



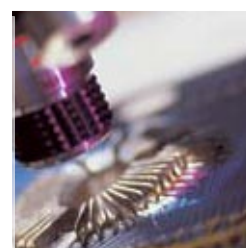
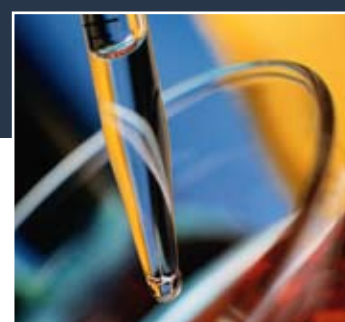
science foundation ireland  
fondúireacht eolaíochta éireann



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## Vision

*Through strategic investments in the people, ideas and partnerships essential to outstanding research in strategic areas, Science Foundation Ireland will help build in Ireland research of globally recognised excellence and nationally significant economic importance.*



## Mission

*SFI will build and strengthen scientific and engineering research and its infrastructure in the areas of greatest strategic value to Ireland's long-term competitiveness and development.*



# SFI Board Members 2006



**Prof. Patrick Fottrell,**  
**Chairperson, former President,**  
**National University of Ireland**  
**(NUI), Galway**

A former Professor of Biochemistry at NUI Galway, Dr. Fottrell also served as Chairman of the Dublin Institute of Technology, the Irish Council of Bioethics

and the Ireland-USA Fulbright Commission. He is a member and former Vice-President of the Royal Irish Academy. Dr. Fottrell obtained his B.Sc. and M.Sc. from University College Cork, his Ph.D. from the University of Glasgow, and his D.Sc. from the National University of Ireland.



**Prof. Mark Keane,**  
**Director General,**  
**Science Foundation Ireland**

Prof. Mark Keane was appointed as Director General of SFI on a temporary basis in August 2006. Prof. Keane joined SFI in 2004 as Director of Information Communication Technology

on secondment from UCD. His career to date includes periods working in Queen Mary College, University of London, the Open University and Cardiff University. He joined the Department of Computer Science at Trinity College Dublin as a Lecturer in 1990 and was made a Fellow of TCD in 1994. From there, he moved to the position of Chair at the Department of Computer Science at University College Dublin in 1998.



**Mr. Seán Aherne,**  
**Vice President of Operations,**  
**Boston Scientific Tullamore Ltd.**

Mr. Aherne has been involved in industry for over thirty years including involvement in three start-up operations. He has held positions in both production operations and engineering, with Boston Scientific,

Sherwood Medical, and Braun. During this time he has led technology projects, ranging from facility design and build, to process automation, and technology transfers.



**Mr. Ned Costello,**  
**Assistant Secretary General, Office of**  
**Science, Technology and Innovation,**  
**Department of Enterprise, Trade and**  
**Employment**

Ned Costello led the development, promotion and coordination of Ireland's Science, Technology and Innovation

Strategy (SSTI). In this context, he chaired the Interdepartmental Committee on STI which is responsible for overseeing the implementation of the Strategy, and the Technology Ireland group which has specific responsibility for enterprise R&D policy and programmes. Mr. Costello joined the Irish Universities Association (IUA) as Chief Executive in January 2007.



**Prof. Jane Grimson,**  
**Head of the Department of Computer**  
**Science, Trinity College Dublin.**

Prof. Jane Grimson is Head of the Department of Computer Science, Trinity College Dublin. Before her current role Prof. Grimson was Vice Provost of Trinity College from 2001-2005, Dean of the

Faculty of Engineering and Systems Sciences from 1996-1999, and Pro Dean of Research from January to August 2001. Dr. Grimson was also the first female President of the Institute of Engineers of Ireland (IEI) (1999-2000) and is a Fellow of the Royal Academy of Engineering.



**Ms. Helen A. Keelan,  
Director, Sirikit Ltd.**

Helen Keelan is a founder Director of Sirikit Ltd., which provides consultancy services in business planning and strategy. Helen's previous roles included 13 years with Intel Ireland, latterly as Strategic Development Manager and previously

as Financial Controller both in Ireland and in the US. Helen became a Chartered Accountant while working with KPMG and is a University College Dublin, Honour's B.Comm. Graduate. She obtained an M.Sc. in Management from Trinity College Dublin and is a Fellow of the Institute of Chartered Accountants in Ireland. Helen is a member of the Enterprise Advisory Group which was set up to advise the Minister for Enterprise, Trade and Employment, on Enterprise policy. She is also a Board member of the Digital Hub Development Authority and is a Director of IAPF (Irish Association of Pension Funds) and Chairs the Investment Subcommittee.



**Prof. Marja Makarow,  
Professor of Applied Biochemistry  
and Molecular Biology, Vice-Rector  
for Research at the University of  
Helsinki**

Marja Makarow is Professor of Applied Biochemistry and Molecular Biology, and Vice-Rector for Research and Researcher

Training of the University of Helsinki. She is President of the European Molecular Biology Conference (EMBC/EMBO) since 2004, and member of the Council of the European Molecular Biology Laboratory since 1999. She served in the Research Council for Health of the Academy of Finland in 1998-2003, and Chairs the Steering Committee of its research programme of systems biology and bioinformatics since 2003. Marja Makarow is member of the Life Science panel of the EURYI programme of ESF since 2004, and chair in 2007. She was member of the multidisciplinary assessment committee of the Canada Foundation of Innovation in 2006, and is member of the international award selection committee of the Millennium Technology Prize since 2006.



**Mr. Peter MacDonagh,  
Research Consultant**

Peter MacDonagh was educated at UCD and Cambridge University. In 1997, he became the special advisor to the Minister for Education & Science, where he was centrally involved in the development and implementation of policy in relation to

research initiatives including the establishment of the Programme for Research in Third Level Institutions (PRTL) and the Irish Research Council for the Humanities and Social Sciences (IRCHSS). During 2000-2002 he was a special advisor to the Taoiseach, where amongst various other areas, he had responsibility for education and research policy.



**Dr. Jim Mountjoy,  
Former CEO Euristix Ltd., Deputy  
Chairman, SFI**

Dr. Mountjoy founded Euristix, an innovative supplier of advanced network management software solutions for the telecommunications industry. Euristix became a market leader and was acquired

by Fore Systems in February 1999, which in turn was subsequently acquired by Marconi. Dr. Mountjoy is currently involved in a non-executive capacity with a number of software companies and is an advisory board member of a number of Venture Capital companies.



**Dr. Martina Newell-McGloughlin,  
Director of the Biotechnology  
Research and Education Program at  
the University of California (UCBREP)**

Dr. Newell-McGloughlin, an internationally recognised authority on biotechnology, directs the UCBREP, which covers all ten campuses of the University of California

and the three national Laboratories; Lawrence Berkeley, Lawrence Livermore and Los Alamos. She is also Co-Director of a (US) National Institutes of Health Training Program in Biomolecular Technology, one of only three in California, the others being at UC Berkeley and Stanford University. In addition, she is an adjunct Professor of Plant Pathology. In 2003, the US Council for Biotechnology named her one of the DNA Anniversary Year Faces of Innovation and in 2005 she received the BIOLINK USA-Ireland Irish America Life Science Award.



**Dr. Don Thornhill, Chairman, National Competitiveness Council of Ireland**

Dr. Thornhill is a former Executive Chairman of the Higher Education Authority and a former Secretary General of the Department of Education and Science. He has been a leading figure

in the development of education and research policy in Ireland – particularly in the development and operation of the Programme for Research in Third Level Institutions (PRTL). He is a board member of a number of organisations in the Irish public and private sectors and is involved in a consultancy capacity with a number of organisations.



**Mr. John Travers, Economic and Business Consultant**

John Travers is an Economic and Business consultant. Previously, he was the founding CEO of Forfás (1993-2002) and of Science Foundation Ireland (2000-2001) during its critical start-up phase. John Travers was Chief Economic Advisor in

the Department of Industry and Commerce (1988 – 1993). Prior to that, he held senior management positions in the Department of the Taoiseach, the Department of Finance and the Department of Local Government. Across all of these positions he has been closely involved in the process of national economic and industrial planning over a period of more than thirty years. He is currently a member of a number of Boards in both the public and private sectors. He was appointed by the Government as Chairman of the National Tourism Development Authority (2002-2003) and of the Expert Group established to plot a new ten-year national strategy for Irish tourism (2003). He holds Postgraduate degrees in Town Planning, Economic Planning and in Business Administration from the Dublin Institute of Technology, the University of Pennsylvania and the National University of Ireland respectively.



# MEMBERS OF COMMITTEES OF THE BOARD 2006

## 1. BOARD SUB GROUP ON PROGRAMME GRANTS

Dr. Martina Newell-McGloughlin (Chairperson), Prof. Jane Grimson, Prof. Mark Keane\*, Mr. Peter MacDonagh, Dr. Eucharía Meehan\*\* (Higher Education Authority) and Dr. Don Thornhill\*\*\*.

## 2. SFI AUDIT COMMITTEE

Dr. Jim Mountjoy (Chairperson), Ms. Gillian Dennehy (Department of Enterprise, Trade & Employment), Ms. Helen Keelan, Dr. Don Thornhill and Dr. Frank McCabe\*\*\*\*.

## 3. MANAGEMENT DEVELOPMENT AND REMUNERATION COMMITTEE

Prof. Pat Fottrell (Chairperson), Mr. Ned Costello and Mr. John Travers.

### **Note:**

In accordance with the process of rotational retirement set out in Section 9 (3) and (4) of the Industrial Development (Science Foundation Ireland) Act 2003, Dr. Frank McCabe and Dr. Don Thornhill were chosen for retirement with effect from the 24 July 2006. Dr. Don Thornhill was subsequently re-appointed to the Board by the Minister of Enterprise, Trade and Employment with effect from 24 October 2006.

Dr. Kristina Johnson resigned from the Board of SFI in with effect from 12th January 2006 and Dr. Jackie Hunter resigned with effect from 16 February 2006.

Prof. Marja Makarow was appointed to the Board with effect from 22 May 2006, Ms. Helen Keelan was appointed to the Board with effect from 5 July 2006 and Mr. Sean Aherne was appointed with effect from 24 October 2006.

\*Dr. William C Harris, the initial Director General of SFI, was a member of the SFI Board and also the Sub Group to 30 June, 2006.

\*\*Dr. Eucharía Meehan was appointed in October 2006.

\*\*\*Dr. Don Thornhill also participated in the Sub Group up to the end of July 2006.

\*\*\*\*Dr. Frank McCabe was Chairperson of the Committee until his retirement from the Board on 24 July 2006 (see above note).



Prof. Pat Fottrell *Chairperson* (left)  
Dr. Jim Mountjoy *Deputy Chairperson* (right)

## Joint Statement by the Chairperson & Deputy Chairperson

We are pleased to introduce the Annual Report and Financial Statements for Science Foundation Ireland (SFI) for 2006.

Under the National Development Plan, 2000-2006 there has been a rapid expansion in the level of investment in scientific research in Ireland. This has been further enhanced through the launch by the Government in July 2006 of the Strategy for Science, Technology & Innovation (SSTI) 2007-2013. The investment plans set out in this strategy significantly increase and underpin the sustainability of the substantial level of funding available for research for the next seven years.

The strategy puts in place a structure for building further the capability and capacity of the Irish research community over the coming years and sets a clear ambition to see Ireland actively recognised as an international location for scientific excellence.

The challenge is now, with the wider research community, to implement this strategy and deliver on these ambitious national objectives. The Board and Senior Management of SFI have been putting in place a framework to ensure that SFI will play a full and pivotal role along with the

other Government Departments and state agencies in delivering the targets set out in the strategy.

For SFI this means that, over the coming years, we will continue our efforts to build world-class research teams, increase the number of high quality researchers and therefore contribute to increasing the output of PhDs, which is a key objective of the Strategy. SFI will be to the forefront in implementing initiatives over the coming seven years which will provide a solid basis for Ireland's future economic development.

