

# GW4 ALLIANCE



## THE GW4 ALLIANCE

The GW4 Alliance brings together four of the most research-intensive and innovative universities in the UK: Bath, Bristol, Cardiff and Exeter.

Over the past 5 years GW4 has invested over **£4.6million** in research, training and world class facilities. GW4's total external grant income across our collaborative research communities and doctoral training programmes is over **£123million**.

**£4.6M** Total GW4 investment

**£123M**

Total GW4 research and training grant income

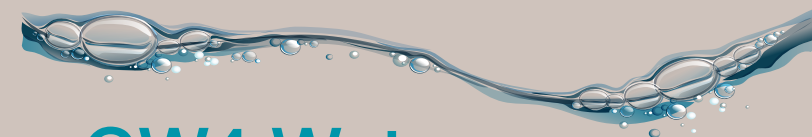
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Total return on investment for every £1 we invest

## GW4 RESEARCH COMMUNITIES

The GW4 Alliance has invested over **£2.8m** in **87 collaborative research communities**, which have generated **£37m in research income**. This means that for every £1 GW4 spends on collaborative research communities, GW4 captures **£13** in external research awards.

Over the past five years GW4's research communities have addressed major global and industrial challenges encompassing a variety of research areas and disciplines, from researching regional responses to Brexit, mental health and nanoparticle-drugs.



**GW4 Water Security Alliance** - one of the largest water research consortiums worldwide

## GW4 SKILLS AND TRAINING

We are developing the researchers of tomorrow and building a highly skilled workforce, from our GW4 Doctoral Training Programmes to the GW4 Crucible programme – which provides hands-on training and mentoring to develop collaborative research leaders of the future.

**16** GW4 Doctoral Training Entities

GW4 institutions host 16 GW4 DTEs and lead on a further 16 externally funded doctoral training programmes. These programmes are highly collaborative, involving a range of academic and non-academic partners. They build on our world leading expertise covering a range of topics from science and technology to art and heritage.

Enrolled students **1080** on GW4 DTE's

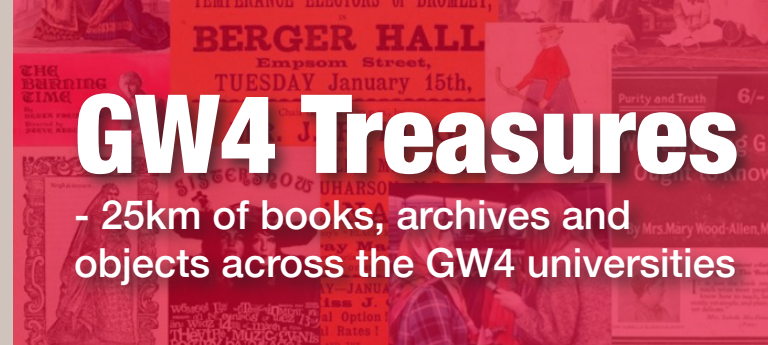
## WORLD CLASS EQUIPMENT AND FACILITIES

GW4 believe in shared access to cutting-edge equipment and facilities to drive scientific discovery and improve lives.

GW4 invests in major flagship centres of excellence which put the region on the map and catalyse collaboration between GW4 researchers and beyond. For example:

- The GW4 Facility for High Resolution Cryo-Microscopy provides researchers across the region with a suite of state-of-the-art microscopy and analysis tools.
- GW4 researchers can access the Pre-clinical In-vivo Functional Imaging facilities across the institutions, including a Micro PET/CT scanner based in Cardiff's PETIC facility and a 3T large animal MRI scanner based in Bristol's Translational Biomedical Research Centre.
- VSimulators is a world class national research facility located at the universities of Bath and Exeter. It provides a platform for multi-disciplinary research to study the human experience of the built environment.

**Explore** GW4's shared equipment database with **over 1,700 items**



**GW4 Treasures** brings together the archives and special collections of the four universities. From historic town plans to feminist pamphlets, there is a rich variety of rare materials to explore and analyse.



**Isambard** was designed by GW4 Alliance researchers in partnership with the Met Office and global supercomputer leader Cray Inc. GW4 Isambard is being used for a range of scientific research, from improving weather and climate modelling at the Met Office, to next generation healthcare and jet engine simulation.

## MAKING CONNECTIONS

Collaboration sits at the very heart of the GW4 Alliance, which is what makes us greater than the sum of our parts.

Research and innovation undertaken by the GW4 Alliance tackles some of society's most vital challenges and informs policy at national and international levels, from pay equality to quantum security.

