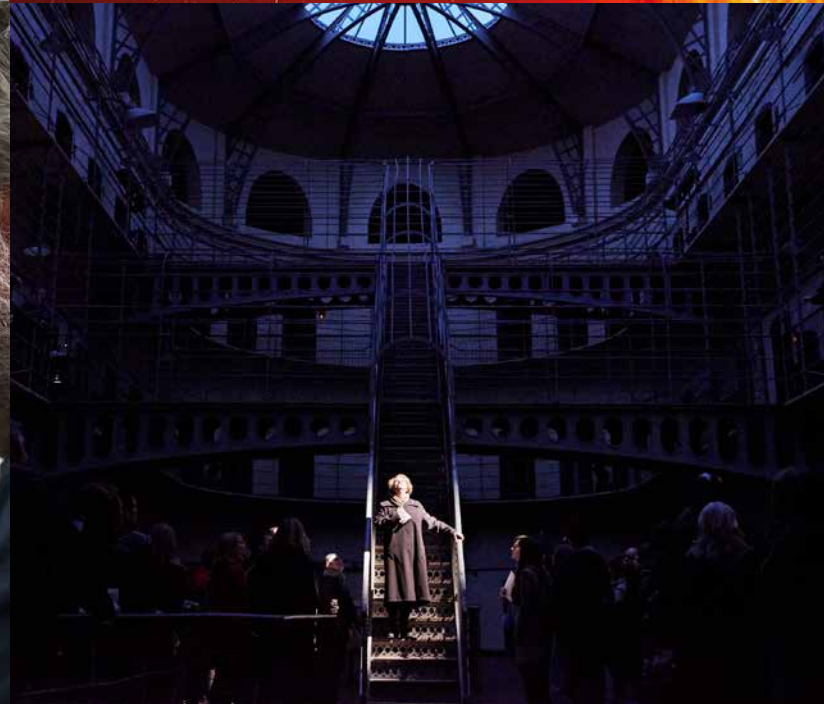




University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath



RESEARCH, INNOVATION AND IMPACT AT UNIVERSITY COLLEGE DUBLIN





INFLUENCE AND IMPACT

University College Dublin is the **university of influence** in the development of modern Ireland.

Our graduates are national and international leaders in business, culture, society and government, and include leaders of some of the world's largest companies and international organisations.

With faculty and students from over 130 countries, global centres in Beijing, Delhi, New York and Kuala Lumpur, and collaborations with institutions in 146 countries, UCD is **Ireland's global university.**

UCD is famously the university of James Joyce, whose creative genius reimagined the capacity of the written word.

Today, research and innovation at UCD continue to draw on this ethos of creativity and influence.

The impact of UCD researchers has been felt around the world, and has led to UCD's being ranked the **top university in Ireland for research.**

RESEARCH AND INNOVATION AT UCD ARE ALL ABOUT...



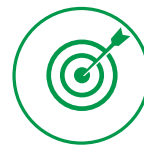
GREAT PEOPLE WITH GREAT IDEAS

In UCD you will find faculty whose research breakthroughs are among the most influential in the world within their scientific domains, whose works of creativity and imagination have won major international recognition and whose policy insights have been transformative.



INTERDISCIPLINARY INNOVATION

We know that opportunities don't stop at the boundaries between disciplines. Research and innovation in UCD draw on the wide range of disciplines in the university, with researchers sharing their insights, expertise and networks to deliver creative solutions.



TRANSLATING IDEAS INTO IMPACT

We translate our research findings into impact of many forms: cultural, economic, environmental, health, political, scientific, social and technological. Many of Ireland's most successful spinout companies have come from UCD, and we license technology to companies large and small.



SUCCESS THROUGH PARTNERSHIP

Our research collaborations span 2,775 institutions in 146 countries and more than 1,000 companies, 50 of which have a presence on our campus. We work with governments and with social, cultural and community organisations to solve complex challenges.



A WORLD OF DISCOVERY

Our 133-hectare modern parkland campus in the dynamic Irish capital represents the country's largest investment in research and higher education. Our diverse research facilities also extend to Ireland's largest hospital network and our 240-hectare research farm.