Since its establishment in 2001, SFI has approved over 1,300 awards across all SFI programmes, representing a substantial investment commitment of over €680 million. During the past 12 months, SFI has continued to focus on building a high quality research environment in Ireland in an effort to establish Ireland as a location renowned for the excellence of its scientific research. In 2006, SFI approved 463 new awards involving a financial commitment of almost €135 million. Payments in respect of new and existing awards during 2006 accounted to €140m and were made to 15 Institutions throughout the country.

SFI is proud of its achievements over the past 12 months and there have been a number of very significant new announcements of innovative projects. Collaboration with industry remained to the forefront and this is clearly demonstrated with the announcement by GlaxoSmithKline (GSK) of the establishment of a ground-breaking research project into gastrointestinal diseases, in collaboration with the Alimentary Pharmabiotic Centre (APC), an SFI-funded Centre for Science, Engineering and Technology (CSET), based in University College Cork.

In addition, SFI invested €7.84 million in two highly significant Mathematics research projects. SFI's focus on encouraging and supporting female researchers was advanced with the approval of 10 awards under the *SFI Principal Investigator Career Advancement Award (PICA)*, which provides assistance to academics undertaking research following maternity, adoptive, carers or parental leave.

A comprehensive overview of the SFI's achievements in 2006 and the successes of our funded researchers are outlined in the main body of this report.



*Since its establishment in 2001, SFI has approved over 1,300 awards across all SFI programmes representing a substantial investment commitment of over €680 million*

Attracting people into research careers in science and engineering is another important goal set out in the SSTI. Clearly, SFI alone cannot resolve this problem, but it is playing an important role through the introduction of measures to promote the attractiveness of science and engineering as a career option. One such initiative is the SFI/Dell Women in Science and Engineering Scholarship which specifically aims to encourage young women into engineering careers. SFI approved the first 10 female engineering scholarships under this programme in 2006.

Other specific innovative programmes include (a) the Secondary Teachers Assistant Researchers (STARs) programme, which brings teachers back into the laboratory over the summer months, reinvigorating them and linking schools to high quality research teams, and (b), the Undergraduate Research Experience & Knowledge Award (UREKA), which provides paid summer research placements for undergraduates in academic research laboratories, and gives students hands-on experience of working with world class researchers.

SFI has managed to achieve outstanding success in a short time and this was acknowledged by the International Evaluation Panel, Chaired by Sir Richard Brook, which produced the report **"Science Foundation Ireland – The First Years 2001-2005"**.

We wish to acknowledge the co-operation that already exists between SFI and other Government Departments and state agencies.

The implementation of the SSTI will require even closer and synergistic working partnerships between SFI and the wide range of organisations with whom we interact throughout the scientific community. The close links that already exist with Forfás, Enterprise Ireland, IDA Ireland, the Higher Education Authority (HEA) and all of the other agencies will be greatly strengthened and improved as an integral part of the implementation of the strategy. SFI will play a full and active part in the joined up policy approach which will be essential to achieving the overall national objectives set out under the SSTI.

We would like to acknowledge and express our thanks in particular to the Taoiseach, Mr. Bertie Ahern, TD, and the Minister for Enterprise, Trade and Employment, Mr. Micheál Martin, TD, and indeed other Government Ministers for their support and ongoing commitment to SFI during the past year.

SFI has a well deserved reputation as an organisation focused on excellence. This focus was established under the leadership of Dr. William C Harris, who vacated his position as Director General in mid-2006, having made an outstanding contribution

to the development of SFI and scientific research in Ireland. This focus on excellence continued under Prof. Mark Keane, who was appointed as Director General, on a temporary basis, by the SFI Board in August 2006, following Dr. Harris's departure. During 2006, the Board of SFI put in place an international recruitment process to appoint a new Director General. In February 2007, the SFI Board approved the appointment of Prof. Frank Gannon, Executive Director of the European Molecular Biology Organisation (EMBO), as the new Director General of SFI.

We would like to express our thanks and appreciation to our fellow Board Members and the staff of SFI for their outstanding commitment to further enhancing the international reputation of the organisation during 2006.



Prof. Pat Fottrell\*  
Chairperson



Dr. Jim Mountjoy  
Deputy Chairperson

\*Currently Executive Chairperson of SFI



Pictured at the announcement of 158 research awards under the SFI Research Frontiers Programme (RFP), 2006 are RFP award recipient Prof. Thorfinnure Gunnlaugsson, Chemistry Department, TCD, Mr. Micheál Martin, TD, Minister for Enterprise, Trade and Employment and Dr. Gary Crawley, Head of the Frontiers Engineering and Science Directorate, SFI.

# Overview of SFI Activity 2006



**Prof. David Cotter, Photonic Systems Group, Tyndall National Institute in Cork.**

Prof. David Cotter leads the Photonic Systems Group at the Tyndall National Institute in Cork. His team was previously based in industry (at the former Corning Research Centre and British Telecom Research Labs in the UK), and brings many years of experience in photonic systems research and development. In the past year the group has made significant advances in cutting-edge optical communications networks. These include simplified techniques for multi-terabit-per-second information transmission in national networks, as well as important new approaches to reducing the cost of next-generation broadband services to the home. "The underlying theme of our work is to invent and demonstrate ways of achieving radical reduction in the costs of providing future high-bandwidth communications."

Just five years on from its establishment in 2001, Science Foundation Ireland (SFI) now engages over 1,400 researchers throughout Ireland. In 2006, almost €140 million in funding was allocated for world-class research into the fields underpinning Information and Communications Technology (ICT) and Biotechnology. This investment is aimed at establishing Ireland as a world-class location for scientific and engineering research and will, through the development of a knowledge based economy, contribute to sustaining future economic growth.

## Highlights for 2006 include:

- The announcement in August by GlaxoSmithKline (GSK) that it was establishing a ground breaking research project into gastrointestinal diseases, in collaboration with Alimentary Pharmabiotic Centre (APC), the SFI-funded **CSET**, in UCC. This project is jointly supported by IDA Ireland and Science Foundation Ireland (SFI) and will involve an overall investment of up to €13.7m.

- An award of just under €1.8 million to the Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN), Trinity College Dublin, which will facilitate research conducted in association with Hewlett Packard, in the field of carbon nanotube composites.
- Overall SFI approved 463 awards to 15 Institutions throughout the country.
- Investment of almost €3 million in three leading young Biotechnology researchers under the **President of Ireland Young Researcher Award (PIYRA)** Programme.
- An investment of €24 million in 158 awards, spread across 11 third-level institutions, under the **Research Frontiers Programme**.
- An investment of €7.84 million in two Mathematics research centres that will encourage mathematicians to work closely with researchers from industry, finance, economics, engineering, and other academic disciplines.

# 1. SFI Programmes

- Awards to 10 young female undergraduates under the inaugural **Science Foundation Ireland/Dell - Young Women in Engineering Scholarships**. The individual scholarships are valued at almost €20,000 each.
- A major boost for female science and engineering researchers with the announcement of a €4.8 million research investment in two programmes - the **SFI Principal Investigator Career Advancement Award** and the **SFI Institute Development Award**.
- SFI attracted 28 overseas based researchers to Irish research bodies.
- 43 secondary school teachers participated in the **Secondary Teacher Assistant Researchers (STARs) Programme**, spending the summer working with SFI researchers and research teams in third level institutions.
- Over 240 undergraduate science students from Ireland and abroad participated in the **Undergraduate Research Experience & Knowledge Award (UREKA)**, spending the summer undertaking research projects.

## (a) Centres for Science, Engineering & Technology (CSET)

The CSET programme is designed to build a critical mass of excellence for Ireland in areas of BioTechnology and ICT that will shape the future of science and engineering. CSETs, therefore, help link scientists and engineers in partnerships across academia and industry to address crucial research questions. These world-class research centres have brought together scientists and engineers in multi-disciplinary teams in partnership with industry to conduct cutting-edge research that will bring long-term economic and societal benefits.

In addition, CSETs, through their education and outreach activities, play an important role in increasing the understanding of science and highlighting educational and career opportunities for individuals in science and engineering research in Ireland.

During 2006, the seven SFI CSETs made considerable progress in terms of their research work and education and outreach activities.

### 1. Alimentary Pharmabiotic Centre (APC)

APC scientists and clinicians are investigating mechanisms by which intestinal bacteria influence health and disease and are developing new therapies

for lifelong debilitating gastrointestinal diseases such as gastroenteritis, irritable bowel syndrome (IBS), ulcerative colitis and Crohn's disease. The APC was launched in 2003 with an award of €16.5 million from SFI. The APC now has a total of 48 SFI-funded staff.

In 2006, the APC established a new collaborative research programme with **GlaxoSmithKline (GSK)**. Researchers from GSK's Neurology and Gastro-Intestinal (GI) Centre of Excellence for



**Dr. Gerard Cagney, Conway Institute, University College Dublin**

The group is fortunate to be working at the interfaces of several disciplines, so they have many interesting collaborative projects. They use mass spectrometry to measure how proteins change in different cells or in disease. With help from SFI, they have assembled a talented team of cell biologists, analytical scientists, and computer scientists who work with world-class researchers in platelet biology, stem cells, and nanotechnology. Proteomics is one of a platform of new technologies that offer high potential for breakthroughs in research, because they address the function of the cell at a 'systemwide' level.

Drug Discovery will work closely with the APC to identify new drug targets for the treatment of debilitating GI disorders, such as inflammatory bowel disease (IBD) and irritable bowel syndrome (IBS). The project is supported by SFI and IDA Ireland and will involve an investment of €13.7m over 5 years.



**Prof. Carol O'Sullivan, Metropolis Project, Trinity College Dublin**

The *Metropolis* project is a novel, interdisciplinary project combining computer graphics, engineering and cognitive neuroscience research. Trinity College researchers Prof. Carol O'Sullivan and Dr. Steven Collins from Computer Science, together with Dr. Fiona Newell from the Institute of Neuroscience and Prof. Henry Rice from Mechanical Engineering, will apply principles of human multisensory perception to create the most realistic, scalable and large-scale simulations of populated cities ever realised. The aim of the research is to simulate large crowds consisting of millions of people and to introduce a high level of variety in animation, appearance and sound, inspired by perceptual models and metrics. Real meaning will be added to the simulations by endowing individual crowd members with appropriate, sentient behaviours that are based on cognitive and sociological models. Furthermore, realistic populace and traffic noise will be simulated, effectively propagated depending on environmental factors, and driven by psychoacoustic principles. The project will build upon TCD's ongoing Virtual Dublin project. The effectiveness of this research will be demonstrated in the areas of games (thereby contributing to the growth of an emergent entertainment industry in Ireland), Environmental Impact Statements (EIS) for improved planning, and outreach activities to create assistive technology for disabled children.

APC's Education and Outreach activities continued throughout 2006. The Microbe Magic @ Schools programme, involved APC scientists visiting 64 schools in the greater Cork area to coincide with Science Week, and presenting "The Circulatory System – keeps you ticking" to over 3,500 students. During the year, in excess of 5,000 school children in both primary and secondary schools were visited all over the country. APC recently established a new transition year programme for secondary schools, concentrating on two disadvantaged schools from Cork city.

## 2. Biomedical Diagnostics Institute (BDI)

The Biomedical Diagnostics Institute (BDI) was established towards the end of 2005 with an award of €16.5m. BDI is a unique industrial-clinical-academic research collaboration focused on the development of next generation biomedical diagnostic devices for use in the home or at the point-of-care. These advanced devices will enable the detection of life-threatening events long before the critical stage is reached - thus improving people's lives and enhancing the efficiency of our healthcare system.

In the past year, BDI has brought together leading researchers from academic institutions, six industrial partners (Ámic, Analog Devices, Becton Dickinson, Enfer Scientific, Hospira, Inverness Medical Innovations/Unipath), and the clinical environment, to form an integrated, cohesive, multi-disciplinary team of close to 60 people.

