ethical AI**  
C1.03 & C1.04 Level 1

14:55 **Evaluation**  
Large Lecture Theatre Level 2

15:05 **Keynote Speech**  
Large Lecture Theatre Level 2

15:25 **Round-up & Prize Giving**  
Large Lecture Theatre Level 2

15:30 **Close**



As the founder, I am delighted with the continuing success of the annual Schools Science Conference supported by the [science4u.info](http://science4u.info) website. We held the first conference in 2003 and this year will be the 21st event. The conferences are based around a theme. I am particularly pleased that the organisers are marking this 21st year anniversary with **Science for Artificial Intelligence**.

I founded the Schools Science Conference and **science4u** to inform and stimulate young people to consider a career in health related science. While everyone knows about doctors and nurses, I felt that few considered or were aware of the whole raft of people involved in the provision of healthcare. I wanted to give this sector a voice and a platform to showcase what they do, why it is important and why so many of us have chosen to develop exciting and rewarding careers in healthcare science.

I eventually became the Consultant Clinical Scientist in charge of the immunology laboratory combining management with teaching, scientific research, as well as meeting and investigating patients. I have now retired and entered a different phase of life where I can indulge other passions, such as skiing and sailing and whilst I am doing that I would like to take the opportunity to wish you well and hope that you too go on to have an interesting career in healthcare science.

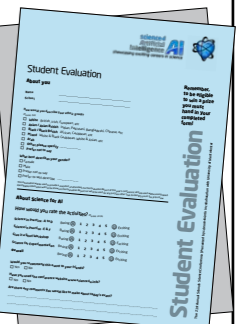
**Don Henderson**

## Prizes

Don't forget to submit your completed evaluation form before the Keynote Speech begins.

Your feedback is invaluable in shaping future conferences and securing funding.

Plus, as a thank you for your input, every completed evaluation form will automatically enter you into a prize draw.



Students – Blue form

Teachers – Grey form





• AI's influence extends even further into the realm of genomics, where algorithms assist healthcare scientists in analyzing vast amounts

of genomic data. From identifying genetic variations linked to disease susceptibility to predicting drug response and prognosis,

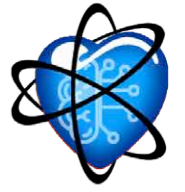
AI is paving the way for precision medicine approaches tailored to each patient's unique genetic makeup.

• Collaborating with AI developers, healthcare scientists are spearheading the creation of innovative digital health tools.

