Chancellor
HM The Duke of Kent, KG

Pro-Chancellors Emeritus
Sir Eric Ash, CBE, FMedSci, FRS
Sir George Edwards, CBE, DL, FMedSci, FRS
(Resigned 2nd March 2003)
Sir Austin Pearce, CBE, FMedSci

Pro-Chancellors
Sir Idris Pearce, CBE, DL
Baroness Perry of Southwark
Mr J O M Robinson, CBE, DL
Sir Alan Rudge, CBE, FMedSci

Vice-Chancellor & Chief Executive and
Vice-Chancellor of the Federal University
Professor P J Deweling, CBE, DL, FMedSci

Treasurer
Mr J D M Robertson, CBE, DL

Baroness Perry of Southwark
Sir Idris Pearce, CBE, TD, DL

Pro-Chancellors
Sir Austin Pearce, CBE, FREng
Sir George Edwards, OM, CBE, DL, FREng, FRS

HRH The Duke of Kent, KG

In Tune with Society’s Needs
Contributing to a Healthier Society

The Advanced Technology Institute

Research & Enterprise

The Healthcare Workforce Research Centre

Vice-Chancellor’s Introduction

1

Constituted in 1964
Reconstituted as the Guildford School of Acting

Education

Guildford College of Further and Higher Education

• Wide range of vocational, professional and
academic qualifications
• Associated institution since September 2000
• BA Business Studies and Cert Ed PGCE
validated by the University

GSA Conservatoire

• Founded as a School of Dance in 1936 and
reconstituted as the Guildford School of Acting
in 1964
• Associated institution since 1993
• BA degrees in Theatre and Stage Management
and Technical Theatres validated by the University

Unis Associated Institutions
Farnborough College of Technology
• Vocational, interdisciplinary institution offering a wide
range of FE and HE programmes
• Accredited institution since 2002
• Foundation, BA, BSc and MSc degrees validated by the University

Guildford College of Further and Higher Education

• Wide range of vocational, professional and
academic qualifications
• Associated institution since September 2000
• BA Business Studies and Cert Ed PGCE
validated by the University

GSA Conservatoire

• Founded as a School of Dance in 1936 and
reconstituted as the Guildford School of Acting
in 1964
• Associated institution since 1993
• BA degrees in Theatre and Stage Management
and Technical Theatres validated by the University

HMS Sultan, Gosport, Nuclear Department

Southern Theological Education and Training Scheme (STETS)
• Certificate, Diploma and BA in Christian Ministry
and Mission validated by the University
• Associated institution since 1999

St John’s Seminary
• Courses of preparation for the Roman Catholic
priesthood, including Bachelor of Theology
validated by the University
• Associated institution since 1999

St Mary’s College – A College of the University of Surrey
• Catholic college of HE established 1850
• College of the University since 1999, accredited 1996
• BA, BA IT, BSc, PGCE, MA and MSc degrees
accredited by the University

Wimbledon School of Art
• Specialist school of art and design
• Accredited institution since 1994
• BA and MA degrees accredited by the University

USR Associated Institutions
Centre for British Teachers
• PGCE, Secondary by Distance Learning
validated since 1996

School Centred Initial Teacher Training
• Consortium based in London, West Midlands
and the South West
• PGCE Secondary in Design and Technology,
Mathematics and Modern Foreign Languages
validated since 1993

SCITT Devon Performing Arts
• Associated with Roehampton since 1999
• Offers PGCE Secondary in Music and Drama,
validated by USR

SCITT (Agency for Jewish Education)
• Associated with Roehampton since 2000
• Offers PGCE Primary, validated by Roehampton

Westminster Pastoral Foundation
• Associated with Roehampton since 1994
• Offers MA in Pastoral Theology, Postgraduate Diploma/MA in Supervision of Counselling and Psychotherapy, MA in Group Analytic Psychotherapy and Postgraduate Diploma/MA in Psychodynamic Counselling
validated by Roehampton

The Pre-Retirement Association (PRA)
• Specialises in mid-career and pre-retirement
education
• Associated institution of USR

The Healthcare Workforce Research Centre

Universities Superintendence of Railways
• Associated institution with USR since 1996

Pre-Retirement Association (PRA)
• Specialises in mid-career and pre-retirement
education
• Associated institution with USR

Wakefield College of Adult & Higher Education
• Associated institution since 1995

World-Class Research Excellence:
The Advanced Technology Institute
Contribution to a Healthier Society
In Tune with Society’s Needs

Serving our Region’s Needs:
Graduate Employment
Springboard for Success on the World Stage

UNISON

University of Surrey, Guildford, GU2 7XH
University of Surrey Roehampton, Senate House, Roehampton Lane, London, SW15 5PU

The Federal University of Surrey

University for Officers of the
SERVING A WORLD-CLASS REGION

AN INTERNATIONAL UNIVERSITY

AN INTERNATIONAL UNIVERSITY
Serving a World-Class Region

AN INTERNATIONAL UNIVERSITY

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Every effort has been made to ensure the accuracy
of the information in this Annual Report but the
University cannot accept any responsibility for errors
and omissions.
This year's annual report focuses on the University of Surrey's contributions and commitment to the 'worlds' it serves. Through its research activities and diverse course portfolio, Unis is a university that spans the globe and which, through Surrey Satellites, even has a presence in that infinite void of space outside our own world's atmosphere.

We enjoy the connections and influence we have in our 'worlds', and it gives me great satisfaction to head a multicultural institution which draws its students from 140 countries, and its academic and support staff from nearly as many. Unis is a truly international university but one which also fully recognises its responsibilities to the region it serves. I hope that this commitment becomes evident through the pages of our report.

There have been many headline achievements during the year, but I should like to briefly introduce three about which you will read more later:

• The award to the University of Surrey of a Queen's Anniversary Prize for the work of Professors Alf Adams and Brian Sealy and their respective Research Groups, in the fields of Ion Beam Applications and Optoelectronics.
• The University's position at the top of the graduate employment league table in The Sunday Times for the sixth successive year.
• The tremendous success of obtaining a Partnership Award in the field of integrated electronics worth £6.2m from the Engineering and Physical Sciences Research Council (EPSRC), the largest of only eight awards made by the Research Council. The continuity of funding over five years enabled by this award will allow our researchers to concentrate more of their valuable time on their world-class research without having to continuously keep submitting new bids.

Financially and Managerially Strong

Those who know me well will be familiar with my observation that a university needs to be both academically excellent as well as financially robust.

At a time when the future funding of the higher education sector is being debated in Parliament, we face many challenges and are working collectively to develop academic, business and estates strategies that will pave the way for a successful future. We have come a long way since the foundations for our University were laid on Stag Hill in 1966 and, to achieve our very ambitious 'Vision for 2020', we will need to make important choices about the University we are to become.
Professor Ahmet Kondoz (front left) and Professor Ravi Silva (front right) and members of their research teams, which were awarded over £6m worth of funds through the Portfolio Partnership from the EPSRC.
An Academic Strategy for the Information Age

My deputy, Professor John Turner, has been given the very challenging task of developing our new academic strategy for submission to the Higher Education Funding Council for England (HEFCE) in July 2004. I have been most impressed with the ideas that have been put forward, and with the mature and democratic way in which the process has been conducted across the University and with many of you, its external stakeholders.

Financially, we have had another good year, achieving a surplus of £3.1m. Our income streams are robust and we have seen an overall increase in turnover, which should give us all cautious confidence for the future.

In last year’s report, I described how we had restructured the Academic Schools of the University to ensure that they were fit for purpose. The progress that has been made to assimilate academic departments, such as Physics and Chemistry, into their ‘new’ Schools has been very good indeed. During the year, I was also very pleased to welcome a new Head of School, Professor Andy Robertson, to lead the School of Biomedical and Molecular Sciences.

The Executive Board has provided an effective forum for university-wide debate and for the move towards the development of a culture which thinks more holistically – recognising that the whole is generally greater than the sum of the parts! To provide momentum for this activity, the Process and Improvement Committee is seeking to develop improved administrative and support services within the Central Administration and the Schools. The early signs of progress are positive, with initiatives such as a university-wide student enquiries system coming to fruition during 2003.

Creating a Financially Secure Future

I awoke one morning in January 2003, to find that I had been misquoted by a number of national media titles. They stated that I believed privatisation to offer the best prospect for the University of Surrey’s long-term economic prosperity. Whilst this was a rather simplistic representation of my remarks, I do believe that universities need to adopt long-term, sustainable strategies and, for this to occur, it is vital for them not to be blown off course by short-term political and funding agendas. It is, therefore, essential that the current parliamentary debate fully recognises the major economic and intellectual contributions made by universities to our nation, and provides access to sufficient resources to guarantee our long-term viability.

Unis’s historical commitment to income diversification has left it better placed than most higher education institutions to survive the financial climate in which we are currently operating. The Surrey Research Park has now enjoyed over 20 years of success. Many scientific ideas which have their beginnings in the University have been commercially developed on the Park. A recent example has come from the Centre for Vision, Speech and Signal Processing (CVSSP) which, through a spin-out company, OmniPerception, signed a collaborative agreement with the Japanese Sharp Corporation, after the electronics giant had scoured the world for face-recognition software.

Unis has been exemplary in delivering the Government’s stated agendas for UK universities to recruit more students from overseas and to work more closely with industry and commerce. We are also working well towards delivering its widening participation targets.

I do believe that universities need to adopt long-term, sustainable strategies.
Since the turn of the millennium, our turnover has risen by 50% to over £150m per annum and, in a recently published league table, UniS was also shown to have the tenth largest financial endowment of any UK university. However, to put this into perspective, it should be emphasised that this figure is by a scale of ten smaller than our US comparator in the same listing. Therefore, if we are to compete successfully at a global level, UK universities will need to create fund-raising and development strategies like our US counterparts.

Last year, I reported that I had asked Professor Peter Butterworth to take responsibility for the development of fund-raise for the University. In addition to the launch of an ambitious programme to encourage capital investments, an Annual Fund has been started, in conjunction with the Surrey Alumni Society, to help provide ongoing student support. The Fund has been supported by enthusiastic alumni, staff and friends of the University from all across the world, who have pledged regular donations to it.

**Defining our International Strategy**

During the year, a new International Strategy for Institutional Relationships was developed, based on UniS establishing a network of institutions with similar characteristics to its own. The fundamentally important characteristics of institutions within the network are that they:

- enjoy high academic status in their own country, with an emphasis on postgraduate development and research;
- are financially robust, with a commitment to enterprise;
- possess a high-quality technological orientation, with a synergy or complementarity to teaching and/or research activities at UniS;
- have a record of effective collaboration with local and regional industry and commerce (such as an active research park) and regional government;
- possess a willingness to interact positively with all other members of the network for mutual benefit and development.

It is envisaged that the network will develop gradually with new members coming from both within EU countries and elsewhere in the world. Partnerships with the University of Kuopio (Finland) and Kyushu Institute of Technology (Japan) have already been established and are progressing well. Kuopio is our joint founding member of the network. In May, I attended the official opening of Mediteknia, a novel institute for applied biomedical, nutrition and pharmaceutical research at Kuopio.

**International Student Recruitment**

Back in 1991, the University of Surrey was awarded a Queen’s Export Achievement Award for its outstanding ability to recruit students from overseas. We continue to remain committed to those countries with whom we have long-established ties and are delighted that, in recent times, we have attracted students from many more countries; a particular example being the 800 or so students studying on our campus from the People’s Republic of China.

**Working for the World**

The University of Surrey’s distinctive international character complements that of the world-class region it serves. We are often able to contribute to the development of networks which benefit the region’s economy and help commerce develop relationships with other countries.

Together with serving our region, we are committed to ‘working for the world’ and many of the exciting activities you will read about in this report show how our academics’ work contributes to the development of a ‘better world’ in scientific, economic, social, political and cultural terms.

In January 2003, in recognition of our success in creating an effective interface between higher education and commerce, the University of Surrey hosted a HEFCE-sponsored conference which looked at ways in which universities are beginning to collaborate more effectively with industry.
The atrium of the new Management Building.
outline planning permission for the site to enable detailed permission to be sought, thus allowing building to commence. Planning permission for the Postgraduate Medical School has already been granted and work on this exciting project will commence in January 2004. It is anticipated that outline planning permission for the rest of the site will also be granted early in 2004.

World-Class Ambitions
Over the past 12 months my staff team has worked diligently and effectively to ensure that UnS is well positioned to drive forward to its next stage of development. I am grateful to each and every one of them for their efforts. There have been many achievements of which we can be proud, and there are many fresh challenges still to face. However, I am convinced that collectively we have the talent, energy and stamina to work through even the most difficult issues to ensure that we achieve our ultimate ambition to become a truly world-class seat of learning.

Professor Patrick J Dowling
CBE, DL, FREng, FRS
Vice-Chancellor & Chief Executive

A Campus Fit for the 21st century
During the year we witnessed the opening of two major new academic buildings on the Stag Hill campus – The Advanced Technology Institute (ATI) and the Management Building.

