Science Foundation Ireland
The National Foundation for Excellence in Scientific Research

Annual Report and Accounts **2004**

science foundation ireland
fondúireacht eolaíochta éireann

Science Foundation Ireland

The National Foundation for Excellence in Scientific Research

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.

CONTENTS

SFI BOARD MEMBERS 2004

Dr 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. Dr Fottrell is currently Chairman of Westgate Biological. 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, Ph.D. from the University of Glasgow, and D.Sc. from the National University of Ireland. He has been a visiting professor at Harvard, Munich, and Asahikawa universities.

Dr Frank McCabe, Deputy Chairperson, SFI. Former Vice President, Intel Corporation. Dr McCabe joined Intel in 1994 as Vice President of technology and manufacturing, based in Co. Kildare, and retired in 1999 following a career in which he had held various industrial leadership posts. His early career was with ASEA in Sweden, after which he started up General Electric Semiconductor in Ireland, which went on to employ 1,800 people.

Dr William C. Harris, Director General, SFI. Dr Harris's career includes service as the Director for the Mathematical and Physical Sciences Directorate of the National Science Foundation (NSF), and as founding President and Executive Director of Columbia University's Biosphere 2 Centre (B2C) in Arizona, and as Vice President for Research and Professor of Chemistry at the University of South Carolina (USC). Dr Harris is an elected fellow of the American Association for the Advancement of Science. In 2005, he was elected as a member of the Royal Irish Academy.

Mr Erich Bloch, Principal, Washington Advisory Group. Mr Bloch is a former Director of the U.S. National Science Foundation (NSF). Previously, he served at IBM in roles including head of the Solid Logic Technology Programme, which produced the microelectronic technology for IBM's System/360 computer. An elected member of the US National Academy of Engineering, Mr Bloch has also received the USA's most prestigious science award, the Presidential Medal for Science and Technology.

Mr Ned Costello, Assistant Secretary General, Science, Technology and Intellectual Property Division, Department of Enterprise, Trade and Employment. Ned Costello is responsible for the development, promotion and co-ordination of Ireland's Science, Technology and Innovation Policy and Ireland's policy in international research activities. He is Chair of the Interdepartmental Committee on Science, Technology and Innovation.

Prof Jane Grimson, Vice Provost of Trinity College Dublin. Prof Grimson was Dean of the Faculty of Engineering and Systems Sciences from 1996-1999, Pro Dean of Research from January to August 2001, and was appointed Vice Provost of Trinity College Dublin (TCD) in September, 2001. Prof Grimson was also the first female President of the Institution of Engineers of Ireland (1999-2000) and is a Fellow of the Royal Academy of Engineering.

Dr Jackie Hunter, Senior Vice President and Head of Neurology & GI Centre of Excellence for Drug Discovery, GlaxoSmithKline. Dr Hunter has an excellent record of achievement as a researcher in both academia and industry. Before taking her current role at GlaxoSmithKline (GSK), she was Vice-President and Head of Biology, Neurology & GI Centre of Excellence for Drug Discovery. Prior to this she was Group Director for Neurobehavioural Research at SmithKline Beecham and Director of Neurology Research for the same organisation. Dr Hunter is also a visiting professor at the Institute of Psychiatry.

Dr Kristina Johnson, Dean of the Pratt School of Engineering, Duke University, North Carolina. Dr Johnson is an internationally known expert in optics, signal processing and computing and Director Emeritus of the Optoelectronics Computing Systems Centre at the University of Colorado. Dr Johnson holds approximately 43 patents, and has helped start five companies. She is a Board Director of Guidant, AES Corporation, and Minerals Technologies.

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 ten campuses and three national Laboratories. She is also Co-Director of a (US) National Institutes of Health Training Grant in Biomolecular Technology, one of only three in California, the others being at UC Berkeley and Stanford University.

Dr Jim Mountjoy, Chairman, Prospectus Consultancy Group. 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 two months later. 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 Don Thornhill, Chairman, National Competitiveness Council of Ireland. Dr Thornhill is a former Executive Chairman of the Higher Education Authority (1998 – 2005) and former Secretary General of the Department of Education and Science (1993 – 1998). He has been a leading figure in the development of education and research policy in Ireland. He is involved in a non-executive and consultancy capacity with a number of organizations.

Mr John Travers, Business and Economic Consultant and former CEO of Forfás and SFI. As CEO of Forfás, Mr Travers led the State's policy and advisory board for industrial development, science, and technology and the body in which the main legal powers for State industrial promotion and technology development are vested. In 2000 – 2001, he also acted as CEO of SFI during its startup phase.

MEMBERS OF COMMITTEES OF THE BOARD 2004

1. BOARD SUB GROUP ON PROGRAMME GRANTS

Jane Grimson (Chair); Martina Newell-McGloughlin; Kristina Johnson; Don Thornhill; William Harris; Jackie Hunter.

2. SFI AUDIT COMMITTEE

Frank McCabe (Chair); Gillian Dennehy*; and Jim Mountjoy.

3. MANAGEMENT DEVELOPMENT AND REMUNERATION COMMITTEE

Pat Fottrell (Chair); John Travers; Erich Bloch; and Ned Costello.

**Replaced Martin Shanagher in August 2004.*

JOINT STATEMENT BY PATRICK FOTTRELL, CHAIRPERSON & WILLIAM C. HARRIS, DIRECTOR GENERAL

In 2004, Science Foundation Ireland (SFI) operated for its first full year as a statutory body. SFI was established as a statutory Body under the Industrial Development (Science Foundation Ireland) Act, 2003. The year 2004 has proven to be extremely productive in terms of grant awards and forging partnerships with industry and academia, but also in building SFI as an organisation.