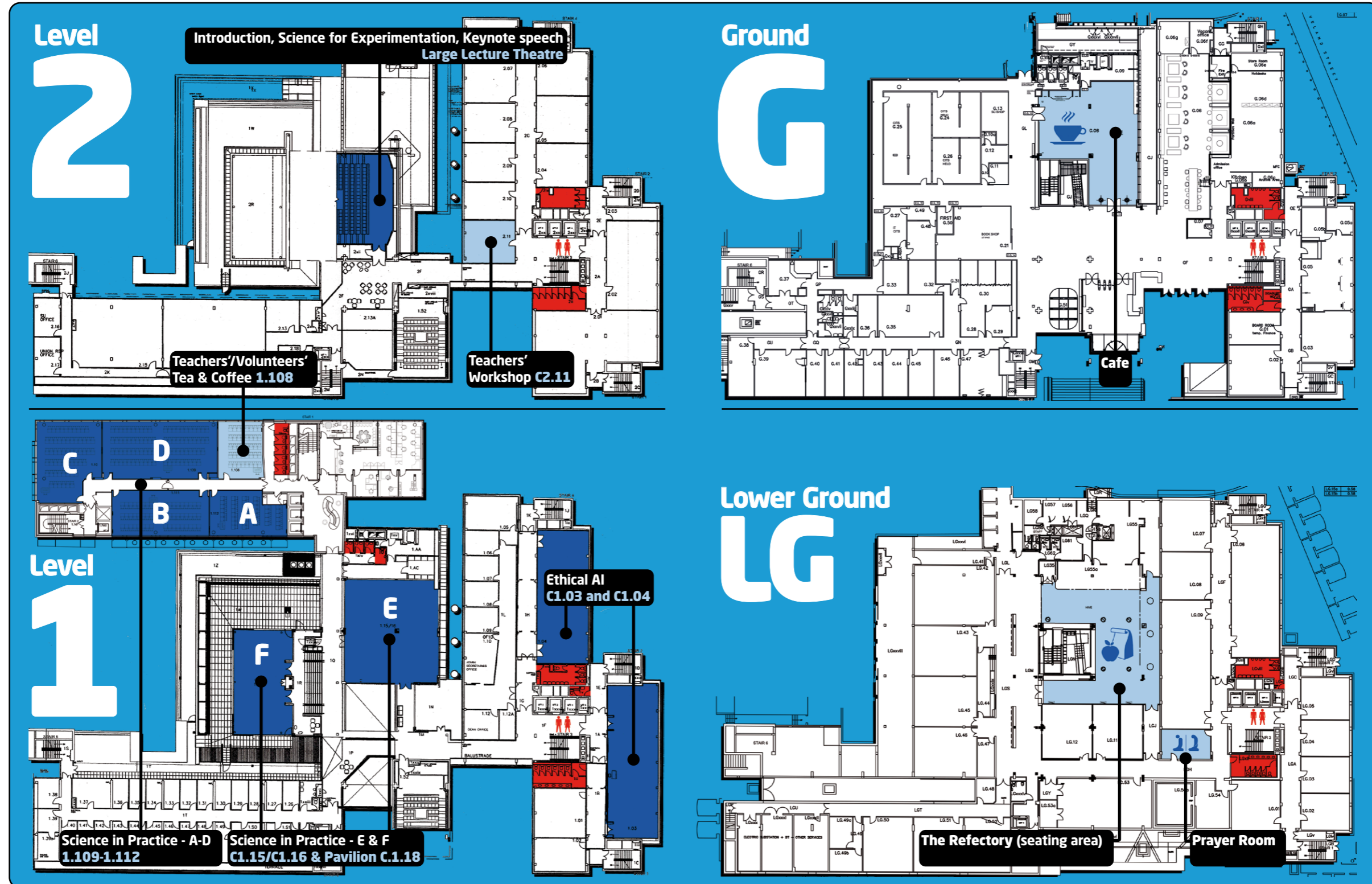
From smartphone apps to wearable devices, these tools empower patients to monitor their health, adhere to treatment regimens,

and communicate with healthcare providers remotely, fostering greater patient engagement and self-management. >>

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# Floorplan



# Floorplan

# Floorplan



• Furthermore, AI-powered virtual assistants and chatbots are seamlessly integrated into healthcare systems to streamline administrative tasks, address patient inquiries,

and provide personalized health information. This not only enhances operational efficiency but also improves patient satisfaction and accessibility to healthcare services.

• As AI continues to evolve, healthcare scientists remain vigilant guardians of ethical and responsible AI use. Through rigorous validation studies, addressing algorithm

biases, safeguarding patient privacy, and upholding regulatory compliance standards, they ensure trust and transparency in AI-driven healthcare solutions.

• The future of healthcare is bright with AI leading the way. As time progresses, AI's role in healthcare will only grow, promising

transformative advancements that will revolutionize the way we approach healthcare delivery and patient outcomes.



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## Acknowledgements & thanks

science4u.info  
"inspiring writing careers in science"

### Organising Group 2024

**Don Henderson**  
Founder

**Kimberly Gilmour**  
Co-Chair

Great Ormond Street  
Hospital for Children  
NHS Foundation Trust

**Stuart Adams**  
Co-Chair

Great Ormond Street  
Hospital for Children  
NHS Foundation Trust

**Sue Alexander**  
Secretary

The Royal Marsden  
NHS Foundation Trust

**Manfred Almeida**  
Treasurer

Imperial College  
Healthcare NHS Trust

**Fred Bonful**  
University of  
Westminster

**Dominika Opyrchal**  
University of  
Westminster

**Jennifer Small**  
UK Health Security  
Agency

**Sharon Gage**  
Event Organiser  
SRG Project Management

**Continuing Professional Development**  
This event is CPD credited with the **Institute of Biomedical Science** scheme - Members can obtain certificates via the IBMS website [ibms.org/home/](http://ibms.org/home/)



**Continuing Professional Development**  
This event is CPD credited with the **Institute of Biomedical Science** scheme - Members can obtain certificates via the IBMS website [ibms.org/home/](http://ibms.org/home/)



### The Queen's Award for Voluntary Service

**Don Henderson**

Founder of science4u and retired Consultant Clinical Scientist

As the founder, I am very pleased with the continuing success of the annual Schools Science Conference supported by the **science4u.info** website. I was also delighted to hear that we attained a **The Queen's Award for Voluntary Service (QAVS)** in 2020. **QAVS** is the highest achievement given to local volunteer groups across the UK to recognise the outstanding work undertaken in their local communities and is the equivalent of an MBE. This achievement is not only in recognition of the work of **science4u** to inspire students to study science and showcase the many careers in healthcare science, but also the work and support of all the programme volunteers, the schools who attend, our collaboration with the **University of Westminster** and the sponsors.