BDI research activity encompasses two types of research programme: core programmes, dealing separately with the fundamental building blocks of a generic diagnostic device, and integration projects which are focused

on fully operational integrated platforms. All BDI core programmes and integration projects are now fully operational. For example, the core microfluidics programme, which is led by Prof. Luke Lee, holder of an SFI Research Professorship, now has a team of five post-doctoral researchers and two postgraduate students. This team is developing novel microfluidic platforms for cancer biomarker discovery and single-platelet systems biology respectively. The Cardiovascular Risk Chip Integration Project is a good example of the BDI focus on integration multidisciplinary inputs into working platforms. This project draws on diverse BDI inputs such as antibody engineering, high-brightness nanoparticle labels, biointerfacial engineering and a novel microfluidics platform, from one of BDI's industrial partners, to produce a device of significant clinical utility.

The BDI's proactive Education and Outreach programme, enhances science education at all levels and informs society of the exciting domain of medical diagnostics and health. The programme has targeted initiatives from primary school through to fourth level, in addition to outreach initiatives for the general public. E&O programme highlights in the year to date include:

- Development of Ireland's first M.Sc. in Biomedical Diagnostics.
- Introduction of a primary school programme "Me & My Body" (MAMBO) to over 150 Irish primary school children.
- Hosting 10 of the brightest Irish & international undergraduate students during the Diagnostics for Monitoring Disease (DiaMonD) UREKA programme in Summer 2006.



### 3. Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN)

CRANN was established as a nanoscience research centre in 2004 with an award of €10 million. During 2006, CRANN has continued to establish itself as the fulcrum for nanoscience activities in Ireland and building on its international reputation as a centre of scientific excellence.

In 2006, CRANN researchers were involved in a diverse range of scientifically excellent discoveries and developments.

CRANN has also significantly developed on its remit to act as an interface with the industrial community. CRANN has eight researchers in residence from industry partners working within the centre. In collaboration with Intel Ireland, CRANN has developed a unique silicon substrate – the Adaptive Grid – which will enable researchers to begin to assess and solve the challenges of depositing, positioning and contacting novel nanomaterials. CRANN also commenced an exciting research partnership with Hewlett-Packard to investigate the use of carbon nanotubes for flexible electronic devices.

CRANN has been involved in some very innovative science education and outreach projects in 2006. In collaboration with Discover Science and Engineering, CRANN developed a computer game “NanoQuest”, which presents nanoscience in a fun but educational manner, supporting educational posting were developed to accompany the game. In addition, CRANN is involved in the development of a website associated with the game.

### 4. Centre for Telecommunications Value-chain Research (CTVR)

The Centre for Telecommunications Value-chain Research (CTVR) was established in 2004 with an award of €20 million. Its mission is to carve out for Ireland an international leadership position in industry-guided research, which redefines key elements of telecommunications systems, architectures and networks, and the value chains used to design, build, market and service them.

The centre involves eight Irish third level institutions working in very close collaboration with industry partners Bell Labs and Xilinx, both of whom have established research labs in Ireland.

The CTVR now has a total of 97 academic staff, funded post-doctoral researchers, PhD students and support staff. During the year over 110 papers have been published in international conferences and journals with approximately one third of these in exceptionally high-impact settings. Four patents have been filed and a pipeline of invention disclosures continues to fill. Prof. Eugene Freuder, one of CTVR's research strand leaders, was elected as a fellow of the American Association for the Advancement of Science (AAAS) and strong links have been built with leading international research teams in places such as Cambridge University in the UK and Virginia Tech in the United States.

One of the centre's main research areas is “Reconfigurability” exploring ways in which the components of a wireless communications network, and the way in which they operate together

can adapt to changing circumstances. CTVR has carved out an international leadership position in this field and in the related application area of Dynamic Spectrum Allocation. The centre was awarded the world's first spectrum licence allowing experimentation in this field and has been instrumental in attracting three leading wireless conferences and meetings to be held in Ireland in 2007, where delegates can avail of the licence and see a showcase of Ireland's achievements in this area. CTVR's reconfigurable antennas teams have also made good progress and have patented a highly novel technique for calibration of large arrays of antenna elements.



**Dr. Marc Devocelle, Department of Chemistry, Royal College of Surgeons in Ireland**

Dr. Marc Devocelle, Department of Chemistry, Royal College of Surgeons in Ireland, funded under the Research Frontiers Programme 2005 & 2006. The SFI funding supports the development of novel technologies to enhance the delivery of host defence peptides (peptides of the innate immune system) to sites of infection. These approaches might also facilitate the development of methods for the selective distribution of these multifunctional peptides to tumour tissues. One SFI-funded project, developed in collaboration with the Pasteur Institute in Paris, has been recognised by the 2006 Dr. Jacques Servier Scholarship Award, established by the Ireland Fund de France and L'Institut Servier.



**Prof. Douglas Leith, Hamilton Institute, NUI Maynooth**

Prof. Leith is Director of the Hamilton Institute at NUI Maynooth. Established in 2001 with seed funding from SFI, the Hamilton Institute ([www.hamilton.ie](http://www.hamilton.ie)) seeks to bridge the gap between mathematics and its applications in ICT and Biology. Major research strands at the Institute include communications networks, systems biology and computational physiology. The Institute's emphasis on genuinely bridging the gap between mathematics and its applications is reflected in strong links with industry, with partners including Intel Ireland, Cisco Systems, Eircom, Bell Labs, DaimlerChrysler, Microsoft, Cold Spring Harbor, Nokia and Samsung. The Institute has extensive international links including active partnerships (joint projects) with leading groups at Yale, Cambridge, Stanford, Technion, TU Berlin. Prof. Leith's own research work lies in the areas of internet congestion control and quality of service in wireless networks. Recent achievements include the development of a new positive systems approach to the analysis of TCP dynamics (TCP is the internet protocol responsible for safely transporting the vast majority of traffic, including email, web, music and video downloads). This has underpinned the H-TCP proposal for changes to TCP that has undergone extensive experimental testing by the international community, is now available in Linux, under discussion with Microsoft and has attracted development funding from Cisco.

## 5. Digital Enterprise Research Institute (DERI)

The Digital Enterprise Research Institute (DERI) at NUI Galway, was established following the awarding of €12 million from SFI in 2003. DERI is dedicated to research aimed at creating and connecting the digital society using Semantic Web technologies. The CSET award is used to fund both research and support activity in the areas of Semantic Web and Semantic Web Services.

DERI has now grown to 80 full time members. Core fulltime research active members include two Professors, three additional senior scientific researchers, six post-doctoral researchers, four research staff and 48 PhD, Masters students and interns. In addition, 17 members are management, business development, education and community outreach staff.

DERI organised a Research Day in November 2006 at which an invited audience of over 40 academic and industrial scientists attended. The agenda covered lectures and demonstrations of DERI's work to date and a panel discussion of the future of Informatics in Ireland. DERI organised and participated in the annual European Semantic Web Conference held in Budva, Montenegro from the 11th to the 14 June 2006.

Hewlett Packard Galway, is DERI's key industrial partner, involved in both SFI-funded activity, and EU projects (Nepomuck) dealing with Web Services. DERI has established project proposals with IBM, Dublin; Nortel, Galway; Ericsson, Athlone; and Storm Technologies, Galway.

In addition, DERI now has collaborative efforts with the following entities

University of Innsbruck in Austria; Stanford University in California, USA; SEMTECH and CHORD in Korea and Universities of Gdansk and Poznan in Poland.

Over the last year, the Institute organised a comprehensive range of Internet courses and projects with Community groups; Primary Schools; Post-Primary Colleges and Third Level Colleges. Excluding the primary school sector, just over five hundred people participated in DERI's 2005-2006 Internet courses. This work received its due recognition when Brendan Smith, the DERI Outreach Officer, won various National and local awards for his endeavours. DERI has also participated in many local events e.g. eGalway Week and the Science and Technology festival in November 2006.

## 6. LERO – the Irish Software Engineering Research Centre

Lero advances the state of the art in software engineering for specific domains. Lero has been jointly established by the University of Limerick (UL), Dublin City University (DCU), Trinity College Dublin (TCD), and University College Dublin (UCD) with UL as leading partner institution. SFI awarded €9.1 million to Lero in 2005.

Lero has chosen automotive software engineering as its initial domain of focus and has built up a community of over 40 researchers and PhD students to address key challenges in this domain. Results that are proven to work in this highly demanding domain can have a significant impact on other software dependent industries in Ireland and abroad. As it develops, Lero expects to address additional domains such as software engineering for medical devices.

Lero's research consists of five inter-related strands, each of which has a Research Area Leader and is concentrated at one of the partner universities.

During its first year, Lero focused on establishing the foundations for a successful national centre. Through several research workshops and events the detailed research agenda and inter-university linkages have been established. Lero hosted academic and industrial visitors from Germany, Finland, Australia, Belgium and Norway.

Lero has built research links to a number of national and international universities and research organisations including Carnegie Mellon University, Technical University of Munich, National ICT Australia, and Fraunhofer. One of the key achievements has been Lero's election as the academic member on the NESSI (Networked European Software & Services Initiative) Executive Board and Steering Committee in June 2006. NESSI is a consortium of key ICT players that aims at developing the European technology platform on software and services.

Lero has both strengthened its links with, and established new relations to, Irish and international industry. Research collaborations with industry partners such as Robert Bosch, IBM, Intel, Siemens, and Snap-On have already started.

Lero's outreach activities have focused mainly on activities for secondary school students. Over 500 students have been exposed to software engineering through school talks and creative software summer courses at UL and TCD. Lero has also been involved in public events including the national Formula One for schools final and University Open Days. Lero ran a poster and essay competition on the theme

of "Software Powering Cars". At third-level, a pilot programming competition was run for undergraduate students at UL. Lero was represented on the judging panel for the IEE Electronics Student Awards in the Formula SAE (Society of Automotive Engineers) competition.

## 7. Regenerative Medicine Institute (REMEDI)

REMEDI was established in 2003 through a €14.9 million award from SFI. Researchers at REMEDI conduct basic and applied research in regenerative medicine, an emerging field that combines the technologies of gene therapy and adult stem cell therapy.

REMEDI's industrial partner Medtronic has increased its involvement in the sponsored research project in line with the development of the project. Increased engagement with medical device engineers and a senior research scientist recruited from the programme by Medtronic to augment R&D at its local facility has occurred.

In July 2006, REMEDI hosted a 3-day conference in Regenerative Medicine at NUI Galway in collaboration with Georgia Tech/Emory, Atlanta and the Mayo Clinic, Rochester. The purpose was to rapidly advance progress in the area of regenerative medicine to clinical trial stage.

REMEDI has an extensive education and outreach programme. A new innovative module, GRO-dialogue, a component of REMEDI's secondary school outreach programme GRO, was developed in Spring 2006. Workshops which challenge students to consider and discuss the ethics surrounding stem cell research were facilitated in Galway City and County schools culminating in an inaugural debating competition.

REMEDI's active public outreach programme aims to promote and focus public debate relating to issues raised by biomedical science and engineering. During 2006 numerous public events highlighting research applications such as



**Dr. Orina Belton – School of Medicine and Medical Sciences, Conway Institute, University College Dublin**

Dr. Orina Belton's research investigates the genetics controlling the risk of atherosclerosis – a complex progressive disease which is the primary cause of heart disease and stroke. Atherosclerosis is responsible for 30% of all cardiac related deaths and as such there is a huge potential for drugs that can influence it. However, there are no drugs available which can completely regress established atherosclerosis, and to date there have been no defined pathways which would explain how this process could be reversed or indeed if such a pathway exists. With her SFI PICA award, Dr. Belton proposes to investigate if there is an endogenous "anti-atherosclerotic" pathway which triggers the regression of atherosclerosis.

"This award will facilitate us in identifying a series of candidate genes which alters atherosclerotic lesion development. Using novel proteomic techniques we will refine the data set to genes that have an associated protein expression. Using both established in vivo models and a human population, with a decreased risk of atherosclerosis, we will be able to identify a pathway that may be physiologically relevant in the regression of the disease and that can be further exploited to identify novel therapeutic targets."