SFI is committed to investing in academic research and building a dynamic research culture that will be a foundation stone for Ireland's future economic growth. SFI supports creative and talented people, bold and sophisticated ideas, and strong and effective partnerships. The goal is to make it possible for Ireland to attract and retain the best research talent we can, and to provide them with the right environment in which to undertake research and contribute to economic prosperity.

In 2004, SFI set out its strategic plan in a document "People, Ideas and Partnerships for a Globally Competitive Irish Research System: 2004-2008". SFI, through its strategic investments, has been working towards delivering this plan over the past year. During the course of 2004, SFI invested a further €136m across a wide range of research projects.

To the end of 2004, SFI has funded 81 Biotechnology research investigators and 77 Information and Communications Technology (ICT) research investigators, and through these investments indirectly employs 1,223 researchers in these broad sectors. We are confident that these new investments in Biotechnology and ICT will produce a new generation of discoveries and inventors that will bring significant benefit to Ireland. In addition, 107 research proposals were approved under the Research Frontiers Programme.

Over the course of the year there have been some significant scientific breakthroughs. A team of researchers has made a major discovery that could lead to new treatments for infectious and inflammatory diseases. The team of immunologists, led by Professor Luke O'Neill in the Department of Biochemistry, Trinity College Dublin, is providing important new information on how our immune systems are regulated during infection and will help efforts to develop new treatments for diseases such as rheumatoid arthritis.

Another team of researchers at the Conway Institute, UCD has taken an exciting step towards understanding how cells guarantee their supply of vital oxygen. Advancing our understanding of what happens when cells are starved of oxygen has important implications for diseases including cancer, inflammatory bowel disease and stroke.

During the course of 2004, SFI has participated in a number of significant collaborative research investments. Perhaps the most significant of these has been the establishment of a major R&D centre by Bell Labs at Blanchardstown in Dublin.

The decision by Bell Labs to locate its R&D centre in Ireland is a major achievement for the country. Bell Labs has been granted over 30,000 US patents, 11 of its researchers have won the Nobel Prize and it continues to be granted an average of two new patents every working day.

The €69 million investment programme agreed by Bell Labs, SFI and IDA Ireland will enable Ireland to become a world-leading location for research into engineering, manufacturing and value-chain technologies in the telecommunications sector. The centre – the first of its type to be established by Bell Labs outside of North America – will be a global headquarters for research into telecommunications and supply chain technologies. This collaborative industry and academic research project involves the establishment of a new Bell Labs research centre in Ireland and the formation of the Centre

for Telecommunication Value-Chain-Driven Research (CTVR) with headquarters at Trinity College Dublin. Opportunities for up to 120 researchers will be created between the two centres.

There have been other significant successes. SFI is backing an initiative that will bring together a unique cluster of scientists from academia and industry to research how doctors can better treat brain illnesses that include Alzheimer's disease, schizophrenia and depression. The project, which involves researchers from the Conway Institute (UCD) and Trinity College Dublin, will work closely with the Neuroscience Discovery Group of Wyeth Research and will be the most comprehensive research of its kind in the State.

SFI has invested almost €4m in a team of software engineering researchers who will address some of the key challenges faced by the Irish software development sector. The group, based mainly at the University of Limerick and at Dublin City University, will work with a number of leading ICT companies, including IBM, Intel, Motorola, Iona Technologies, as well as Irish Small and Medium Enterprises.

SFI has also facilitated the establishment of Siemens Research Ireland and a number of leading Siemens research scientists are transferring here. They are collaborating with the Royal College of Surgeons in Ireland in the fields of Biotechnology, Bioinformatics and Pharmaceuticals.

Encouraging young innovative researchers is critical in developing contemporary research and education programmes for Ireland. In October 2004, President McAleese received four leading young scientists and engineers – the first ever SFI President of Ireland Young Researcher Awards (PIYRA) recipients – at Áras an Uachtaráin. The award will provide significant and stable support to these top tier young investigators at a level and over a time duration that will enable them to develop careers as internationally recognised researchers.

2004 was the first year of the Secondary Teacher Assistant Researchers (STARs) initiative aimed at giving teachers the opportunity to conduct research in Irish laboratories over the Summer holiday period. 29 teachers from around the country received support to conduct research alongside an SFI-funded researcher or research team for up to eight weeks during the school holiday period. The goal is to help teachers renew their interest in science as researchers, connect them with science faculty in the universities and institutes of technology, and enhance the teaching of science across the educational system.

Much of the work undertaken and supported by SFI was acknowledged by the Taoiseach, Bertie Ahern, T.D. and the Tánaiste, Mary Harney, T.D. when they hosted the first SFI Science Summit in Dublin Castle on 1st September. The summit brought together leaders in the business and scientific community and government under the theme 'Transforming our Economy through Science and Innovation'. Over 250 delegates attended, including SFI-funded researchers, government and agency leaders, industry representatives and policy makers.

We would like to thank the Taoiseach, the Tánaiste and Mr Micheál Martin, Minister for Enterprise, Trade & Employment for their unstinting support for SFI throughout 2004.

During the course of 2004 we have filled three key positions at the Foundation. In February, Dr Maurice Treacy joined as Director of the SFI Biotechnology (BioT) Division. Dr Treacy has had an outstanding career in research and more than 13 years of experience in the biotechnology industry.

In September, Prof Mark Keane was appointed as Director of Information and Communication Technologies (ICT). Prof Keane joined from UCD where he was Chair of Computer Science and Associate Dean of Science.

Also in September, Dr Gary Crawley was appointed as the Head of the Research Frontiers Programme (RFP). Dr Crawley joined from his position as Professor of Physics and Dean of the College of Science and Mathematics at the University of South Carolina (USC).

We would like to extend sincere thanks to Dr Alastair Glass who left in 2004 to become chairperson of the board of the new Tyndall National Institute in Cork. In the three years that Dr Alastair Glass was Director of ICT, he helped the Foundation establish a suite of new research programmes, articulated the need for research collaborations and partnerships and helped set the vision for building a globally competitive research culture in Ireland.