The ATI, opened by Lord Sainsbury, brings together electronic engineers, physicists and biologists working on high-speed electronics and wireless, optoelectronics and photonics, large area electronics and displays, carbon nanotechnology and optical and biological sensors. These technologies are supported by work on underlying theory and by materials modification and analysis, using ion beams and high pressures. The latter techniques are now being applied at UnS to biomedical applications and the study of foods. The ATI will foster this diffusion of techniques into new fields, putting advanced technology at the service of our human needs for food, health and communications.

The new building for the School of Management provides it with a state-of-the-art home which offers students learning resources which are second to none. These include well-equipped computer laboratories, a professional kitchen and restaurant suite for use in hospitality and food degree programmes and dedicated high-quality seminar rooms.

Manor Park
In January 2003, and after a great deal of support from Guildford Borough Council, a new Local Plan was adopted that allocated Manor Park for development for future university purposes. This was a very significant step as it took this land out of the Metropolitan Green Belt. The planning process now requires the University to secure
During the year, the University of Surrey lost one of its greatest friends, Sir George Edwards, who died in March 2003. It was Sir George’s vision and tenacity that, in the early days, did much to create the University’s unique approach and to ensure that it remained rooted in the real world.

Sir George Edwards became Pro-Chancellor Designate in 1964 and Pro-Chancellor two years later on the day the University was granted its Royal Charter. At that time he was at the peak of his distinguished career in aeronautical engineering. During his 15 years as Pro-Chancellor, Sir George did far more than appear at formal ceremonies and meetings. He devoted much time and effort to academic development in the University, particularly in promoting its relationship with industry. His influence was also felt on the sports field, especially in cricket, for which he was a passionate enthusiast. Besides serving as President of Surrey County Cricket Club, he was also the first President of the Staff Cricket Club.

On his retirement as Pro-Chancellor in 1979, Sir George was made Doctor of the University honoris causa and also became Pro-Chancellor Emeritus. He continued to give much valuable advice to the University over the years and we owe it to his memory to ensure that the University of Surrey does indeed become a world-class seat of learning.
More than 20 new academic programmes were validated during the year. These include many designed to meet new market needs by combining the expertise of a number of different subject areas and Schools.
Teaching and Learning Strategy
During the year, a revised teaching and learning strategy was agreed. This sets out the aim of the University to “provide a high-quality learning experience to all students – by offering and developing an appropriate portfolio of programmes that is continually updated, using high-quality methods and offering modes of delivery on an on-campus and blended basis to an increasingly diverse and global society”. Work continued to focus on four key teaching and learning strategic priorities and, in addition to core funding, a contribution in the region of £250,000 has been made to activities that support these.

1. Refreshing Course Provision
More than 20 new programmes were validated during the year. These include many designed to meet new market needs by combining the expertise of a number of different subject areas and Schools. Examples include the BSc (Hons) in Entrepreneurship in Technology, IT and Business and the BA (Hons) in Culture, Media and Communication which have recruited well. These join the new courses in Business Management and in Law, both now in their second year of operation, which have also strengthened the University’s portfolio of undergraduate provision.

2. Skills and Personal Development
Agreement was reached on a Skills Statement that will guide our approach to the development and delivery of skills for all students at the University. At the same time pilot work was completed on the arrangements for Personal Development Plans for students. This is to ensure that students can develop skills in line with the University’s agreed Skills Statement. This work is taking place alongside the innovative DAVE project being run by the Students’ Union.

3. Learning Technologies
Agreement was reached on the new Virtual Learning Environment for UniS and for the Federal University more generally. From September 2003, programmes have been available on WebCT Vista. This is a sophisticated academic enterprise system which will provide an exciting and very versatile platform to meet the University’s future needs in learning technologies.

4. Widening Participation
A series of projects including student shadowing, a junior website (for 12-16 year-olds), school visits, widening participation marketing materials, staff development guidance and data collection, have all contributed to the strategic priority of the University to attract and support the most able students, no matter what their background.

Centre for Learning Development
The Centre for Learning Development (CLD) has taken a more strategic role in supporting the University’s teaching and learning strategy. To contribute to this, and in addition to its work in Skills and Personal Development and in E-Learning, the CLD has arranged a series of scholarly seminars dealing with a range of aspects of innovative practices in teaching and learning. It also arranged two university-wide teaching and learning events and has piloted a Student Course Experience Questionnaire. The CLD has also taken on responsibility for The Learning and Teaching Programme in Higher Education which forms a part of the induction of new lecturing staff to the University.

Quality Assurance and Enhancement
Following a major audit, the Quality Assurance Agency (QAA) expressed confidence in the arrangements of the Federal University of Surrey for assuring quality. A developmental engagement of provision for computing education with the QAA led to a similar expression of confidence. To support the enhancement of quality the Academic Standards Committee has put in place a series of activities, including School visits and cross-university briefings, on key issues in maintaining and enhancing quality standards.
Focus on: Staff

The University’s staff are its greatest asset, and we are firmly committed to their development. A wide range of staff development courses are run, both general and specific, and staff are encouraged to enrol on relevant courses leading to qualifications.

UniS promotes on merit, without regard to budgetary quotas, and has one of the highest proportions of professorial posts among its academic staff of any UK university.

Long-term Commitment to Research Staff
During the year we offered permanent contracts to all research staff graded RA2 and above, as a step towards abolishing the short-termism and lack of job security found among university researchers. UniS is the first English university and the first UK research-led university to take this ground-breaking initiative.

The move shows a commitment to the research base as well as positive recognition of the staff who deliver not only high-quality research, but also the ability to obtain research funding for the University. Staff who will be offered these contracts have gained national recognition of their expertise and have made major contributions to the University of Surrey’s excellent outcome in the 2001 Research Assessment Exercise (RAE).

Senior Management Training
A mentoring scheme for senior management has been put in place and this has proved popular. A set of seminars for Heads of Schools and members of the Executive Board on ‘Leading Strategic Change’ was also provided and proved to be helpful and thought-provoking.

A new, two-year Modular Management Programme for Heads of Department and equivalent, and for corresponding support staff, has been launched to run alongside the Administrative Development Programme (ADP) for administrative grades.

Equal Opportunities
An Equal Opportunities Officer was appointed during the year, and is implementing a wide-ranging EO policy, agreed last year. The University was commended for its policy on Race and Ethnic Discrimination. There have also been significant developments following on from the Disability Discrimination Act. UniS continues to recruit academic staff from an international pool; its staff are no less international than its students.
Over the past 12 months, the University of Surrey’s total research income rose to £41m of which £22m was received in the form of research grants and contracts. As the Vice-Chancellor has outlined in his introduction to the annual report, we also obtained a new Portfolio Partnership Award in the field of integrated electronics worth £6.2m from the EPSRC. The University also won £12m worth of additional funds from the Government’s latest Science Research Investment Fund (SRIF) allocation. This is being spent across the institution in line with our research strategy.

Research Strategy
The University’s research strategy places emphasis on larger, more managed research environments in areas where it is rated world-class, such as electronics and communications, human sciences, biological, medical and basic sciences. It proposes support for pockets of excellence elsewhere and for emerging areas of research excellence. In addition, there is support to nurture up-and-coming research staff.

- In line with the strategy, we have already appointed 12 new research professors as part of our investment strategy for the next Research Assessment Exercise (RAE) and further appointments at both senior and junior level will be made over the next 12 months.

- Multidisciplinarity is a key to our strategy and significant financial investment has also allowed the creation of the following new multidisciplinary research areas to complement our existing three established Centres:
  - The Surrey Sleep Research Centre;
  - The Centre for Research into Nationalism, Ethnicity and Multiculturalism (CRONEM) – a joint initiative with the University of Surrey Roehampton supported out of the Federal Innovation Fund;
  - The Health Workforce Research Centre (HWRC).

In the next year we will ensure that all postgraduate research programmes have appropriate skills training embedded into them. Research and enterprise training for staff in mid-career will be established alongside the existing schemes for new staff.

A major challenge for the University and for the wider HE sector will be the adoption of full economic costing for research which we will introduce in the 2004/5 academic year.

Enterprise
The University’s strategy on consultancy is moving towards the creation of a University company to manage and support this activity. A joined-up enterprise strategy allows Uni$ to better exploit commercially the results of its research and to protect Intellectual Property Rights (IPR). Pre-incubator funds are provided out of the SETSquared and GReat Ideas in Science and Technology (GRIST) initiatives, while the USSF and CASCADE seed corn funds have resulted in increased licence income and seven spin-outs in the last two years. Uni$ now has in place a complete support scheme from research business development to enterprise exploitation which is the envy of many.

In the next year we will ensure that all postgraduate research programmes have appropriate skills training.
A new high-technology beacon for the University was unveiled by the Minister for Science and Innovation, Lord Sainsbury, at a ceremony on 7 October 2002. The Advanced Technology Institute (ATI) brings together six research groups from across the University to stimulate cross-disciplinary research. World-class staff have been provided with a purpose-built environment, incorporating state-of-the-art equipment, infrastructure and building design.

The ATI houses some of the highest-rated research groups in the UK, working on microwave subsystems, lasers and optoelectronics, large area electronics and nanotechnology, ion beam applications, high pressure measurement techniques and biosensors. The building was designed by Sir Nicholas Grimshaw and Partners and is a multi-purpose facility which is capable of rapid redirection of use. The 3,000m² building is a £10m joint venture between UniS and HEFCE.

At the opening Lord Sainsbury said, “This Institute, supported by the Government through the Joint Infrastructure Fund, will be an important centre for research. It will bring together some of the country’s leading scientists and engineers in one building to carry out world-class collaborative research in key areas of science and technology.”

The ATI has been named the Daphne Jackson Building, in honour of the first woman Professor of Physics in the UK. Professor Jackson was a lifelong campaigner, encouraging women into engineering and science careers.

Leadership
At the helm of the new Institute is Professor Michael Kearney, who joined UniS in August 2002. Prior to assuming the directorship of the ATI, Michael had held the post of Professor of Electronic Device Engineering at Loughborough University for seven years and was Head of Department there between 1997 and 2000.

Professor Kearney’s research interests are broad, covering electronic and microwave devices, transport in disordered systems, statistical physics, and random processes. Specific examples include GaAs devices for millimetre wave applications, SiGe technology for high-speed electronics, the study of fundamental conduction processes in mesoscopic and nano-devices, and the development of photovoltaic devices for renewable energy sources.

“Coming to UniS was a once in a lifetime opportunity to work with some of the leading researchers in the field of electronics and its related sub-disciplines,” says Professor Kearney.
The building was designed by Sir Nicholas Grimshaw and Partners and is a multi-purpose facility which is capable of rapid redirection of use. The 3,000m² building is a £10m joint venture between UniS and HEFCE.
Queen’s Anniversary Prize

Based within the ATI are two specific areas of expertise which were acknowledged by the highly prestigious award in February 2003 of a Queen’s Anniversary Prize for Higher and Further Education at a ceremony at Buckingham Palace. The award was made in recognition of the University’s outstanding work over three decades in the fields of ion beam applications and optoelectronic devices.

In collaboration with industry, research undertaken at UniS in these areas has piloted leading-edge solutions in the development of many articles now regarded as commonplace in the modern world, such as:

- CD and DVD players
- the Internet
- printers
- electronic circuits and devices
- light-emitting devices for displays.

Over the past thirty years, the University’s major research programmes in ion beam applications and optoelectronics have generated research income running to tens of millions of pounds; hundreds of students at PhD level have been trained and have subsequently pursued industrial careers in these fields.

The Surrey Ion Beam Centre (IBC), the only national facility of its kind, is acknowledged as a European Centre of Excellence. It has been supported by the EPSRC for over twenty years. Much of its work is highly collaborative, with projects being undertaken with over 30 other university groups and the provision of high-quality services to a large number of companies.

Professor Brian Sealy, who led the IBC until recently says: “It is gratifying that our work has been acknowledged with this prestigious prize. Over many years we have carried out research at the cutting edge to make our work relevant to the needs of industry. We have made and continue to make a major contribution to the UK electronics industry.”

A major part of the University’s optoelectronics activities have involved semiconductor laser devices. Professor Alf Adams of the Optoelectronic Materials and Devices Research Group says of the work, “I am delighted that our research has been recognised with this award. Here at the University of Surrey we invented, explained and helped demonstrate strained-layer quantum-well lasers in the 1980s. These devices now generate the signals in every long-haul optical fibre in the world.”

About one billion strained-layer lasers are made each year, forming a $10bn annual global market. New generation devices are being developed all the time, with current emphasis on blue light emitters and surface-emitting lasers, very high-speed modulation of light signals and fundamental studies aimed at getting silicon to emit light efficiently.

The Ion Beam Centre is forging ahead still further, having received a grant for a new continuously operating state-of-the-art ion beam accelerator to replace the previous 47-year-old machine. This accelerator makes the IBC one of the best-equipped laboratories of its kind in Europe. A hugely diverse range of substances will be studied using the new machine including cement, plastics, ceramics, rubber, bio-materials, semiconductors used in electronic circuits, the materials that make up flat panel displays, and materials used in the controlled release of drugs into the body.