Dr. Belton was one of ten recipients of the SFI Principal Investigator Career Advancement (PICA) Award in 2006.

public lectures on the REMEDI/Mayo Clinic spinal cord injury research programme were delivered by Prof. Anthony Windebank in Cork, Dublin and Galway.

REMEDI has obtained approval for the development of a new M.Sc. course in Regenerative Medicine at NUIG.

REMEDI has also won close to € 2 million in grant and private sector funding in 2006. This is an increase of 25% over 2005 and reflects a greater diversification of sources of funding. These factors are important in maintaining the long-term future and sustainability of REMEDI activities.



**Prof. Therese Kinsella, UCD Conway Institute, SFI- Principal Investigator**

Professor Kinsella has been involved in basic cardiovascular research for well over a decade now and largely focuses on mechanisms of signalling by the cyclooxygenase-derived prostaglandins, the key molecular target of aspirin and the more recent, if not somewhat controversial, Coxibs. She is recognised as a world-class leader in this highly competitive field of research. To date, her work has been strongly supported by agencies such as the Wellcome Trust, the Health Research Board and, of course, the Irish Heart Foundation. "Receipt of SFI funding offers enormous benefits and potentials to broaden our research approaches and, more importantly, to explore avenues that are more likely to realise a more commercialisable outcome in the long run", Kinsella claims..

## (b) President of Ireland Young Researcher Awards 2006

The President of Ireland Young Researcher Award (PIYRA) recognises outstanding engineers and scientists from Ireland and abroad who, early in their careers, have already demonstrated exceptional potential for leadership at the frontiers of knowledge. In 2006, SFI approved three PIYRA awards valued at almost €1 million each to the following recipients:

### Dr. Emma Teeling – University College Dublin

This project examines the molecular evolution of sensory perception in mammals, using bats as an unusual and highly specialised model. The senses of vision, smell and hearing are the key sensory areas under investigation. The objectives of the project are to: (1) identify which genetic mutations and genes are most likely to cause deafness and blindness in humans and other mammals; (2) investigate which parts of the genome control how we see hear and smell by examining how they evolve in animals that use these senses in different ways.

### Dr. James O'Donnell – Trinity College Dublin

Von Willebrand factor (VWF) plays a central role in normal blood clotting and also serves as a carrier molecule for pro-coagulant factor VIII. A deficiency of VWF causes the commonest inherited bleeding tendency (von Willebrand disease), while elevated levels of VWF are associated with increased thrombosis. Dr. O'Donnell aims to improve our understanding of the role of VWF in common vascular diseases. This work could have important implications for the design and development of future therapeutic agents.

### Dr. Oliver Blacque – University College Dublin

Primary cilia are short hair-like structures on the surface of cells which play important sensory roles in the body.

A number of human ailments are caused directly by defects in primary cilia such as cystic kidneys, retinal dystrophy, bone abnormalities, organ laterality defects and Bardet-Biedl Syndrome, a condition that also includes symptoms such as obesity, diabetes and high blood pressure. Using tiny microscopic worms as an animal model, Dr. Blacque will examine the genetic basis of cilia function, regulation and development. The aim of this research is to improve our understanding of cilia biology and to provide insights into the ever increasing number of human afflictions that are linked to cilia dysfunction.

## (c) Research Frontiers Programme (RFP)

The Research Frontiers Programme supports excellent research in a broad range of scientific and engineering disciplines including those that underpin Biotechnology and ICT. There were 259 full-proposals submitted in January 2006 under RFP2006 and following review by twelve panels of international reviewers, 158 awards were approved. The average award size was €150,000 over three years and the overall success rate was 21%.

### Research Frontiers Programme RFP2006 – Breakdown of Awards by Discipline

Biochem	€2.2m	20 awards
Biomed	€2.8m	14 awards
Chemistry	€3.0m	20 awards
Computer Science	€1.7m	11 awards
EEEOB	€2.2m	14 awards
Engineering	€3.1m	19 awards
Genetics	€1.6m	11 awards
Geoscience	€1.5m	11 awards
Mathematics	€2.2m	17 awards
Physics	€3.3m	21 awards



## (d) SFI Mathematics Initiative 2006

SFI's Mathematics Initiative encourages mathematicians to work closely with researchers from industry, finance, economics, engineering, and other academic disciplines. SFI approved two awards under the Mathematics Initiative following review by a new panel of international reviewers.

Under the Initiative, the Mathematics Applications Consortium for Science and Industry (MACSI), headed by Prof. Stephen O'Brien at the University of Limerick, will receive €4.34 million over five years. MACSI will establish an interdisciplinary collaboration between Irish mathematicians and enterprise partners with a view to forming an expert group in mathematical modelling and simulation of real processes in industry, science and engineering. MACSI will also develop a graduate programme to produce mathematicians with expertise in the area of applied mathematical modelling.

The Claude Shannon Institute for Discrete Mathematics, Coding and Cryptography, headed by Dr. Gary McGuire, involves collaboration between researchers from UCD, UCC, DCU and NUI Maynooth and will receive €3.5 million over five years. It will create an infrastructure for mathematicians, engineers, computer scientists and business to work together to tackle the mathematical problems facing the communications industry. The Institute will also develop a graduate programme to produce well trained and broadly educated researchers in this general area of mathematics.

## (e) Women in Science & Engineering

In 2005, Science Foundation Ireland introduced three new programmes to address the under-representation of women in Irish science and engineering research. The objective of the programme is to encourage and participate in the development of sustainable mechanisms and practices which will ensure that women have an equal opportunity to compete on the basis of their scientific expertise, knowledge and potential. Considerable progress was made during 2006 in implementing the three programmes.

SFI announced 10 awards under the **SFI Principal Investigator Career Advancement Award (PICA)**, which supports research careers at every level and takes into account the different needs of women, and indeed any individuals, who have interrupted their careers for maternity, adoptive, carers or parental leave.

At the same time, SFI announced three **Institute Development Awards** to University of Limerick, UCC and TCD. The awards are aimed at providing Research Bodies with the opportunity to enhance the participation of women in science and engineering research activities and research management. SFI also approved the first 10 Scholarships under the **SFI/Dell Young Women in Engineering Scholarship Awards**. The awards are aimed at attracting and encouraging more high-achieving young women into third-level education in engineering disciplines. The overall value of each award is approximately €20,000, with each of the 10 winners receiving an annual award of €2,000;

a Dell notebook computer; the assistance and support of a research active mentor throughout their undergraduate career; plus the opportunity to spend summers in a research internship in university or industry.



**Dr. John Breslin, DERI, NUI Galway**

Dr. John Breslin is a researcher funded under the CSET grant to the Digital Enterprise Research Institute, NUI Galway, and was the recipient of two Net Visionary awards from the Irish Internet Association in 2005 and 2006. He is researching 'semantically-interlinked online communities' (SIOC), a Semantic Web project to connect Internet-based conversations and discussion forums.

"There are many isolated islands of discussion taking place online - message boards, blogs, mailing lists - and complementary issues are frequently being discussed on multiple sites using different discussion systems. You'll often find that you have to traverse a number of these sites to find a complete answer to a particular question. The aim of SIOC is to interlink these discussion posts, for example, through the users who create them or through the topics that they are covering. The funding of the SIOC project as a part of the DERI CSET grant has shown what an impact two or three people working on a good idea can have: as well as some well-cited publications, the vision of SIOC has led to a number of interesting projects in the business, biomedical and personal computing domains worldwide via a growing community of interest."



Pictured at the announcement of the award by SFI of €1.8 million to the CRANN for industrial collaboration with HP are (from L-R) Mr. Lionel Alexander, Vice President & General Manager of Hewlett Packard (HP) Manufacturing Ltd; Prof. Mark Keane, Science Foundation Ireland (SFI), Prof. John Boland, Director, Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN); and Mr. Micheál Martin, TD, Minister for Enterprise, Trade and Employment

## 2. Attracting Researchers to Ireland

SFI's programmes have been designed to assist Irish research bodies attract outstanding researchers to their institutions from outside of Ireland. During 2006, 28 researchers were attracted to Irish research bodies. SFI specifically focuses on recruiting to Ireland researchers or research teams whose accomplishments, potential and recognition by international peers place them amongst the top tier in their disciplines.

SFI Research Scientist	Programme	From Research Body/Industry	To Research Body
<b>Biotechnology Researchers</b>			
Dr. Derek Walsh	Investigator	NYU, School of Medicine	DCU
Prof. Robert Lahue	Investigator	University of Nebraska, USA	NUIG
Dr. Pavel Baranov	Investigator	University of Utah, USA	UCC
Prof. Marek Radomski	Investigator	University of Texas, USA	TCD
Prof. Mark Achtmann	Investigator	Max-Planck-Institut, Germany	UCC
Dr. Stephan Keely	Investigator	University of California, USA	RCSI
Dr. Mojgan Naghavi	Investigator	Columbia University, USA	UCD
Dr. Oliver Blacque	PIYRA	Simon Fraser University, Canada	UCD
Prof. Harry Holthofer	Research Professorship	University of Helsinki, Finland	DCU
Prof. Kevin Francis Sullivan	Research Professorship	Scripps Research Institute, USA	NUIG
Dr. Brendan Loftus	Research Professorship	Institute for Genomic Research, USA	UCD
Prof. Gil U Lee	Walton	Purdue University, USA	TCD
Prof. Michael Claude Berndt	Walton	Monash University, Australia	RCSI
Prof. Michael Patrick Walsh	Walton	University of Calgary, Canada	DKIT
Prof. Hans Gregersen	Walton	Aarhus University, Denmark	ITT
Prof. Lynn Ten Eyck	Walton	University of California, San Diego, USA	UCD
Dr. Philip Desmond Hodgkin	Walton	Hall Institute for Medical Research, Australia	NUIM
Prof. Sara Linse	Walton	Lund University, Sweden	UCD
Prof. Craig Lunte	Walton	University of Kansas, USA	DCU
Prof. Michael Brook	Walton	McMaster University, Canada	NUIG



ICT Researchers			
Prof. Jean-Pierre Colinge	Investigator	UC Davis	Tyndall National Institute, UCC
Dr. Emanuele Pelucci	Investigator	Institute of Quantum Electronics & Photonics, Swiss Federal Institute of Technology, Lausanne	Tyndall National Institute, UCC
Prof. Nicholas A. Kotov	Walton	University of Michigan, USA	TCD
Dr. Brian Williams	Walton	MIT, USA	UCC
Prof. Peter Brusilovsky	Walton	University of Pittsburgh, USA	National College of Ireland
Prof. Valentin Freilikher	Walton	Bar-Ilan University, Israel	NUI Galway
Dr. Oleg Mryasov	Walton	Seagate Tech, USA	TCD
Prof. Charles Anderson	Walton	Colorado State University, USA	NUI, Maynooth



**Prof. Thorfinnur Gunnlaugsson, Supramolecular and Medicinal Chemistry Research Group, School of Chemistry, TCD**

Head of the Supramolecular and Medicinal Chemistry Research Group at School of Chemistry, at Trinity College Dublin, which consists of ca. 18 researchers in the areas of organic, medicinal, inorganic, physical and biological chemistry. Thorri was born in Iceland and obtained his PhD from Queen's University of Belfast in 1996. After postdoctoral fellowship at University of Durham, he was appointed as a lecturer in Medicinal Chemistry at Trinity College Dublin in October 1998, followed by the appointment to a lectureship in Organic Chemistry in 2000. He was made a Fellow of Trinity College Dublin in 2003 and promoted to a Professor in October 2004. His main research interests are in the area of supramolecular and medicinal chemistry. He is the 2006 recipient of the Royal Society of Chemistry Bob Hay Lectureship which is annually awarded by the RSC Macrocyclic and Supramolecular Chemistry Group. He has received numerous funding from Irish funding bodies such as EI, HRB, SFI and IRCSET. He is the author of over 80 papers in his research areas.



Pictured on the occasion of the announcement of the SFI/Dell Young Women in Engineering Scholarship Awards - Helen Guinane, Christine Power, Yvonne Murphy, Prof. Mark Keane, Director General, Science Foundation Ireland, Karen McMorrow, Eimear Dolan, Claire Morrison, Mr. Nicky Hartery, VP Manufacturing, Dell, Laura Bree, Niamh O'Connell, Tara Reale, and Una Hally.