From its inception, SFI has operated in close partnership with Ireland's academic community as well as IDA Ireland, Enterprise Ireland, and Forfás. We would like to thank all of the bodies and organisations that have assisted SFI over the past year for their support and cooperation.

Finally, we would like to thank the Board of SFI and the staff of SFI for their unremitting commitment to the organisation and their contribution to the success of SFI to date.

Patrick Fottrell
Chairperson

William C. Harris
Director General

OVERVIEW 2004: A YEAR OF ACHIEVEMENT

Over the past number of years Irish scientific research has undergone considerable change, and Science Foundation Ireland (SFI) has assumed a significant leadership role in this transformation. 2004 was an extremely productive year for SFI as it continues its support for science and engineering research in Ireland.

ACHIEVEMENTS IN 2004:

- SFI made a further 288 awards across all SFI programmes involving funding commitments in excess of €136 million.
- SFI facilitated Irish research institutions to recruit and retain research leaders from around the world to Ireland.
- 107 research proposals from academic scientists and engineers in the fields embracing the Earth Sciences, Engineering, Mathematics, Physical Sciences, Biosciences and Computer Science were approved under the Research Frontiers Programme (RFP).
- SFI supported the scientific research community to raise both the level and quality of the scientific research being undertaken in research institutions in Ireland.
- Collaborative projects were funded with China under the Ireland-China Research Collaboration Fund Agreement managed for SFI by the Royal Irish Academy.
- Industry was proactively encouraged to locate their research laboratories in Ireland in partnership with the IDA and Enterprise Ireland.
- SFI has also introduced a number of new funding programmes including:
    - The President of Ireland Young Researcher Awards to support researchers within five years of completing their Ph.D.
    - The Secondary Teacher Assistant Researchers (STARs) to support second-level teachers in conducting research in Irish laboratories during summers.
    - Industry Supplements Programme to fund collaborative projects with industry that are directly related to and enhance existing SFI peer-reviewed programmes.
    - The Undergraduate Research Experience & Knowledge Award (UREKA) programme to support active research participation by undergraduate students in any of the areas of research funded by SFI.

- SFI continued its significant development during 2004. Sanction was received from the Department of Finance to increase staffing levels from 30 to 44 people. The recruitment of these additional staff has enabled SFI to engage in a more meaningful and constructive manner with other agencies and organisations in the national system of innovation and also to develop international linkages.
- SFI participates in the European Molecular Biology Conference (EMBC), which is an international academy focused on molecular biology in its broadest sense. It seeks to respond to newly developing areas which use molecular biology methods and to attempt to describe biological events at the molecular level. Its activities are funded by 21 member states (including Ireland), and carried out principally through the actions of approximately 900 molecular biologists who have been elected as individual members of EMBC. Through its partnership with the European Molecular Biology Organisation (EMBO), EMBC supports a broad range of life science programmes.

BIOTECHNOLOGY RESEARCH INVESTMENT

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.

By the end of 2004, the SFI Biotech Directorate funded 75 research investigators including three centres (REMEDI, APC and CHP), had commitments of over €174 million; and indirectly employed 440 plus life-science researchers within Ireland in areas as diverse as agri-food, neuroscience, immunology, sensors/devices, cell biology/ cell cycle/apoptosis, microbiology, nanotechnology and bioinformatics/systems biology.

- **Agri-food** production and consumption covers activities ranging from agriculture to food consumption. SFI's most significant such single investment is the Alimentary Pharmabiotic Centre (APC) at UCC, under the direction of Prof Fergus Shanahan. APC is conducting research into the causes and potential cures for inflammatory bowel disease, Crohn's disease and ulcerative colitis from an immunological perspective, and using foods (neutraceuticals) as a potential form of treatment.

- **Immunology** focuses on the immune system, immunity and allergy. Ireland possesses one of the recognized global leaders in immunological research, especially in the areas of Toll Receptors, Prof Luke O'Neill.

  Prof Luke O'Neill and Prof Kingston Mills, both of TCD, have developed research synergies that have led to the creation of a start-up company (Opsona) now attempting to commercialise their research output.

- **Sensors/Devices** research in this area is focused on the science and technology underpinning the next generation of biomedical diagnostic devices.

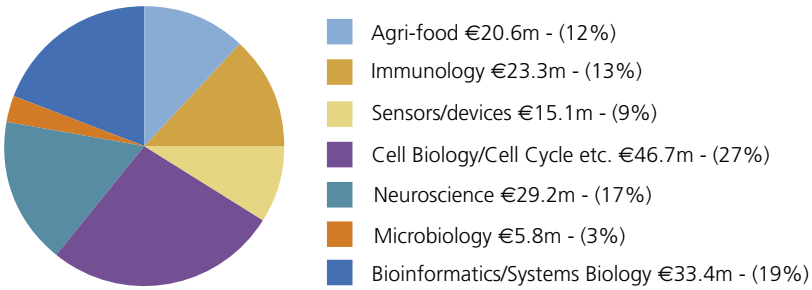
- **Cell Biology/Cell Cycle/Apoptosis/Structural Biology** the Regenerative Medicine Institute (REMEDI) CSET at NUI Galway brings together world class scientists and clinicians who are working together to combine the technologies of gene therapy and adult stem cell research to repair and replace damaged tissue. Under the joint leadership of Professors Tim O'Brien and Frank Barry, integrated research teams are examining heart and neurological diseases, as well as arthritis to develop new therapeutic modalities to enable repair of diseased or damaged tissue using genes and living cells.

- **Neuroscience** deals with the anatomy and physiology and pathology of the nervous system. Dr Kevin Mitchell, Smurfit Institute of Genetics, TCD, had his research activities recognized when he became the first Irish researcher to be awarded a European Molecular Biology Organisation (EMBO) Young Investigator Award.

