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Towards a Research-Intensive University

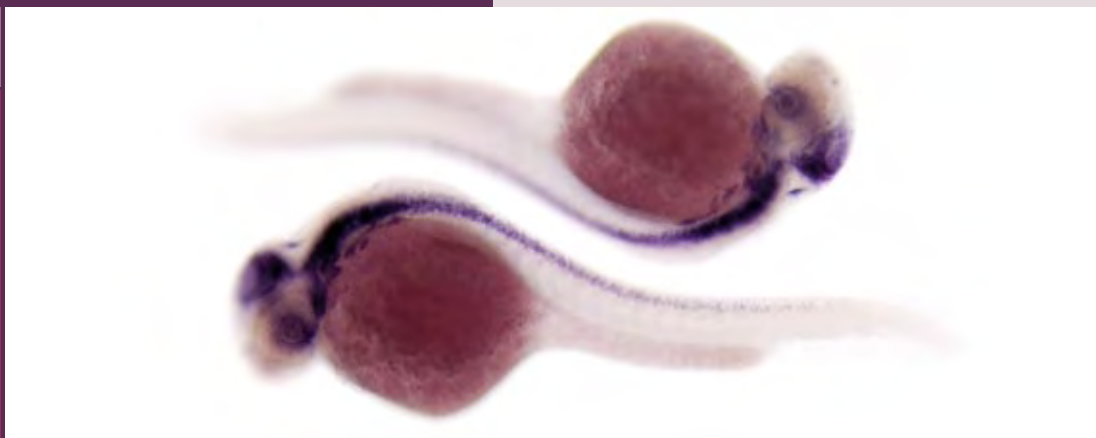
UCD is committed to becoming a leading European research-intensive university that nurtures innovation and creative discovery within its community of world-class researchers.

Combined with being a national and European leader in graduate education, the excellence and distinctiveness of research in UCD contributes to the social, economic and cultural objectives of a knowledge society.

UCD continues to build its reputation as a destination of choice for leading research talent, providing an environment in which research leaders can innovate and excel.

UCD is forging exciting educational and research partnerships and collaborations with academic, community, business and professional organisations, enhancing confidence in UCD as a destination for quality investment and making it a national leader in research funding.

The overall winner of the 2007 Images of Research competition was Maria Cederlund, School of Biomolecular and Biomedical Sciences and UCD Conway Institute, for her image Gene Expression in Zebrafish Embryos. The violet stain in this image shows where the gene *mab2112* is expressed in the 28 hours zebrafish embryo



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UCD Conway Institute of Biomolecular and
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(CSCB)
Dublin Molecular Medicine Centre (DMMC)
UCD Geary Institute
UCD Humanities Institute of Ireland
UCD Urban Institute Ireland
UCD Mícheál Ó Cléirigh Institute
UCD Clinton Institute for American Studies
UCD Institute for Sport and Health
UCD Global Irish Institute
UCD Centre for Chinese Studies / UCD
Confucius Institute for Ireland

NovaUCD

Research Publications

Details of all research publications for the period of the Report are available online at www.ucd.ie/research/publications

Research Funding

UCD has been highly successful in increasing the total value of research contacts won by 16% on 2005/06. In addition to the regular grant activity outlined in the following two tables, UCD has also been extremely successful in securing nationally competitive funding, particularly through the Programme for Research in Third Level Institutions (PRTL) funded by the HEA, and has also demonstrated unprecedented success in initiating a number of strategic initiatives, which are outlined later in this section.

Table 1 – Research Awards

Year	Total Value Contracts Signed incl. Contributions to Overheads (€ million)	Total Contributions to Overheads (€ million)	Total Number of Contracts Awarded	Number of Proposals Submitted
2003/2004	49.8	5.6	405	685
2004/2005	62.5	8.1	495	1,074
2005/2006	82.9	11.8	664	1,245
2006/2007	96.3	14.8	556	1,234

Table 2 – Funding Sources

Funding Source	Number of Contracts	Value (€ million)
Science Foundation Ireland (SFI)	86	23.2
Department of Agriculture, Fisheries and Food	32	9.1
European Commission	31	4.7
Health Research Board (HRB)	77	12.0
Enterprise Ireland (EI)	31	4.7
Irish Research Council for Science, Engineering and Technology (IRCSET)	63	3.9
Irish Research Council for the Humanities and Social Sciences (IRCHSS)	20	1.5
Environmental Protection Agency (EPA)	7	1.0
Business	28	8.6
Others	181	27.6
TOTAL	556	96.3



UCD Research building

UCD Internal Funding Schemes in Support of Research

Strategic and Major Initiatives Scheme

One of UCD's strategic aims is to encourage interdisciplinary research and cross-campus programmes that will see UCD compete for major funding opportunities. Now in its second year, the UCD Research Strategic and Major Initiatives Scheme continues to encourage large scale strategic proposals that are likely to attract funding in excess of €10 million. The scheme is designed to support a number of feasibility studies (with funding of up to €50,000) that can be developed into major funding proposals. The funding is for interdisciplinary programmes including collaborations with external institutions.

Seed Funding Scheme

Now in its third year the Seed Funding Scheme provides researchers with flexible opportunities for internal funding. The Scheme aims to provide seed funding to researchers at all stages of their careers with particular emphasis on projects that can successfully compete for subsequent external support. A second call for the Dissemination and Outputs Programme, specific to conference attendance, was introduced in June 2007 in recognition of the fact that researchers and the university alike benefit greatly from participation at conferences. Funding available under the Scheme has risen to €1.25 million this year. More than 600 researchers submitted applications to the Seed Funding Scheme in 2007 and 43 per cent of these researchers were awarded funding. See Table 3.

A runner-up in the Images of Research competition was this picture titled Microwave plasma standing wave created by Greg Byrne UCD School of Electrical, Electronic, and Mechanical Engineering, with the collaboration of Denis Dowling



Table 3 – Seed Funding Scheme

Round 2 2006		
Programme	No. of Awards	Amount Awarded €
Dissemination and Outputs	48	109,771
Enterprise and Commercialisation	7	35,000
TOTAL	55	144,771
Round 1 2007		
Programme	No. of Awards	Amount Awarded €
Internal and External Collaboration	39	325,082
Horizon Scanning	29	295,949
Dissemination and Outputs	104	156,647
Small Equipment Award	24	251,895
TOTAL	198	1,049,573
Round 1 (Second Call) 2007		
Programme	No. of Awards	Amount Awarded €
Dissemination and Outputs / Conference Participation Only	63	75,393
TOTAL	63	75,393

President's Research Fellowship Scheme

The President's Research Fellowship Scheme offers UCD researchers the opportunity to apply for an internal fellowship to enhance their research profile in UCD. The Fellowships are intended to support academics whose professional development as researchers would benefit from a period of focused research. In 2006/07, 31 applications were received for the President's Research Fellowship Scheme for 2007 and eight awards were made. See Table 4.

Table 4 — Presidents Research Fellowship Scheme Awards

Name	School
Professor Mark O'Malley	UCD School of Electrical, Electronic and Mechanical Engineering
Professor Gerry O'Sullivan	UCD School of Physics
Professor Adrian Ottewill	UCD School of Mathematical Sciences
Dr Gavin Barrett	UCD School of Law
Professor Alan Carr	UCD School of Psychology
Dr Nuala Brady	UCD School of Psychology
Dr John Brannigan	UCD School of English and Drama
Dr Graeme Warren	UCD School of Archaeology

Research Awards

UCD was awarded €30 million under the Programme for Research in Third Level Institutions (PRTL), Cycle 4, funded by the HEA, for transformative initiatives in science and humanities research. This is made up of €17.5 million capital infrastructure funding for the development of the UCD Science Centre and €12.5 million recurrent funding for projects in the humanities and sciences.

Within the humanities, the UCD Global Irish Institute, with its radically interdisciplinary programme will concentrate on the study of Ireland and its diaspora. The Irish Social Science Data Archive will also receive funding to further a national infrastructure in social science data collection and management.

Within the sciences four main collaborative programmes are to receive recurrent funding:

- The Biopharmaceutical and Pharmacological Sciences programme builds on the €72 million National Institute for Bioprocessing Research and Training (NIBRT) which is being funded by IDA Ireland in the UCD Belfield Innovation Park;
- Food Ireland supports one of Ireland's largest industries, agri-business, through the development of a collaborative national food and health research programme;
- The National Nanoscience Programme is designed to impact on emerging nano-technologies identified as key future wealth generators;
- Biomedical Science will facilitate the national consolidation and co-ordination of research and training activities in the biomedical sciences, delivering a coherent information portal and nationally accessible platform for molecular/translational medicine and biomedical sciences.

2006 SFI President of Ireland Young Researcher Awards

In recognition of their exceptional potential for leadership at the frontiers of knowledge and research, two UCD researchers were awarded SFI President of Ireland Young Researcher Awards (PIYRA). Science Foundation Ireland's most prestigious awards, valued at €1 million each over five years, recognises talented engineers and scientists at a very early stage in their careers. Two UCD researchers, Dr Emma Teeling and Dr Oliver Blacque, were among five recipients to receive over €4 million under the scheme. UCD is the only Irish institution to have been awarded more than one award for the second year running.

Dr Teeling's PIYRA-winning research examines the molecular evolution of sensory perception in mammals using the unique auditory and visual

senses of the bat as a model. Her research aims to identify the genetic variations that are most likely to cause deafness and blindness in humans.

Dr Blacque's PIYRA award goes towards the investigation of cilia biology; primary cilia are short hair-like structures on the surface of cells which play important sensory roles in the body. Defects in primary cilia cause cystic kidneys, retinal dystrophy and bone abnormalities. Using tiny microscopic worms as a model, Dr Blacque will examine the genetic basis of cilia function, regulation and development.



SFI President of Ireland Young Researcher Award recipients Dr Emma Teeling and Dr Oliver Blacque with President Mary McAleese

Enterprise Ireland Award

Professor Barry Smyth, UCD School of Computer Science and Informatics, was awarded the Enterprise Ireland Informatics Commercialisation Award 2006 for his leadership in commercialising university research. The annual award is presented to a researcher, research group or institution that exhibits commitment, innovation and success in relation to the commercialisation of university research. On presenting Professor Smyth with the award, Feargal Ó Móráin, Director of Applied Research Commercialisation at Enterprise Ireland stated that Professor Smyth had achieved a harmonious balance between academic and commercial success, and had also maintained a

strong track record of research excellence while managing to commercialise his work through the company ChangingWorlds.