## 3. International Co-operation

Science Foundation Ireland has established formal active collaborative arrangements through the US-Ireland R&D Partnership and also with China and India. The aim of these collaborations is to increase the extent and the quality of scientific exchange between the countries involved, with a view to building links between Irish academic research leaders and their counterparts in each country.

Progress on implementing these collaborative arrangements is outlined below.

### US-Ireland R&D Partnership

The Governments of the United States of America, Northern Ireland and the Republic of Ireland have come together for a unique initiative to advance scientific progress in fields that will have a significant impact on the health, well-being and economic prosperity of all their citizens.

This US-Ireland R&D Partnership has its origins in the US-Ireland Business Summit that took place in Washington, DC in 2002. The US-Ireland R&D Partnership is helping link scientists and engineers in partnerships across academia and industry to address crucial research questions. It will foster new and existing industrial research activity

that could make an important contribution to the respective economies: and will expand educational and research career opportunities in science & engineering.

Considerable progress was made in implementing the Partnership during 2006. Five thematic areas have been identified as important research grand challenges for the health and prosperity of the citizens of the United States, Ireland and Northern Ireland:

- Nanotechnology
- Diabetes
- Sensors
- Cystic Fibrosis
- Emerging Respiratory Infections

For each thematic area, working groups, composed of representatives from the funding bodies in each jurisdiction, have been established. Various workshops have been held involving participants from the three jurisdictions to encourage collaboration and the groups are putting in place mechanisms for progress in relation to funding applications.

### Scientific Co-operation between India and Ireland

During the Irish Trade Mission to India led by the Taoiseach (January 2006), SFI and the Indian National Science Academy (INSA) signed an agreement to encourage co-operative research between scientists based in Ireland and India. The agreement aims to promote mutual bi-lateral co-operation from world class scientific researchers in both countries. Initially this has been undertaken through joint workshops held in India and Ireland. The agreement will be reviewed every two years. The INSA and SFI agreement forms part of an overall agreement on Scientific and Technological co-operation agreed between the Irish and Indian Governments as part of the trade visit.

Under the agreement, representatives from SFI and SFI-supported BioTechnology Researchers embarked on a visit to India to examine the possibilities for tangible research collaborations with their Indian counterparts, during which they attended the BioBangalore, a major international biotechnology conference, which was held 7-9 June 2006 in India.



### China Ireland Agreement on Research Collaboration

During the Trade Mission by the Taoiseach in January 2005, Dr. William Harris and Prof. Chen Yiyu signed a new research co-operation agreement on behalf of SFI and the Chinese National Science Foundation (NSFC). The agreement aims to maintain and develop co-operative research activities in the fields of science and engineering within the framework of the joint research collaboration agreement on Science and Technology between the Government of the People's Republic of China (PRC) and the Government of Ireland signed in 2002. Initially, collaborative activities are being undertaken in the fields of Biotechnology (BioT), Information Technology and Computer Science (ICT) and New Materials.

Specific activities under the agreement include the hosting by SFI in May 2006 of a China-Ireland Bio Workshop which was attended by 20 Chinese delegates including researchers, representatives from the NSFC and Chinese Embassy and in June 2006, seven SFI-funded researchers and representatives from SFI participated in SFI-NSFC Joint ICT Workshop held in Beijing.

### The China Ireland Research Collaboration Fund - SFI and the Ministry of Science and Technology (MOST)

The China Ireland Research Collaboration Fund is established under the auspices of the agreement on Scientific and Technological Co-operation between the Government of the PRC and the Government of Ireland signed on the 8 September 2000, thereby contributing to future co-operation in the field of science and technology between both countries.

The fund was administered on behalf of SFI by the Royal Irish Academy. The fund provides for exchanges of leading researchers at third level institutions in Ireland and China working in the fields underpinning BioT and ICT. Nine new collaborative research projects between Chinese and Irish based researchers were approved in 2006, this is in addition to the 12 awards previously approved in 2005.



**Prof. John Gamble, Dept. of Geology, National University of Ireland**

Prof. John Gamble's recent research has focused on understanding the plumbing systems of active andesite volcanoes, notably Mt. Ruapehu, at 2797m it is the highest mountain in the North Island of New Zealand, and the most active of New Zealand's on-shore volcanoes. The principal goal of this research has been to use U-Th series dating to determine the time-scales of volcanism, from pre-historic lavas to the present and through this to improve future predictions of activity and the estimates of the flux of magmas. It was in recognition of this and associated internationally acclaimed research into subduction zone volcanism that the Gamble Volcanic Complex, a complex of active submarine volcanoes on the Kermadec Arc (27°.20'S; 177°.41'W) was named.

This research is funded by the Research Frontiers Programme and it supports PhD scholar, Ms. Mairi Gardner, who is comparing eruptions in New Zealand volcanoes with Anak Krakatau in Indonesia. This work is providing new and important insights into the workings of these dangerous and often unpredictable types of volcano.



APC-GSK Investment Announcement – l-r – Prof. Mark Keane, Director General, SFI, Mr. Seán Dorgan, CEO, IDA Ireland, Dr. Jackie Hunter, Senior Vice President and Head of GSK's NGI CEDD, Mr. Micheál Martin, TD, Minister for Enterprise, Trade & Employment, Prof. Fergus Shanahan, Director, APC and Dr. Maurice Treacy, Director Bioscience & Bioengineering, SFI.

## 4. SFI Investment By Directorates

### (a) BioSciences & BioEngineering

Biotechnology involves all disciplines that underpin the study of gene expression, protein synthesis and characterisation, protein signalling, DNA, RNA, genomics, biosensors, drug delivery and bioremediation. Research in biotechnology disciplines will affect healthcare, diagnostics, pharmaceuticals, environmental management, agriculture, marine science, medical devices, consumer goods and food and drinks businesses.

As a result of SFI investments, indigenous talent has been retained and international talent has been recruited to Ireland. The SFI Bio Directorate now funds over 115 research investigators, including three CSETs (REMEDI, APC and BDI); has commitments of over €226m and indirectly employs 730+ life-science researchers within Ireland in areas as diverse as agri-food, neuroscience, immunology, sensors/ devices, cell biology/cell cycle/apoptosis, microbiology, nanotechnology, bioinformatics/systems biology and pharma-chem.

#### ■ **Agri-food (€22.9m):**

Agri-food production covers activities ranging from agriculture and crop production and optimisation to food consumption. SFI's most significant ongoing investment is the Alimentary Pharmabiotic Centre (APC) at UCC, under the direction of Prof. Fergus Shanahan, which was funded in 2003. During 2006 APC expanded to include a collaboration with GlaxoSmithKline (GSK) in a ground breaking research project into gastrointestinal diseases. This project is jointly supported by IDA Ireland and Science Foundation Ireland (SFI) and will involve an investment of up to €16.5m.

In September Dr. Alan Kelly of UCC hosted the International Workshop on Applications of Novel Technologies in Food and Biotechnology. The focus of the workshop was on food safety and biomedical issues, including emerging issues such as bacterial contamination, viruses and prions.

#### ■ **Neuroscience (€28.1m):**

Neuroscience focuses on the anatomy, physiology and pathology of the nervous system. Some relevant awards in 2006 include a Principal Investigator award to Prof. Roger Anywl of TCD to

carry out research which will investigate the cellular basis of memory in the mammalian brain and the deficit in memory caused by Alzheimer's disease, in the hope of identifying a therapy to alleviate Alzheimer's. Prof. Michael Rowan, also of TCD, was funded to carry out a research programme to study neurodegeneration mediated by beta amyloid protein in Alzheimer's disease.

SFI sponsored the "Neuroscience Ireland Inaugural Scientific Conference and Exhibition" hosted by Dr. Kieran McDermott, UCC. The conference profiled the latest developments in neuroscience research - fundamental, frontier, clinical and biotechnological - in Ireland.

#### ■ **Immunology (€29.0m):**

Research focuses on the immune system, immunity and allergy. Some relevant awards in 2006 include Prof. Kingston Mills from TCD, a recognized world-leader in T-cell immunology, was awarded an SFI grant for his research to investigate what causes the imbalance between different cell types within the immune system leading to disease and aims to develop new and improved therapies for cancer and/or autoimmunity.

*As a result of SFI investments, indigenous talent has been retained and international talent has been recruited to Ireland*

■ **Sensors/Devices (€29.2m):**

Research in this area is focused on the science and technology underpinning the next generation of biomedical diagnostic devices. Major ongoing investments include the Biomedical Diagnostics Institute (BDI) at DCU under the direction of Prof. Brian MacCraith, funded in 2005.

Other investments made in 2006 include Prof. Patrick Prendergast of TCD who was awarded an SFI grant to advance the field of computer simulation in the design of medical devices. His research programme targets the pre-clinical phase of medical device engineering and aims to replace the current computer simulations which can mimic the performance of a device in an ideal situation (ideal patient and surgical procedure) with simulations which are closer to the reality of multi-centre trials in a diverse population.

■ **Cell Biology/Cell Cycle/Apoptosis/Structural Biology (€69.3m):**

SFI's significant ongoing investment is in REMEDI, funded in 2005, under the joint leadership of Professors Tim O'Brien and Frank Barry.

Other investments include Prof. Harry Holthofer, an internationally recognised researcher in the area of diabetes who was awarded a Research Professor Recruitment Award to establish a diabetic nephropathy lab at DCU. He has identified the technologies, platforms,

validation techniques and research milestones that must be achieved to successfully investigate the molecular mechanisms of diabetic nephropathy.

Afshin Samali, NUIG, received a Principal Investigator award to carry out research into "Mediators and regulators of ER stress-induced apoptosis". The focus will be into programmed cell death or apoptosis.

■ **Microbiology (€7.6m):**

Research includes micro-organisms including viruses, prokaryotes and simple eukaryotes using methods from biochemistry and genetics. It is also related to pathology, immunology, and epidemiology. In 2006 Prof. Colin Hill (UCC), Prof. Paul Ross (Teagasc) and Dr. Paul Cotter (UCC) were funded to carry out research focusing on Lantibiotics which are bacterially produced antimicrobial peptides that are active against many clinically important bacteria, including drug resistant strains.

■ **Bioinformatics/Systems Biology (€30.0m):**

Where biology, computer science, and information technology merge into a single discipline. In 2006 Prof. Brendan Loftus, UCD, was awarded an SFI Research Professorship to focus on the investigation of the whole host response to pathogenic infection. This is a systems biology approach that will combine wet-lab experiments with high-level bioinformatics analysis, which is Prof. Loftus's forte.



**Prof. Stefano Sanvito, Computational Spintronics Group, Trinity College Dublin**

Prof. Sanvito is the leader of the *Computational Spintronics Group* at Trinity College Dublin, who pioneers computer simulations as a tool for nanoscience and nanotechnology. One of the main projects of the group is the development of the code *Smeagol*, a state of the art computational package for predicting electronic properties of nanoscale devices. These range from molecular transistors for revolutionary computer architectures, to bio-sensors for preventative medicine, to magnetic devices for data storage. *Smeagol* is distributed free of charge to the academic community and at present counts for over fifty uses from Europe, the US, Asia, South America and Australia. The prediction of large magnetoresistance in magnetic devices incorporating organic molecules and the explanation of the puzzling controversy around the metallicity of DNA are among the many recent results obtained with *Smeagol*. Finally, Prof. Sanvito's theoretical activity helps and supports the experimental research of various experimental groups in Ireland and abroad and in particular in CRANN.



**Prof. Marek Radomski, Chair of Pharmacology, School of Pharmacy and Pharmaceutical Sciences TCD**

Professor Radomski is internationally known ([www.isihighlycited.com](http://www.isihighlycited.com)) for his work on pharmacology of nitric oxide and matrix metalloproteinases. The SFI-funded research focuses on the biological effects of nanoparticles on vascular haemostasis and disease. "We are exploring nanopharmacological and nanotoxicological effects of non-engineered and engineered nanoparticles in experimental and clinical settings. The strategic objective of this research is to evaluate a detrimental impact of nanoparticulates on human health, as well as to design safe nanopharmacologicals for innovative treatment of cardiovascular, cancer and inflammatory diseases".