- **Microbiology** covers microorganisms including viruses, prokaryotes and simple eukaryotes using methods from biochemistry and genetics. It is also related to pathology, immunology, and epidemiology. Based in the Moyne Institute in TCD, Professor Kevin Devine works in the bacterium Bacillus subtilis. Professor Devine hopes to yield insights into how gene expression is co-ordinately regulated by a signalling network of multiple two-component signal transduction systems in B subtilis and other G+C group of bacteria.

- **Bioinformatics/Systems Biology** where biology, computer science, and information technology merge into a single discipline. Professor Ken Wolfe has been funded by SFI since 2001. There are a number of metrics of success for this group and their work in the area of genome evolution. The work on both prokaryotic and eukaryotic systems and are world-renowned in both areas. The group has been involved in the human genome project and Dr Mario Fares from the Wolfe group was funded by SFI as President of Ireland Young Researchers in 2004.

Biotechnology Investments (€170M)



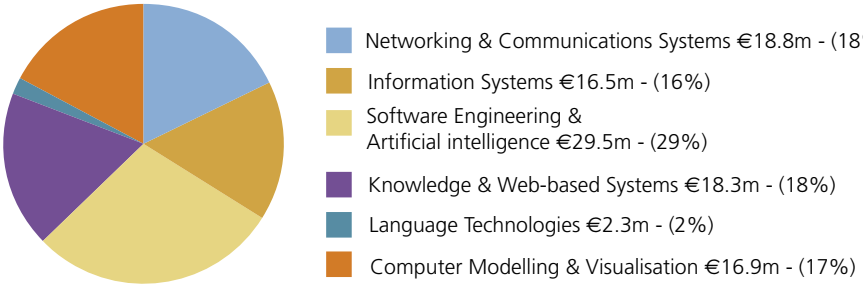
INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) INVESTMENT

By the end of 2004, the SFI Information & Communications Technology (ICT) Directorate funded 77 research investigators, had commitments of over €248 million and indirectly employed 673 researchers in a variety of hardware and software areas in Ireland. These research areas are fundamentally important to a range of ICT industries in Ireland.

In software, there are six major areas of funding:

- **Networks & Communication Systems** covering investment in research in wired and wireless networks. Major clusters in this area are the National Communications Network Research Centre at National University of Ireland (NUI) Maynooth and Dublin Institute of Technology (DIT) and the Autonomic Networking Cluster, Waterford Institute of Technology.
- **Information Systems** 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 (NUI Maynooth) and the Adaptive Information Cluster at Dublin City University (DCU) and University College Dublin (UCD).
- **Software Engineering & Artificial Intelligence** covering investment in robust methods for software engineering and advanced artificial intelligence techniques. Major investments are the Cork Centre for Constraint Computation at University College Cork (UCC) and the Irish Software Engineering Research Centre Development Award (University of Limerick (UL), with UCC and DCU).
- **Knowledge & Web-based Systems** covering investment in advanced, knowledge-based systems for information handling on the World Wide Web and Internet. The two main investments are in Semantic Web Systems at Digital Enterprise Research Institute (DERI) CSET at National University of Ireland Galway (NUIG) and the Adaptive Information Systems (UCD and DCU).
- **Machine Translation** covering techniques for natural language processing for automated machine translation of textual and spoken language.
- **Modelling & Visualisation** tools for computational science in several different areas; astrophysics, bioinformatics, climatology and the marine (e.g. National Geoinformatics Centre in NUI Maynooth). The investments are in Grid Technology (WebCom-G at NUIG, TCD and UCC) and the High End Computing Initiative (NUIG, UCD, UCC, TCD, NUIM).

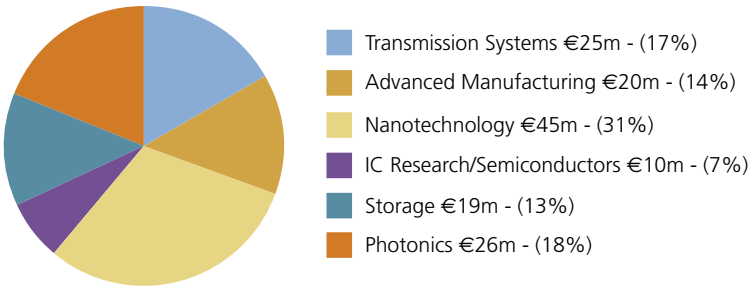
ICT Software (€102M)



In hardware, there are six major areas of funding:

- **Nanotechnology** covering physics, properties of materials, and devices at the nanoscale. The major investment is the CRANN Nanotechnology CSET (TCD, UCD, UCC).
- **Integrated Circuits & Semiconductors** covering innovations in processes, materials, and design of IC chips. The major investment is the PlasMAC group (DCU, NUI Maynooth).
- **Photonics** covering theory, design, and fabrication of photonic devices. The major investments are the O'Reilly group and researchers in the Tyndall National Institute (UCC) and Prof Chris Dainty (NUIG).
- **Transmission Systems** covering design and test of new network architectures and systems. One major investment is Prof David Cotter's group, which was brought to Ireland from the UK and is located at the Tyndall National Institute.
- **Storage** covering advanced materials, characterization, and devices for information storage (e.g.in magnetic materials). The major investments here are in the Prof Coey and Prof Shvet's groups in TCD which are now part of CRANN.
- **Advanced manufacturing technology** for the telecommunications industry largely funded under the CTVR (Bell Labs).

ICT Hardware (€145M)



THE CENTRES FOR SCIENCE, ENGINEERING AND TECHNOLOGY (CSETS)

The CSETs Programme is designed to build a critical mass of excellence for Ireland in areas of Biotechnology (BioT) and Information and Communications Technology (ICT) that could well shape the future of science and engineering. The objective of this programme is to fund scientists who will build collaborative efforts that develop internationally competitive research clusters allied to industry.