The latest in a distinguished line of Directors of the Ion Beam Centre is Roger Webb, Professor of Ion Beam Physics in the ATI. He joined UniS in 1983 as a Research Fellow with the then SRC Surrey Ion Beam Centre run by the Surrey Centre for Ion Beam Applications (SCRIBA). Before this, Roger had spent three years as a post-doctoral researcher at the Naval Postgraduate School in Monterey, California, making molecular dynamics studies and computer animations, which is still the main area of focus for his research activities. His current research activities include the use of molecular dynamics simulations to predict the behaviour of cluster impacts on surfaces, as well as the use of more simple binary collisions simulations to predict the effects of energetic particle-solid interactions, in particular ion implantation profiles in crystalline solids.
Professor Alf Adams pioneered strained-layer quantum-well lasers.

Professor Brian Sealy in the Ion Beam Centre.
Jeremy Allam is Professor of Ultra-fast Optoelectronics and the new Leader of the Optoelectronics Devices and Materials Research Group. He obtained his first degree in Physics from the University of Oxford, and his PhD from Unis. He was appointed to his present professorial position in April 2000 – a joint appointment between the Departments of Physics and Electronic Engineering.

Jeremy’s research interests include ultra-fast carrier dynamics in semiconductors for optoelectronic devices, high-speed photonic measurement technologies, and high-field carrier transport. He has recently commissioned a new ultra-fast laser facility comprising laser oscillators and amplifiers, parametric oscillators and amplifiers, and frequency mixers, providing a capability for sub100 fs optical pulses from UV to the mid-IR wavelengths. This new capability considerably strengthens the already state-of-the-art measurement facilities available to staff working on a wide range of activities throughout the ATI.

Microwave Subsystems Engineering

Ian Robertson is Professor of Microwave Subsystems Engineering and Leader of the Microwave and Systems Research Group.

Ian is the Honorary Editor of IEE Proceedings (Microwaves, Antennas and Propagation) and, with more than 300 research papers to his credit and the editorship of two books, he has attracted over £2m worth of research funding for his work.

Present activities within the group are aimed at developing microwave circuits and systems for a variety of applications ranging from communication devices to radar. A particular emphasis is placed on the development of low-cost solutions, important for future commercial markets. Since the ATI was set up, exciting possibilities have begun to emerge in relation to other activities; for example, the fusion of microwave and optoelectronic technologies to provide new functionality. Increasing attention is now being given to exploiting these multidisciplinary options.

Computational Quantum Electronics Group

Within the ATI, the Computational Quantum Electronics (CQE) Group uses advanced computer simulation techniques based on sophisticated hardware platforms to explore the complex quantum worlds of ultra-fast photonics, designed functional materials and bio-nanotechnologies. The Group is headed by Professor Ortwin Hess, who was appointed Professor of Computational Quantum Electronics in March 2003.

The flavour of much of the work undertaken by the group is far-reaching and exotic. As Professor Hess explains: “At the beginning of the twenty-first century, research and technology has embarked on a journey into the world of the ultra-small and the ultra-fast, the nano-world if you will. Traditionally, physicists and engineers have used a standard set of equations and approximations to describe movements and behaviour. In the nano-world these begin to break down and one has to resort to more fundamental approaches based ultimately on full-blown quantum mechanics. To make significant progress requires the use of sophisticated computer modelling and simulations, which is now possible thanks to advances in hardware and software. The ATI provides an excellent environment in which to operate at this high level of complexity, by linking our theoretical
work with the experiments of other groups. The opportunities for exciting breakthroughs are huge.”

Examples of the technologies being studied are designed materials like quantum dots, carbon nanotubes and functional photonic crystals, the controlled manipulation of single biological molecules and the observation and exploitation of quantum effects on ultra-fast timescales. The investigation of such innovative materials, systems and key technologies elucidates the very nature as well as application of ultra-fast, non-linear and quantum phenomena. In the life sciences, advances in photonics and nanodevices are enabling a number of revolutionary and ultra-sensitive spectroscopic and diagnostic tools to be developed for the study and manipulation of complex bio-molecules or cells. An EU project is also being coordinated at UniS aimed at manufacturing a new type of laser system which will be less expensive than anything currently available.

Nanoelectronics
Advances in nanoelectronic devices promise more for less: smaller, cheaper, lighter and faster devices with greater functionality, using less material and consuming less energy. In recognition of the importance of the field, and of the unique opportunities at UniS to capitalise on existing research strengths, some £4m was awarded in response to a specific application through the Government’s 2003 Science Research Investment Fund (SRIF). This is a joint application between the School of Electronics and Physical Sciences, which houses the ATI, and the School of Biomedical and Molecular Sciences. The majority of the grant will be used to buy equipment specifically to fabricate and theoretically model nanoelectronic device structures, some of which will incorporate biologically functional materials such as DNA. The interface between nanoelectronic devices and biological molecules, which have similar dimensions, offers extraordinary possibilities, particularly in the world of medicine and medical diagnostics. The University can play a major role in this challenge, as it already holds two valuable patents in this sector that, for example, could be significant in the exploitation of carbon nanotubes in nanodevices.

In October 2002 it was announced that Ravi Silva, Professor of Solid State Electronics within the ATI, would head a £1.2m nanotechnology research project aimed at the next generation of electronic devices. These aim to be smaller and faster than the silicon devices currently available. The majority of the grant was supplied by the EPSRC, together with funding from industry and UniS. The focus of the research will be based around the purchase of an Ultra-High Vacuum Scanning Tunneling Microscope combined with Scanning Electron Microscope and energy analyser, a very powerful and versatile instrument built to specification and one of only six available worldwide. The UHV STM / SEM machine represents a completely new capability for the fabrication of devices on a nano-scale.

Professor Silva and his team are currently carrying out research on carbon nanotubes, which are a derivative of the C60 molecule (popularly known as a Buckyball), and a major underpinning technology for the wider nanoelectronics initiative. The research is being channelled into core areas to allow rapid exploitation in others. These include the areas of fabrication, characterisation of electronic and optical properties, and nano-manipulation.

“Nanotechnology based on carbon nanotubes could well revolutionise the future of electronic devices, computer memory and even replacement lights,” says Professor Silva. “Further, the future of renewable energy may well be hydrogen-based, and carbon nanotube structures will increase the storage of energy many times over, if suitable nano-vessels can be created. We have a unique facility here, which we hope will act as an incubator for new applications and devices. The opportunities are practically endless and very exciting.”

Portfolio Partnership Award
In April 2003, it was announced that the University of Surrey’s Integrated Electronics Research Programme was one of only eight in the UK to receive one of the EPSRC’s new Portfolio Partnership Awards. The UniS team, led by Professor Ravi Silva, with Professor Ian Robertson as one of four co-investigators, was awarded funding in excess of £5m over five years to further their research in a number of specific fields.
Wireless multimedia research in the University's Centre for Communication Systems Research (CCSR) is led by Professors Barry Evans and Ahmet Kondoz. As part of the Portfolio Partnership, technologies will be studied that enhance existing capabilities in areas such as 3G and develop new capabilities for the 4G.
The Portfolio Partnership is fostering the cross-disciplinary activities required to address the “grand challenges” of the future. Much of the themed research undertaken by the group has relevant interfaces, in terms of, for example, plastic displays that allow for immersive environments, or high-speed electronic information transfer with maximum information content for surgery in a portable manner.

Radical alternatives to established microelectronics technologies promise to revolutionise applications in wireless multimedia communications and medical imaging systems. Through the use of novel materials, such as carbon and its composites, and the exploitation of system level RF integration techniques and advanced information processing, futuristic new concepts such as wearable multimedia communicators and wrap-around medical diagnostic systems are envisaged.

One objective is to produce devices to functionalise carbon nanotubes. Expertise unique to University of Southampton on the low temperature growth of these structures was published in Nature Materials in October 2002, when the team demonstrated a new method of growing carbon nanofibres at room temperature. The technique used involves substituting the standard thermal energy requirements for growth with a novel plasma decomposition of methane on a Ni catalyst. According to Professor Silva, “Vapour-grown carbon fibres will offer one of the most cost-effective means of producing discontinuous carbon fibres using large-scale catalytic processes. To our knowledge, this is the first demonstration of the growth of carbon nanofibres at room temperatures by any method.”

Other aspects of the team’s work include the development of large area plastic substrates for applications such as wrap-around displays, solar cells, large area sensors, and composites for the aerospace and automobile sectors. It will also explore new device structures and novel architectures that will attempt to exploit one-dimensional conduction, and will examine devices to interface directly to biological systems. The focus of the systems integration and circuit design activities is to push the upper frequency limit of radio frequency and optoelectronic transceiver modules.

Wireless multimedia research in the University’s Centre for Communication Systems Research (CCSR) is led by Professors Barry Evans and Ahmet Kondoz. As part of the Portfolio Partnership, technologies will be studied that enhance existing capabilities in areas such as 3G and develop new capabilities for the 4G. Immersive presence and augmented reality will be the areas focused on for the mid-to long-term research. The navigation and interaction with information over fixed but more importantly wireless networks, including the Internet, will be a key part of this programme, which will help make the man-machine interface a more enjoyable experience.

The Medical Imaging team led by Professor Maria Petrou in the Centre for Vision, Speech and Signal Processing (CVSSP) is also part of the Portfolio Partnership. It will base its research on optimising the search of a database of 3D objects, to enhance extraction of feature values that characterise human organs and human tissue. As part of the programme the use of photometric stereo techniques for 3D-surface and colour reconstruction will be studied. This is of particular relevance to representation of human faces for plastic and reconstructive surgery.
Health is a key issue and today occupies a much wider spectrum of concerns and interests in our world than cure and care alone. Consequently, health and fitness are increasingly seen as areas where positive action has at least an equally important role. At UniS, we have been making a major contribution to understanding and practice in health and health-related issues.

Genomic Frontiers
“The Human Genome Project has been described as ‘unlocking the key to the secret of life’,” says Johnjoe McFadden, Professor of Molecular Genetics. “Although this sounds rather dramatic, the metaphor is not too far from reality. The detailed understandings that the completion of the sequence has provided offer the potential for a knowledge of the human body’s mechanisms we could only guess at in the past.”

Professor McFadden heads the Microbial Sciences Group. His current work includes mycobacterial research, meningococcal research and bio-nanotechnology.

New work being undertaken in the School of Biomedical and Molecular Sciences at UniS, under the new Head of School, Professor Andy Robertson, is making extensive use of the material released by the Human Genome Project (HGP). Andy joined UniS in July 2003, from his post as the first Director of the new Conway Institute of Biomolecular and Biomedical Research at University College Dublin. His main research interests relate to cell biology and clinical aspects of endocrinology, particularly human reproductive endocrinology.

“I strongly believe that good, basic and clinical research are complementary to each other and are best served by being performed as part of a planned continuum,” he says. “I am delighted that, here at UniS, we have such excellent opportunities to develop a Functional Genomics Research programme which combines our biomedical expertise with the clinical skills of St George’s Hospital Medical School.”

This programme, underwritten by a £2.3m SRIF grant, has enabled the University to develop laboratories with state-of-the-art facilities and provide core support for post-genomic research activities on cancer, cardiovascular disease, neuroendocrinology, toxicology and nutrition.

Colin Smith, Professor of Functional Genomics, heads the group making extensive use of HGP information to better understand genetic activity, which genes perform which function and what turns on and off gene expression. “In cancer, for instance,” Colin says, “the understanding we have of genetics will help us predict the prognosis of a tumour, thus enabling clinicians to diagnose much more accurately and to tailor more effectively the right treatment of the disease to the individual patient.”

Colin joined UniS in 2003 from UMIST in Manchester. His research group is focusing on producing DNA microarrays and optimising methods for global analysis of transcription in streptomyces.

This is a small portion of the extensive work in this leading-edge discipline. UniS is at the forefront of post-genomic research, having invested a total of £5m in the Functional Genomic Initiative. The 5* biomedical science research team, interacting close to the clinical interface, will ensure that patients gain maximum benefit from this vital research area.
Above: The Genomics labs.
Left: The double helical structure of DNA. Biomedical research at UNSW is making use of the wealth of data publicly available through the completion of the Human Genome Project earlier this year.
Below: Professor Colin Smith (right) explains an area of his work to Sir Richard Sykes (left) and the Vice-Chancellor (centre).
Multidisciplinary Sleep Research

Sleep is a crucial part of human life. Its functions have only recently become better understood although its importance is still not fully appreciated. Researchers at University have made (or contributed to) a number of important discoveries in this field in recent years. Internationally recognised as a world centre for sleep research, the University has established excellent links with other world-leading institutions to effect collaborations, student and staff exchanges and joint research projects, pushing back still further the frontiers of knowledge in this crucial area of human life.

Sleep is a central part of our 24/7 society and a major determinant of cognitive functioning, well-being and health. Sleep disorders are prevalent across the population, with 10-20% of the European and US populations reporting frequent sleep disruption. Nevertheless, effective strategies to alleviate sleep complaints and treat sleep disorders are often not available.

The new Surrey Sleep Research Centre (SSRC), established in February 2003, brings together the sleep expertise from the Schools of Biomedical and Molecular Sciences and Human Sciences. It also encompasses a wide range of disciplines: physiology, cognitive-, health- and occupational psychology, sociology, chronobiology, molecular biology, neuroendocrinology and psychopharmacology. Within these disciplines, world-class expertise and state-of-the-art equipment and facilities are available.