GREAT TRAINING FOR GREAT PEOPLE


It begins and ends with great people. UCD is the Irish university most sought after by Irish and international students. Our research-enriched education and training produce outstanding graduates and researchers prepared for successful careers.

33 460 
STUDENTS

2775 
COLLABORATING
INSTITUTIONS

146 
COUNTRIES

€1.3 BN 
ANNUAL
ECONOMIC OUTPUT

€1 BN 
IN RESEARCH
GRANTS OVER THE
LAST 10 YEARS

MAJOR RESEARCH THEMES





Agri-Food

The agri-food sector is at the forefront of our response to some of the most pressing global challenges, and is Ireland's largest indigenous industry. UCD is working with the sector to ensure sustainability and global competitiveness, and to develop safe, novel foods and promote human health. Through our expertise in animal science and veterinary medicine, we promote efficient, sustainable, healthy and welfare-friendly livestock production. Our graduates are leaders in the agri-food sector nationally and internationally.



UCD is ranked **NUMBER 1 GLOBALLY** for citations at scale to our research papers in Agricultural Sciences and in Food Science and Technology.



The UCD **INSTITUTE OF FOOD AND HEALTH** leads Food for Health Ireland, a national university/industry technology centre aimed at developing, marketing and selling nutritional ingredients to improve consumers' health and wellness.



UCD is the leading source of **GRADUATES** for the €26 billion Irish agri-food sector, supporting leading companies such as Glanbia, Kerry Group and Dawn Farms.



The Centre for Veterinary Epidemiology and Risk Analysis at UCD informs **ANIMAL HEALTH POLICY** in Ireland and across the European Union.

PASSING THE TEST

In the mid-1990s BSE (commonly known as 'mad cow disease') came to public prominence around the world as a threat to human and animal health, and posed a major threat to the global exports of Irish beef.

Ground-breaking research led by Professor Mark Rogers, now Registrar and Deputy President of UCD, developed the science behind a novel BSE test. This was licensed to Enfer Scientific, which used it to develop a commercially robust diagnostic that became one of the first in Europe to get regulatory approval.

Enfer, initially a small company with six employees in Co. Tipperary, quickly expanded to become a leader in BSE testing, employing a staff of 120.



Culture, Economy and Society

UCD is renowned for our contributions in Arts, Humanities and Social Sciences and in Business and Law, with eight disciplines ranked in the top 100 internationally. UCD researchers continue to lead in the scholarship of Ireland and its global environment: interpreting the past, critically interrogating the present and imagining the future. They inform public policy and public debate, and deliver and support landmark cultural contributions. Through its provision of critical expertise and of talented graduates, and working with our strong network, UCD supports a strong and sustainable economy and helps make Ireland a more attractive place to live.



UCD's contribution to literature continues through the work of leading **IRISH WRITERS** such as Marina Carr, Emma Donoghue, Roddy Doyle, Thomas Kilroy, Frank McGuinness, Éilís Ní Dhuibhne, Joseph O'Connor and Colm Tóibín. Two of these were represented in the 2016 Oscar nominations.



Dr Orla Doyle leads **PREPARING FOR LIFE**, a programme that is informing public policy and making Ireland a better place in which to grow up. Over 200 families from North Dublin have taken part in the pilot study, which has shown how early childhood support interventions make children healthier and smarter, with fewer behavioural problems.



The UCD Sutherland School of Law is one of the **LEADING RESEARCH LAW SCHOOLS** in Europe. UCD law graduate Peter Sutherland was founding Director-General of the World Trade Organisation, and Chairman of Goldman Sachs International and of BP.



The triple-accredited UCD Michael Smurfit Graduate Business School has a global reputation for contemporary and impactful research. In the latest FT Global MBA rankings, the school is ranked among the **TOP 20 BUSINESS SCHOOLS IN EUROPE** for research.

SHAPING MODERN IRELAND

The period from 1912 to 1923 was a pivotal one in Irish history. It witnessed political transformation and political violence of magnitudes unknown for generations.

UCD came of age during the revolutionary decade. Many UCD staff, students and graduates were involved in critical events, and following independence the university and its graduates played an integral role in the foundation and the development of the modern Irish state.