Science for Artificial Intelligence is presented by [science4u.info](http://science4u.info) in collaboration with **University of Westminster School of Life Sciences and College of Liberal Arts and Sciences**

science4u is grateful to the following organisations and their staff for their kind participation and enthusiasm in creating content and presenting today's programme

- Barts Health NHS Trust
- Great Ormond Street Hospital for Children NHS Foundation Trust
- Health Services Laboratories
- Hybrid Games
- Imperial College Healthcare NHS Trust
- Institute of Biomedical Science
- London North West University Healthcare NHS Trust
- Microsoft UK
- NHS Blood and Transplant
- North West London Pathology
- Royal College of Nursing
- St George's University Hospitals NHS Foundation Trust
- St George's, University of London
- STEM Learning
- Synnovis
- The Institute of Cancer Research
- The Royal Marsden NHS Foundation Trust
- UK Health Security Agency
- University College London
- University of Westminster

### Key content creators



Science for Artificial Intelligence was made possible thanks to the very generous support of our key sponsors



Thanks also to the following organisations for their generous support



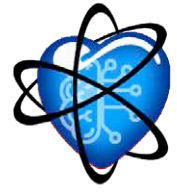
# Acknowledgements

Funding

Gold

Silver

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# About us

science4u.info

westminster.ac.uk

## Visit the conference website

Explore captivating event **Photographs** and test your knowledge with conference **Quiz**. Then, brace yourself as top minds vie for healthcare innovation supremacy in the **Battle of the Devices**. Embark on a journey through the **Virtual Laboratory** to experience diagnosis, explore immunology tests, and immerse yourself in the world of scientists through videos.

## UNIVERSITY OF WESTMINSTER<sup>Ⓜ</sup>

**It may be early days for you to decide about a career but not for developing your interests.**

Opportunities change fast, particularly in London where business drives and is driven by technology - only a small number of professionals have job titles as recognisable as doctor or lawyer but there are many more which you may not be aware of. We can help you keep yourself informed about the many opportunities and possible career paths that there are in the rapidly changing sciences.

Our central London site is dedicated to the teaching and research of Science and Technology where we offer a full range of professionally certified courses in: **Biomedical Sciences, Medical Sciences, Pharmacology & Physiology, Nutrition and Psychology, Business Information Systems, Data Science & Analytics, Smart Computer Systems, Computer Science, Computer Network Security, Software Engineering and Computer Games Development**

At Westminster, students will become part of our vibrant research culture and will develop practical and professional skills under the guidance of staff who have an international reputation for their professional and research activities. The University has invested more than £30 million in equipment and has created state-of-the-art learning spaces and laboratories, meaning students will benefit from cutting edge and innovative teaching facilities.

Our courses are informed by employers, our research and collaborations with national and international institutions. Students will be prepared for a professional working life in a range of environments such as hospitals, research institutions, the scientific or medical civil services. For more information on our courses, please visit our web page at [www.westminster.ac.uk](http://www.westminster.ac.uk)

## The Story of Menarini

Born in Italy in 1886, shaped in Europe, thriving globally

The Menarini Group is an Italian pharmaceutical company, ranked 17th in Europe and 32nd in the world during 2022 with a turnover of 4.16 billion Euro and 17,700 employees. The Menarini group headquarters are based in Florence, Italy.

The Menarini Group has always pursued three strategic objectives: research, innovation and internationalisation, and is present in the most important therapeutic areas including cardiology, gastroenterology, pneumology, anti-infectives, diabetology and anti-inflammatory agents/analgesics. With 18 manufacturing plants and 9 Research and Development centres, the Menarini Group has a strong presence through-out Europe, Asia, Africa, Central and South America.



A.Menarini Farmaceutica Internazionale SRL  
*Where science meets art*