- **Pharma-Chem (€9.9m):**  
Pharma-Chem describes the interface between fundamental chemistry and the development of new drugs. In 2006 Prof. Marek Radomski was awarded a Principal Investigator grant to establish an innovative nanopharmacology initiative in TCD using nanosensors in pharmacological research on platelet function. His goal over the period of the research grant is to further unravel the roles of nitric oxide, matrix metalloproteinases and reactive oxygen species in platelet and platelet-leukocyte aggregation and to generate new insights into the impact of carbon nanoparticles on the vascular system.

The following table illustrates the SFI financial commitment of €226m\* to date in Biotechnology in these areas:

Agri-food:	€22.9m
Neuroscience:	€28.1m
Immunology:	€29.0m
Sensors/devices:	€29.2m
Cell Biology/Cell Cycle/ Apoptosis/Structural Biology:	€69.3m
Microbiology:	€7.6m
Bioinformatics/Systems Biology:	€30.0m
Pharma-Chem:	€9.9m
<b>Total</b>	<b>€226m*</b>

\* Total amounts for major awards. Bio also provides smaller awards under programmes such as ETS Waltons, UREKA and STARS, bringing the total investment to over €256m.

## (b) Information & Communications Technology (ICT) Investment

By the end of 2006, the SFI Information & Communications Technology (ICT) Directorate funded 118 research investigators, had commitments of over €310 million and indirectly engaged 825 researchers in a variety of hardware and

software research areas in Ireland. These research areas are fundamentally important to a range of industries in Ireland.

In software, there are six major areas of funding:

- **Networking & Communication Systems (€23.7m):**  
covering investment in research in wired and wireless networks. The largest cluster in this space is the National Communications Network Research Centre at National University of Ireland Maynooth (NUIM), University of Limerick (UL) and Dublin Institute of Technology. In addition, SFI funds work in Autonomic Network Management at the Telecommunications Software & Systems Group (TSSG) based at Waterford Institute of Technology.
- **Information Systems (€7.3m):**  
covering investment in the integration and optimization of software and hardware systems; for example, in sensor networks and middleware for sentient computing. Major groups are the Hamilton Institute (NUIM) and the Adaptive Information Cluster at Dublin City University (DCU) and University College Dublin (UCD).
- **Software Engineering & Artificial Intelligence (€44.3m):**  
covering investment in robust methods for software engineering and advanced artificial intelligence techniques. Major investments are LERO, the Irish Software Engineering Research Centre at the University of Limerick and Cork Centre for Constraint Computation at University College Cork (UCC). SFI also funds work in this area in algorithm analysis-based program optimization tools, machine learning and evolutionary computing.



- **Knowledge & Web-based Systems (€19.8m):**  
covering investment in advanced, knowledge-based systems for information handling on the World Wide Web and Internet. The two main investments are the Digital Enterprise Research Institute (DERI) CSET at NUI Galway and the Adaptive Information Cluster at DCU and UCD. Professor Stefan Decker recently took over as Director of DERI, and has led DERI in being chosen as the location for Enterprise Ireland's eLearning research cluster.
- **Language Technologies (€2.8m):**  
covering techniques for natural language processing for automated machine translation of textual and spoken language. SFI provides funding for the National Centre for Language Technology at DCU.
- **Computer Modelling & Visualisation Systems (€22.2m):**  
tools for computational science in several different areas; astrophysics, bioinformatics, medical and diagnostic imaging, climatology and the marine (e.g. National Geoinformatics Centre in NUI Maynooth). Major investments are in the Irish Centre for High-End Computing (NUIG, UCD, UCC, TCD, NUIM) and in Grid Technology (WebCom-G at NUIG, TCD and UCC). Recently, SFI funded Professor Carol O'Sullivan of the Interaction, Simulation and Graphics Lab (TCD) in the area of computer graphics.

In hardware, there are six major areas of funding:

- **Nanotechnology (€56.5m):**  
covering physics, properties of materials, and devices at the nanoscale. The major investment is the CRANN Nanotechnology CSET (TCD, UCD, UCC).

- **IC Research (€33.9m):**  
covering innovations in processes, materials, and the design of IC chips. A major investment is the PLASMAC group (DCU) and a number of new Investigators were funded in this area recently, including Prof. Jean-Pierre Colinge (Tyndall National Institute).
- **Photonics (€28.2m):**  
covering theory, design, and fabrication of photonic devices. Examples include the Photonic Theory Group led by Prof. Eoin O'Reilly (UCC) and the Adaptive Optics Research team led by Prof. Chris Dainty (NUIG).
- **Transmission Systems (€29.5m):**  
covering design and testing of new network architectures and systems. One major investment is Prof. David Cotter's Photonics Systems Group at the Tyndall National Institute.
- **Storage (€12.5m):**  
covering advanced materials, characterization, and devices for information storage (e.g. in magnetic materials). The major investments here are in Prof. Michael Coey and Prof. Igor Shvet's groups at TCD which are part of the CRANN CSET.
- **Advanced Manufacturing Technology (€21.3m):**  
where a major investment has been made in the telecommunications sector through the CTVR CSET.



**Prof. A. Stewart Fotheringham,**  
Director, National Centre for  
Geocomputation, National University  
of Ireland, Maynooth

Prof. Fotheringham is the Director of the National Centre for Geocomputation (NCG) at NUIM, which conducts computational research on all aspects of spatial data. Spatial data are those that contain locational information as well as attribute information. They are extremely common and wide ranging with examples including incidence of a disease, traffic flows, pollution occurrence, land use change, monitoring of noise pollution, forest health, ocean floor mapping and flood monitoring. The NCG is involved in spatial data capture using various sensors; spatial data visualisation; and spatial data analysis and modelling. The group is currently involved in 12 different projects including the capture of spatial data by merging GPS and digital video, fusing data from airborne and terrestrial LiDAR, pattern recognition from remotely sensed images, the local statistical analysis of spatial processes through a technique known as Geographically Weighted Regression which is being developed at the NCG, and spatial data mining and visualisation. The NCG is applying for patents concerning its research on sensor technology and has distributed software for GWR commercially to about 500 sites around the world. The NCG currently consists of around 15 individuals including academic researchers, PhD students, research assistants and administrative staff.

The following table illustrates the SFI financial commitment of €302m\* to date in Information & Communications Technology (ICT) in the above areas:



**Prof. Jochen Prehn, Royal College of Surgeons in Ireland**

Prof. Jochen Prehn has been attracted to Ireland through an SFI Research Professorship. His SFI-funded research team focuses on the molecular analysis of cell death pathways in neurons and cancer cells, with a particular emphasis on the role of apoptosis and its activation by mitochondria and Bcl-2 family proteins. The aim is to identify new target structures for the treatment of disorders that are associated with an overactivation of pro-apoptotic Bcl-2 family proteins. Examples are stroke and neuro-degeneration. Conversely, the aim is also to identify new concepts that can override apoptosis resistance in cancer cells, a phenomenon that is frequently observed during cancer therapy. A particular expertise is real time imaging of protein dynamics and protein interactions in living cells, using advanced microscopy techniques. In an SFI-supported partnership with SIEMENS Ireland, this research has been taken even further and has developed in silico models of apoptosis in order to understand apoptosis sensitivity and resistance on a systems level. These theoretical models will now be combined with quantitative clinical data to predict treatment responsiveness and to guide in the choice of new treatment paradigms.

<b>Software</b>	
Networking & Communications Systems	€23.7m
Information Systems	€7.3m
Software Engineering & Artificial Intelligence	€44.3m
Knowledge & Web-based Systems	€19.8m
Language Technologies	€2.8m
Computer Modelling & Visualisation Systems	€22.2m
<b>Hardware</b>	
Nanotechnology	€56.5m
IC Research/Semiconductors	€33.9m
Photonics	€28.2m
Transmission Systems	€29.5m
Storage	€12.5m
Advanced Manufacturing Technology	€21.3m
<b>Hardware and Software Total*</b>	
	<b>€302m</b>

\* Total amounts for major awards. ICT also provides smaller awards under programmes such as ETS Waltons, UREKA and STARS, bringing the total investment to over €310m.

## (c) Frontiers Engineering & Science

The goal of the FES Directorate is to support excellent research in a broad range of scientific and engineering disciplines including those that underpin Biotechnology and ICT. The FES Directorate has committed funding of €47.5 million in the BRG2004, RFP2005 and RFP2006 Programmes and supports 316 investigators. During the calendar year 2006, the FES Directorate completed the evaluation of full-proposals submitted under the Research Frontiers Programme (RFP) 2006, the evaluation of full-proposals submitted under the Mathematics Initiative 2006, conducted site visits to almost all grantees supported under RFP2005, completed the evaluation of pre-proposals for RFP2007 and completed the review of proposals submitted to the Equipment Call 2006.



Pictured at the announcement of the PIYRA award recipients (L-R): Prof. Mark Keane, Director General, SFI, Dr. James O'Donnell, TCD, President Mary McAleese, Dr. Emma Teeling, UCD and Dr. Oliver Blacque, UCD.

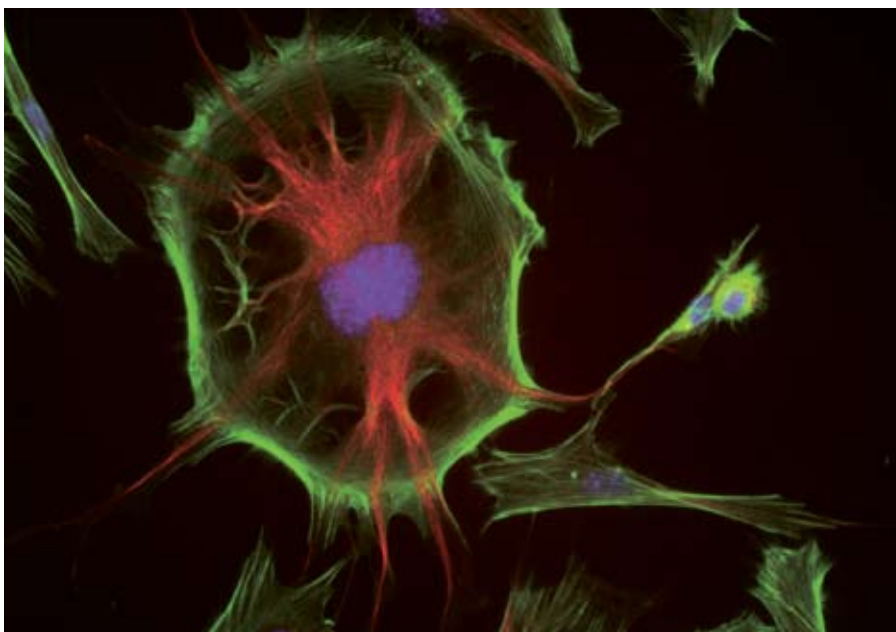
The Research Frontiers Programme (RFP) is important for a number of reasons:

- The RFP provides support for post-doctoral fellows and especially post-graduate students, who are crucial to the future of science and engineering both in universities and industry in Ireland. Irish universities must continue to produce well trained, creative young investigators to ensure the future of research in Ireland and the future of Irish high tech industries which depend on scientific innovation.
- The RFP provides the broad underpinning to the strategic areas in SFI by supporting a wide range of research in fields like mathematics, physics and chemistry. The new industries and start-up companies in both BioT and ICT are based on fundamental research carried out sometimes many years earlier. Research in these areas will continue to provide the ideas and tools upon which the industries of the future will be based.

- The RFP represents an investment in the longer term future when we are less certain which scientific areas are likely to be most important both economically and in terms of quality of life for the people of Ireland. Currently BioT and ICT areas are providing an important economic impetus in Ireland. However, in the future, areas such as energy resources, environmental protection and materials could also have very significant economic and social importance.