UCD is delivering a major programme of scholarship and outreach for the Decade of Centenaries, informing debate and understanding with an objective voice in a manner that brings education and new perspectives to the fore. We also reflect on the centenaries through creative and cultural works including the landmark play *Signatories*, premiered in Kilmainham Jail on the centenary of the Easter Rising.



Energy

At UCD we are working to find solutions to the energy challenges of the 21st century. Our research expertise covers the traditional energy sources of oil and gas as well as the integration of renewable energy and the interface between energy and ICT in areas such as Smart Grids and Smart Cities. We analyse the economics and the behavioural science around energy choices, we seek to enable the policy framework to promote efficient and sustainable energy use, and we drive the emergence of new energy enterprises. We partner extensively with energy companies in our research, and many leaders of the sector nationally and internationally are UCD graduates. One such graduate David O'Reilly, former Chairman and CEO of Chevron, chairs the UCD Energy Advisory Board.



UCD is ranked number 1 globally for publications in the field of **WIND POWER** and its integration with electric utilities. This research, and the graduates from this research programme, have enabled Ireland's world-leading performance in integrating wind power onto the electricity grid.



The water industry is one of the largest industrial users of energy. UCD spin-out **OXYMEM** is leading the development of innovative solutions in aeration that will dramatically reduce the energy consumed by waste water treatment.



Ireland has a diverse geological framework with vast potential for untapped energy resources, particularly offshore. UCD leads the €26M iCrag Research Centre in **APPLIED GEOSCIENCES**, funded by industry and SFI, which carries out research to find and harness these resources.



UCD is leading in **ENERGY SYSTEMS INTEGRATION** internationally. This is a key area in the transition to a low-carbon, competitive economy, taking an integrated view of water, gas and electricity systems to optimise resource use. The Energy Systems Integration Partnership Programme is an €11M partnership between UCD and key energy partners.

REALVALUE – DELIVERING REAL VALUE

Small scale energy storage systems within homes, coupled with the use of advanced ICT, can improve efficiency and value along the whole electricity supply chain, from generation and distribution to the end consumer.

UCD is addressing this opportunity in RealValue, a €15.5M energy storage project funded by the EU research and innovation programme Horizon 2020. The project is led by Glen Dimplex, and also includes leading industry partners Intel, SSE, ESB and EirGrid.

The project will include real-world implementation and testing in 1,250 homes in Germany, Latvia and Ireland. It will use techno-economic modelling and virtual demonstration to validate the technical and commercial potential of the small-scale energy storage model.

RealValue will also produce findings to support the integration of wind and solar energy.



Environment

Many of the most significant global challenges relate to our ability to sustain our environment and to use natural resources wisely. UCD researchers deliver practical solutions in the areas of sustainable living, natural resources, climate change, natural hazards and the built environment. Their expertise spans a broad range of disciplines, including the biological and physical sciences as well as economics, behaviour and regulation, and they address the challenges facing Ireland's unique environment along with the major global questions. UCD's parkland campus is itself a valuable amenity in the local environment. It contains woodland walks, state-of-the-art sports facilities, a sculpture trail and historic period houses, alongside landmark education and research facilities.



Six UCD professors have won prestigious **EUROPEAN RESEARCH COUNCIL** awards in environmental research.



Facilities in the UCD Rosemount Environmental Research Station are capable of simulating any global climatic and atmospheric condition: past, present or future. By analysing the past, our research is being used to predict the impact of **CLIMATE CHANGE** on agriculture.



UCD is leading international research and development in the **BIOECONOMY**, investigating the use of renewable biological resources from land and sea to produce food, materials and energy. We have worked with industry and government partners to deliver an EU model demonstrator for the bioeconomy in Ireland.



Sheila O'Donnell and John Tuomey received the Royal Institute of British Architects **ROYAL GOLD MEDAL**, the world's most prestigious architecture award, for their influence on the advancement of architecture.

SMART THINKING FOR SMART COASTS

Clean bathing water is vital for the health of bathers and to keep Blue Flag awards for beaches. Detailed understanding of potential pollution from land-based sources throughout coastal zones is required, therefore, to protect public health and tourism.

UCD was a partner in Smart Coasts, an EU-funded Irish-Welsh project that addressed this problem and reported in 2015.