The SSRC undertakes a wide range of multidisciplinary and translational studies in the real world and in the laboratory, with partners in research institutes, the medical community, industry and commerce. It will also facilitate the communication and transfer of research findings to the medical community and the public.

Dr Derk-Jan Dijk, Director of the SSRC, says, “The Centre differs from other UK research institutions as it will provide a truly multidisciplinary approach to ‘sleep in the 24/7 society’. Such a multidisciplinary approach will lead to an appreciation of the variety of factors that affect sleep timing and quality. It will also lead to an appreciation of the wide range of effects that sleep has on health, the quality of our roles within society, both at home and in the workplace, and our quality of life.”

Derk-Jan Dijk was born in the Netherlands. During the 1990s he spent six years in various posts at the Harvard Medical School, Boston, USA, his final position being Assistant Professor of Medicine (Neuroscience). He joined University in 1999 as Reader in Physiology, was appointed Director of the Centre for Chronobiology in 2000 and was made Director of the Surrey Sleep Research Centre in 2003.

“Now that the negative health consequences and economic costs of sleep disruption have been established, sleep is high on the research agenda in many disciplines. The importance of sleep to our well-being should not be underestimated,” says Derk-Jan.

“Our survey data shows that we sleep less than necessary for us to function at our best. We will now investigate the mechanisms that lead to these sleep disruption-related decrements in performance and also develop and evaluate treatment approaches.”

International Links

Circadian Biology and Sleep Medicine have a long history at Brigham and Women’s Hospital. University was fortunate in being able to welcome Charles A Czeisler, PhD, MD, Director of the Division of Sleep Medicine at Harvard Medical School and Chief of the Division of Sleep Medicine at Brigham and Women’s Hospital, to the opening ceremony of the SSRC in June 2003.

The partnership between University and Harvard has brought many positive benefits to both institutions. University lecturer, Dr Steven Lockley, spent the last three years at Harvard Medical School. Steven initiated a series of collaborations which continue to develop between the institutions. Since 2002, a total of 13 University undergraduates have carried out their professional training placements at the Brigham and Women’s Hospital. Several PhD student placements have been arranged, as well as joint-funding proposals to the US Department of Defense and the National Institutes of Health.

“It is very satisfying to work on collaborations between the two leading research institutions,” says Steven. “Developing possibilities for the two research teams to work in collaboration, rather than in competition, will mean that everyone gains, including the wider research community, as we will avoid duplication of effort and resources which will ultimately lead to exploring new scientific frontiers.”
The PhD student programme is a productive part of these links. Danielle Rodriguez worked at Brigham and Women’s Hospital as a Research Assistant in the Biomathematical Modelling Unit and is now a full-time PhD student at UniS, funded by a Surrey Sleep Research Centre studentship. Her research, supervised by Professor John Groeger and Dr Derk-Jan Dijk, is centred around the study of adolescents and their cognitive and driving performance when suffering sleep deprivation. The completion of sleep diaries and wearing of activewatches helps researchers to simulate in the laboratory the young people’s real-life sleep schedule in order to assess their ability to carry out tests.

Joseph Hull is a collaborative PhD student from Harvard supervised by Lockley, Dijk and Czeisler, and is conducting research on blind subjects and the body clock. In an extension of the PhD and post-doctoral work conducted initially by Lockley and colleagues here at UniS, totally blind subjects are studied under ‘real-world’ conditions at home, both with and without restrictions in their lifestyle, and in a laboratory for five weeks continuously, where the environment is more tightly controlled. Detailed measurements of hormonal, temperature, sleep, and performance rhythms are made and are compared between the three different conditions and with the results of similar tests on sighted subjects. Being able to accurately measure the human circadian period is vital for future circadian research in order to be able to time potential therapies appropriate to each patient, as shown for melatonin treatment in the blind by Lockley and colleagues, or for looking at the genes involved in generating circadian rhythms and sleep as Dr Simon Archer and Dr Malcolm von Schantz are currently investigating here at UniS.

When he completes his studies, Joseph Hull will be eligible for a PhD from UniS and will have had experience of both world-class institutions’ research excellence, as he puts it, “combining the best of both worlds”.

UniS students and staff attend the monthly ‘Sleep Grand Rounds’ at Brigham and Women’s Hospital – by videoconferencing link. The first of this year’s presentations was given by Dr Steven Lockley at the end of his three-year stay in Boston. Videoconferencing is also used for study-progress meetings and the link played a crucial role at the start of the current UniS students’ professional placement year, when their US visas were late arriving. The students actually took the first of their training modules long distance ‘down the line’, being instructed how to place electrodes on their subjects’ heads to measure EEG activity, in preparation for a study of sleep and work hours in junior doctors at the Brigham and Women’s Hospital.

How Britain Sleeps
A survey of nearly 2000 adults in Britain, carried out through NOP by Professor John Groeger and his colleagues in the spring of 2003, identified some interesting information about how Britons sleep. It provides unique information on the quantity and quality of British sleep patterns, the types of sleep and the problems we experience. The survey, which was conducted through face-to-face interviews with a representative sample of people aged 16 to 95, will enable the Surrey Sleep Research Centre to map trends by age group, gender, lifestyle and household composition.

“This is a unique study,” says John, a Professor of Cognitive Psychology in the School of Human Sciences. “Nothing on this scale has been carried out in Europe. Even in the USA, such studies have only ever been conducted by phone surveys with unrepresentative samples.”

The study showed significant gender differences. Although women do not sleep more than men, almost twice as many report difficulties sleeping which may indicate a differential need for sleep. Biologically speaking, young people need more sleep than older people. The survey confirms that those in their teens and early twenties do indeed have more sleep, but from their late twenties onwards adult sleep durations alter little with age. Perhaps not surprisingly, there is a big difference in sleep patterns between people who have children and those who do not. What is surprising is that with two or more children under 15 in the household, men sleep less than women.

“The survey has equipped us with an excellent set of data which can be used to answer a wide range of questions about how Britain sleeps, how much we sleep and what individual factors need to be considered when seeking to improve the nation’s sleep patterns,” Professor Groeger says. “This large-scale quantitative research usefully complements physiological sleep studies which currently can only be conducted with small sample sizes.”

John would like to carry out more detailed research on the sleep patterns of young people. A common complaint in families is that adolescents spend a lot of time in bed, but John asks whether this is because the biological need to sleep is much higher at this phase of life. It could be a physiological fact.
that young people need the sleep and are substantially sleep deprived through long hours of study, the need to earn money and of course the lure of parties and clubs!

Sleep Within the Social Structure

Studies conducted by Jenny Hislop and Professor Sara Arber in the School of Human Sciences have explored sleep as a social act – as an inextricable part of the social world we inhabit, not only reflecting the roles people play within their social context, but also structured and reinforced by the gendered nature of these roles.

A study undertaken through focus groups of women aged 40-59 showed that their commitment to the family places them under the obligation of being able to deal with the needs of others during the night, as well as during the day. For the majority of the women studied, their ‘waking role status’ involves paid employment; however, in the home their role of partner and/or mother is the dominant factor controlling the sleep period.

The women in this study saw disturbed sleep as a ‘woman’s lot’ over which they have little control. They absorb and manage the disruptions to their sleep with little fuss, conscious not to disturb the sleep of others. Rather than perceiving themselves as victims, women seek pragmatic solutions to balance their responsibilities within the household with their need for sleep.

Sleep, and importantly the place and act of sleeping, be it in the same bed or separately, also plays a central role in the relationship between a couple. Qualitative research with women aged 60 and over shows that the pattern of sleep in later life changes in response to physiological and psychosocial factors, becoming lighter, more fragmented and characterised by more frequent and prolonged awakenings.

This study showed that the process of change in sleep patterns associated with ageing is unique and different – not only between individuals but between men and women. Sleep is the outcome of the interaction of life events in association with the physiological ageing of both the mechanisms of sleep and the body.

Jenny Hislop says, “We suggest that women’s relationship with their partner and the roles and responsibilities embedded within this relationship play a key role in structuring women’s sleep in later life.”

Women’s sleep later in life can be affected by partners who snore or suffer from increasing physical or mental disabilities. A strategy considered by women who experience these difficulties is to move from the double bed. This is not as simple as it sounds, however, since the double bed is central to the sleeping relationship of most couples and a symbol of their partnership. Similarly, after divorce or widowhood, the emptiness of the double bed serves as a reminder to these women of the loss of partnership and companionship.

“Sleep, like breathing, is a central part of our lives, essential to our well-being and ability to function,” says Sara Arber.

“Women’s sleep takes place against a complex backdrop of physical, psychological and social factors which interact to create the potential for sleep disruption. It is not
surprising, therefore, that sleep disruption has become an expected, though unwelcome, characteristic of mid-life and older women’s experience of sleep.”

The Genetics of Sleep
Research published by Dr Simon Archer, Dr Malcolm von Schantz and Professor Jo Arendt in the June 2003 issue of the journal Sleep showed that there is a genetic predisposition to morning or evening preference. The work, in collaboration with clinical colleagues at St Thomas’s Hospital (London) and the Hospital de Gelderse Vallei (Netherlands), showed a correlation between the different lengths of the so-called ‘clock’ gene Period 3 (Per3), and whether individuals were at their best in the mornings (‘larks’) or in the evenings (‘owls’). This study is the first reported correlation between individuals with an extreme evening preference and variability in a specific gene.

Dr Simon Archer, lead author of the paper says, “We discovered that the shorter variant of the gene is significantly more common in people with an extreme evening preference. This is even more so in patients suffering from delayed sleep phase syndrome, a sleep disorder where people fall asleep at very late times and have difficulty waking up in the morning.”

Dr Malcolm von Schantz, senior author, says, “There are at least ten of these ‘clock’ genes and there are differences between them. Whether you are a night owl or a morning person is determined by the sum of these differences.” The research was funded by the Medical Research Council (MRC) and the Biotechnology and Biological Sciences Research Council (BBSRC) and received widespread media coverage in the UK and internationally.

Diet Trials – Testing the Nation’s Weight Loss
Obesity is one of the most important public health problems in the developed world. It is a risk factor for heart disease, high blood pressure, diabetes and stroke; diseases which claim millions of lives each year. Millions of people across the developed world turn to one diet or another in response to these serious health issues as well as to improve their self image.

The BBC found little hard evidence to back the claims of diet companies, mostly supported by their own or limited research. So they turned to University scientists to carry out a randomised trial over a six-month period. Dr Helen Truby and her team in Nutrition and Dietetics in the School of Biomedical and Molecular Sciences were commissioned to carry out a study of 300 clinically pre-obese or obese people from around the country.

All the volunteers were carefully weighed and monitored under University supervision to ensure they did not lose too much weight and that their dietary intake was nutritionally adequate. Blood tests allowed monitoring of changes in cholesterol and glucose (blood sugar), and state-of-the-art scanners assessed how much body fat (as opposed to lean tissue, or water) was being lost.

The individuals’ stories of struggle and determination in the face of temptation were at the heart of the TV series Diet Trials, which ran from mid March to early April 2003 and attracted some five million viewers. Viewing figures show that some 61% of the audience was female and that up to 20 million people watched some element of the series during its run.

Diet Trials was set up as a competition between four of Britain’s most popular diets in four different categories – Weight Watchers; Rosemary Conley’s Diet and Fitness Plan; Slim Fast meal replacements; and the Dr Atkins New Diet Revolution. The participants were randomly placed into one of these diet groups or a non-dieting control group.

“All the diets tested were effective and did produce weight loss,” says Helen Truby. “There was considerable variation in weight loss within each diet group, but the actual differences between the diets were quite small. The differences revealed by this study are more helpful in identifying which diet works best for each individual, as no one diet can be identified as ‘best’ overall.”

The main findings showed that all the diets performed equally well, though women did better on the two group-based diets: Weight Watchers and Rosemary Conley, and men did better on the ‘do-it-alone’ diets: Dr Atkins and Slim Fast – and men lost more weight overall than women.

No harm had been done to dieters’ kidneys by following the controversial Atkins low carbohydrate diet for six months, but scientists pointed out that only healthy individuals were tested over six months and that they were all advised to take a vitamin and mineral supplement. Further studies need to be done to test this diet’s safety in the longer term.

The research team not only broadened the scientific understanding of these popular diets, but also brought a greater understanding of how research is conducted through randomised trial to a broad section of the public via the medium of television.
There are no longer enough young people to replace those retiring and where unemployment is low and skills shortages are growing, such as in South-East England, this represents a real economic and social problem.
British society is a rich field for study and research. It is in a state of flux; increasingly subject to changes in constitution, culture and behaviour from an ever-widening sphere of influences.

At UniS, our work in the field of social research is not only of high quality but also has a real contribution to make. It frequently addresses real and current issues that impact on the daily lives of many parts of our society. By engaging with and supporting both policymakers and practitioners, we are also informing those who will help to shape our futures. The past year has seen developments in the activities of research centres working on projects as diverse as ageing, gender, policing, the environment and globalisation – and on many of the interrelated issues.