The following table illustrates the total commitments made to date by the FES Directorate:

Biosciences	€10.9m
Chemistry	€7.7m
Computer Science	€3.5m
EEEEOB	€4.1m
Engineering	€5.7m
Geoscience	€3.3m
Mathematics	€4.6m
Physics	€7.8m
<b>Total</b>	<b>€47.6m</b>





Pictured at the announcement of the Women in Science & Engineering Research awards are PICA award recipients (L-R) Dr. Debra Laefer, UCD; Dr. Caroline Jeffries, RCSI; Dr. Orina Belton, UCD; Dr. Geraldine Boylan, UCC; Prof. Anita Maguire, UCC; Prof. Sylvia Draper, TCD; Dr. Clair Gardiner, TCD, together with (centre L-R) Dr. Pat Fottrell, Chairperson, SFI and Mr. Michael Ahern, TD, Minister for Trade and Commerce.

# Statutory and Other Notices

## 1. Board Members – Register of Interests

The Board operates in accordance with best practice corporate governance principles set out in the Code of Practice for the Governance of State Bodies, as issued by the Department of Finance, both in its activities and in its use of committees. In accordance with these guidelines, SFI Board Members register their interests in other undertakings with the Secretary.

## 2. Ethics in Public Office Acts, 1995 and Standards in Public Offices Act, 2001

SFI became subject to the Ethics in Public Office Acts 1995 and 2001 on the 1 January 2005. SFI has complied with the provision of the Act.

## 3. Freedom of Information Act, 1997 and Freedom of Information (Amendment) Act, 2003

SFI became a prescribed body under the Freedom of Information Act, 1997 from 31 May 2006. SFI complies fully with the Act. Requests for information under this Act should be addressed to the FOI Officer, SFI, Wilton Park House, Wilton Place, Dublin 2.

## 4. Prompt Payments of Accounts Act, 1997

SFI comes under the remit of the Prompt Payments of Accounts Act, 1997, which came into effect on 2 January 1998, and the European Communities (Late Payment in Commercial Transactions) Regulations, 2002, which came into effect on the 7 August 2002.


The payment practices of SFI, as required by the Act, are reported on below for the year ended 31 December 2006. It is the policy of SFI to ensure that all invoices are paid promptly.

Specific procedures are in place that enables SFI to track all invoices and ensure that payments are made before the due date. Invoices are registered daily and cheques are issued as required to ensure timely payments. There were no late payments during 2006.

## 5. Employment Equality Acts, 1998 and 2004

SFI wholeheartedly supports the principle of equal opportunities in employment. It opposes all forms of discrimination on the grounds of colour, race, nationality, sexual orientation, ethnic or national origin (and/or area of origin), religion, gender, marital status, age or disability. SFI's commitment to implementing equal opportunities is reflected in its policies, practices and procedures, e.g. recruitment, promotion, training, use of nondiscriminatory language in company documents and publications. The objective is to ensure that all staff are selected and treated only on the basis of their abilities, knowledge and qualifications.





## 6. Safety, Health and Welfare at Work Act 1989

In accordance with the above Act, SFI in consultation with Forfás implements appropriate measures to protect the safety, health and welfare of all employees and visitors within its offices.

## 7. Clients' Charter

SFI has published a Clients' Charter setting out its commitment to a high quality of service. This Charter includes a procedure for dealing with complaints. In 2006, no complaints were received under the Charter.

# Organisational Chart



Mark Keane  
**Director General**

Board Sub Group on Programme Grants  
Audit Committee  
Management Development &  
Remuneration Committee



Maurice Treacy  
**Bioscience &  
Bioengineering  
Directorate**



Gary Crawley  
**Frontier  
Engineering  
& Scientific  
Research  
Directorate**



Gene Wong  
**Information &  
Communications  
Technology  
Directorate**



Mattie McCabe  
**Secretariat &  
External Relations  
Director**



Donal Keane  
**Chief Operations  
Officer**

# 2006 ANNUAL FINANCIAL STATEMENTS



31 December 2006

# Statement of Board Members' Responsibilities


## For 2006 Annual Financial Statements

Section 24 (2) of the Industrial Development (Science Foundation Ireland) Act, 2003 requires Science Foundation Ireland to keep, in such form as may be approved by the Minister for Enterprise, Trade and Employment with the consent of the Minister for Finance, all proper and usual accounts of money received and expended by it and, in particular, shall keep in such form as aforesaid all special accounts as the Minister may from time to time direct. In preparing those financial statements, Science Foundation Ireland is required to:

- select suitable accounting policies and apply them consistently;
- make judgements and estimates that are reasonable and prudent;
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that Science Foundation Ireland will continue in operation;
- disclose and explain any material departures from applicable Accounting Standards.

The Board is responsible for keeping proper books of account which disclose with reasonable accuracy at any time its financial position and which enables it to ensure that the financial statements comply with the overall requirements of Section 24 of the Industrial Development (Science Foundation Ireland) Act, 2003. These books of account are located at the Foundation's headquarters, Wilton Park House, Wilton Place, Dublin 2. The Board is also responsible for safeguarding its assets and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

On behalf of the Board:



**Patrick Fottrell**  
*Executive Chairman*

Date: 12th June 2007



**Jim Mountjoy**  
*Deputy Chairman*

Date: 12th June 2007



# Statement On Internal Financial Control

On behalf of the Board of Science Foundation Ireland I acknowledge our responsibility for ensuring that an effective system of internal financial control is maintained and operated.

The system can only provide reasonable and not absolute assurance that assets are safeguarded, transactions authorised and properly recorded, and that material errors or irregularities are either prevented or would be detected in a timely period.

The Board has taken steps to ensure an appropriate control environment is in place by:

- Clearly defining management responsibilities and powers;
- Establishing formal procedures for monitoring the activities and safeguarding the assets of the organisation;
- Developing a culture of accountability across all levels of the organisation;
- Following a number of critical audit reviews of the grant data base system, a project is now in place to examine the replacement of the current system.

The Board has established processes to identify and evaluate business risks by:

- Working closely with Government and various Agencies to ensure that there is a clear understanding of Science Foundation Ireland goals and support for the Agencies' strategies to achieve those goals.
- Requiring senior management to put in place risk assessment and risk management processes for the Audit Committee.

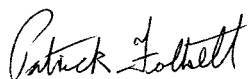
The system of internal financial control is based on a framework of regular management information, administration procedures including segregation of duties, and a system of delegation and accountability. In particular it includes:

- A comprehensive budgeting system with an annual budget which is reviewed and agreed by the Board;
- Regular reviews by the Board of periodic and annual financial reports which indicate financial performance against forecasts;
- Setting targets to measure financial and other performance;
- Formal project management disciplines.

Science Foundation Ireland has established an internal audit function, in accordance with the Framework Code of Best Practice set out in the Code of Practice on the Governance of State Bodies, which reports directly to the Audit Committee. The work of internal audit is informed by analysis of the risk to which the body is exposed and, in 2006, the internal audit plan was based on this analysis. The analysis of risk and the internal audit plans are endorsed by the Audit Committee. The Audit Committee meets at least six times a year and reviews the outcome of the specific internal audits and confirms the ongoing adequacy and effectiveness of the system of internal financial control. The Board's monitoring and review of the effectiveness of the system of internal financial control is informed by the work of the internal auditor and the Audit Committee which oversees the work of the internal auditor and the control exercised by the executive managers within SFI who have responsibility for the development and maintenance of the financial control framework.

I confirm that the Board conducted a review of the effectiveness of the system of internal financial controls for 2006.

Signed on behalf of the Board



**Patrick Fottrell**

*Executive Chairman*

# Report of the Comptroller and Auditor General

For presentation to the Houses of the Oireachtas

I have audited the financial statements of Science Foundation Ireland for the year ended 31 December 2006 under the Industrial Development (Science Foundation Ireland) Act, 2003.

The financial statements, which have been prepared under the accounting policies set out therein, comprise the Accounting policies, the Income and Expenditure Account, the Balance Sheet, the Cash Flow Statement and the related notes.

Respective Responsibilities of the Board and the Comptroller and Auditor General

Science Foundation Ireland is responsible for preparing the financial statements in accordance with the Industrial Development (Science Foundation Ireland) Act, 2003 and for ensuring the regularity of transactions. It prepares the financial statements in accordance with Generally Accepted Accounting Practice in Ireland. The accounting responsibilities of the Members of the Board are set out in the Statement of Board Members' Responsibilities.

My responsibility is to audit the financial statements in accordance with relevant legal and regulatory requirements and International Standards on Auditing (UK and Ireland).

I report my opinion as to whether the financial statements give a true and fair view, in accordance with Generally Accepted Accounting Practice in Ireland. I also report on whether in my opinion proper books of account have been kept. In addition, I state whether the financial statements are in agreement with the books of account.

I report any material instance where monies have not been applied for the purposes intended or where the transactions do not conform to the authorities governing them.

I also report if I have not obtained all the information and explanations necessary for the purposes of my audit.

I review whether the Statement on Internal Financial Control reflects Science Foundation Ireland's compliance with the Code of Practice for the Governance of State Bodies and report any material instance where it does not do so, or if the statement is misleading or inconsistent with other information of which I am aware from my audit of the financial statements.

I read other information contained in the Annual Report, and consider whether it is consistent with the audited financial statements. I consider the implications for my report if I become aware of any apparent misstatements or material inconsistencies with the financial statements.

## Basis of Audit Opinion

In the exercise of my function as Comptroller and Auditor General, I conducted my audit of the financial statements in accordance with International Standards on Auditing (UK and Ireland) issued by the Auditing Practices Board and by reference to the special considerations which attach to State bodies in relation to their management and operation. An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures and regularity of the financial transactions included in the financial statements. It also includes an assessment of the significant estimates and judgements made in the preparation of the financial statements, and of whether the accounting policies are appropriate to Science Foundation Ireland's circumstances, consistently applied and adequately disclosed.

I planned and performed my audit so as to obtain all the information and explanations that I considered necessary in order to provide me with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error. In forming my opinion I also evaluated the overall adequacy of the presentation of information in the financial statements.

## Opinion

In my opinion, the financial statements give a true and fair view, in accordance with Generally Accepted Accounting Practice in Ireland, of the state of Science Foundation Ireland's affairs at 31 December 2006 and of its income and expenditure for the then ended.

In my opinion, proper books of account have been kept by Science Foundation Ireland. The financial statements are in agreement with the books of account.



**John Purcell**  
*Comptroller and Auditor General*

28 June 2007

# Accounting Policies

## (1) BASIS OF ACCOUNTING

The Financial Statements have been prepared under the historical cost convention in the form approved by the Minister for Enterprise, Trade and Employment with the consent of the Minister for Finance under the Industrial Development (Science Foundation Ireland) Act 2003. The Financial Statements are prepared on an accruals basis, except where stated below and are in accordance with generally accepted accounting practice. Financial Reporting Standards, recommended by the Accounting Standards Board, are adopted as they become effective.

## (2) INCOME RECOGNITION

Income from Oireachtas Grant represents actual cash receipts in the year.

## (3) FIXED ASSETS

Fixed Assets comprise tangible fixed assets that are owned by Science Foundation Ireland and includes assets that were acquired prior to the establishment of SFI as an independent agency of Forfás on 25 July 2003. Fixed Assets are stated at cost less accumulated depreciation. Depreciation is calculated in order to write off the cost of fixed assets over their estimated useful lives (see Note 6).

## (4) CAPITAL ACCOUNT

The Capital Account represents funds utilised for the acquisition of Fixed Assets and is written down in line with depreciation and revaluation policies for these assets.

## (5) FOREIGN CURRENCIES

Monetary assets and liabilities denominated in foreign currencies are translated at the exchange rates ruling at the Balance Sheet date. Revenues and costs are translated at the exchange rates ruling at the dates of the underlying transactions.