The project involved water quality forecasting based on sampling and analysis, linked to electronic information systems to provide bathers with up-to-date details of water conditions.

The modelling to underpin this initiative was ground breaking and gave more accurate water quality predictions than achieved to date anywhere else in the world.



Health

Healthcare is evolving rapidly, driven by changes in demographics, by discoveries in biomedical research, and by emerging technologies. At UCD, we are looking to the future of healthcare, one where new therapies, technologies and devices emerge from the symbiosis of technology and biology. Health research in UCD builds on our expertise in fundamental biomedical science and allied areas of science and technology. We tackle challenges such as infectious diseases, metabolic and cardiovascular disease and cancer, and we consider animal as well as human health. We are also leaders in health promotion, informing policy and practice, and our connected health programme works with clinicians, industry and patients to change the way healthcare is delivered.



UCD professor Des Higgins developed the world-standard Clustal programme for DNA sequence analysis. One of his papers on the topic is one of the top 10 most **HIGHLY CITED** research papers of all time. Publications that reference it include more than 27,000 patents which address a range of global problems such as controlling disease and improving plant yield.



In most cancer treatments less than 30% of medicines are effective. UCD's Systems Biology Ireland is working to change that by developing approaches based on personalised medicine. The centre is ranked in the **TOP 5 SYSTEMS BIOLOGY CENTRES** in the world and is a strategic partner for the European Molecular Biology Lab.



UCD works with **9 OF THE TOP 10** pharmaceutical companies on drug development and production.



Groundbreaking research led by UCD associate professor Emmeline Hill led to the discovery of the **SPEED GENE** in racehorses, which has had a major impact on breeding and management for the global thoroughbred industry. This work was commercialised by UCD spin-out Equinome, which was acquired by Plusvital in 2015.

ONEHEALTH

The One Health initiative recognises the close links between human and animal health. By addressing challenges in the area, UCD, in collaboration with our international partners, is working to safeguard the health of the population.

UCD is ranked 31st in the world for veterinary science, and is the only university nationally with a programme in this area.

UCD is the only Irish university in the top 100 in the *Times Higher Education* world university rankings in clinical, pre-clinical and health.

In One Health, we combine these strengths with our strength in agricultural science and food science and technology, and utilise our resources within the country's largest hospital group, the Lyons research farm, the UCD Veterinary Hospital and the National Virus Reference Laboratory.



ICT

UCD has a long tradition of excellence in Information and Communication Technologies, supporting the development of the sector in Ireland and beyond through the provision of talent and expertise. Today, the university lies at the heart of the dynamic ICT sector in Dublin, with more than 300 ICT/online companies located within 30 minutes of our campus, including world leaders such as Facebook, Google, HP, IBM, Intel and Microsoft. Our ICT research advances knowledge and delivers highly-trained researchers in fields such as Data Analytics, Artificial Intelligence, the Internet of Things, Smart Systems, Privacy and Security. It also connects these fields with others, addressing applications such as Smart Agriculture, Connected Health, Industry 4.0 and Digital Humanities. UCD has some of the most highly cited researchers worldwide in machine learning and in a number of domains of artificial intelligence.



UCD is the premier **SOURCE OF ICT GRADUATES IN IRELAND.**

Our graduates have gone on to be Vice-Presidents in ICT companies such as Apple, Google and Intel.



UCD professor Bogdan Staszewski has received international recognition as an **INDUSTRIAL PIONEER** for leadership in commercialising digital RF in the wireless cellular industry. His work to combine the analog and digital components of RF circuits, a key element of mobile phones, reduced production costs significantly, making mobile phones more affordable.



UCD's online law enforcement Masters in Forensic Computing and Cybercrime Investigation has trained senior officers in **INTERPOL, EUROPOL, NATO, AND THE UNITED NATIONS**, and government, defence forces and police in over 60 countries.



Integrated circuits that started in a UCD campus company have gone into more than **500 MILLION COMPUTERS** worldwide.

BIG DATA – BIG DEAL

Every day businesses all over the world generate billions of log events. These contain key pieces of information, but sifting through the data to find them is a vast, time-consuming task. Log management systems are typically expensive to buy and their success depends on the technical skills of users.