Royal Irish Academy Gold Medals and Membership

Professor James Dooge and Professor Peter Neary were awarded Royal Irish Academy (RIA) Gold medals in the fields of engineering sciences and social sciences respectively. Former Minister for Foreign Affairs and emeritus Professor of Civil Engineering at UCD, James Dooge is widely regarded as one of the founding fathers of modern hydrology.

Professor Peter Neary (left) and Professor Jim Dooge (right) display their awards received from the Royal Irish Academy



Professor Peter Neary, Professor of Political Economy at UCD from 1980 to 2006, is undoubtedly one of Ireland's most distinguished academic economists. Professor Neary's main field of research is international trade theory, where he works on trade and industrial policy, globalisation, and competition.

In recognition of their outstanding academic achievements, three UCD academics were awarded membership of the RIA in May 2007. This is the highest honour that can be attained by scholars and scientists working in Ireland. The awards were made to:

- Associate Professor Jennifer Todd, UCD School of Politics and International Relations and IRCHSS Senior Research Fellow;
- Professor Desmond Higgins, Professor of Bioinformatics, UCD Conway Institute, the most cited computer scientist in the world;

- Professor Ciaran Regan, UCD School of Biomolecular and Biomedical Science, Professor of Neuropharmacology and Coordinator of the Applied Neurotherapeutics Research Group.

During the year, Professor Paul Engel was elected Vice-President of the Academy and Chairman of the Life Sciences committee.

Charles Parsons Energy Research and Griffith Geoscience Research Awards

The implementation of the government's National Development Plan 2007 - 2013 included new initiatives for energy: the Charles Parsons Energy Research Awards and the Griffith Geoscience Research Awards.

UCD was the only institution to win two of the seven Charles Parsons Energy Research Awards, worth a total of €5.38 million. The winning entries were selected by an international peer review panel, from 22 proposals covering 11 third level institutions. The UCD Electricity Research Centre (ERC), directed by Professor Mark O'Malley was one of the winners. A collaboration between the Power Systems Research Group at UCD and the electricity industry on the island of Ireland, its research is focused on three main areas: new and evolving electricity markets, the integration of wind power into electricity grids and power system operations. The UCD Bioresources Research Centre (BRC), directed by Professor Shane Ward, was the second winner. The award of €3 million will contribute significantly to the BRC's work on liquid biofuel and biomass-to-energy research.

UCD also won two of the eight Griffith Geoscience Research Awards which were made to Professor Patrick Shannon of the Marine and Petroleum Geology Research Group, and Professor Christopher Bean of the Geophysics Group. These awards totalled over €2 million.

The Marine and Petroleum Geology research group in the UCD School of Geological Sciences has established an outstanding group of scientists to focus on understanding of slope and deep water sea-bed processes and in providing a geological framework for basin development, petroleum exploration and reservoir analysis in the Irish offshore. The Geophysics research group at UCD is internationally recognised for its contributions in understanding such complex phenomena as earthquakes and climate.

Strategic Achievements

Ageing Research

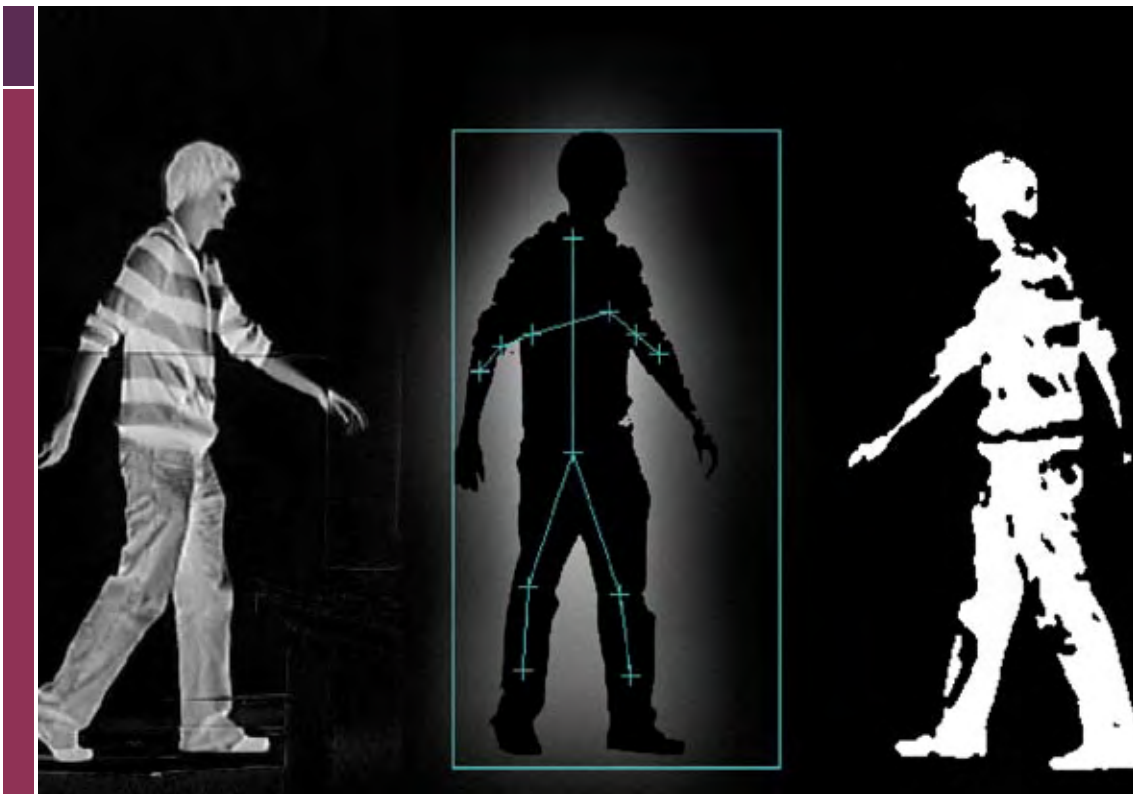
UCD leads the Technology Research for Independent Living Centre (TRIL), a \$30million / €23 million investment that was launched in January 2007 and involved collaboration with Trinity College Dublin (TCD), NUI Galway (NUIG) and Intel's new European Digital Health Group. The TRIL Centre will create one of the largest research efforts into the consequences of ageing across the globe. Its research projects will address the physical, cognitive and social consequences of ageing informed by ethnographic research and underpinned by biomedical engineering. UCD has an active, high-quality research environment in the healthcare domain including biomedical engineering and bioinformatics; the TRIL Centre builds on this and positions UCD as a centre of excellence for biomedical engineering in research in Europe.

Professor Richard Reilly of the UCD School of Electrical, Electronic and Mechanical Engineering is TRIL Centre Director and Principal Investigator of the TRIL Centre's Biomedical Engineering

activities. Here a large team of biomedical engineers is focused on the acquisition, collection and interpretation of physiological and behavioural markers of ageing. The emphasis is not just on laboratory research but on the delivery and validation of technical solutions within the home environment. The TRIL Centre at UCD focuses on neural engineering and multimodal signal processing, as well as the technology platform that supports the programme across the consortium.

Complex and Adaptive Systems Laboratory

The Complex and Adaptive Systems Laboratory (CASL) was formed in November 2006 and, under the direction of Dr Scott Rickard, brings together over 30 principal investigators and 175 graduate students and postdoctoral researchers from the UCD Schools of Business; Computer Science and Informatics; Electrical, Electronic and Mechanical Engineering; Geological Sciences and Mathematical Sciences; and the UCD Conway Institute in a dedicated 2,600m² five storey facility.



A runner-up in the Images of Research competition was this image created by Brian O'Mullane titled Gesture Recognition. The TRIL project aims to create assistive technology for the elderly. This is a set of images taken during a unique physical gesture recognition process being developed by the technology research team

Cormac Nolan, UCD School of Biology and Environmental Science, won third place in the Images of Research competition for his picture titled Sleeping with the Anemone. It is of a Caribbean spotted cleaner shrimp that uses its bright colours and white antennae to attract clients to its anemone. This one was spotted in the shallows after a research dive collecting fish in Turneffe Atoll, Belize



CASL is comprised of 25 SFI principal investigators in the fields of Computational Biology, Computational Science, Data Intensive Science, Sensing Systems, Mathematics of Information and Communication, and Mathematical Finance to create innovative research and graduate programmes that transcend disciplinary boundaries.

Translational Medicine

A five year collaborative partnership between UCD Conway Institute and Servier Laboratories, a leading French pharmaceutical company, was established in February 2007 with a grant of €3.3 million. The UCD Servier Centre for Translational Medicine, a Franco-Irish collaboration bringing biomedical science to society, initially targets development of new medicines to treat high blood pressure and heart disease. The Centre's research programme will in the future address unmet needs in areas such as heart failure and Alzheimer's disease.

National Digital Research Centre

The National Digital Research Centre (NDRC) is a €25 million programme developed in 2006 by a consortium of third level institutions including UCD, DCU, TCD, Dún Laoghaire Institute of Art, Design and Technology (IADT) and the National

College of Art and Design (NCAD) with the support of the Department of Communications, Energy and Natural Resources. The NDRC mission is to create value by translating innovative research into commercial potential. It will provide a highly practical and collaborative national focal point to drive the value of research and its commercial applications.

Autism Genome Project

UCD researchers are playing a major role in a leading global project that aims to find the genes that contribute to the risk of developing autism. The international consortium known as the Autism Genome Project (AGP) will receive a total investment of €12 million from a variety of international organisations over the next three years. UCD researchers, Professor Andrew Green and Dr Sean Ennis from the UCD School of Medicine and Medical Science, and TCD researchers will play a lead role in the project, the aim of which is to find a link between clinical and genetic information in patients and in so doing better understand the factors contributing to autism. This will be crucial to the development of diagnostics, targeted treatment and intervention.

Research Achievements

Institute of Biomedical Informatics

The Institute of Biomedical Informatics (IBI) is a collaboration led by UCD which includes NUIG, TCD and Queen's University Belfast (QUB) working with Hewlett-Packard. The new all-Ireland research institute was established in 2007 to develop the software tools needed to investigate the link between genes and diseases such as cancer, cardio-vascular disease and diabetes.