In 2004, SFI announced funding for the Centre for Telecommunications Value-Chain-Driven Research (CTVR). This joint €69 million investment agreed between Lucent Technologies' Bell Labs, SFI and IDA Ireland will see Ireland become a world-leading location for research into engineering, manufacturing and value-chain technologies in the telecommunications sector. 120 researchers are involved in the projects based between the CTVR (headquartered at TCD) and the newly established Bell Labs global headquarters for research into telecommunications and supply-chain technologies located at Lucent's facility in Blanchardstown, Dublin.

The research to be undertaken in CTVR will focus on advancements in product engineering, manufacturing and value/supply-chain techniques, tools and technologies. The expertise and know-how developed in the centre will facilitate, stimulate and encourage design and innovation and allow for new products to be brought to the market more quickly and more efficiently. That expertise and know-how will be directly applicable to both multinational and indigenous companies engaged in the design, manufacture and operation of highly refined electronics products, including the next generation of fixed and wireless communications networks.

The CTVR involves eight other leading Irish Universities and Institutes of Technology, including the University of Limerick; NUI Maynooth; Dublin Institute of Technology; Institute of Technology Sligo; University College Dublin; Dublin City University and University College Cork and Tyndall Institute.

Pictured at the announcement of the establishment of the Bell Labs major centre in Ireland. L-R Dr William C. Harris, Director General, SFI; Dr Jeff Jaffe, President of Research and Advanced Technologies, Bell Labs; Ms Mary Harney, Tánaiste and Mr Seán Dorgan, CEO, IDA Ireland.

INDUSTRIAL COLLABORATION

Interaction with industry is an underlying principle for innovative and creative research. It is crucial for the validation and dissemination of research results. Companies cooperate with SFI-funded researchers in many different ways. CSET partners must include industry. CSETs have established partnerships with companies such as Bell Labs, HP, Intel, Medtronic and Proctor & Gamble.

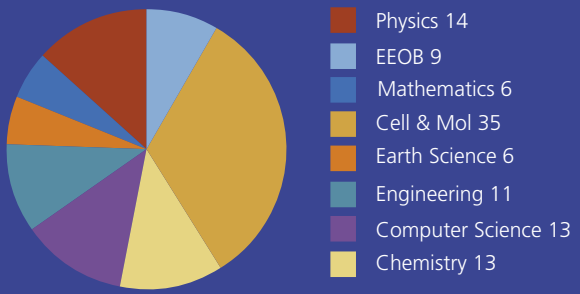
In addition to CSETs, individual SFI Research Investigators collaborate with industry. In 2004, SFI introduced the Industry Supplement award to facilitate research partnerships between SFI-funded researchers and industry researchers. The award provides an opportunity for current SFI researchers to get supplement funds to undertake collaborative projects with industry. These projects should be directly related to and enhance the existing SFI peer-reviewed programmes. SFI-funded researchers are now working with companies such as Siemens; Areogen; SUN Microsystems; Dow Corning; Agilent Technologies; and IBM Dublin Software Lab.

RESEARCH FRONTIERS PROGRAMME (RFP)

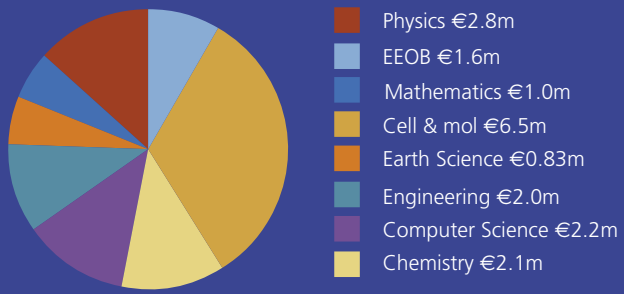
In 2003, SFI assumed overall responsibility for the Basic Research Grants (BRG) programme that had previously been administered by Enterprise Ireland. This transition provided the opportunity to examine the BRG programme in detail, with the objective of enhancing and building a broad base of support for science and engineering at SFI. The Frontier Science and Engineering (FES) Directorate was formed to respond to a range of scientific and engineering disciplines, in addition to the strategically focussed areas supported by the BioT and ICT Directorates.

In 2004, SFI committed to significantly expanding investment in the Basic Research Grants programme. The programme was renamed the Research Frontiers Programme and funding was increased by 19% to €19 million over three years. The programme attracted 632 proposals over a range of disciplines. Following review of these proposals, SFI made 121 awards. The overall success rate of proposals was therefore 19.2%. Of these awards, 14 were funded and administered by the Irish Research Council for Science Engineering and Technology (IRCSET) at a level of €2.7million over three years. SFI funded 107 research proposals from academic scientists and engineers in the fields embracing the Earth Sciences, Engineering, Mathematics, Physical Sciences, Biosciences and Computer Science.

Sector Breakdown of SFI RFP Investment



Number of Awards by Discipline (107)



Total Funding by Discipline €19.03M

Dr William Harris, Director General, SFI; Dr Mary Kelly, Programme Officer, SFI; Dr Fergal O'Brien, Department of Anatomy, Royal College of Surgeons in Ireland; Dr Mario A. Fares, Department of Biology, NUI Maynooth; President of Ireland, Ms Mary McAleese; Dr Emmeline Hill, Department of Animal Science, University College Dublin; and Mr Mattie McCabe, Director, SFI.