The Ageing Workforce
Britain’s population, and its workforce, are getting older. Birth rates are at an all-time low and early retirement is common. There are no longer enough young people to replace those retiring and where unemployment is low and skills shortages are growing, such as in South-East England, this represents a real economic and social problem.

So, with politicians, economists and commentators drawing attention to the need for an age-diverse workforce to ensure future prosperity, the University’s ground-breaking new research centre – The Centre for Research into the Older Workforce (CROW) – is a timely initiative, set up with the support of funds from the South-East England Development Agency (SEEDA) and two European Union projects.

The Centre’s Director and Professor of Education, Stephen McNair, joined UniS in 1999, bringing with him extensive experience of education and training policy, both in the UK and internationally. He says of the new Centre, “We will be addressing one of today’s most important social issues – the role of older people in the workforce and society. CROW is being established with the remit to investigate how the older labour market works and how society can make better use of the talents and potential of people over 50.”

UniS is well-placed geographically to conduct research in this area and the Department of Educational Studies was a natural choice as a base for CROW, having a long-standing interest in learning and older people. It also enjoys partnerships with the Pre-Retirement Association and the National Institute of Adult Continuing Education – coupled with a raft of project work on social exclusion.

CROW has already carried out a national survey, producing important new findings about how job change affects social division in the population. The report fills a gap in knowledge about the frequency and nature of work transition in the workforce, particularly among older workers.

Professor McNair says, “The work shows that many people would consider working after formal retirement, but few do. More than half of all the people over 30 in work say they would like to work part-time after they formally retire. For men, the number who say this increases as they get older.”

The survey showed how important qualifications are in determining the success of individuals in the labour market. Those with qualifications were much more likely to make career moves for positive reasons, and to increase their responsibility and skills when they do change. The well-qualified go on making positive career moves into their fifties and sixties, while the unqualified are squeezed out of the labour market in their mid fifties. Increased responsibility and higher skills are the most common outcomes of job change for everyone under 60, but a worryingly large proportion receive no training or advice to prepare for this.
The research showed that women are more likely to face retirement poverty than men.

The Social and Economic Effects of Ageing

The University’s academic interest in ageing includes the 5* research-rated Department of Sociology which hosts the Centre for Research on Ageing and Gender (CRAG), established to focus specifically on the interconnections between gender and ageing. Recent CRAG reports sponsored by the Economic and Social Research Council (ESRC) highlighted some interesting findings about the economic and social consequences of ageing for both men and women.

The research showed that women are more likely to face retirement poverty than men because the majority cannot make sufficient private pension contributions. The Government’s current policy of allowing state pensions to decline in value relative to average earnings, while increasing reliance on occupational and other private pensions, will perpetuate the disadvantage that women face in providing adequately for their retirement.

Dr Jay Ginn, Co-director of the Centre comments, “Women’s typical sequence of paid and unpaid roles over the course of their lives limits their ability to accumulate private pensions. At the same time, the levelling effect of state pensions is being eroded.”

Dr Ginn has used British survey data to examine how women’s patterns of paid and unpaid work influence their chances of building an adequate private pension of their own – and how changing patterns of partnership and parenthood influence outcomes. The research shows that for the majority of women, their private pension disadvantage – and hence their risk of personal poverty in later life – is unlikely to diminish in the future. At the same time, new patterns of pension disadvantage are emerging, influenced by partnership status, parenthood, class and ethnicity.

For example, older women who are single enjoy a private pension advantage compared with women who were married at any time. Compared with married women aged over 65, a single woman’s odds of receiving a private pension income are nearly seven times higher. The odds for widows are four times higher, but for divorced women they are only one and a half times higher.

The effect of motherhood in reducing full-time employment, earnings and private pension coverage is less for women with a university degree. Nevertheless, having children still substantially reduces their pension-building opportunities as the earnings of women graduates with a pre-school child are, on average, only 44% of those of childless women graduates. This has consequences for pension contributions.

Among younger women, marriage and motherhood are diverging, with a consequent increase in child-rearing outside marriage. The adverse effect that raising a family has on women’s private pension coverage is magnified for lone mothers. Among women aged 20-39, a divorced woman’s chance of having private pension coverage is less than half that of married women.

Divorced women begin to ‘catch up’ on lost employment, earnings and pension-building only when their children are independent, but they remain at high risk of poverty in later life. On average, children are four to five years old at the time of divorce, restricting their mothers’ opportunities for earning and pension-building for a number of years. For this and other reasons, legislation allowing pension-sharing at divorce is unlikely to end divorced women’s pension disadvantage compared with other women and divorced men.

Are Older Men Neglected?

Results of research conducted by Dr Kate Davidson and Professor Sara Arber of CRAG, show that masculinity continues to structure men’s experiences and activities in later life, despite the onset of ill-health, widowhood or living alone.

Professor Arber explains, “From large-scale surveys, we know that older, married men are less likely to report poor health and to smoke and drink beyond safe limits than previously or never married men, but we don’t know why.”

Qualitative interviews sought to explain how older men viewed their health and health maintenance strategies. Just over 20% of the sample interviewed were men who were very ill and in need of considerable professional health input. Although the married men tended to talk about their prevailing ailments, men who had never been married talked very little about their health, despite the fact that they often had prostate or heart problems.

Divorced men were more likely to report stress as a cause of ill-health, but considered that it was a condition they had to sort out for themselves.

Whilst women routinely visit the doctor throughout their life for family planning advice, during pregnancy or with their children, older men consider such visits a sign of weakness, and they did not want to be seen as ‘giving in’ to sickness.

Older men are aware of health promotion information in a similar way to other groups in society, but they do not always adhere. The results, however, of ignoring such advice can
be more dangerous than for younger generations, given that men continue to be at higher risk of catastrophic ill-health earlier than women.

Although divorced older men are a growing segment of the population, they were found to be significantly disadvantaged in terms of their involvement in formal organisations, their social networks with kin and with friends and neighbours, and had higher levels of health-risk behaviours, particularly smoking and drinking.

Most social organisations fulfil the dual purpose of providing social interaction and a forum in which to be active (such as sports) or ‘useful’ (such as carrying out voluntary work). In contrast, organisations that are geared for older people are seen as being where other people do things for them, rather than them doing for others.

“We asked all the older men interviewed if they were likely to attend a day centre. Overwhelmingly they said they were most unlikely, except as a ‘last resort’,” Dr Davidson explains. “There is a perception that people are only sitting around, chatting or playing bingo – the sort of things that some older women enjoy doing. There seems to be a stigma attached to going there.”

The research showed that older men do not feel that organisations run specifically for older people are appropriate for their needs, except perhaps as a last resort if they become alone, disabled or otherwise mentally or physically incapacitated. Notions of the masculine imperative of independence and self-reliance persist in later life and contribute to decision-making in terms of seeking professional help, both for social provision and medical consultation.

**Contributing to Future Policing Strategies**

Professor Jennifer Brown is Director of the Forensic Psychology Masters Programme in the School of Human Sciences, and among the areas her research has covered are stress in the police force, cross-cultural comparison of the experiences of policewomen, and investigative aspects of crime. She has contributed in great measure to the postgraduate teaching programme and research at UnS.

Professor Brown conducted a research study with Susan Tait among a small number of female clergy and policewomen to compare and contrast their experiences of their working environments and their perceptions of how male colleagues relate to them. The comparison is relevant because both organisations have a *raison d’être* which involves preservation of order and a caring role. Additionally, both the Police Service and the Church have strong organisational cultures, an inherent tension between masculine and feminine values, a numerical bias in favour of men and an historical reluctance to permit women to serve.

“Policewomen are far more likely than clergywomen to network informally, socialising over a few pints in friendship groups built around their shift system,” comments Jennifer. “The clergywomen take advantage of more formal networks like WATCH (Women and the Church) to meet up to discuss mutual concerns and share problems.”

The women priests did not show any inclination to adopt masculine behaviours whereas women police officers, especially the younger ones, conceded that they did adapt to masculine norms of behaviour. Another interesting finding was that it seemed from the study that identity and self-esteem are more closely associated with masculine values in the Police Service and feminine in the Church.

Another of Jennifer’s publications, jointly authored with Dionne Harleston, reviewed the available research literature on the topic of the experiences of two minority groups in the Police Service; women and black police officers. It also presented findings of a research study conducted in 2001 by Dionne, to gain a better understanding of the perceptions of a number of serving police officers who are black and Asian women. They reported examples of sexist behaviour on the part of male colleagues, but did note that, since the Stephen Lawrence Inquiry, in their words “things have changed for the better”.

Some officers reported that they had joined the Service to help make a difference to attitudes of the police taken by the ethnic communities. Their presence in a police uniform had received both negative and positive responses from the black and Asian community. For a number of them, membership of the Black Police Association had provided support and confidence when issues had arisen. The continuation and development of research at UnS in these areas will help assist society with future policing strategies of benefit to all our communities.
Ensuring Sustainable Futures

The Centre for Environmental Strategy (CES) has been contributing to the evolution of the sustainable development agenda for ten years, seeking to reconcile the techno-economic, ecological and social constraints which limit what people can do on the planet.

The Centre makes effective use of UniS’ strength in multidisciplinary research. Researchers with completely diverse academic backgrounds – engineering, science and the social sciences – are able to combine their skills to bring different approaches to challenges facing the environment. “Multidisciplinarity allows you to address questions of real value to society that cannot even be formulated within a single discipline,” says Professor Roland Clift, the founding Director. “Environmental problems do not fit into one discipline. If you look at the engineering issues alone you miss out on the understandings that other fields can bring to the research and debate on the environment.”

The Centre is particularly known for its work on supply chains. The Centre for Environmental Strategy (CES) is known particularly for its work on supply chains.

The location of CES in the School of Engineering ensures that its work focuses on practical problems, and goes beyond analysis to producing solutions and long-term strategies – “understanding the real world”. The Centre is particularly known for its work on supply chains, based on the analytical approach of Environmental Life Cycle Assessment, sometimes known as “cradle to grave analysis” applied in Life Cycle Management. Industrial Ecology, an emerging field in which CES is a leader, offers a systematic approach to multiple use and re-use of materials and energy.

CES is also a leader in Foresighting and Backcasting, an approach to planning for sustainable development. Dr Walter Wehmeyer and Dr Jonathan Chenoweth in CES, together with Professor Tony Clayton of the University of the West Indies, have been writing a manual aimed at helping the activities of developing countries in supporting drives for innovation and competitiveness. The manual will be published by the Commonwealth Science Council early in 2004.

During the year, CES enrolled its first participants on a unique Masters programme in Environmental Life Cycle Management, supported by a 4-year grant from the EPSRC and accredited by the Institute of Environmental Management and Assessment. The programme is managed by Dr Sarah Cowell and uses a novel “blended” format combining distance with on-site learning to enable workplace-based participation.

Professor Clift was appointed a Distinguished Professor of the University during the year and, in June 2003, was awarded The Royal Academy of Engineering’s prestigious Sir Frank Whittle Medal for “an outstanding and sustained engineering achievement contributing to the well-being of the nation”.

Also during the year, Professor Clift was appointed to the Royal Society and the Royal Academy of Engineering’s working group on nanotechnology. The Academies have been commissioned by the UK Government’s Office of Science and Technology to conduct a study into the potential benefits and possible problems associated with nanoscience and nanotechnology. The study aims to identify the environmental and health and safety uncertainties, together with the ethical and societal implications that may arise from the development of the technology both at present and in the future. The group
includes experts in ethics, health, the environment and consumer concerns, as well as scientists and engineers whose expertise is in nanotechnology.

**Globalisation: Rhetoric and Reality**

To many people the word ‘globalisation’ conjures up images of protestors outside meetings of the International Monetary Fund (IMF), the World Bank, the World Trade Organisation and the World Economic Forum. “Popular discussion of globalisation has typically been long on rhetoric and loose generalisations and short on specifics,” says Professor Graham Bird, Director of the Surrey Centre for International Economic Studies (SCIES). Economists tend to prefer the notion of international economic integration with this covering issues of both trade and finance.

Research undertaken by Graham and his collaborators has, for a number of years, been aimed at supplying a more scientific analysis of some of these issues. The research, part-financed by grants from the ESRC, the British Academy and the Department for International Development, has expanded our knowledge base, has frequently crossed conventional disciplinary boundaries, and has also generated important implications for policy.

Graham is a Visiting Professor at the Fletcher School of Law and Diplomacy, Tufts University in the USA. He has been an adviser to the Independent Evaluation Office of the IMF and is a Visiting Scholar in the IMF’s Research Department. Peter Clark, a senior economist in the IMF’s Research Department recently observed that “Graham has written more ‘good stuff’ about the IMF than anyone else in the world”.

This work has, amongst other things, challenged the conventional view that signing an agreement with the IMF “catalyses” others to lend, a finding that has tremendously important implications at a time when the world is striving to achieve the Millennium Development Goals to encourage economic development and reduce international poverty.

Professor Bird’s research has broken new ground by integrating economics and politics in seeking to explain why some countries make use of the IMF while others do not. Methodologically this research has been novel inasmuch as it combines large sample econometric investigation with case studies of the ‘outliers’ identified by the large sample analysis. Further research has examined the design of IMF conditionality, the poor record of implementation of IMF-supported programmes and why it is that some countries make a prolonged use of IMF resources. It has also examined the effectiveness of debt relief as a way of assisting poor countries. Again, as with many aspects of globalisation, Graham points out that the rhetoric often differs from the reality.