The goal of the IBI is to conduct research and develop international standards in the field of biomedical informatics. The institute will also develop educational programmes on biomedical informatics for the commercial and public sectors and will help create a suite of commercial services for the health industry. There will be strong emphasis on systems research and service provision through large-scale computing, data management and mining, and data visualisation.

Blaschka Congress and Exhibition

UCD and the Natural History Museum co-hosted the first international conference focused on the work of father and son glass artists Leopold and Rudolf Blaschka. The conference was accompanied by a public exhibition of some previously unseen Blaschka models. Blaschka glass sculptures are renowned for their historical, technical and artistic importance and include anatomically detailed and scientifically correct models of hundreds of species of marine animals and magnified microscopic organisms. Collections-based Biology in Dublin (CoBiD), the UCD partnership that organised the conference, was launched in 2003 to promote teaching and research into preserved biological specimens held in museum collections. CoBiD is the only such collections-based teaching programme in the world. It is run by the UCD School of Biology and Environmental Science and the National Museum of Ireland (Natural History).

Irish Heart Foundation appoints UCD Professor as President

Professor Eoin O'Brien, Adjunct Professor of Molecular Pharmacology at the UCD Conway Institute, was appointed as President of the Irish Heart Foundation. A cardiologist and world leader on hypertension, Professor O'Brien was founder and director of the Blood Pressure Unit and has published over 600 scientific papers on hypertension research. He is author of *Blood Pressure Measurement* and the popular *ABC of Hypertension* and sits on the editorial boards of a number of scientific journals devoted to hypertension; he is Chairman of the Committee on Blood Pressure Measurement in Low Resource Settings at the World Health Organisation.

Images of Research Competition

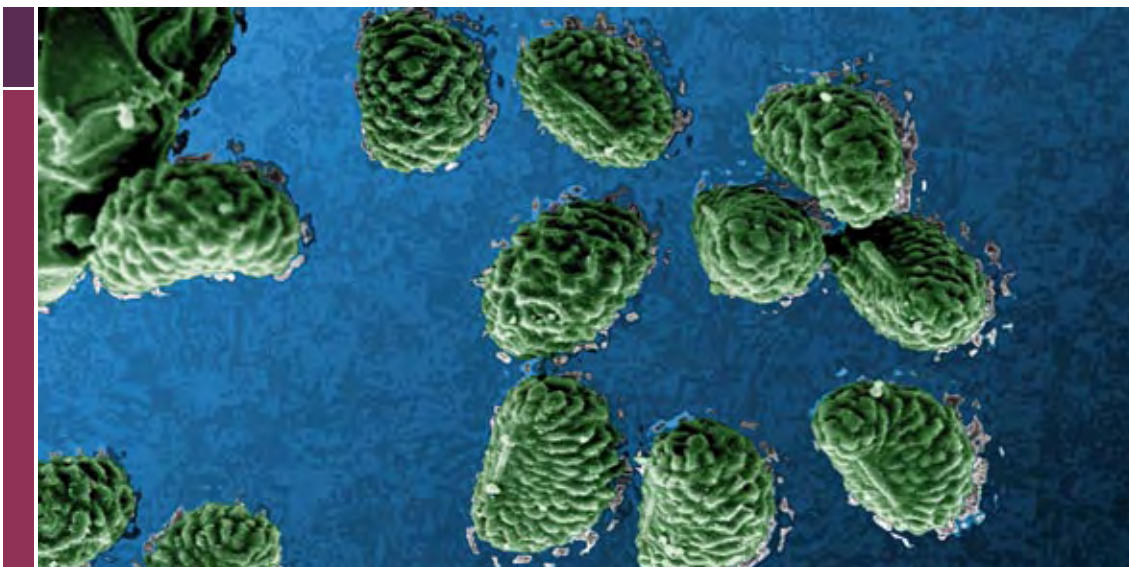
A unique event in Ireland, the *Images of Research* competition and exhibition featured over 250 images created by researchers in UCD, showcasing the depth and diversity of research under way in the university. The images submitted in the competition and on display in the exhibition related to all of UCD's academic and research disciplines including Arts, Life Sciences, Social Sciences, Humanities, Engineering and Physical Sciences. The competition and exhibition now run annually in UCD.



Blaschka glass model of an octopus (©National Museum of Ireland)

Shortlisted in the Images of Research competition was this image created by Dr Alfonso Blanco, UCD Conway Institute, titled Different World II—Islands.

The image shows fern spore analysed by scanning electron microscopy



Plasma Astrophysics collaboration with Oxford University

A major collaborative research project that will address fundamental astrophysical questions was established between St John's College Oxford and the UCD School of Mathematical Sciences. UCD researchers, led by Dr Peter Duffy in Dublin, will work with research partners in Oxford towards understanding the role played by magnetised turbulence in the transport and acceleration of highly energetic particles in quasars and microquasars. The theoretical and computational models developed in UCD and Oxford will be compared with the data gleaned from the astronomical observations. A unique feature of this project is its interdisciplinary nature; drawing on the fields of observational astronomy, theoretical physics, computational science and developments in transport theory for terrestrial, nuclear fusion plasmas.

Major initiative to help reduce poverty in developing nations

UCD has received €1.5 million funding in the first round of Irish Aid's Programme of Strategic Cooperation; the programme encourages partnerships between Irish third level institutions and their counterparts in developing countries. The UCD International Development Studies Initiative will establish a multi-disciplinary team of researchers from the UCD Conway Institute, the UCD Geary Institute and the UCD Urban Institute Ireland to investigate poverty reduction in developing countries. The UCD initiative is spearheaded by Professor Patrick Paul Walsh and the key areas of research include: Health and HIV

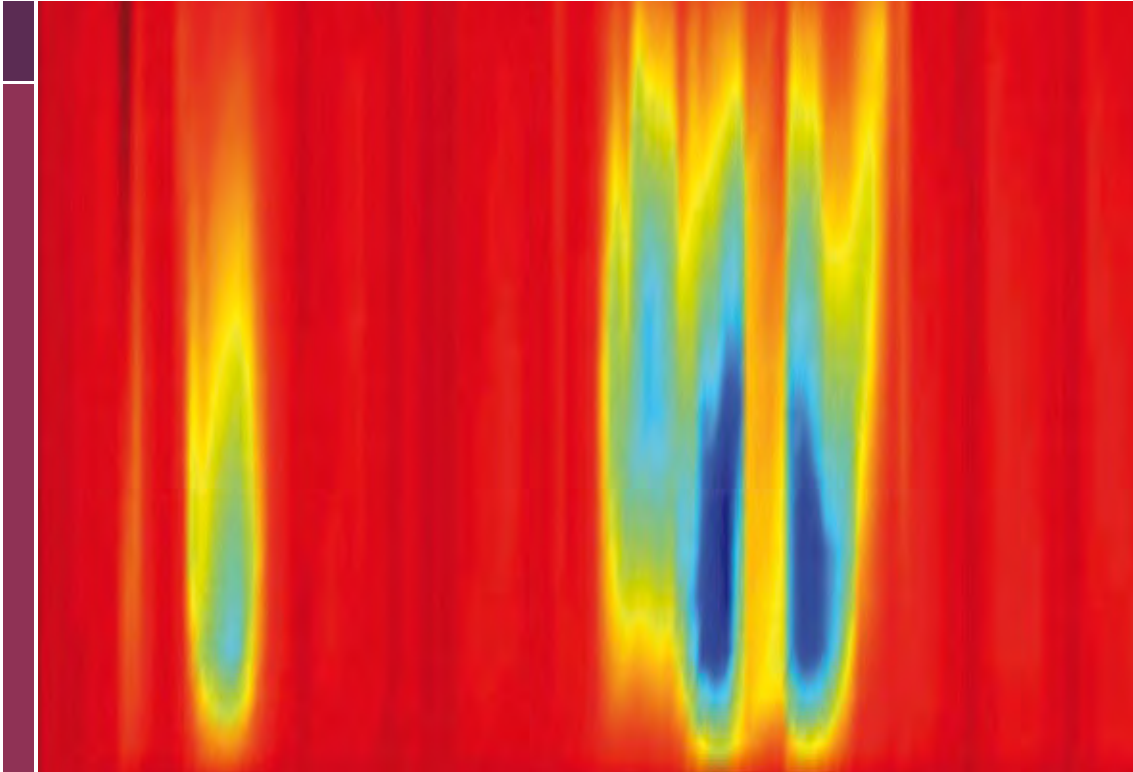
Aids; Poverty and Disadvantage; Good Governance; Pro-Poor Growth; Education; Gender Equality; Food and Livelihood Security; and Environment.

UCD St Vincent's Genome Resource Unit

The opening of the UCD St Vincent's Genome Resource Unit by the Minister for Education and Science, Mary Hanafin TD in April 2007, enables scientists to share and compare genetic data from Irish patient populations with data from patient populations worldwide. Debilitating diseases such as heart failure, cancer, arthritis and diabetes are major research priorities for clinical investigators at UCD and the facility enables clinician scientists working with the UCD Conway Institute to bring emerging technologies to bear on some of the most intractable global diseases.

Centre for Behaviour and Health

A new research initiative at the UCD Geary Institute which focuses on Health and Health Behaviour was launched in May 2007. The new Centre for Behaviour and Health is set to establish itself as a global centre of excellence which will shape policy debates and examine how people make life influencing decisions. Professor Colm Harmon, Director of the UCD Geary Institute, is one of the key leaders of the research alongside Professor Patrick Wall from the UCD School of Public Health and Population Science. With Ireland as its focus, the groundbreaking research taking place at the Centre is directly relevant to a rapidly changing Irish society and to the policy community.



Second place in the Images of Research competition was Bridge's Soul by Daniel Cantero Lauer, UCD School of Architecture, Landscape and Civil Engineering. This image shows the relative error of the UNB (Under vehicle Bending moment) for different frequencies of sine wave road profiles, taking as reference the response for 1cm amplitude

Food and Health Research

Nine research initiatives are underway in UCD in the area of food and health research. Professor Michael Gibney was appointed to lead the interdisciplinary Institute of Food and Health. Funding in excess of €20 million has been won for the following research projects: Food Ireland; National Functional Food Research Programme; National Diet and Health Research Centre; National Nutrigenomics Research Programme; National Food Safety and Nutrition Surveillance; National Graduate Development Programme. Research partners include University College Cork (UCC), Dublin City University (DCU), University of Ulster, University of Limerick (UL), Teagasc and others.