ENCOURAGING YOUNG RESEARCHERS – PRESIDENT OF IRELAND YOUNG RESEARCHER AWARDS

In October 2004, four leading young scientists based in Ireland were awarded the first ever SFI President of Ireland Young Researcher Awards (PIYRA) at a presentation hosted by the President of Ireland, Mary McAleese. PIYRA recipients receive funding of up to €1.2 million over a five-year period. The four recipients of the 2004 Award were:

- Dr Mario A. Fares, Department of Biology, NUI Maynooth
  'Optimisation of protein function and potential drug targets through computational and biomedical analysis'
- Dr Emmeline Hill, Department of Animal Science, University College Dublin
  'Genomics of performance in the equine athlete'
- Dr Jens Erik Neilsen, Department of Biochemistry, Conway Institute, University College Dublin
  'A multidisciplinary informatics-based approach to understanding enzyme catalysis'
- Dr Fergal O'Brien, Royal College of Surgeons in Ireland
  'Tissue engineering for the development of bone graft substitutes'

SFI SCIENCE SUMMIT

In September 2004, the Taoiseach, Mr Bertie Ahern, T.D. and the Tánaiste, Ms Mary Harney, T.D. hosted the first SFI Science Summit in Dublin Castle. The summit brought together over 250 leaders in the science, business and government communities under the theme 'Transforming our Economy through Science and Innovation'.

Speakers' topics covered science/industry partnerships, branding Ireland as a location for research excellence, economic potential of SFI investments and research quality. Among the speakers were three of Ireland's most distinguished researchers, Prof Tim O'Brien, Director of REMEDI at National University of Ireland, Galway; Prof John Pethica FRS, Director of the CRANN at Trinity College Dublin; Prof Dolores Cahill, Director of the CHP at the Royal College of Surgeons in Ireland along with Dr Reg Shaw, Managing Director of the Wyeth BioPharma Campus at Grange Castle, Co. Dublin, Mr Lou Manzione, Bell Labs and Mr Jim O'Hara, General Manager of Intel Ireland.

Pictured at the SFI Science Summit held on 1st September 2004 were, (L- R) Prof Pat Fottrell, Chairperson, SFI; An Taoiseach, Mr Bertie Ahern, T.D.; An Tánaiste, Ms Mary Harney, T.D. and Dr William C. Harris, Director General, SFI.

SECONDARY TEACHERS ASSISTANT RESEARCHERS (STARS)

2004 was the first year of operation of the Secondary Teacher Assistant Researchers (STARs) initiative. The STARs programme provides support for teachers to conduct research alongside an SFI-funded researcher or research team during school summer holiday periods for up to eight weeks. The goal is to help teachers renew their interest in science as researchers, connect them with the science faculty in universities and institutes of technology and enhance the teaching of science across the educational system. Twenty-nine teachers participated in the STARs programme in 2004.

UNDERGRADUATE RESEARCH EXPERIENCE & KNOWLEDGE AWARD (UREKA)

In 2004, SFI introduced the UREKA programme to support active research participation by undergraduate students in any of the areas of research funded by SFI. The programme endeavours to expand student participation in all kinds of research – whether disciplinary or interdisciplinary – encompassing efforts by individual investigators, groups, centres and others. Active research experience is considered one of the most effective ways to attract talented undergraduates and retain them in careers in science and engineering. 47 undergraduates participated in the programme in the summer of 2004.

RESEARCHERS ATTRACTED TO IRELAND

SFI seeks to attract a wide range of researchers from across the globe to Ireland (as well as attracting many international students and post-doctoral researchers). The ETS Walton Visitor Awards enables highly qualified academic and industrial researchers, resident outside Ireland, to visit Irish third-level institutes to carry out research projects and collaborate with Irish researchers. In 2004, seven ETS Walton Researchers visited Ireland. Since the introduction of the award in 2002, twenty-nine researchers have participated in the programme, and three have subsequently become full SFI funded Investigators based in Irish academic institutions.

STATUTORY AND OTHER NOTICES

1. Board Members – Register of Interests

The Board operates to the best practice corporate governance principles and in accordance with the guidelines 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

During 2004, SFI was not formally prescribed under the Ethics in Public Office Acts 1995 and 2001.

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

SFI has not been prescribed under the Freedom of Information Act, 1997 and the Freedom of Information (Amendment) Act, 2003. However, SFI provides information when requested, in compliance with the provisions of these Acts.

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 2nd January 1998, and the European Communities (Late Payment in Commercial Transactions) Regulations, 2002, which came into effect on the on 7th August 2002.

The payment practices of SFI, as required by the Act, are reported on below for the year ended 31 December 2004. It is the policy of SFI to ensure that all invoices are paid promptly. Specific procedures are in place that enable it 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 four late payments in excess of €7.17 during 2004 that exceeded the due payment dates by a total of 25 days. The value of these payments was €2,258.23

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,

Mr Micheál Martin T.D., Minister for Enterprise, Trade and Employment pictured with SFI Board members.

promotion, training, use of non-discriminatory 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 2004, no complaints were received under the Charter.