In early 2003 Graham published a book on *The IMF and The Future: Issues and Options Facing the Fund*, which is being widely cited as a balanced and temperate analysis of key aspects of globalisation.
UniS has held its place at the top of The Sunday Times league tables as the UK university which is ‘top for jobs’ since 1997. The statistics published on 14 September 2003 showed that 97.4% of UniS graduates found jobs in the first six months after graduation, beating the University of Cambridge into fourth position.

The Sunday Times comments: “This is the University for Jobs, such is Surrey’s impressive record in graduate employment. It was one of the pioneers of sandwich courses and in its portfolio of largely science-based degrees, 80% feature a ‘professional training year’ in industry. This clearly pays off: not only does Surrey consistently have the lowest rate of graduate unemployment, it also gets 85% of its graduates into graduate-level jobs, compared with the national average of 66%.”

The publication What do Graduates do? produced by the Association of Graduate Careers Advisory Services (AGCAS), shows that degrees which provide work experience provide the best employment prospects. High graduate employment levels at Surrey can be explained by a combination of factors. The majority of UniS degree level courses include a year’s professional training and that, taken together with the vocational nature of the UniS degree and the applied way in which the subject is taught, leads to the development of rounded, well-qualified graduates with strong transferable skills.

The Careers Service at UniS plays a key role in helping graduates find suitable employment. Links with a wide range of employers across the globe are strong and since the quality of UniS graduates is well known, demand remains high.

“There are no ‘black spots’ in our graduate employment record at all,” says Russ Clark, Head of the UniS Careers Service. “The fact that across the board virtually every graduate from the University of Surrey finds employment within six months of graduation illustrates the excellence of our degree programmes and how well they equip our graduates for the real world.”

Civil Engineering graduates featured particularly well in the national employment returns. However, at UniS the picture was even better with not a single civil engineering graduate known to be unemployed six months after graduation. All the UniS civil engineers went to graduate-level positions with an average income of £21,000 (16% above the UK graduate average of £18,000). Other subjects with no notified graduate unemployment at the University of Surrey include: biochemistry, physics, nutrition, mechanical engineering, microbiology, dance, nursing and midwifery.
Young, growing companies from The Surrey Research Park have made the world their marketplace in the past year.

Royal recognition of sales success came to ID Business Solutions (IDBS) in the form of two Queen’s Awards for Enterprise. One award, for outstanding achievement in innovation, was given for their flagship ActivityBase software, which is now used by nearly 200 top pharmaceutical and biotechnology companies. This data management and analysis software is helping to reduce the 15-year lead time and average $800m cost of getting a new drug to market. The second award, for International Trade, acknowledges the fact that over 75 per cent of IDBS’ income is earned abroad.

Yet another accolade for IDBS came when Chairman and CEO, Neil Kipling, won the Southern Region Entrepreneur of the Year Award for Technology and Communication. Neil formed IDBS when he was just 26 and moved to the Research Park six years later, in 1995. The company has benefited from a close relationship with UniS ever since, recruiting five UniS graduates into key positions so far. IDBS has expanded twice into larger premises on the Park and has also opened offices in California, New Jersey and Massachusetts, as well as having partners in Japan. It now employs more than 150 people, 40 per cent of whom are engaged in research and development.

Others companies were also active on the world stage. Disperse Technologies plc continued to sign licence agreements with major multinational cosmetics corporations, whilst beginning a research project to use its technologies in the oral delivery of drugs. This could have far-reaching consequences as most new drugs tend to be poorly water-soluble, making them difficult and expensive to deliver orally. Eventually, this could lead to new methods of drug delivery.

Pixology’s software, which helps underpin the rapidly developing digital photography market, was also adopted by world leaders in the imaging field. Nikon and Konica are both using Pixology’s Intelligent Red-eye Imaging Software Solution – IRISS™ – which tackles the problem with just one click. Red-eye – one of the biggest problems in consumer photography – is caused when light from the flash reflects off blood vessels in the retina. Nikon became the first manufacturer to offer an automatic red-eye removal system as standard with all its cameras. The software is also used in Konica’s R1 Super Minilabs, which produce photographic prints.

From family snaps to blockbuster movies: a mathematical formula developed by Philip McLauchlan and Allan Jaenicke of Imagineer Systems helped add some extra magic to the hit film *Harry Potter and the Chamber of Secrets.*

The pair had met at UniS’ acclaimed Centre for Vision, Speech and Signal Processing (CVSSP), where Philip had been a lecturer and Allan his student. Their software makes removing unwanted objects from film easy. What previously required each frame to be retouched painstakingly by hand can now be done better and more quickly by computer. The secret lies in motion-compensated algorithms that can track a...
moving object, such as a sports car, on film and register how the background changes as it passes. The software knows exactly what is covered up by the passing car at any given moment and copies this background to mask the vehicle.

The CVSSP is enjoying further success with a spin-out company, OmniPerception, which signed a collaborative agreement with the Japanese Sharp Corporation, after the electronics giant had scoured the world for face-recognition software sufficiently compact to fit on its new 1 Megabyte flash memory Smart Card.

OmniPerception, chaired by Centre Director, Professor Josef Kittler, was established with the aid of seed funding from the University to exploit this technology which clearly has massive potential in an increasingly security-conscious world. Its FacialPIN program is so compact and efficient that both the facial image and the algorithm responsible for checking the face can be fitted on the Smart Card. This means the card itself checks the genuine face it already contains against the one just photographed by the security system. Because the true identity never leaves the card, it remains more secure.

The success of the Research Park’s technology companies and its enviable location, close to two major international airports, attracts many individual businesses. But now whole countries are seeing the benefits, too. Norway opened Springboard UK on the Park, in order to help its SMEs access world-class technology and global markets. Nine companies have joined the initiative and three other areas of the UK are now following the Uni’s lead by establishing similar centres.

Lessons learned from the Research Park’s success in promoting and supporting the area’s knowledge-based economy are being exported. Dr Malcolm Parry, Managing Director of the Park, was elected Chair of the United Kingdom Science Park Association, which represents more than 50 UK science parks. One of his first duties was to visit Kenya for a workshop, organised by the Commission for Higher Education, to explore links between universities and industry. He was also invited to visit China and Korea to advise on the setting up and development of science parks.

Raising Guildford’s profile as a world-class location for technology businesses is also on the agenda and the Research Park has sponsored the town’s membership of the World Technopolis Association (WTA). The WTA’s main goals are to promote regional development and prosperity by encouraging co-operation between its membership of 22 ‘science cities’ in 10 countries.

Raising Guildford’s profile as a world-class location for technology businesses is also on the agenda.
Visual multimedia studio in CVSSP.
The recently published Lambert Review highlights the strategic importance of UniS\textsuperscript{direct} in facilitating and strengthening collaboration between UniS and the business community.

There has been a marked change of culture as more UK universities follow UniS’ lead in playing a more active role in the regional and national economy. However, there is still more to be achieved. Universities still need to improve in the identification of their competitive strengths; the Government must continue to support business–university collaboration; and business needs to learn to exploit the innovative ideas generated within the HE sector.

**Protecting and Commercialising Research**
Over the past year, new licence deals have been negotiated on 22 patents, with a large number of licences being secured in software. During the year 23 patents produced a gross revenue of £107,000.

**Promoting Entrepreneurship – SETSquared**
The SETSquared Centre currently incubates eight companies and has granted another four entrepreneurs virtual membership.

Four companies out of five achieved SMART awards – an 80% success rate. Interaction with, and support from, the business community has increased substantially over the year. With 18 corporate partners and the launch of the SETSquared Mentoring Scheme, entrepreneurs have access to invaluable, high-quality advice. SETSquared provides value by fostering the relationship between member and mentor.

**Promoting Entrepreneurship – GRIST**
UniS\textsuperscript{direct}, in partnership with the Universities of Brighton and Kent, has been awarded the opportunity to operate and project manage a £1m SEEDA-funded loan scheme, GRIST – GReat Ideas In Science and Technology.

GRIST is designed to allow aspiring entrepreneurs to create new businesses. It is a valuable addition to the resources UniS provides to help academics and others in the wider community to exploit commercially their ideas and inventions. GRIST loans are available up to a maximum of £20,000 for one year. The loans are interest free and no security is needed. Although GRIST is a pilot scheme, if successful it could be rolled out across the SEEDA region.

Anthony Woolhouse, UniS\textsuperscript{direct}’s Head of Ventures says, “This innovative scheme linked to the SETSquared services provided on the Research Park and the Surrey Enterprise Hub facilities, demonstrates our clear commitment as a university to promote growth of new technology-based businesses in South-East England.”

**Promoting Entrepreneurship – Cascade and the University of Surrey Seed Fund (USSF)**
Following the Higher Education Innovation Fund (HEIF) award to a consortium of universities comprising Royal Holloway, Brunel, Reading, Sussex and UniS, the Cascade seed fund was successfully launched. By the end of 2002 some 65 projects were at the review stage. As a lead partner in the consortium, UniS\textsuperscript{direct} has developed and launched a website for Cascade which is intended to guide putative academic entrepreneurs through the investment criteria and the due diligence involved with the investment decision.

University of Surrey Seed Fund (USSF) loans were advanced to OmniPerception, Si Light, Polametrix, Genie and CXR. Investments in the new ventures, OmniPerception, Genie and Polametrix were completed during the year, and CXR completed in August. Top-up investments in Cybersense and OmniPerception were also
approved with Cybersense completing in September 2002 and Omniperception in September 2003.

Promoting Research, Expertise and Knowledge Transfer

The Lambert Review suggests human interaction to be the most effective form of bringing together universities and the business community. At UniS, this is facilitated through Business Development Managers who conduct business forums to allow academics and industry to come together regularly. This fosters knowledge transfer and helps to create valuable, mutually beneficial, long-term relationships.

During the year, a number of events were held by UniSdirect to stimulate relationships between the University and the region it serves. These included forums on the following topics:

- **Latest Developments in Healthcare Research** (in collaboration with the Royal Surrey County Hospital);
- **Healthcare Telematics** (in collaboration with the Department for Trade and Industry);
- **e-Science** (in collaboration with the School of Electrical and Physical Sciences) – to build partnerships between the University and industry in key areas of Grid application;
- **Shifting Sands** (in partnership with the Centre for Research on Ageing and Gender) – at which care home providers throughout the South-East of England were able to learn how research findings from CRAG could help them;
- **Simulating Reality On-screen** (in partnership with CVSSP and the Digital World Research Centre [DWRC]) – on new techniques used to simulate real-life scenes through motion capture, computer-generated simulation of real-life, and military applications of simulation on-screen and on the battlefield;
- **Bots Mean Business** – in association with the Loebner Prize contest (in partnership with the DWRC) – explored the capabilities and benefits of Chatterbots and related natural language technology in the business world.

Knowledge Transfer Partnerships (KTPs)

In June 2003, the Government announced that TCS would be replaced by Knowledge Transfer Partnerships. The new scheme has become broader and more flexible. Programmes can now last for up to three years and are encouraged across all disciplines.

This year, grants were approved for three TCS programmes: ReNeuron Ltd with SBMS (£115,600); Pankhurst Design and Developments Ltd with Engineering/EIHMS (£32,426) and Premier Tax Free (UK) Ltd with Management (£101,060). UniS currently has five programmes running, and with plenty in the pipeline, the future of KTP looks healthy.

Process Analysis and Automation Ltd (PAA) began a KTP programme with UniS two years ago. PAA received a TCS grant of £140,000 which covered 60% of the project costs. The main sponsor for the two-year project was the Department of Trade and Industry. This part-funded the employment costs of two recent graduates (TCS Associates) to undertake the project and cover travel and equipment costs. In addition, a nominated academic supervisor spent half a day a week at the company to provide expertise.

The programme enabled PAA to introduce new technologies into their software package OVERLORD including distributed control over TCP/IP, Bluetooth communications between PC and instrumental hardware, and a new database feature allowing data transfill to all advanced databases incorporating SQL. It allowed the associates to work on a wide range of automated projects, gaining interpersonal and project management skills, as well as a full range of expertise in automated laboratory systems. The programme fostered a long-term relationship between UniS and PAA, forming a base for future opportunities such as student placements and project work. Work from this project is also being used to develop new courses at the University.

Working with Small to Medium-sized Enterprises (SMEs)

The importance of fostering relationships with the local community and in helping SMEs is paramount. UniSdirect has received in excess of £2m from the European Social Fund to address skills gaps within the SEEDA region, benefiting some 900 SMEs.

Building on the success of the **Women in Business Project**, UniSdirect has been awarded a further £277,000 of European Social Fund research grant to investigate the existing training opportunities/interventions available to female entrepreneurs and to make recommendations for future initiatives.