Pioneering Researcher in Nanoscience joins UCD Conway Institute

Professor Suzi Jarvis and her nanoscale function group have recently joined the UCD Conway Institute from the Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN) at TCD. Her multidisciplinary team has a skills base that includes physics, electrical and mechanical engineering, materials science, mathematics, chemistry, biology and phycology. Using atomic force microscope (AFM) techniques, Professor Jarvis and her group are investigating the

nanometre-scale functionality of organic and biological molecules. The group has a number of national and international collaborations and Professor Jarvis is also a co-founder of the International Nanotriobiology Forum, which explores the science of triobiology (science and technology of interacting surfaces in relative motion) at the nanoscale.

UCD Spin-out Company wins International Artificial Intelligence Award

ChangingWorlds, a NovaUCD spin-out company has received a *Deployed Application Award* from the Association for the Advancement of Artificial Intelligence (AAAI). The award, which recognises successful practical and commercial applications of Artificial Intelligence technologies in industry, was presented at the nineteenth annual AAAI conference which took place in July 2007. Professor Barry Smyth from the UCD School of Computer Science and Informatics, one of the founders of ChangingWorlds, presented the winning paper titled *Enabling Intelligent Content Discovery on the Mobile Internet*. The paper describes how the ClixSmart portal personalisation technology developed by ChangingWorlds has been deployed by leading mobile operators worldwide to deliver portal usability benefits leading to increased portal usage and revenue growth.

Fourth Level

The UCD Strategic Plan clearly sets the objective of the university becoming a national and European leader in graduate education. This is key to the further development of UCD as a research intensive university, to the vibrancy of its academic community and to the success of Ireland as a knowledge society.

Students promoting the inaugural Graduate Student Opportunities Day in O'Reilly Hall in February 2007

UCD has the greatest number of graduate students of any university in Ireland. At 5,907 this represents 26% of the total UCD student population. The numbers of graduate research students in UCD increased significantly to a total of 1,908 in 2006/07. Overall, UCD has 22% of all the graduate research students in higher education institutions in Ireland.

Progress to date

Following the initial establishment of the five UCD Graduate Schools in 2005/06, led by Professor Michael Ryan, Dean of Doctoral Studies and Postdoctoral Training, this year saw the establishment of new governance structures for graduate education in UCD. This involved the establishment and approval of terms of reference for the University Graduate Programmes Board (UGPB) with oversight of all graduate programmes in UCD and for the five UCD Graduate School Boards. In most Graduate Schools, a sub-board for graduate taught programmes was also established.

The UCD structured PhD was introduced and put in place for all PhD students entering UCD in September 2006. Implementation of the structured PhD involved both research and modules in research methodology and transferable skills. In addition, all taught graduate programmes were modularised.

Significantly, 100 new four year funded Ad Astra Research Scholars posts were established and a pilot of a new scheme to develop research and professional development plans with each scholar was also introduced.

A range of initiatives were taken to attract graduate students to the university:

- The Graduate Studies website was upgraded and new branded material was produced;
- A pilot online applications process for a range of graduate programmes began and received very positive feedback from applicants;



- An inaugural welcome event for incoming graduate research students was held in October 2006;
- The inaugural UCD Graduate Opportunities Day was held on February 21st, 2007. This was attended by over 1,100 potential new graduate students including existing undergraduates from other universities and potential mature students already in employment.

Potential linkages of UCD's graduate programmes with partner universities through *Universitas 21* are being examined.

Future objectives

In 2007 the Research and Professional Development Plan (RPDP) will be rolled out to all incoming PhD students and regulations for all other research degrees will be developed and co-ordinated. The RPDP is a set of tools to aid in the preparation and progress of research and professional skills. It is an integral part of the structured PhD programme and is specifically designed to help in the planning, monitoring and completion of PhD studies.

There will also be a co-ordination of all graduate taught programmes with the wide selection of modules now available.

It is also intended to increase the UCD graduate student population from 26% to 40% and to develop collaborative graduate programmes with other universities in Ireland and abroad.

UCD Conway Institute of Biomolecular and Biomedical Research

The strategic objectives of the UCD Conway Institute are to:

- Establish a world class centre of excellence in the biomedical sciences at UCD within 10 years with success being measured by internationally accepted research outcomes;
- Support the development of novel technologies and their application to translational research to better understand the molecular pathogenesis of disease in areas such as diabetes, neuroscience and infection, inflammation and repair;
- Offer leadership in interdisciplinary biomedical research by providing the environment that supports new scientific areas such as systems biology through the successful integration of sciences traditionally considered outside conventional biological disciplines such as mathematics, computer science, physics and economics with those already within the Institute;
- Achieve innovation through co-operation and partnership at local, national and international level with academic, healthcare and commercial partners.

There will be a continued increase in PhD numbers to meet the government target to double the number of PhDs by 2013.

The UCD Conway Institute currently has 135 Conway investigators. Together with their associated teams of approximately 320 graduate students and 150 postdoctoral fellows, they comprise an active research community of some 600 people. The Institute's Director is Professor Janet Allen.

Progress to date

UCD Conway Institute made successful bids for funding under the PRTL, Cycle 4 to develop national graduate enhancement programmes in two areas: (Bio)pharmaceutical and Pharmacological Sciences (BPS) and Biomedical Sciences Network (BMSN).

A total of €19.8 million in peer reviewed grant income was awarded to Conway investigators during the year in review. Twenty invention disclosures, four patent applications and two licensing agreements were lodged by Conway investigators. In addition, up to August 2007, 53 PhD and five Master's thesis submissions were made by graduate students affiliated to Conway investigators. There were a total of 228 peer-reviewed publications by Conway investigators during the period.

Complementing existing research programmes in both the Conway and CSCB (Centre for Synthesis and Chemical Biology), the new (Bio)pharmaceutical and Pharmacological Sciences programme builds on the National Institute for Bioprocessing Research and



Science teachers
Laura Barry, Seosamh
Ó Braonáin and Aoife
McCarthy with their
model of DNA made
at the SFI Secondary
Teachers Assistant
Researchers (STARS)
programme held in the
UCD Conway Institute

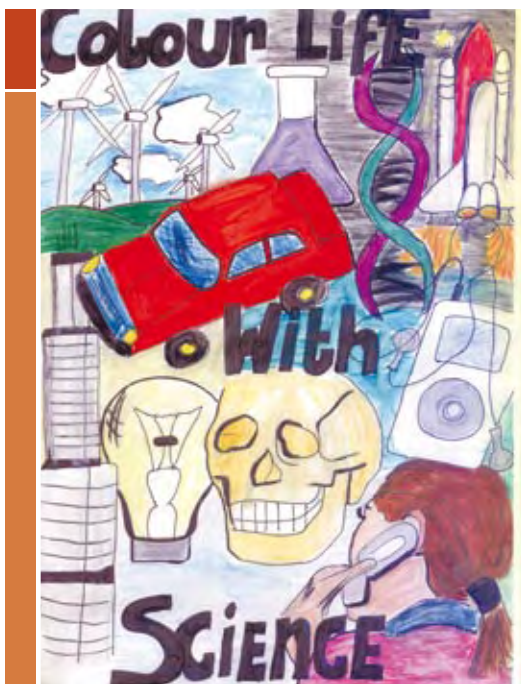
Training (NIBRT) initiative. Together, these landmark initiatives will concentrate on providing trained researchers for Ireland's emerging biopharmaceutical industry (e.g. Wyeth, Amgen). There will be a particular focus on the production of biological therapeutics — molecules produced by cells that can be used to treat common human diseases such as arthritis, kidney disease and inflammatory bowel disease.

The Biomedical Sciences Network will facilitate national consolidation and co-ordination of research and training activities in the biomedical sciences. It is hoped this network will be instrumental in delivering a coherent information portal and nationally accessible platform for molecular/translational medicine and biomedical sciences. An important feature is the development of tailored research training opportunities for clinicians to foster clinician-scientists.

Professor Mike Scott established the first transgenic laboratory in UCD. Located in the Specific Pathogen Free (SPF) facility of UCD Conway Institute Biotechnical Services, this laboratory became operational in August 2007.

Notable achievements

Colour Life with Science by Isabel Kelly, Teresian School, Donnybrook, Dublin 4, which won the secondary school category of the Conway Institute AccesScience '07 poster competition



Several key members of staff were recruited including Dr Ollie Blacque (primary cilia), Professor Suzi Jarvis (atomic force microscopy), Professor Helen Roche (metabolomics in human nutrition) and Professor Michael Keane (appointed Professor of Medicine and Therapeutics). Dr Giuliano Elia was appointed Director of the mass spectrometry facility.

Developed at the UCD Conway Institute, Biontrack, which delivers software solutions to support protein researchers in industry and academia, was the runner-up in the 11th NovaUCD Campus Company Development Programme (CCDP) held in November 2006.

Under UCD's new structured PhD programme, the Institute developed and delivered accredited modules to 207 graduate students. These include *Introduction to Core Research Skills*, *Advanced*

Research Skills for Biological Scientists, *Introduction to 'Omic' and Advanced Imaging Technologies*, *Communications for Research Scientists*, *Neuroimmunology* and *Immunology*.

A new PhD in Bioinformatics and Computational Biomedicine was developed by Professor Denis Shields during the period. It aims to give students a strong interdisciplinary training, with both numerate and biological research experience.

The 2006/07 *Science4Schools* outreach programme brought the wonders of science and scientific research to 3,000 primary and secondary school pupils and their teachers nationally. Events included *ScienceWorks*, primary school workshops, a transition year work experience programme and *AccesScience Junior*, which teamed up with the new UCD Ambassador Programme to give guided campus tours to pupils prior to the event.

AccesScience '07 celebrated the 10th anniversary of the inaugural Merville Lay seminars and some past winners were invited back to join in the celebrations. Doctoral student Elaine McSherry took first prize for her presentation *The Missing Links?: How Breast Cancer Spreads*.

Future objectives

UCD Conway Institute will create a rich interdisciplinary environment to foster excellence in biomedical research by forging links within the biological sciences to the UCD teaching hospitals, to chemistry through the CSCB, with emerging academic disciplines relevant to systems biology such as applied mathematics, computer science and engineering (CASL) and with economics through the UCD Geary Institute.