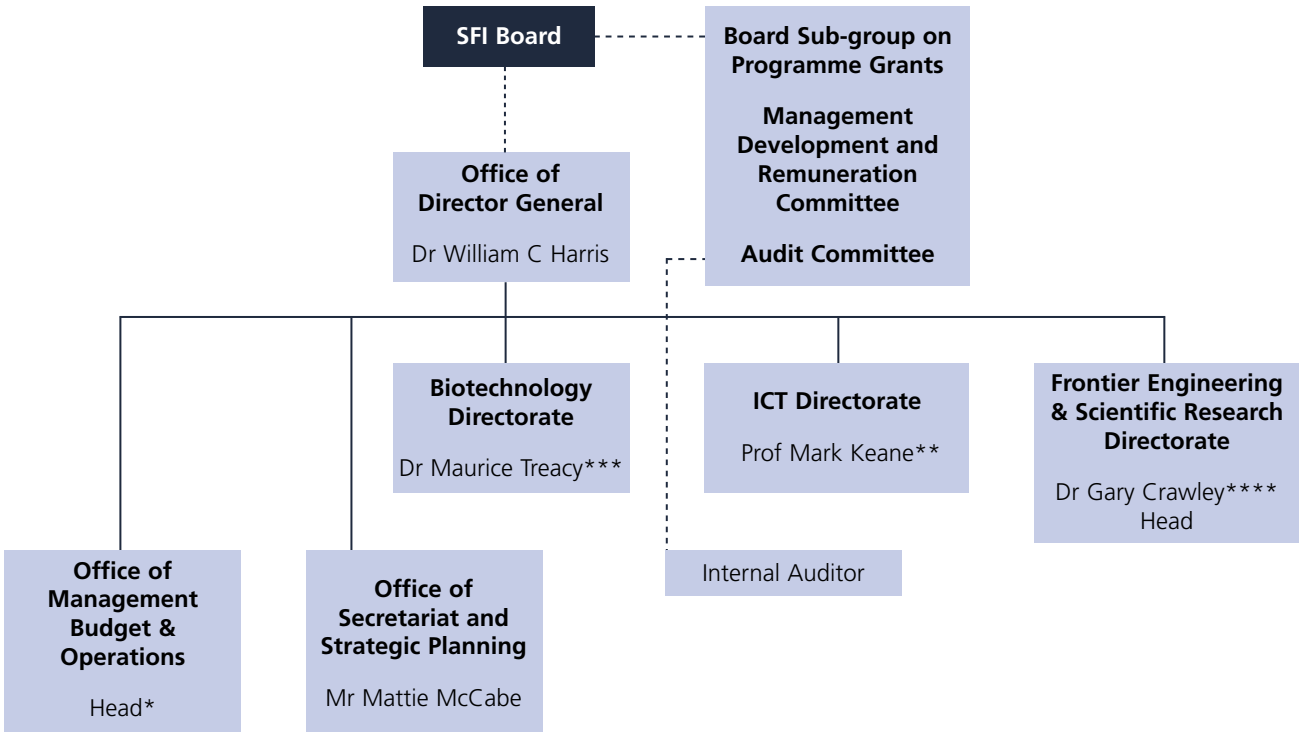
Publications 2004

1. Points of Excellence

2. Vision 2004-2008 People, Ideas and Partnerships for a Globally Competitive Irish Research System.

ORGANISATION STRUCTURE

(In 2004, SFI had sanction for 44 posts)



**Consultancy engagement on a temporary basis*

***Alastair Glass resigned as ICT Director and was replaced by Mark Keane on 1/9/2004.*

**** Appointed 1/2/2004*

***** Appointed 1/9/2004.*

Annual Financial Statements
31 December **2004**

sfi
science foundation ireland
fondúireacht eolaíochta éireann

SCIENCE FOUNDATION IRELAND

Report of the Comptroller and Auditor General for presentation to the Houses of the Oireachtas

I have audited the financial statements on pages 4 to 10 under the Industrial Development (Science Foundation Ireland) Act, 2003.

Respective Responsibilities of the Board and the Comptroller and Auditor General

The accounting responsibilities of the Board are set out on page 1. It is my responsibility, based on my audit, to form an independent opinion on the financial statements presented to me and to report on them.

I review whether the statement on the system of internal financial control on page 2 reflects Science Foundation Ireland's compliance with applicable guidance on corporate governance 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.

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 auditing standards 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 in the financial statements. It also includes an assessment of the significant estimates and judgments 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 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, proper books of account have been kept by Science Foundation Ireland and the financial statements, which are in agreement with them, give a true and fair view of the state of affairs of Science Foundation Ireland at 31 December 2004 and of its income and expenditure and cash flow for the year then ended.

Gerard Smyth
For and on behalf of the
Comptroller and Auditor General
18 August 2005

STATEMENT OF BOARD MEMBERS' RESPONSIBILITIES

For 2004 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 of by the Minister for Enterprise, Trade & 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
Chairman

William C. Harris
Director General

STATEMENT ON INTERNAL FINANCIAL CONTROL

For 2004 Annual Financial Statements

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.

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, for the year 2004, had an outsourced internal audit function, which operated in accordance with the Framework Code of Best Practice set out in the Code of Practice on the Governance of State Bodies and 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 2004, 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 quarterly and reviews the outcome of the specific internal audits and confirms the ongoing adequacy and effectiveness of the system of internal financial control.

I confirm that the Board conducted a review of the effectiveness of the system of internal financial controls for 2004. 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.

Signed on behalf of the Board

Patrick Fottrell
Chairman

ACCOUNTING POLICIES

For 2004 Annual Financial Statements

(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 & 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 5).

(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

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.

(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 I&E account in the year of issue.

(9) Comparison with 2003 Accounts

The comparative figures for 2003 in the main body of the Accounts are for the five months from 25 July 2003 to 31 December 2003.

INCOME AND EXPENDITURE ACCOUNT

For the year ended 31 December 2004

	Notes	**2004** **€'000**	2003 €'000
Income			
Oireachtas Grant	1	**113,730**	49,159
Other	2	**51**	15
		113,781	49,174
Expenditure			
Administration and General Expenses	3	**4,961**	1,840
Depreciation	5	**104**	49
Grants	4	**108,556**	47,386
		113,621	49,275
Surplus/(Deficit) for Year		**160**	(101)
Balance at beginning of Year		**(17)**	187
Transfer to Capital Account	6	**(145)**	(103)
Accumulated Deficit at end of Year		**(2)**	(17)

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 13 form part of these Financial Statements.

On behalf of the Board:

Patrick Fottrell
Chairman

William C. Harris
Director General

BALANCE SHEET

For the year ended 31 December 2004

	Notes	**2004** **€'000**	2003 €'000
Fixed Assets			
Tangible Fixed Assets	5	**388**	243
Current Assets			
Cash at Bank		**82**	-
Accounts Receivable	7	**19**	15
		101	15
Accounts Payable	8	**103**	32
Net Current Assets		**(2)**	(17)
Net Assets		**386**	226
Represented By:			
Capital Account	6	**388**	243
Income and Expenditure Account		**(2)**	(17)
		386	226

The Accounting Policies, Cash Flow Statement and Notes 1 to 13 form part of these Financial Statements.