Logentries, a UCD spin-out, disrupted the global log management industry by developing a user-friendly and accessible data access and analysis technology which companies could purchase on a cost effective SaaS basis.

The company was founded in 2010 as a spin-out from UCD's Performance Engineering Laboratory following a decade long research collaboration with IBM's Dublin Software Lab. IBM and UCD now have two co-labs on our campus and are working together on technologies for the next generation of smart and sustainable cities.

In 2015 Rapid7 Inc., a leading US provider of security data and analytics solutions, acquired Logentries for \$68 million. At the time of acquisition Logentries had 70 employees and served over 3,000 customers in more than 65 countries.

TURNING IDEAS INTO OPPORTUNITIES



EDUCATION FOR INNOVATION & ENTREPRENEURSHIP

At UCD students develop skills in creative thinking, problem solving, design thinking and innovation. This takes place both within their fields of study and in cross-disciplinary activities such as the UCD Innovation Academy. UCD has repeatedly been ranked among the top five universities in Europe for producing VC-backed graduate entrepreneurs.



STUDENT ENTERPRISES

Start-up Stars is an entrepreneurship programme which provides a framework and support for UCD undergraduate and postgraduate students who want to work together to develop and grow start-up companies.



COMMERCIALISATION SUPPORTS

UCD provides a range of support programmes to assist UCD researchers in the commercialisation of the intellectual property emerging from their research activities. These programmes range from hackathons to bootcamps to intensive accelerator programmes.



INCUBATION

NovaUCD is the hub for new ventures and entrepreneurs at UCD. It is a purpose-built, state-of-the-art incubation facility for knowledge-intensive start-up companies, and has incubated some of Ireland's most successful spin-out companies.



INDUSTRY CO-LOCATION

NexusUCD, the industry partnership centre at UCD, offers high-quality modern office space and associated services to established innovation-led companies who seek to locate in close proximity to UCD to collaborate with and benefit from engagement with the university's world-class research base.



EARLY STAGE INVESTMENT

UCD is a leading partner in the €60 million University Bridge Fund launched in 2016 to invest in early-stage companies with global potential that are built from world-class research outputs, and to assist them in scaling internationally. Investors in the fund, managed by Atlantic Bridge, are the European Investment Fund, Enterprise Ireland, AIB, Bank of Ireland, UCD and Trinity.

HOW WOULD YOU LIKE TO ENGAGE?

How do I develop and access talent for growth and expansion?

How do I scope future trends?

How do I access expertise to develop a new idea or product?

How do I access research funding and supports?

How do I better understand and influence policy?

How do I network with other industries in a collaborative research environment?



EXPLORING OUR EXPERTISE

We can direct you to the research expertise most relevant to your needs. Whether through contract research work, licensing our technologies or a research partnership, we can help you find the type of engagement that best suits your needs.



ACCESSING INFRASTRUCTURE AND TECHNOLOGY

If you are interested in accessing our laboratories, equipment or core technologies, or locating on our campus, we will be happy to discuss the possibilities.



ACCESSING TALENT

Engaging with UCD's academics means that you have access to our best and brightest students. Schemes from Science Foundation Ireland, the Irish Research Council, the EU and others can provide funding for a talented early-stage researcher to work in/with your organisation.



PARTNERING IN RESEARCH

We have many very successful examples where enterprise or other organisations partner with our research groups in pursuit of shared objectives. A number of schemes are available to co-fund these partnerships, at a level that can range up to several millions of euro.



JOINING MAJOR NETWORKS

UCD is your route to major networks that may otherwise be difficult to access. In many cases, enterprise partners join with UCD and other academic partners in larger networks, such as the Research Centres funded by Science Foundation Ireland, Technology Centres funded by Enterprise Ireland/IDA and a range of EU-funded networks.



BUILDING A BROAD RELATIONSHIP

There are many mechanisms though which to build a strategic relationship with UCD. We work with industry partners and identify areas of shared need, resulting in joint investment that supports education, research and innovation. This includes philanthropic support for faculty positions, for student-facing initiatives and for infrastructure.



Contact us

✉ workwithus@ucd.ie

🌐 www.ucd.ie/researchandinnovation