Research paper success

The publication with the highest impact factor during the reporting period was from a research team led by Professor Denis Shields [Edwards RJ, Moran N, Devocelle M, Kiernan A, Meade G, Signac W, Foy M, Park SDE, Dunne E, Kenny D and Shields DC. *Bioinformatic discovery of novel bioactive peptides*, *Nature Chemical Biology* 2007; 3:108-112]. The paper outlines how the team examined whether rational bioinformatic design of oligopeptides specifically targeted to potentially signalling-rich juxtamembrane regions could identify modulators of human platelet function. They found that systematic screens of this nature are highly efficient tools for discovering short signalling motifs in molecular signalling pathways.

Centre for Synthesis and Chemical Biology (CSCB)

The Centre for Synthesis and Chemical Biology (CSCB) is a collaboration in the chemical sciences between UCD, TCD and the RCSI. With 48 principal investigators and their teams, the CSCB comprises over 200 researchers. The UCD researchers (33 principal investigators) are from the UCD Schools of Chemistry and Chemical Biology, Biomolecular and Biomedical Science, Physics and Chemical and Bioprocess Engineering.

The mission of the CSCB, under its Director, Professor Pat Guiry, is to promote knowledge, health and economic advancement through excellence in the chemical sciences of synthesis and chemical biology, to enrich the nation's research and educational resource base and to facilitate the development of the pharmaceutical industry in Ireland. The CSCB has the following strategic objectives:

- Advancing knowledge in the chemical sciences of synthesis and chemical biology, as part of a collaborative biomedical research effort;
- Reacting to changes in and requirements of the Irish pharmaceutical and emerging biopharmaceutical industry;
- Raising the research profile of Ireland through international collaboration and increased high impact publications;
- Fostering entrepreneurship, supporting technology transfer and developing strong partnerships with industry;
- Providing new high quality research and teaching programmes for Irish students at third and fourth level;
- Developing a significant outreach programme to enhance the public understanding of chemical sciences.

Progress to date

In 2006/07, CSCB researchers published over 130 articles in peer-reviewed journals, gave over 160 invited lectures and poster presentations and were awarded over €4 million in external funding.

Professor Stefan Oscarson was appointed as Ireland's first Professor of Chemical Biology in the UCD School of Chemistry and Chemical Biology in February 2007. Professor Oscarson's main research interest is the synthesis of biologically active natural products, in particular oligosaccharides and glycoconjugates, for use in biological and medicinal experiments and applications. Professor Oscarson was the recipient of a SFI Professor Recruitment award of €760,000 in February 2007.

CSCB researchers played a key role in the (Bio)pharmaceuticals and Pharmacological Sciences National Graduate Enhancement programme which was funded by PRTL, Cycle 4. This involves collaboration with colleagues in TCD, DCU, UCC and the RCSI.



Participants in the 15th European Symposium on Organic Chemistry which was held in UCD in July 2007

The *Science@CSCB* outreach programme reached over 1,500 students through a series of half-day workshops, a transition year work experience week, demonstration lectures and school visits. The outreach team were awarded an RDS Science Live demonstration lecture bursary which enabled them to bring UCD research to secondary school pupils from over 20 schools with an interactive presentation.

Notable achievements

The fifth annual CSCB symposium, *Recent Advances in Synthesis and Chemical Biology V*, was held in the RCSI in December 2006. 200 delegates heard plenary lectures from six distinguished speakers, describing current research at the interface between chemistry and biology. The speakers were Professors Erick Carreira (ETH), Barbara Imperiali (MIT), Peter Sadler (University of Edinburgh), Tom Simpson (University of Bristol), Anna Maria Papini (University of Florence), and Gerard Canters (Leiden University).

CSCB researchers also hosted a three-day workshop on *Modern Carbohydrate and Glycoconjugate Chemistry* where young European and US researchers presented their research work and initiated collaborations with their peers.

A COST Action D40 workshop, *Innovative Catalysis: New Processes and Selectivities* was held at the CSCB. The primary objective of the Action is the discovery of new, highly innovative, pre-competitive research that lays the foundation for providing new industrial products and processes with significant competitive advantages over the current state of the art.

The 15th European Symposium on Organic Chemistry (ESOC) took place in UCD in July 2007 and was the largest organic chemistry event ever held in Ireland with over 600 national and international attendees.

Future objectives

The CSCB will continue to strive towards the strategic, research, teaching and learning objectives as outlined at its inception by aiming to:

- Strengthen the links between UCD, TCD and the RCSI by encouraging collaborative research between researchers at these institutions;
- Increase the number of PhD students and further enhance the research effort through the hiring of more postdoctoral fellows and visits of internationally recognised scientists to the CSCB;
- Actively source funds to support the research effort;
- Increase the quality and quantity of peer-reviewed publications and the number of invited lectures given by CSCB researchers;
- Update existing modules and devise new modules for both undergraduate and graduate training;
- Complete the design of the new BSc degree in Medicinal Chemistry and Chemical Biology which began with its first entry of students in September 2007;
- Expand the *Science@CSCB* outreach programme to include more visits from students and teachers.

James Claffey,
Clara Pampillón, Dr
Katja Strohfeldt, Dr
Matthias Tacke and
Nigel Sweeney

Tumour research

CSCB Principal Investigator Dr Matthias Tacke, and his research team at the UCD School of Chemistry and Chemical Biology, have recently published highly significant preclinical results on the anti-tumour activity of Titanocene Y on human breast tumours and in a mouse model. In the mouse model, a decrease not only in tumour growth but also a reduction in tumour volume to around one-third was observed for the first time. Dr Tacke's group has been working on anti-cancer drugs belonging to the titanocene family for five years.



Dublin Molecular Medicine Centre

The Dublin Molecular Medicine Centre (DMMC) exemplifies UCD's commitment to collaborative partnerships in the biomedical sciences. This joint venture between UCD, TCD and RCSI is helping to position Dublin as a centre of excellence in molecular medicine research and education. Dr Ruth Barrington was appointed as Chief Executive in May 2007.

The DMMC has helped align the activities of Dublin's biomedical research institutions and six affiliated teaching hospitals under a common framework designed to facilitate cross-institutional collaboration and enhance translational research capability.

Key outputs are:

- The creation of an internationally recognised community in molecular medicine;
- Novel research programmes and enabling technologies resulting in increased international impact by the participant academic institutions;
- New diagnostics, therapeutics and more effective intervention strategies;
- The generation of valuable biological collections with high context information for individual investigators;
- Building a multi-disciplinary education curriculum that is informed by the biopharmaceutical industry and which enables career long learning.

Progress to date

The official opening of the UCD St Vincent's Genome Research Unit (GRU) took place in April 2007. This investment by UCD in partnership with St Vincent's University Hospital, the DMMC and the HEA delivers an integrated clinical network which enables UCD to play a leadership role through the auspices of the European Clinical Research Infrastructure Network. The facility will maximise the synergy between clinical and bench-based scientists.

The development of a city-wide infrastructure for translational and clinical research is progressing well after a DMMC co-ordinated bid secured Wellcome Trust and HRB funding to create the Dublin Centre for Clinical Research (DCCR). The development of essential cross-institutional



Pictured at the opening of the UCD St Vincent's Genome Research Unit were (l to r): Dr Hugh Brady, UCD President, Mary Hanafin TD, Minister for Education and Science, Dr Seamas Donnelly, Director, UCD St Vincent's Genome Resource Unit, Prof Noel Whelan, Chair, St Vincent's Board, Dr Risteard O'Laoidhe, Chair, St Vincent's Medical Board

infrastructure involves a major research nurse training programme and the establishment of an integrated informatics infrastructure. For the latter, a pilot phase is ongoing with the construction of a Biobank Information Management System for the DMMC Prostate Cancer Research Consortium.

The joint HRB and DMMC workshop *Clinical Research Training in Ireland*, held in September 2006, was attended by leaders from university medical schools, hospital and university research institutes, funding agencies and government. The workshop considered how best to train clinician scientists in Ireland. These workshops are important in defining existing deficits in personnel and resources and formulating the best way forward; in this case helping to lay the foundations for the Biomedical Science Network application for PRTL funding to support clinician scientist training.

In October 2006, Scientific Advisory Committee members convened around the DMMC Science Day, which took place in the TCD Institute of Molecular Medicine, St James's Hospital. Over 100 scientists attended which provided an opportunity for graduate and postdoctoral investigators to present their research in the areas of cancer, neuropsychiatric disease, cardiovascular disease, and infection, inflammation and immunity.

Notable achievements

Eight DMMC courses and workshops took place between September 2006 and August 2007. These are short taught courses in the biosciences with a major emphasis on translational research, used by graduate students to supplement research degrees and by postdoctoral workers and staff as career long training across disciplines and institutions.

The DMMC international workshop *Epigenetics: From Mechanisms to Medicines* took place in UCD in June 2007. The international workshops are a new strand of the DMMC education and training programme, which benefit from a combination of local and international expertise and attendance.

By summer 2007, the number of individuals attending one or more DMMC courses since their inception in December 2003 had risen to 1,228 with many repeat attendees. The total includes 551 from UCD and affiliated hospitals. The teaching expertise is also cross-institutional; 161 individual members of staff based in DMMC parent institutions and other universities and hospitals in Ireland and overseas have been instructors on DMMC Courses. Many have taught on several courses, and the total includes 53 from UCD.

Future objectives

The Dublin Centre for Clinical Research presents a unique opportunity to develop a new clinical research infrastructure. It will connect with the existing GRUs at Beaumont Hospital, St Vincent's University Hospital and the Mater Misericordiae University Hospital to establish a city-wide network that ensures a greater number of patients can benefit from clinical research in the most cost effective manner.

In the coming year, the DMMC education and training programme will continue to develop and will include collaborative courses with the biopharmaceutical industry. Longer term, cross-institutional education will be delivered with more courses and a move into e-learning.

The formation of the Irish Clinical Research Infrastructure Network (ICRIN) is a prelude to a large and ambitious project to create an all-Ireland

proposal to establish Molecular Medicine Ireland (MMI), with UCC and NUIG joining the current DMMC partners. MMI will use the DMMC model and existing infrastructure to align activities of five of Ireland's premier biomedical research institutions and affiliated teaching hospitals. It will create a critical mass and centre of excellence in molecular medicine research and education.



The Irish Clinical Research Infrastructure Network (ICRIN) was officially launched in January 2007.