On behalf of the Board:

Patrick Fottrell
Chairman

William C. Harris
Director General

CASH FLOW STATEMENT

For the year ended 31 December 2004

	Notes	**2004** **€'000**	2003 €'000
Reconciliation of Surplus/(Deficit) for Year to Net Cash Flow from Operations			
Surplus/(Deficit) for Year		**160**	(101)
Bank Interest		**(51)**	(15)
(Profit)/Loss on Disposal of Assets		-	2
Depreciation Charge:			
- Tangible Fixed Assets	5	**104**	49
(Increase)/Decrease in Accounts Receivable	7	**(4)**	172
Increase/(Decrease) in Accounts Payable	8	**71**	32
Net Cash Flow from Operations		**280**	139
Net Cash Flow from Operations		**280**	139
Returns on Investment and Servicing of Finance			
Bank Interest		**51**	15
Cash Flow before Capital Expenditure		**331**	154
Capital Funding			
Sale of Tangible Fixed Assets		-	-
Purchase of Tangible Fixed Assets	5	**(249)**	(154)
Cash Flow after Capital Expenditure		**82**	-
Contribution to Exchequer		-	-
Increase in Cash		**82**	-
Reconciliation of Increase in Cash to Cash at Bank			
Movement in Cash for the Year		**82**	-
Cash at Bank at 01 January 2004		-	-
Cash at Bank at 31 December 2004		**82**	-

NOTES TO THE ACCOUNTS
For the year ended 31 December 2004

(1) Oireachtas Grant

	2004	2003
	€'000	€'000
Administration and General Expenses	**5,160**	1,893
Research Grants	**108,570**	47,266
	113,730	49,159

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, 2004, the aggregate amount so provided was €2,209,243,030.

(2) Other Income

	2004	2003
	€'000	€'000
Bank Interest	**51**	15
Total	**51**	15

(3) Administration and General Expenses

	2004	2003
	€'000	€'000
(3a) Board Members' Remuneration and Expenses	**180**	78
Pay Costs	**1,328**	400
Other Personnel Costs	**110**	26
Travelling Expenses	**232**	81
Specialised and Professional Services	**1,135**	358
Consultancy and Studies	**1,000**	418
Rents, Rates, Repairs and Maintenance	**380**	170
Other Operating Expenses	**585**	299
Audit Fee	**11**	10
Total	**4,961**	1,840

Pay Costs comprise:		
Wages and Salaries	**1,246**	370
Social Welfare Costs	**79**	29
Superannuation Costs	**3**	1
Total	**1,328**	400

(3b) The services of the Director General (DG) of SFI are provided by a United States based corporation under a 5-year consultancy contract. The contract provides for payment for his services together with a potential bonus. The payment is designed to cover a basic fee, retirement contributions and relocation costs.The potential bonus is equivalent to that approved by the Review Body on Higher Remuneration in the Public Sector for the CEOs of the State Industrial Development Agencies.

The cost of the remuneration package is charged to consultancy in the financial statements and amounted to €460,928 plus VAT which brings the total to €557,724.

(4) Grants

	2004	2003
	€'000	€'000
Biotechnology Grants	**35,857**	13,342
Information and Communications Technology Grants	**49,048**	19,628
Multi Grants	**4,395**	14,416
Basic Research Grants	**7,882**	-
Annual Overhead & Investment Plan Grant Payments	**11,374**	-
Total	**108,556**	47,386

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

At 31 December 2004, SFI had €246m in future grant committments.

NOTES TO THE ACCOUNTS *(Continued)*

For the year ended 31 December 2004

(5) Tangible Fixed Assets

	Computer Equipment €'000	Motor Vehicles €'000	Fixtures & Fittings €'000	System Development €'000	**Total €'000**
COST					
At 1 January 2004	145	50	130	90	**415**
Additions	63	-	15	171	**249**
At 31 December 2004	208	50	145	261	**664**
DEPRECIATION					
At 1 January 2004	77	37	58	-	**172**
Charge for Year	63	13	28	-	**104**
At 31 December 2004	140	50	86	-	**276**
NET BOOK AMOUNT					
At 1 January 2004	68	13	72	90	**243**
Net Movement for Year	-	(13)	(13)	171	**145**
At 31 December 2004	68	-	59	261	**388**

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

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

Assets in course of construction are depreciated when commissioned.

(6) Capital Account

	2004 €'000	2003 €'000
At 1 January 2004	**243**	140
Transfer from Income & Expenditure Account		
- Cost Additions	**249**	154
- Cost Disposals	-	(3)
- Depreciation Additions	**(104)**	(49)
- Depreciation Disposals	-	1
Net Movement	**145**	103
At 31 December 2004	**388**	243

NOTES TO THE ACCOUNTS *(Continued)*
For the year ended 31 December 2004

(7) Accounts Receivable

	2004	31 December 2003	25 July 2003
	€'000	€'000	€'000
General Debtors and Prepayments	**19**	3	-
Interagency Balance	-	12	187
Total	**19**	15	187

(8) Accounts Payable

	2004	2003
	€'000	€'000
General Creditors and Accruals	**92**	32
Interagency Balance	**11**	-
Total	**103**	32

Interagency balance relates to the balance owed by Science Foundation Ireland to Forfás at 31 December 2004, 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.

(9) 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.

NOTES TO THE ACCOUNTS *(Continued)*
For the year ended 31 December 2004

(10) 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.

(11) 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.

During 2004, no business came before the Board regarding payment to an organisation in which a Board Member declared an interest, in respect of services provided by that organisation to the Agency.

(12) Contingencies and Legal Actions

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

(13) Approval of Financial Statements

The Financial Statements were approved by the Board of Science Foundation Ireland on 21st February 2005.

Learn more about SFI and our programmes at www.sfi.ie

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