## (6) SUPERANNUATION

Science Foundation Ireland is established as an agency of Forfás in accordance with Section 6 (1) of the Industrial Development (Science Foundation Ireland) Act, 2003. Staff employed at the Foundation are legally employees of Forfás and are seconded to the Foundation, consequently, under Sections 2 and 3 of the Second Schedule of the Industrial Development Act, 1993, Forfás is responsible for all employee pension entitlements. Forfás prepares and administers pension schemes for the granting of pension entitlements to its staff including staff seconded to Science Foundation Ireland. Forfás is also responsible for pension reporting requirements, including those set out under FRS 17.

## (7) OPERATING LEASES

The rentals under operating leases are accounted for as they fall due.

## (8) RESEARCH GRANT PAYMENT

Amounts paid to Research Bodies on foot of research grants are charged to the Income and Expenditure account in the year of issue.

# Income and Expenditure Account

For the year ended 31 December 2006

	Notes	2006 €'000	2005 €'000
<b>Income</b>			
Oireachtas Grant	1	147,570	129,561
Other Income	2	266	51
Profit on Disposal of Fixed Asset		-	23
		<b>147,836</b>	129,635
<b>Expenditure</b>			
Pay	3	3,070	2,563
Administration Expenses	4	4,062	4,213
Depreciation	6	272	245
Grants	5	139,865	122,155
		<b>147,269</b>	129,176
Operating Surplus for Year		<b>567</b>	459
Contribution to the Exchequer	14	<b>(1,048)</b>	-
Net (Deficit)/Surplus for the Year		<b>(481)</b>	459
Balance at beginning of Year		<b>438</b>	(2)
Transfer from/(to) Capital Account	7	<b>108</b>	(19)
<b>Accumulated Surplus at end of Year</b>		<b>65</b>	438

There are no recognised gains or losses, other than those dealt with in the Income and Expenditure Account.


The Accounting Policies, Cash Flow Statement and Notes 1 to 15 form part of these Financial Statements.

On behalf of the Board:



**Patrick Fottrell**  
Executive Chairman

Date: 12th June 2007



**Jim Mountjoy**  
Deputy Chairman

Date: 12th June 2007




# Balance Sheet

For the year ended 31 December 2006

	Notes	2006 €'000	2005 €'000
<b>Fixed Assets</b>			
Tangible Fixed Assets	6	299	407
<b>Current Assets</b>			
Cash at Bank		174	878
Accounts Receivable	8	93	48
		267	926
<b>Accounts Payable</b>	9	202	488
<b>Net Current Assets</b>		65	438
<b>Net Assets</b>		364	845
<b>Represented By:</b>			
<b>Capital Account</b>	7	299	407
<b>Income and Expenditure Account</b>		65	438
		364	845

The Accounting Policies, Cash Flow Statement and Notes 1 to 15 form part of these Financial Statements.

On behalf of the Board:



**Patrick Fottrell**  
Executive Chairman

Date: 12th June 2007



**Jim Mountjoy**  
Deputy Chairman

Date: 12th June 2007

# Cash Flow Statement

For the year ended 31 December 2006

	Notes	2006 €'000	2005 €'000
Reconciliation of Surplus/(Deficit) for Year to Net Cash Flow from Operations			
<b>(Deficit)/Surplus for Year</b>		<b>(481)</b>	459
Bank Interest	2	<b>(96)</b>	(51)
(Profit)/Loss on Disposal of Assets		-	(23)
Depreciation Charge	6	<b>272</b>	245
(Increase) in Accounts Receivable	8	<b>(45)</b>	(29)
(Decrease)/Increase in Accounts Payable	9	<b>(286)</b>	385
<b>Net Cash Flow from Operations</b>		<b>(636)</b>	986
Cash Flow Statement			
<b>Net Cash Flow from Operations</b>		<b>(636)</b>	986
<b>Returns on Investment and Servicing of Finance</b>			
- Bank Interest	2	<b>96</b>	51
<b>Cash Flow before Capital Expenditure</b>		<b>(540)</b>	1,037
<b>Capital Funding</b>			
- Receipts from Sale of Tangible Fixed Assets		-	23
- Purchase of Tangible Fixed Assets	6	<b>(164)</b>	(264)
<b>(Decrease)/Increase in Cash</b>		<b>(704)</b>	796
Reconciliation of Increase in Cash to Cash at Bank			
<b>Movement in Cash for the Year</b>		<b>(704)</b>	796
<b>Cash at Bank at 01 January 2006</b>		<b>878</b>	82
<b>Cash at Bank at 31 December 2006</b>		<b>174</b>	878

# Notes to the Accounts

For the year ended 31 December 2006

	2006 €'000	2005 €'000
<b>1 Oireachtas Grant</b>		
Pay	3,210	2,743
Administration Expenses	4,495	4,618
Research Grants	139,865	122,200
	<b>147,570</b>	<b>129,561</b>

Under Section 35 of the Industrial Development (Science Foundation Ireland) Act, 2003, the aggregate amount of grants made by the Minister to Forfás and its Agencies, to enable them to discharge their obligations and liabilities shall not exceed €3,400,000,000. At 31 December, 2006 the aggregate amount so approved was €2,746,519,030.

<b>2 Other Income</b>		
Bank Interest	96	51
Research Grant Refunded	170	-
<b>Total</b>	<b>266</b>	<b>51</b>

<b>3 Pay</b>		
<b>Pay Costs comprise:</b>		
Wages and Salaries	2,857	2,384
Social Welfare Costs	183	148
Superannuation Costs	30	31
<b>Total</b>	<b>3,070</b>	<b>2,563</b>

SFI continued the process of filling sanctioned positions during the year.

Sanctioned Positions	44	44
Full Time Employed (at year end)	36	33
Temporary Staff Employed (at year end)	3	5
<b>Total</b>	<b>39</b>	<b>38</b>

<b>4 Administration Expenses</b>		
Board Members' Remuneration and Expenses	219	189
Programme Management	1,126	859
Facilities	622	578
Professional Fees	266	1,100
Marketing Promotion & PR	515	505
IT Support & Infrastructure	539	230
Travel & Subsistence Costs	166	217
HR Management	427	355
Office Furniture & Equipment	17	20
General Office Expenses	150	147
Audit Fee	15	13
<b>Total</b>	<b>4,062</b>	<b>4,213</b>

# Notes to the Accounts

For the year ended 31 December 2006 (continued)

	2006 €'000	2005 €'000
<b>5 Grants</b>		
Biotechnology Grants	<b>56,712</b>	46,205
Information and Communications Technology Grants	<b>63,680</b>	60,234
Research Frontiers Grants	<b>19,473</b>	15,716
<b>Total</b>	<b>139,865</b>	122,155

Grants are payable to Irish third level institutions to carry out world class basic research projects.

Included in the above analysis by Directorate are amounts of €26m (2005 - €28m) in respect of funding of the Annual Overhead Investment Plan.

The Annual Overhead Investment Plan represents funding of the institutional research infrastructure associated with SFI-funded researchers. Funds are disbursed on the basis of annual submissions by the institutions which are evaluated by external reviewers on behalf of SFI.

At 31 December 2006, SFI had €208m in future grant commitments.

	Computer Equipment €'000	Motor Vehicles €'000	Fixtures & Fittings €'000	System Development €'000	Total €'000
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## 6 Tangible Fixed Assets

### COST

At 1 January 2006	286	50	159	383	<b>878</b>
Additions	158	-	6	-	<b>164</b>
Disposals	-	-	-	-	-
At 31 December 2006	444	50	165	383	<b>1,042</b>

### DEPRECIATION

At 1 January 2006	213	12	118	128	<b>471</b>
Charge for Year	99	13	33	127	<b>272</b>
Disposals	-	-	-	-	-
At 31 December 2006	312	25	151	255	<b>743</b>

### NET BOOK AMOUNT

At 1 January 2006	73	38	41	255	<b>407</b>
Net Movement for Year	59	(13)	(27)	(127)	<b>(108)</b>
At 31 December 2006	132	25	14	128	<b>299</b>

The cost of Tangible Fixed Assets is written off in equal instalments over their expected useful lives as follows:

- (i) Computer Equipment & Systems Development 3 years
- (ii) Motor Vehicles 4 years
- (iii) Fixtures & Fittings 5 years

Assets in course of construction are depreciated when commissioned.



# Notes to the Accounts

For the year ended 31 December 2006 (continued)

	2006 €'000	2005 €'000
<b>7 Capital Account</b>		
At 1 January 2006	<b>407</b>	388
Transfer from/(to) Income & Expenditure Account		
- Cost Additions	<b>164</b>	264
- Cost Disposals	-	(50)
- Depreciation Additions	<b>(272)</b>	(245)
- Depreciation Disposals	-	50
Net Movement	<b>(108)</b>	19
At 31 December 2006	<b>299</b>	407
<b>8 Accounts Receivable</b>		
General Debtors	<b>13</b>	40
Prepayments	<b>80</b>	8
<b>Total</b>	<b>93</b>	48
<b>9 Accounts Payable</b>		
General Creditors	<b>13</b>	256
Accruals	<b>150</b>	128
Interagency Balance	<b>39</b>	104
<b>Total</b>	<b>202</b>	488

Interagency Balance relates to the balance owed by Science Foundation Ireland to Forfás at 31 December 2006, being the difference between the amount of money paid to Forfás by Science Foundation Ireland and the actual money spent by Forfás on behalf of Science Foundation Ireland.

## 10 Commitments under Operating Leases

Science Foundation Ireland currently has no commitments under operating leases on the building, but pays rent to Forfás as a contribution to the lease costs incurred by Forfás.

## 11 Taxation

Section 227 of the Taxes Consolidation Act, 1997, exempts SFI from further taxation on Case IV and Case V rental income in excess of that deducted at source.

## 12 Board Members - Disclosure of Transactions

In the normal course of business, Science Foundation Ireland may enter into contractual arrangements with undertakings in which Science Foundation Ireland Board Members are employed or otherwise interested. Science Foundation Ireland has adopted procedures in accordance with the guidelines issued by the Department of Finance in relation to the disclosure of interests by Board Members and these procedures have been adhered to by Science Foundation Ireland during the year.

## 13 Contingencies and Legal Actions

There are no contingencies or legal actions which require specific provision in the Financial Statements.

# Notes to the Accounts

For the year ended 31 December 2006 (continued)

	2006	2005
	€'000	€'000
<b>14 Contribution to the Exchequer</b>		
The Contribution to the Exchequer is made up as follows;		
Refund of 2005 Oireachtas Grant (see (a) below)	<b>878</b>	-
Research Grant Refunded (see (b) below)	<b>170</b>	-
	<b>1,048</b>	-

(a) The Cash balance as at 31 December 2005 of €878,000 was repaid to the Department of Enterprise, Trade and Employment on 28 March 2006.

(b) A refund of €170,000 was received from a research body in October 2006. As the refund came from Non Exchequer funds, in accordance with established procedures SFI forwarded this refund to the Department of Enterprise, Trade and Employment.

## 15 Approval of Financial Statements

The Financial Statements were approved by the Board of Science Foundation Ireland on 28 May 2007.

# Appendix A

## Analysis of Grant Payments by Institution For the year ended 31 December 2006

	2006	2005
	€'000	€'000
Dublin City University	10,553	7,213
NUI Galway	12,415	14,592
NUI Maynooth	7,785	6,613
Royal College of Surgeons	2,743	4,063
Trinity College Dublin	39,027	30,280
University College Cork	23,799	20,278
University College Dublin	21,285	17,332
University of Limerick	6,827	8,095
Tyndall National Institute	13,651	12,714
Carlow Institute of Technology	89	61
Cork Institute of Technology	403	257
Dublin Institute of Advanced Studies	290	167
Dublin Institute of Technology	582	216
Dundalk Institute of Technology	-	7
Institute of Electrical Engineers	-	5
Tallaght Institute of Technology	-	9
Limerick Institute of Technology	-	2
Royal Irish Academy	200	194
Waterford Institute of Technology	216	57
<b>Total</b>	<b>139,865</b>	<b>122,155</b>



Learn more about SFI and our programmes at [www.sfi.ie](http://www.sfi.ie)

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