ICRIN was created under a Memorandum of Understanding between UCD, TCD, RCSI, UCC, NUIG and the DMMC. This agreement links together five medical schools and affiliated teaching hospitals to create a network capable of conducting nationwide clinical studies in all disease areas. It is funded by the Health Research Board and the Health Services Executive.

An ICRIN co-ordinator, Ms Margaret Cooney, was recently appointed within the DMMC Directorate and will progress the development of a national infrastructure that facilitates cutting edge clinical research in a safe and regulated environment. ICRIN's main objectives are to:

- Ensure that education and training programmes are put in place for clinical research staff;
- Allow Irish academic and non-academic clinical investigators to participate in multi-centred clinical studies;
- Drive a standardised approach to biobanking at all sites;
- Assist harmonisation of procedures in Ireland with respect to informed consent, ethical review, data monitoring, adverse event reporting, etc., in line with ongoing work in Europe.

ICRIN is Ireland's representative within the European Clinical Research Infrastructures Network (ECRIN).

UCD Geary Institute

The UCD Geary Institute conducts leading edge research on life course issues and the way public policy affects areas such as early childhood outcomes, youth inequalities, retirement behaviour and educational choices. The hallmarks of the Institute are its cross-disciplinary perspective on a research agenda that examines effective solutions to economic, political, epidemiological and social questions.

The Institute vision is to:

- Support frontier methods of investigation, leading to the very best in research publication;
- Enhance the international profile and ranking of its researchers;
- Play a central role in the training of the next generation of researchers by maximising opportunities for graduate students to work alongside senior researchers on live projects;
- Provide objective analysis and effective solutions that address the challenges facing policy makers.

Progress to date

The Institute continues to focus on major publications in peer reviewed outlets and 2006/07 was a very successful year for Geary researchers with publications in the *Journal of Human Resources*, *Canadian Journal of Economics*, *Quarterly Journal of Economics*, *American Economic Review*, *Economic Inquiry* and many others.

A vibrant year of seminars included launching the weekly interdisciplinary behavioural seminar, funded by the Geary Centre for Behaviour and Health, and a qualitative methods laboratory.

There was continued close engagement with research groups in international partnerships which include RAND Corporation, Kennedy School of Government at Harvard and University of Chicago Harris School of Public Policy.

Graduate student involvement in research clusters has deepened. Graduate students at Geary participate in a number of reading groups, seminars, workshops and technical programming. In 2006/07 the Institute was host to three graduate students from its Harvard partnership.

A major redesign of the website illustrates more directly the activity at Geary and the policy implications of its work. UCD Geary has continued to have a strong media presence including interviews in Irish, UK and US print and broadcast media on research. In this year outputs widened to include a policy briefings series, and use of web based innovations such as podcasting to distribute audio and video content from major lectures.

Notable achievements

The Institute had significant success in major national research competition. In the HEA funded PRTLI, Cycle 4 it secured major investment in the Irish Social Sciences Data Archive. Under the government's Strategic Innovation Fund (SIF) programme the Institute received funding for its work on evaluating university access programmes and the development of a longitudinal study of the university student and postdoctoral population, and the Irish Aid programme, led by Professor Paul Walsh.

Contracts signed in 2006/07 exceeded €3 million and the Institute has grant applications to national and international funding competitions valued in excess of €7 million.

Major research projects were launched during the year. Work on the evaluation of the first experimental social policy programme in Ireland, led by Dr Orla Doyle, *Preparing for Life* in Dublin's Darndale area will take a cohort of children from



Professor James Heckman (UCD Professor of Science and Society and Nobel Laureate in Economics), visiting a class in Bawnogue Community School, Clondalkin, Dublin. The image titled Investing in Children was taken by Professor Colm Harmon, Director of the UCD Geary Institute

the womb to early schooling with a carefully designed, rigorously evaluated intervention. The Institute Director, Professor Colm Harmon and Dr Vincent Hogan are leading the econometric evaluation of the *Building Schools for the Future* (BSF) capital investment programme in England, which aims to ensure that all secondary schools in the country have 21st century facilities within 10-15 years. Former UK Prime Minister Tony Blair called BSF the “greatest school renewal programme in British history reversing a generation of under-investment in our schools”.

Future objectives

UCD Geary Institute will build on its key appointments and funding successes with a number of specific targets:

- The pursuit of new funding opportunities including the Basic Frontiers Programme of SFI, the European Research Council and other Framework opportunities;
- Deepening research interests in behaviour and health. In particular, a major target for 2007/08 includes securing resources for a major programme of research on health measurement issues aligned to delivery of a better understanding of the sources of health disparities in the population. The Institute will also build capacity for major research initiatives in the area of social policy interventions, including statistical methodologies;
- Structuring research programmes as self sustaining research centres such as the Behaviour and Health centre. Targets for 2007/08 include consolidation of work on public opinion and political behaviour and micro analysis of public policy;
- Using the alliance with the Harris School of Public Policy at the University of Chicago will provide additional expertise to the programme, and plans are developing for the establishment of programmes aimed at policy professionals.

*Dr Dorren McMahon
(centre) with colleagues
Jason McKay, and
Dr Karen Robson*

Educational inequality project

Dr Dorren McMahon is the recipient of a Marie Curie Excellence Grant worth €1.3 million, which is funding a four year inter-disciplinary project on cross-national educational inequalities among young people in Europe. Excellence Grants are intensely competitive and rare in the social sciences. The award has allowed for the development of a trans-national project team to concentrate on the different discipline perspectives contributing to educational inequality. As the project unfolds the enormous potential for knowledge transfer in the best practices of European and indeed trans-global research is becoming evident.

While a considerable amount of comparative research has already been carried out on national differences in average levels of educational attainment, the focus of this project is on variation around the average in a cross-national European context. The project has a series of outputs culminating in a major monograph, a series of online working papers, a website, development of an information portal on educational inequality, seminars, conferences and peer-reviewed publications. The programme has also been host to graduate students from the Geary partnership with the Multidisciplinary Program in Inequality at Harvard.



UCD Humanities Institute of Ireland

UCD Humanities Institute of Ireland (HII) is a dynamic contributor to UCD's strategic mission to become a leading international research-intensive university.

The HII's strategic objectives aim is to support innovation and excellence in arts and humanities research, while concurrently providing a platform for high quality doctoral students and postdoctoral fellows. The Institute is directed by Dr Marc Caball. Its current research programme is funded through the HEA's PRTLII, Cycle 3 and is entitled *Identity, Memory and Meaning in the 21st Century*.

Progress to date

During the period of this report, 34 doctoral students, four postdoctoral fellows and four project researchers were attached to UCD HII. In addition to the Institute Director and Institute Manager, there are six principal researchers from the UCD College of Arts and Celtic Studies leading research strands within the HII's current programme. The Irish Virtual Research Library and Archive (IVRLA) team consists of a project manager and six digitisers who are digitising a substantial amount of humanities content from UCD's archival holdings.

The HII is committed to enhancing critical mass in the humanities at national level through links with other institutions, including its PRTLII funded research links with St Patrick's College, Drumcondra, and through links with the National Centre for Franco-Irish Studies at IT Tallaght. In the area of international networking in the humanities, the HII is an active member of the Consortium for Research Institutes in the Humanities.

Among the innovative inter-disciplinary topics investigated by HII doctoral students in this period were: memorials and monuments to the Irish famine; mesolithic identities and landscape in the Irish midlands; the concept of genealogy in post-1945 German literature; the paranormal in Ireland, Britain and France in the nineteenth century; and civil wars and memories in post-1989 European cinema.

The HII inter-disciplinary seminar series developed further as a national focal point for academic and intellectual discussion among humanities and human science researchers at UCD and beyond.

Professor Alain Peyraube (CNRS Paris), the world-renowned scholar of east Asian linguistics and member of the European Research Council, delivered a HII Distinguished Guest Lecture in October 2006; Professor Philip Esler, theologian



Pictured at the Institute's Communities of Knowledge conference were (l to r): Clara Cullen, UCD Doctoral Scholar, Dr Marc Caball, Director, UCD Humanities Institute of Ireland, Professor Mary Daly, Principal, UCD College of Arts and Celtic Studies and Dr Michael Ryan, Chester Beatty Library

and biblical scholar, and the current chief executive of the UK Arts and Humanities Research Council delivered a HII Distinguished Guest Lecture on the humanities and knowledge transfer in November 2006; Professor Steven Uran, an expert on modern French history (CNRS Paris) and Professor Sneja Gunew (University of British Columbia), a leading international scholar of multiculturalism, were HII Distinguished Lecturers in March and May of 2007.

As part of UCD's broader commitment to promoting scholarship of international quality, UCD Press, which is affiliated to the HII, continues to develop as a market leading publisher in research relating to historic and contemporary Ireland. During the academic year 2006/07, HII hosted UCD's Centre for Canadian Studies on an interim basis and managed its programme of activities.

Future objectives

The HII's strategic research agenda will centre on Ireland in a comparative global context. It is intended that such a programme will leverage UCD's extensive strengths in Irish and European Studies across the disciplines and will exploit the HII's access to research networks in Ireland and internationally.

UCD Urban Institute Ireland

UCD Urban Institute Ireland (UII) is a centre for the development of new technologies, policies and ideas designed to improve the quality of the working and living environment. Professor Eugene O'Brien was Director of the Institute during the reporting period.

The main UII research clusters and their key objectives are:

- **Energy and Indoor Environment:** to pursue an integrated understanding of building energy and indoor environmental performance through academic and applied research and collaboration with governmental and industrial partners;
- **Transport and Transport Infrastructure:** to develop new and better methods of facilitating the effective transportation of people and goods;
- **Urban Environment:** to advance knowledge and understanding of issues in the urban environment encompassing quality of life and health, ecology and biodiversity, land use and its implications, flooding and flood risk mitigation, urban services including water and waste disposal;
- **Environmental and Rural Policy:** to develop a leading international research centre in rural and environmental policy analysis, underpinned by a multi-disciplinary ethos that will provide a platform for an integrated and coordinated approach to key issues.

*Conor Lenihan TD,
Minister of State with
Institute Director,
Professor Eugene
O'Brien at the launch
of the Developing
World Research Group
brochure*



Progress to date

A number of multidisciplinary groupings and international consortia were convened and a large number of proposals submitted to national and European funding sources. The proposals submitted addressed topics as diverse as climate change, energy efficient building regulations, the future of road freight in Europe, digital libraries and urban modelling.