The Business Training Exchange project managed by UniSdirect aims to train SMEs to anticipate and manage new and emerging situations. As part of this project, UniSdirect worked with a local company, Mission Performance, to provide a course on leadership skills. This consisted of a day in the classroom with Will Carnegie – a skipper in the BT Global Yacht Race – and a day on a yacht, putting theory into practice.
Serving our Region’s Needs:
The Healthcare Workforce Research Centre (HWRC)

The 2001 Census shows that for the first time more people are aged over 60 (21%) than under 16 (20%) and consequently the retirement age is likely to increase. But what impact does this have on the healthcare workforce? And how important is it that we research into the type of workforce required to sustain our economic, social and individual well-being? For the Government, which plans to double expenditure on the NHS over the next decade, research into the healthcare workforce is imperative and remains a priority.

Crucial workforce issues for the health and social care sector encompass universal concerns such as pay and working conditions, the roles, responsibilities and productivity of individual workers, and the impact of organisational structures and technology on human resource management. Emphasis is increasingly placed on the changing age profiles of the workforce.

The Healthcare Workforce Research Centre (HWRC) based at UniS focuses on changing workforce requirements to deliver healthcare.

Professor Karen Bryan, Centre Director, explains, “European and UK government priorities strongly emphasise the need to provide an informed and measurable response to radical changes affecting patterns of productivity, with particular concern for the workforce required to sustain our economic, social and individual well-being. Emphasis is being placed on the changing age profile of the workforce, which will increasingly become more reliant on older people.”

The HWRC brings together a wide range of expertise from across the University including health sciences, sociology, psychology, management and organisational development, health economics, health ergonomics and computing. This expertise is focused to address research related to three interrelated cross-disciplinary themes:

- People – health, well-being and enhancement of individual workers and workforce demography;
- Practice – workers interaction with technology and work systems performance;
- Planning – changing structure of healthcare workforce and how it can be modernised to achieve maximum effectiveness and improved healthcare outcomes.

Four research projects are currently underway:

1. Patient Safety
At the heart of the Government’s current policy is improvement in the quality of healthcare services, with a focus on increasing and strengthening patient safety in the UK.

Previous research shows that about 10% of patients admitted to UK hospitals may suffer some kind of adverse outcome. Although these are mostly minor, a very small number of cases result in severe and even fatal consequences. Patient safety can be put at risk for a number of reasons, for example, through errors in communication, medication errors or through the use of specialised equipment and technologies. This could cost the NHS some £2bn per year in additional hospital stays.

In order to address these issues, UniS has been awarded £250,000 to fund five research networks, which will study the prevention of medical error. This funding has been jointly awarded by the Medical Research Council (MRC), the Department of Health, the Economic and Social Research Council (ESRC), and the Engineering and Physical Sciences Research Council (EPSRC).

Professor Peter Buckle, from the Robens Centre for Health Ergonomics at UniS, is leading one of the research networks to study
Emphasis is being placed on the changing age profile of the workforce, which will increasingly become more reliant on older people.
the prevention of medical error. This network is focused on improving the design of healthcare systems and components, and developing appropriate methods for the evaluation of safety in new designs, especially usability. The research is being undertaken in close collaboration with the University of Cambridge and the Royal College of Art.

Four other research networks overseen by Unis are exploring:

- medication error and the role information technology has to play in reducing it;
- medical errors that occur at general practice level;
- the reduction of medication errors by improving patients’ understanding of their treatment, through the development of computer systems which can create medication information tailored to individual needs;
- how to determine and measure medical error.

Unis is heading a further collaborative project with the Primary Care Trusts, Hospital Trusts and the South-West Thames Faculty of the Royal College of General Practitioners. This project titled, Guidelines and Education for Nurses Imparted Electronically (GENIE), promotes voluntary reporting of events and near misses.

Near misses are important because they illustrate what could occur. The reporting system addresses how the healthcare workforce can reduce avoidable errors and patient harm by examining what can be learned from practice and developing educational feedback that can be delivered electronically.

2. Working with Children and Young People: The UK Observatory for the Promotion of Non-violence

The Government’s Green Paper, Every Child Matters, highlights its aim to reform and improve children’s care. Unis has recently launched a national initiative to address the key issues of aggression, bullying, anti-social behaviour and violence amongst children and young people. The UK Observatory for the Promotion of Non-violence will inform policymakers and provide support and cohesion to the efforts of government, teachers, researchers and the voluntary sector in addressing what has become a serious national problem.

Professor Helen Cowie, the Observatory’s Director states: “The UK Observatory will play a key role in promoting a more joined-up approach to dealing with the root cause of anti-social behaviour and violence amongst children and young people.”

The UK Observatory offers a unique combination of experts in research, practice and training from a range of disciplines, all committed to addressing the issue of violence in education and in healthcare settings. The underlying aim of the Observatory is to heighten awareness of school violence and its underlying causes and to enhance the skills and knowledge of those who work directly with young people. The project will also create and sustain contacts with the other international observatories of school violence in Bordeaux, Quebec and Brasilia.

In conjunction with this project, Unis will host the 4th International Conference on School Violence and Public Policies in 2007. This conference will extend the work already headed by Unis which examines the prevention of violence in healthcare settings.

3. Developing Work Practices and Roles: Speech and Language Therapy (SLT) for Young Offenders

Speech, language and communication are skills that many of us take for granted in our everyday lives. However 2.5 million people have a communication disorder of some kind.

The Speech and Language Therapy project led by Professor Karen Bryan, Director of the HWRC, attempts to help young offenders overcome their communication difficulties, enabling them to access education, social, economic and career opportunities once they are released.

Unis is leading the way in this type of research, as currently speech and language therapy is only available in selected adult prisons. This two-year project, funded by the Helen Hamlyn Foundation, is the first of its kind in putting SLT into young offender institutions and juvenile centres.

The UK Observatory offers a unique combination of experts in research, practice and training from a range of disciplines.
Karen says, “This project is important as prison health is now part of the NHS and because at least 80% of young offenders have difficulty with aspects of communication.”

The project, a partnership between UniS, the Prison Service and local SLT managers, is taking place within Brinsford and Werrington Young Offenders Institutions. It has two main priorities. The first is to initiate therapy services and deliver individual group therapy to young offenders. The second priority is to assess new inmates and scope the overall need for SLT within young offender institutions. The project will develop and pilot appropriate screening materials, assess new entrants and work with the establishments to facilitate the assessment of speech, language and communication needs.

4. The Experiences of Internationally Recruited Nurses (IRNs)

Ground-breaking research at UniS shows that many nurses recruited from overseas are facing racism and exploitation whilst working in the UK. The study, directed by Professors Karen Bryan and Pam Smith with Dr Helen Allan and Dr John Larsen, detailed how IRNs frequently experienced racism and discrimination within the workplace and how their qualifications as competent nurses were questioned.

Internationally recruited nurses felt excluded and isolated within the healthcare sector because of how they were treated by both their colleagues and patients. In general, IRNs were happy with support provided in the NHS but strongly criticised the independent sector.

Commissioned by the Royal College of Nursing, the European Institute of Health and Medical Sciences (EIHMS) report is the first in-depth study into the experiences of IRNs in the UK. It reinforces previous reports, which show that there is an acute shortage of trained nurses in the UK, and it is likely that this will increase in the future. In 2000, two thirds of registered nurses in the UK were aged 40 or older. More than 73,000 of these nurses were aged between 50 and 55 and would expect to withdraw from the nursing workforce in the next five to ten years. The problem of skill shortages is expected to worsen in the future as there will be an increased demand for healthcare, mainly as a result of the UK’s ageing population.

To help meet the demand for nurses, the Government intends to continue recruiting trained personnel overseas. In the last three years over 30,000 new non-UK nurses have registered in the UK, with the number increasing each year. In 2000/01 9,694 IRNs were registered, with the number rising to approximately 15,000 in 2001/02. It is for this reason that studies, like this by UniS and EIHMS, are so crucial to the strength of the healthcare workforce in Britain.

Recommendations by the EIHMS report are as follows:

- Improved induction and adaptation courses for both IRNs and UK staff who work with them.
- Appropriate pay and grading for IRNs to ensure their skills and experience are valued and utilised within healthcare organisations.
- A comprehensive strategy and clear action to tackle racism and exploitation across healthcare sectors.
Surrey in Space

Far right: AlSAT-1 mated with the Cosmos launch vehicle at the Plesetsk Cosmodrome.
Right: AlSAT-1 is prepared for launch at the Plesetsk Cosmodrome.
Below: The Algerian satellite undergoes thermal vacuum testing at the Rutherford Appleton Laboratory in Didcot.
Surrey Satellite Technology Limited (SSTL) launched the first satellite of the Surrey-led international Disaster Monitoring Constellation (DMC) in November 2002. ASAT-1 is Algeria’s first national space asset and encompasses the latest in small satellite technology. During the first months of operation, it has returned outstanding results, demonstrating the microsatellite’s remarkable capability and outstanding performance.

High-resolution cameras, that produce a unique combination of extremely large image area (up to 600x600 km swath width) at a ground sampling distance of 32 metres, are capturing vast areas of the Earth in a single image. On-board solid-state recorders enable 1 Gbyte of data to be stored for transmission to the Algerian ground station in Arzew.

Reviewing the results, SSTL’s CEO, Professor Sir Martin Sweeting, says: “AISAT-1 has met and exceeded our very high expectations. We are particularly pleased for our customer and DMC partner, the Centre National Techniques Spatiales (CNTS), who have taken their first step into space with a truly innovative and important mission.”

Imagery from the satellite has been used for soil and land classification, watershed and other hydrological mapping, and to create Geographical Information Systems (GIS) for managing water resources. CNTS has been inundated with imaging requests from Algerian government departments, including topographical data to determine the breeding areas of desert locusts. New flushes of vegetation have been highlighted across a very wide area and assisted teams on the ground to target these potential locust breeding grounds.

CNTS Director, Dr Oussedik, said: “Algeria is proud to join the community of space faring nations and to have this opportunity by working with Surrey and the UK to achieve our first satellite in orbit. This project has trained Algerian specialists to bring the benefits of space to our nation and its people.”

The Disaster Monitoring Constellation will comprise five satellites constructed at the Surrey Space Centre. This innovative concept, designed by SSTL, brings together a unique partnership of nations, Algeria, China, Nigeria, Turkey and the UK, and provides a sustainable space programme for those who might otherwise be unable to afford their own independent space capability. As partners, these countries are able to reap the benefits of sharing a powerful resource – not one satellite but five. The DMC’s Earth imaging data is already attracting considerable commercial interest that will lead to the generation of income from each satellite – an important element of any sustainable space programme.

The DMC imagery, in partnership with Reuters AlertNet, will be available openly to serve the needs of the international disaster relief community. As a national resource, each satellite will provide remote sensing services for such needs as agricultural monitoring, land use, urban planning, water resource management, coastal desertification and geological surveys.

Further advances in technology will be demonstrated with a satellite for the DMC currently being built at the Surrey Space Centre. The £8.5m contract for an advanced Earth observation microsatellite for the Chinese Ministry of Science & Technology, was won in competition with the established Chinese space industry and marks a major achievement for SSTL.

Weighing 140kg, the satellite will provide a higher resolution 4-metre panchromatic imaging system, as well as a 32-metre multispectral camera. Data from the satellite will be used for mapping Chinese territory, and the Beijing Government will use it to help monitor and improve pollution standards leading up to the Olympic Games to be held in Beijing in 2008.

In another major achievement, SSTL has been selected by the European Space Agency (ESA) to undertake the critical first step in Europe’s largest space venture yet – the Galileo global navigation system. In a contract worth £20m, SSTL is building the Galileo System Test Bed (GSTB-v2A) satellite platform. The satellite will enable ESA to obtain an early experimental signal for the demonstration of Galileo technology and test key European technologies in the harsh space environment that the operational Galileo satellite will encounter. The results from the GSTB-v2A mission will be taken into account in the follow-on projects that will develop the full Galileo constellation of 30 satellites. Having an in-orbit test bed satellite will greatly reduce the technical risks in the development of the full constellation.

Lord Sainsbury, Britain’s Space Minister, said “The European Space Agency’s decision to award such an important contract to a UK company is recognition of the leading-edge innovation and expertise of our space industry. SSTL have a track record in building small, innovative satellites for specialist needs and producing high technology solutions to challenging timescales.”
Sport at Surrey is an inclusive activity. UniS numbers British and European champions amongst its student body, but it also reaches out into the community to provide access to sporting facilities for those who might otherwise be unable to participate in sport of any kind.

The Elite Sports Programme
The Elite Sports Programme enables students to combine study whilst training at a level that will allow them to achieve their sporting ambitions. Kirsten Lawton is a British and European trampolining champion. She is studying psychology with the ambition to become a criminal psychologist. Kirsten seems to take success in her stride and has an excellent approach to the pressures of being a world-class trampolinist while studying for a degree, something she attributes to the programme. “The funding obviously helps,” she says, “but I have received great support which has been invaluable in enabling me to combine my academic and sporting careers. It’s great to feel part of a team.”

The incredible commitment of the volunteers is highlighted by many parents as being a key to the success of the Sports Club. John Collins is a lively 10-year-old boy with Downs Syndrome who attends the Club. His parents, Martin and Linda says: “The volunteers are wonderful and give John the one-to-one coaching and support he needs. He really looks forward to his Saturday morning sessions; it is the highlight of his week. Long may the Sports Club continue.”