By engaging with stakeholders and harnessing the creativity and specialist expertise of colleagues we strengthen our networks of influence and strategic partnerships, creating real-work impact.

External partners **425**  
**272** Events and workshops

## CLIMATE

GW4 has globally recognised research strengths, academic communities and assets in resilience; from exploring the social science of climate change at the Centre for Climate Change and Social Transformations at Cardiff University to conducting world-leading research at the Centre for Resilience in Environment, Water and Waste at the University of Exeter.

GW4 has the power to bring together our academic excellence with industry and organisations, such as the Met Office in Exeter, to address the global challenges of climate change.

We will harness this power to accelerate our position as international leaders in climate research by developing a strategic programme to address the risks and problems resulting from climate change.

## ANTIMICROBIAL RESISTANCE (AMR)

Society is facing a rise in the number of bacteria becoming resistant to existing antibiotics without an increase in new antibiotics or new treatments. GW4 aims to tackle this global challenge with an interdisciplinary approach, creating a GW4 network of unparalleled expertise.

From evolutionary biological research at the Miner Centre at the University of Bath to our work with NHS Trusts and Public Health Wales, GW4 is home to leading research facilities and expertise.

The GW4 Crucible 2020 programme will encourage future research leaders to come together to generate innovative, multifaceted responses to antimicrobial resistance (AMR).

## NEXT GENERATION MICROELECTRONICS

Compound semiconductors are at the heart of many devices we use today, from smart phones to tablets and are central to the development of the 5G network and electric vehicles.

The GW4 region is home to the largest silicon design cluster outside of the USA. The national Compound Semiconductor Applications Catapult is located in South East Wales and The Institute for Compound Semiconductors at Cardiff University provides cutting-edge facilities that enable researchers and industry to work together.

The GW4 Alliance has cutting-edge research across photonics, wireless, sensors, compound semiconductors and quantum engineering. This research capacity across areas enables GW4 to support and lead on the rapid technological advancements in this sector.

## ADVANCED ENGINEERING

The GW4 region is home to a high concentration of advanced engineering enterprises, from global businesses such as Airbus, Rolls Royce and GKN to thriving SMEs.

The £70m Institute for Advanced Automotive Propulsion Systems (IAAPs) – led by the University of Bath, will be a global centre of excellence supporting collaborative research with the automotive industry to develop future generations of ultralow and zero emission vehicles.

The region is also home to the National Composites Centre (NCC), which has been designated as a High Value Manufacturing Catapult Centre by the UK Government.

## CREATIVE AND CULTURAL ECONOMY

The creative industries sector is the fastest growing sector of the UK economy and the GW4 region is home to a wealth of creative and cultural assets from film production and animation to Virtual Reality and Augmented Reality, including the Audience of the Future project at the University of Exeter.

The GW4 region is home to two Creative Clusters:

**Clwstwr**  
developing collaboration and innovation to grow media production not just in the Cardiff city area but across Wales and beyond.

**Bristol+Bath Creative R+D**  
working with industry to increase understanding of user engagement in new platforms.  
GW4 is continuing to develop innovative ways of working, including our new research partnership with the National Trust. Co-produced multidisciplinary research communities will build on areas of existing research strengths including Colonial Legacies and Creative Industries and Audience Experience.

## DIGITAL INNOVATION

Underpinning all our themes is digital innovation.

As a region, we have taken a leading role in developing the digital technologies that are transforming people's lives.

The £100m Bristol Digital Futures Institute at the University of Bristol will bring researchers together to create new approaches to digital innovation and social change. Working with a wealth of partners, researchers will be able to drive the digital future; testing cyber-attack scenarios and researching new digital technologies and systems at scale.

We will continue to build on our digital capability across the region to harness the power of data and digital technologies and the interaction between people and technology for socio-economic impact.

**Environmental Intelligence**  
**SMART CITIES**  
**Creative Economy**  
**Cyber Security**  
**Digital Engineering**  
**Digital Health**  
**Autonomy and Robotics**  
**Digital Transport of the Future**

For more information about



Visit our website: [gw4.ac.uk](http://gw4.ac.uk)

Email us: [info@gw4.ac.uk](mailto:info@gw4.ac.uk)

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Figures sourced from GW4 research and training activities, and the South West England and South East Wales Science and Innovation Audit.

GW4 region has more climate expertise than any other area worldwide



GW4 region home to the world's first Compound Semiconductor cluster

GW4 region hosts the

**top 15**

global aerospace companies