High profile seminars and conferences were hosted at UII under the umbrella of the existing clusters and new emerging areas. A seminar on land taxation was attended by an audience of 100 business leaders, local authority planners, developers, policymakers and property industry representatives. A conference on bridge and transport research in Ireland jointly organised by

TCD and UCD attracted an international audience. In December 2006, Minister of State Conor Lenihan TD visited the Institute to launch the Developing World Research Group brochure.

The number of research students continues to increase. There are currently nine postdoctoral researchers and 127 PhD and research Masters students. In 2006/07, UII associate members and students authored more than 100 publications.

Future objectives

The Urban Institute has been successful in achieving a prestigious IRCHSS/IRCSET Graduate Research Education Programme (GREP) to establish a PhD programme in Sustainable Development. This award is the first of its kind in Ireland and is currently pending final approval from the Research Council's Executive Committee.

The fourth level programme in Sustainable Development will produce graduates who are trained to apply technical and policy tools from different disciplines to complex problems for which there is no known solution. The programme is aimed at prospective graduate researchers, from a range of disciplines, wishing to pursue interdisciplinary research related to the challenges of Sustainable Development. This should include graduates from disciplinary backgrounds in Human and Social Sciences, Engineering and Life Sciences.

UCD Mícheál Ó Cléirigh Institute

The mission of the Institute is to continue the tradition of learning in Irish history and civilisation established by the Irish Franciscans in the 17th century; to conserve the legacy of manuscripts and books entrusted to UCD by the Irish Franciscans; to make the collection available as a research tool for scholars of Irish studies; to act as an educational resource for scholars in Ireland and abroad; and to encourage an appreciation of the country's rich inheritance from the past in modern Ireland. The Institute's Director is Dr John McCafferty.

Progress to date

During 2006/07 the Institute significantly expanded its conservation programme and holdings in medieval and early modern manuscripts as part of the transfer agreements with the Irish Franciscans. Manuscript A4, *Acallam na Senórach*, is one of the largest literary texts surviving from early Ireland and survives here in a 16th century copy. Conservation of this manuscript is one of the most intricate and time-consuming works carried out on a vellum manuscript in UCD to date. The 'D' manuscripts, often known as the Wadding papers, are now, with assistance from the Heritage Council, undergoing conservation. Work on the first volume, carried out by Ms Susan Corr, has yielded spectacular results and will pave the way for renewed scholarly exploitation of this rich archive.

2007 marks the 350th anniversary of the death of Luke Wadding and the 400th anniversary of the foundation of St Anthony's Irish College in Louvain (modern Leuven in Belgium). The national co-ordinator for the official government commemoration of these anniversaries organised under the aegis of the Department of the Taoiseach is Dr Edel Bhreatnach of the Institute. The full programme of events spanning most of the third level and cultural institutions within the state can be viewed at www.louvain400.eu. Significant highlights included the inauguration of the calendar in December 2006 and the first performance of a specially commissioned *St Francis Cantata* by Michael McGlynn on 1 March 2007. A series of linked conferences and seminars in UCD and elsewhere, launched in Belgium by President McAleese and in Ireland by An Taoiseach, Bertie Ahern TD, centred on a summer school organised by the Institute in Leuven in May.

Work on the IRCHSS sponsored project for cataloguing the pre-1829 material heritage of mendicant orders in Ireland has continued. A database of hundreds of newly recorded objects is now being tested and a series of publications, including a major monograph, are on target for the project end date of 31 January 2008.

Future objectives



Logo of the Louvain 400 commemorations

The Louvain 400 commemorations will run through the winter of 2007, featuring loans and expertise from the Institute for exhibitions in the National Museum, National Library, Waterford Museum, the Hunt Museum and a special collaborative exhibition organised by UCD, the RIA and TCD.

Arising from the relocation of over 1,500 early printed books to UCD, a collaborative project between the Institute, the Katholieke Universiteit Leuven and the University of Münster will be initiated in spring 2008 with a view to reconstructing the library holdings of the 17th century Franciscan colleges in Louvain and Rome.



Franciscan chalice

UCD Clinton Institute for American Studies

The UCD Clinton Institute for American Studies has been established at UCD with the support of the Irish government in recognition of the crucial contributions by President William Jefferson Clinton to the Irish peace process. The Institute, directed by Professor Liam Kennedy, is devoted to advancing academic research and public discussion about the United States in Ireland and beyond. It advances UCD's strategic mission to internationalise research programmes and to foster interdisciplinary research and teaching programmes.

Progress to date

In the period 2006/07 the Institute ran research seminars, public lectures, symposia and international conferences. These included conferences on *The United States and Iraq: Reflections and Projections* (November 2006) and *Terrorism and the City* (January 2007), both events widely covered by television and print media. Visiting speakers during the year included: Mike Davis (University of California, Irvine), Professor Marilyn Young (New York University), Professor Werner Sollors (Harvard University), Professor Donald Pease (Dartmouth College), and Professor John Carlos Rowe (University of Southern California).

The Institute continued to support dedicated, collaborative projects to spearhead its research culture. During 2006/07 it seed-funded projects on the US and Northern Ireland, 1968-2000; War and American Identity; and The American-Irish — all projects involving Irish and international scholars and professionals.

The graduate programmes (MA and PhD in American Studies) expanded to include many new modules shared with allied units in the UCD College of Arts and Celtic Studies which has enhanced their multidisciplinary mix.

In July 2007 the Institute ran its inaugural summer school, a week-long series of workshops and lectures that brought together 60 scholars and doctoral students from the US and Europe. The summer school played an important role in developing the international status of the Institute as a leading centre for American Studies and forum for global debates on the study of American history, culture and foreign policy.

In January 2007 the Institute moved to dedicated offices in the renovated Belfield House.



Future objectives

The Clinton Institute will continue to build its graduate and research programmes. This will involve:

- Launching a new MA programme in 2008/09 in Media and International Conflict which will link to research projects supported by the Institute and will draw on cross-institutional research and teaching in this area;
- Pursuing national and European funding opportunities to support research projects, and the nurturing of new funding partnerships with public and private sectors to support cultural and outreach programmes;
- Developing partnerships with media and cultural organisations in Ireland to support Institute projects. In 2007/08 this will include collaborating with Temple Bar Cultural Trust to source funding for and organise a conference/festival devoted to Irish-US musical relations;
- Furthering international collaboration with centres of excellence in American Studies, through collaborative research projects, the Institute's summer school and graduate student exchanges.

Pictured at the UCD Clinton Institute for American Studies summer school were (back row, l to r): Prof Donald Pease (Dartmouth College), Dr Hamilton Carroll (University of Leeds) and Prof Liam Kennedy (UCD); (front row, l to r): Prof Janet Davis (University of Texas), Prof John Carlos Rowe (University of Southern California) and Prof Donatella Izzo (University of Naples, 'L'Orientale')

UCD Institute for Sport and Health

The UCD Institute for Sport and Health (ISH) has just completed its inaugural year under the direction of Professor Colin Boreham. The ISH has been established as part of a wider vision for the advancement of sport and health on the UCD campus and for the Irish nation. The ISH exists to optimise sporting performance and health within Ireland through the execution, application and dissemination of science. It offers an interdisciplinary range of services for a diverse spectrum of needs. These range from public health and wellbeing to sporting excellence, acknowledging the critical role of sports and physical activity in enhancing human function and performance.

In carrying out its teaching, research and service functions, the ISH is governed by the following principles to:

- Provide teaching and outreach services of the highest standard;
- Strive to be at the forefront of international sports science research.

Progress to date

In addition to Professor Boreham, Professor Giuseppe De Vito and Dr Brian Caulfield have joined ISH and Professor Greg Whyte has been appointed Visiting Professor.

Other associate and full-time staff are planned, including a joint appointment of a sports psychologist with the IRFU/ Irish Sports Council. Staff have published over 40 peer reviewed scientific articles in the past year, including several in high-impact journals. A number of research projects are ongoing and a recent Health Research Board contract has been awarded to investigate the effects of exercise on back pain, led by Dr Deirdre Hurley-Osing.

A new BSc in Health and Performance Science has been developed with its first cohort taking up places in 2007. Facility developments include the refurbishment of a human performance laboratory in the former Philips building, and the first delivery of equipment.

All staff have been involved in a wide range of academic and scholarly activities including conference organisation and keynote delivery, contribution to external committees and organisations and national policy formation.

Future Objectives

As a small country, Ireland's future sporting success cannot be based on competition and natural selection, but on the channeling of scientific resources and superior training. Similarly, it is now apparent that virtually all of the major chronic diseases and conditions affecting public health may be prevented or ameliorated by



UCD medical student, Joanne Cuddihy who benefits from the expertise and support of the UCD Institute for Sport and Health. She broke the Irish 400 metre record at the World Athletics Championships in Japan in August 2007 and will represent Ireland at the Olympic Games in Beijing in 2008

appropriate exercise. The ISH will marshal and coordinate the efforts of its own scientists and practitioners with the considerable expertise and institutional momentum of UCD to create an unprecedented centre of excellence in Ireland.

Specific objectives involve the further recruitment of high level academic and support staff, the continuing forging of links with National Governing Bodies of Sport in relation to sports science service provision, the development of a world class laboratory facility at the ISH, and the securing of further funding to support research activities. Finally, continued expansion of the new BSc and further integration of teaching, research and service provision with partners both within UCD and outside will remain a top priority.

UCD Global Irish Institute

The UCD Strategic Plan identifies the establishment of the Global Irish Institute as a statement of the university's wider interest in the global Irish community and a key element in its wider research strategy of:

- Identifying areas of strength for prioritisation;
- Fostering appropriate interdisciplinarity and collaboration;
- Internationalising research programmes.

The study of Ireland has been identified as a priority research theme for the university. It is the mission of the Institute to deliver research programmes around this theme which utilise the unique archival holdings and support the range of talent and expertise within UCD. The Director of the Institute is Dr Brian Jackson.

Progress to date

The Institute secured funding of €2.6 million under the PRTL, Cycle 4 for the Global Ireland research programme as part of a wider collaborative research consortium, the *Humanities Serving Irish Society* project, a strategic alignment of Irish humanities research projects from DCU, NCAD, NUIG, NUI Maynooth (NUIM), TCD and UCC, under the umbrella of the RIA.

The Global Ireland programme aims to:

- Transform the study of Ireland;
- Re-imagine the idea of a university;
- Provide a nexus for scholarship, policy and active civic engagement.

The research programme seeks to venture beyond the traditional parameters of 'Irish Studies' programmes and look at Ireland in a comparative international context using methodological approaches from a range of disciplines across the humanities and social sciences.

Four priority themes have been identified within the programme:

- Footprints of Ireland: heritage and landscape;
- Irish identities: cultural and linguistic expression;
- State and society: historical development and contemporary challenges;
- The Irish experience: ethno-national conflict resolution, political integration and economic development in a British-Irish, European and global context.

The first round of recruitment for postdoctoral and doctoral research positions under this programme will begin in 2008.

Before this, the Institute is producing a volume of short essays to clarify the mission of the Global Ireland programme, to establish a clear UCD Global Ireland brand within the 'Irish Studies' cultural landscape and to re-iterate the role of the university in creating a forum for the interaction of scholarship, policy and active civic engagement.

The Institute hosted the 59th UCD International Summer School in July 2007. The programme focused on Irish foreign policy between 1919 and 2006 and looked at the development of Ireland through the prism of its foreign policy and international relations. The programme was curated by Professor Michael Kennedy, executive editor of the RIA *Documents on Irish Foreign Policy* series and the course was delivered by a distinguished panel of experts from UCD, other Irish and British universities and the Irish Defence Forces.

Future objectives

The format for the school will serve as a template for future summer schools. It is intended that the theme of the summer school 2008 will be plantation and migration.

The Institute has also secured a significant commitment to fund a series of public lectures and symposia on the theme of knowledge and the citizen.

UCD Centre for Chinese Studies / UCD Confucius Institute for Ireland

The UCD Centre for Chinese Studies (established in January 2006), was launched by Chinese Vice-Premier Zeng Peiyan on 26th September 2006.

The Centre contributes to UCD's strategic objectives by promoting its international profile in the areas of student recruitment and research. It also co-ordinates and develops a range of courses and degree programmes designed to offer a better knowledge and understanding of China. Under its Director, Dr Liming Wang, the Institute aims to work with government, business and academia in Ireland and China to create stronger educational, cultural and commercial links between the two countries.

The primary objectives of the Centre are to:

- Increase recruitment of Chinese students through partnership programmes;
- Offer degree pathways in Chinese Studies to home students;
- Develop an international research profile in Chinese Studies;
- Facilitate development of economic and cultural links between Ireland and China;
- Provide government and business with professional consultancy services.

Progress to date

The major milestone of this year saw the launch of UCD Confucius Institute for Ireland by the Chinese Vice Premier Zeng Peiyan on 26th September 2006. The Institute is dedicated to the promotion and development of Chinese language, culture, studies and business. It is a joint venture between the Office of Chinese language Council International, Renmin University of China and UCD.

A BComm (Chinese Studies) with a total of 12 modules has been successfully delivered by the Institute for the first time in Ireland. Over 159 applicants were received for the programme in 2006 and 14 places were awarded. There was an increase of 40% in 2007 with 223 applicants and 19 awarded places.

A total of five outreach programmes also began and are open to UCD students and the wider community. Programmes include Chinese language, martial arts and calligraphy.

An international conference, attended by over 130 delegates from 13 countries, marked the first and largest gathering ever in Ireland, to examine the latest economic, cultural, social and political developments in China.

A number of cultural events, including the Beijing Opera, were held to promote cultural awareness of Chinese diversity, history and traditions.

A survey on the interest of secondary schools to introduce Chinese as a foreign language was conducted. Positive feedback has resulted in a number of secondary schools taking up Chinese lessons and cultural activities for students and teachers alike. All teachers are affiliated with the Centre.

Future objectives

- Two new graduate programmes will be launched, comprising of an MSc in Chinese Business Studies in 2008 and an MA in Contemporary China Studies in 2009;
- The existing model of BComm with Chinese Studies will be expanded to other subject areas;
- Promoting further international collaboration and an even greater awareness of the Chinese language and culture in Ireland;
- Development and promotion of teaching and research in the area of Chinese Studies within UCD and Ireland;
- Provision of services to the public and private sectors that will facilitate improved relations and a deepening of economic links between Ireland and China;
- Pursuit of new funding opportunities;
- Greater engagement with policy makers, providing first hand research evidence to inform and lead policy questions and influence policy decisions.



Members of China's Beijing Opera Company who performed at UCD in March 2007

NovaUCD – The Innovation and Technology Transfer Centre

A major strategic objective for UCD is to contribute to the social, economic and cultural objectives of a knowledge society. In this regard, key actions identified in UCD's Strategic Plan for NovaUCD, the university's Innovation and Technology Transfer Centre, include:

- Initiation of a knowledge management programme;
- Identification and protection of UCD's intellectual property;
- Commercialisation of UCD's intellectual property through licensing and spin-off companies;
- Training of UCD staff in knowledge transfer and entrepreneurship through integration of NITM (National Institute of Technology Management) and NovaUCD;
- Developing corporate partnerships with business and industry to support and enhance research activities.

The activities of NovaUCD are overseen by a Board chaired by Paul McCambridge, Vice-President and Managing Director of Xilinx and includes senior representatives of UCD, industry, NovaUCD sponsors and research funding agencies. The Director of NovaUCD is Dr Pat Frain.

Progress to date

NovaUCD is responsible for the implementation of the UCD intellectual property policy and supporting the development of a strong intellectual property pipeline. All 2006/07 targets for identification, protection and commercialisation of UCD intellectual property, mainly through licensing to new and established companies, were achieved.

During the year UCD's enhanced intellectual property policy *University College Dublin, Intellectual Property Policy and Procedures*, which had been approved by the UCD Governing Authority, was launched. The policy is intended to actively support the commercialisation of university intellectual property in a manner which ensures maximum benefit to society and the Irish economy, while providing a significant increase in the financial incentives and recognition for the creator of the intellectual property.

The growing level of R&D expenditure in UCD is fuelling the generation of increasing numbers of invention disclosures and other commercial opportunities. In the last year the number of UCD invention disclosures reported to NovaUCD increased to 44 from 29 in the previous year. This is indicative of a considerable increase in the level of potential intellectual property being generated across the university from its research programmes. UCD also filed seven priority patent applications last year across all areas of life sciences, engineering and information and communication technology. In addition seven PCT (Patent Co-operation Treaty) patent

applications and four national/regional patent applications were filed. During 2006/07, six license agreements were signed with a range of indigenous and international companies.

At year end, 23 knowledge-intensive companies, occupying over 85% of the available incubation space are located in NovaUCD. In keeping with NovaUCD's strategy of continuously refreshing its community of entrepreneurs, six client companies 'graduated' from NovaUCD during the year to make way for new ventures.

Notable achievements

NovaUCD's technology transfer team is being significantly expanded following the announcement that Enterprise Ireland is to invest nearly €3 million over five years to strengthen UCD's technology transfer office. The investment is enabling NovaUCD to employ three additional experienced technology transfer professionals as well as a contracts manager and administrative support.

A number of NovaUCD based companies were successful in raising finance during the year. BiancaMed a health technology spin-out from the UCD School of Electrical, Electronic and Mechanical Engineering secured €2.5 million from DFJ ePlanet Ventures and existing corporate investor ResMed. Visor, the internet-based accounting solutions company completed a €1 million equity investment round from Enterprise Ireland and private investors.

NovaUCD's Aonta Technologies was the joint winner of the Dublin Regional Finals of InterTradelreland's 2006 All-Island Seedcorn Competition. Aonta is using technological advances to create innovative rich media conferencing solutions for the global enterprise and service provider market place.

The €30 million AIB Seed Capital Fund is located at NovaUCD and is being jointly funded by AIB and Enterprise Ireland. This is the first fund to be established under Enterprise Ireland's €175 million Seed and Venture Capital Scheme 2007-2012.

Now in its 12th year, NovaUCD's Campus Company Development Programme is providing support for the promoters of 11 high-tech knowledge-intensive start-ups which are taking innovative ideas from proof-of-concept to fully developed, commercially sound enterprises.

The NovaUCD 2006 Campus Company Development Award was presented to Fitfone. Fitfone, founded by Dr Conor O'Brien has designed, developed and patented platform technology which when embedded into a mobile phone facilitates remote health and fitness assessment to assist in increasing an individual's life expectancy.



*Dr Conor O'Brien,
Campus Company
Development Award
winner*



*NovaUCD is located in
a magnificent mid-18th
century house on the
university campus.
The building is bright, airy
and open with high-quality
shared and circulation
spaces that encourage
the formal and informal
interactions necessary
for the development
of a community of
entrepreneurs*

A range of initiatives to increase commercial awareness across the campus including the development of PhD modules on commercialisation of research outputs and other training programmes were developed and delivered by NovaUCD.

Dr Pat Frain, Director of NovaUCD was elected Chair of the Council of AURIL (Association of University Research and Industry Links). AURIL is the professional association representing Knowledge Transfer practitioners in the UK and Ireland.

Future objectives

NovaUCD's vision is to become an international leader in the commercialisation of research and other knowledge-intensive activity for the benefit of the economy and society. Building on prior

successes in technology transfer and campus company development, NovaUCD has developed an ambitious five year plan the main objectives of which include:

- Increasing the early identification, capture, protection and commercialisation of intellectual property;
- Promoting entrepreneurship and assisting in the development of campus companies with particular emphasis on UCD spin-out companies;
- Developing collaborative arrangements and partnerships with industry;
- Increasing the awareness and knowledge of commercialisation and creating a culture of innovation and entrepreneurship.

Professor Ciaran Regan



NovaUCD 2007 Innovation Award

Professor Ciaran Regan was presented with the NovaUCD 2007 Innovation Award in recognition of his successes in the establishment of key strategic and collaborative links with industry and in the commercialisation of neuroscience research.

His achievements to date include securing €10 million in funding from Wyeth Discovery and Science Foundation Ireland to establish the Applied Neurotherapeutics Research Group at UCD which aims to identify novel neurotherapeutic targets. This link was of critical importance in Wyeth's later decision to establish a €13 million bio-therapeutic drug discovery research facility at UCD.

His research is focused on understanding mechanisms of brain plasticity and in exploiting these mechanisms as novel drug targets. He is a named inventor on six UCD patents and also co-founded a UCD spin-out company Berand Neuropharmacology in 2004 which is developing novel therapeutics for the treatment of autism and obesity.