Visit by University of Pennsylvania Squash Team
With a combination of a large donation from an alumnus and contacts from when he was coach at the Roehampton Club, Craig Thorpe-Clark was able to bring his entire squash squad from the University of Pennsylvania for a week in England. The Penn team was using the visit to the UK as an intensive training camp before a league programme which involves matches with seven other Ivy League universities. They were looking for a match to challenge them and they certainly got what they wanted when they visited the Varsity Centre. They received a friendly drubbing from a UniS team comprising members of the National League Team, Varsity Club members and students.

The visit was co-ordinated by UniS Performance Director for Squash, Ian Robinson, Ian Woodley and Director of Sport, Barry Hitchcock. Whilst in Guildford, the Penn squad was received at the Guildhall by the then Mayor, Councillor Tony Phillips. The Vice-Chancellor, Professor Patrick Dowling met the squad before the match and presented Penn’s Associate Athletic Director, Mary DiStanislao, with a satellite image of South-East England, taken on the morning of the visit, as a memento.
University of Surrey Elite Sports Programme 2002-2003

- Olu Baptist: Athletics
- Peter Holden: Rifle Shooting
- Trish Davey: Kayaking
- Cameron Johnson: Pole Vaulting
- Catherine Christmas: Ice Skating
- Kirsten Lawton: Trampolining
- Claire Hannon: Kayaking
- Stuart Davis: Water-skiing
- Andrew Kelly: Kayaking
- Jennifer Harris: Ice Skating
- Hayley Tribe: Synchro Swimming
- Hannah Gilbert: Athletics
- Mohammed Rahim: Athletics
- Claire Tutt: Horse Riding – dressage

Left: UniS alumnus and gymnast, Ross Brewer, won a team gold medal at the Commonwealth Games held in Manchester in 2002. Recently, he became the British Men’s Gymnastics Champion and was featured in an advertising campaign by Mercedes Benz cars. Ross has his sights firmly set on competing in the 2004 Summer Olympic Games to be held in Athens.
Cross-Cultural Music and Dance Performance

This year, the School of Arts launched the Research Centre for Cross-Cultural Music and Dance Performance sponsored by the Arts and Humanities Research Board. The Centre is a collaboration between three pioneering and established departments that lead their respective academic fields in Britain: The School of Arts at UniS, the Department of Music at the School of Oriental and African Studies (SOAS), and the School of Arts at the University of Surrey Roehampton (USR).

In its research, the Centre, directed by Professor Janet Lansdale, addresses questions raised by the performance of sound and movement, particularly within Asian and African artistic practice, seeking a symbiosis between the performance concerns of ethnomusicology and musicology, and exploring analysis methodologies utilised in theatre and dance research. The Centre will invite Asian and African experts to work with its researchers so that different forms of knowledge can be brought together.

The AHRB Research Centre co-ordinates the research of 25 academics and performers from SOAS, UniS and USR. The Centre also enhances the existing research of all three departments, supports strategic elements in existing research programmes and contributes to postgraduate training. It develops strategies for the study of performance, offers opportunities for joint research and introduces ethnomusicology to UniS.

UniS is heading two of the seven research projects: New Directions in South Asian Dance and Post-colonial Identity Construction, and Transformations in African Music and Dance Performance.

New Directions in South Asian Dance and Post-colonial Identity Construction

Led by Dr Janet O’Shea this project explores concepts of tradition and transformation within South Asian Dance practices and investigates how they inform post-colonial identity formation. This will be achieved by working with British-based and international South Asian artists in residence at UniS, Roehampton and SOAS and by carrying out fieldwork in India and Sri Lanka.

The project explores how dance practices inform post-colonial and immigrant identity formation. It will address questions of modernity as well as those of tradition.

Janet O’Shea says, “This is a fascinating area of research, as through analysing dance movements and choreography, you are able to pinpoint where a dancer originates from, right down to a particular village. Dance movement says more about a culture than a dialect.”

Janet will explore questions such as whether the notion of ‘tradition’ is still relevant to present-day dance practice and whether it will be replaced by ideas of ‘classicism’ indicating a clarity of aesthetic principles.

Transformations in African Music and Dance Performance

This project, led by Jean Johnson-Jones, is unique in the way it combines dance and music research with ethnographic data collected in Britain and Africa.

With globalisation and the increasing movement of musicians and dancers around the world, the project is timely since it addresses a shift in the scholarly study of ethnochoreology and ethnomusicology, in which data is collected both ‘at home’ and ‘in the field’. The project explores the transformation of African contemporary performance and practice in relation to changing criteria and modes of performance and production in Britain and the home environment.

The research questions addressed explore culturally-learned responses to rhythm and tempo, particular music and dance styles, group dynamics and dance vocabulary, in order to analyse transformations in dance and music relationships, practice, vocabulary and aesthetic perception.

Transformation is important where dance and music is recorded, where local genres are put on national and international stages, and where group participation in performance is varied. The Centre therefore extends existing theoretical frames through the emphasis on collating different elements such as social and cultural, performer perceptions and scientific analysis.

The Centre will invite Asian and African experts to work with its researchers.
The Year in Brief...

1. Tim Radcliffe (centre) receives the prestigious 2002 Hotel & Catering International Management Association (HCIMA) Hospitality Award for ‘Best Hospitality Management Student’. He is flanked by HCIMA Chief Executive Phillipe Rossiter (left) and HCIMA President Alistair Telfer (right).

2. Lord May of Oxford, President of The Royal Society, gave the 2002 Leggett Lecture, Science Advice, Policy Choices and Public Confidence. During his visit he inspected a Variegated London Plane tree which he had planted on campus in 1996.

3. Students’ Union Communications Officer, Richard Watts, spent a day shadowing the Vice-Chancellor. Richard is pictured here with his favourite reading matter as he joined the VC in his car for a trip to London!

4. Professor Peter Buckle, from the Robens Centre for Health Ergonomics in the European Institute for Health and Medical Sciences, published research which showed that young and inexperienced electric guitar players may be at particular risk of developing musculoskeletal problems, such as Repetitive Strain Injury (RSI).

5. Professor Josef Kittler, Director of the Centre for Vision, Speech and Signal Processing, was awarded the Institution of Electrical Engineers’ achievement medal for his continuing contribution to the field of engineering.
The Year in Brief...

4 Dr Mike Dexter (second right), Director of the Wellcome Trust opened the new laboratories in the School of Biomedical and Molecular Sciences.

7 Pat Cox (seated), President of the European Parliament, gave a lecture at the invitation of the School of Management.

8 Jane Mefo (right), PhD student from the School of Electronics and Physical Sciences recently presented a poster of her research at a reception in the House of Commons. She is pictured here with local MP Sue Doughty, who attended the event to meet Jane and discuss her work.

9 Students from the University turned back the clock in RAG week, dressing in Victorian costume, to raise over £1,500 for Breakthrough Breast Cancer.

10 Alfredo Perl, the world-renowned Chilean pianist, made his first visit to Guildford to play a recital at the University in the first week of the Guildford Music Festival.
Rachel Hale (third from left) is a BSc Psychology student on placement in Uganda with an organisation called Youth for Development, part of VSO. She is pictured here at a project run by the AIDS Orphans Education Trust, to which she was attached during her professional training.

Youngsters from 14 local schools enjoyed a fun-filled day of chemistry at the Salters’ Festival of Chemistry, in an activity in which both chemistry and fashion skills were required.

Margaret Hodge (far left) visited UniS when she was Higher Education Minister and toured the ATI and the Management School. She is pictured here meeting Students’ Union Sabbatical Officers and local young people to discuss their concerns about the future funding of higher education and graduate debt.

Professor Sir Harry Kroto (right) presented the 2003 Innovation Lecture, 2010 NanoSpace Odyssey. He is pictured here being welcomed to the University by Professor John Turner, Deputy Vice-Chancellor.

A new publication, Trees at Surrey, was published, listing 100 of the most notable trees and shrubs on the campus, with a map showing their position, and giving details of their planting date.
Thirty Year Ten students from local schools spent a day at UniS, taking part in exciting aerospace activities organised by the Educational Liaison Centre in association with the School of Engineering.

The relaunch of the TCS as Knowledge Transfer Partnerships gives small and medium-sized enterprises access to funding to support university graduates for up to three years while providing expertise and skills to business. ReNeuron Ltd is a local company which has benefited from the previous TCS programme. The company’s Chief Scientific Officer, Dr John Sinden (left), is pictured here with Professor Peter Goldfarb, Head of Biochemistry in the School of Biomedical and Molecular Sciences.

The University sponsored a floral display, The Eden Project, in the Cathedral Flower Festival during June.

A brand new web-based facility Surreyjobs.info was launched in early July, linking 20 public sector organisations across the county, including UniS, to facilitate applicants’ access to information about employment in the public sector in Surrey.

The Loebner Prize Contest was hosted this year by the Digital World Research Centre at UniS. The competition sought to find chatterbots (talking computers) which can communicate indistinguishably from the human brain. Finalists in the competition were (from left to right) Vladimir Veselov (Eugene Goostman) Rollo Carpenter (Jabberwacky) and Fred Roberts (Elbot).
The University has achieved a financial surplus of £3.063m which exceeded budgetary expectations. The University’s cash position continues to be robust and this is necessary given that there is a continuing requirement for further substantial investment.

There are several reasons for this improved result. 2002/2003 out-turn overall, Academic Schools have met their budget targets without need for recourse to central contingency provisions. The University’s Research Park, which largely comprises the Foundation Fund, has achieved a surplus better than forecast despite challenging trading conditions in the property letting market.

The University’s subsidiary companies also achieved profits in excess of forecast mainly due to the improved performance of Surrey Satellite Technology Ltd (SSTL), the University’s principal trading subsidiary.

The University’s Executive Board has operated an incentive scheme as part of devolved financial arrangements which rewards those Schools which achieve out-turns better than budget.

### Income and expenditure accounts
for the year ended 31 July 2003

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Funding Council grants</td>
<td>35,313</td>
<td>31,159</td>
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<tr>
<td>Academic fees and support grants</td>
<td>39,939</td>
<td>34,649</td>
</tr>
<tr>
<td>Research grants and contracts</td>
<td>22,317</td>
<td>22,511</td>
</tr>
<tr>
<td>Other operating income</td>
<td>44,167</td>
<td>33,871</td>
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<tr>
<td>Endowment and trust income and interest receivable</td>
<td>9,216</td>
<td>9,263</td>
</tr>
<tr>
<td>Total income</td>
<td>150,952</td>
<td>131,453</td>
</tr>
<tr>
<td>Expenditure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff costs</td>
<td>75,900</td>
<td>69,028</td>
</tr>
<tr>
<td>Other operating expenses</td>
<td>60,871</td>
<td>48,409</td>
</tr>
<tr>
<td>Depreciation</td>
<td>7,113</td>
<td>6,442</td>
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<tr>
<td>Interest payable</td>
<td>4,094</td>
<td>4,120</td>
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<tr>
<td>Total expenditure</td>
<td>147,978</td>
<td>127,999</td>
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<tr>
<td>Surplus on continuing operations after depreciation of assets and before tax and minority interests</td>
<td>2,974</td>
<td>3,454</td>
</tr>
<tr>
<td>Taxation</td>
<td>122</td>
<td>(213)</td>
</tr>
<tr>
<td>Surplus on continuing operations after depreciation of assets and tax and before minority interests</td>
<td>3,096</td>
<td>3,241</td>
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<tr>
<td>Minority interests</td>
<td>(33)</td>
<td>4</td>
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<tr>
<td>Surplus for the year</td>
<td>3,063</td>
<td>3,245</td>
</tr>
</tbody>
</table>

### Balance Sheet
as at 31 July 2003

<table>
<thead>
<tr>
<th></th>
<th>Consolidated 2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tangible assets</td>
<td>99,193</td>
<td>92,990</td>
</tr>
<tr>
<td>Investments</td>
<td>27,075</td>
<td>25,087</td>
</tr>
<tr>
<td>Endowment asset investments</td>
<td>57,870</td>
<td>61,487</td>
</tr>
<tr>
<td>Current assets</td>
<td>1,122</td>
<td>1,318</td>
</tr>
<tr>
<td>Stocks and stores in hand</td>
<td>23,894</td>
<td>21,116</td>
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<tr>
<td>Debtors</td>
<td>13,858</td>
<td>4,423</td>
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<tr>
<td>Investments</td>
<td>9,479</td>
<td>4,416</td>
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<tr>
<td>Cash at bank and in hand</td>
<td>57,870</td>
<td>61,487</td>
</tr>
<tr>
<td>Total assets less current liabilities</td>
<td>189,030</td>
<td>170,511</td>
</tr>
<tr>
<td>Creditors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amounts falling due within one year</td>
<td>(43,461)</td>
<td>(40,326)</td>
</tr>
<tr>
<td>Net current assets/(liabilities)</td>
<td>4,892</td>
<td>(8,053)</td>
</tr>
<tr>
<td>Total assets less current liabilities</td>
<td>189,030</td>
<td>170,511</td>
</tr>
<tr>
<td>Creditors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amounts falling due after more than one year</td>
<td>(57,268)</td>
<td>(46,363)</td>
</tr>
<tr>
<td>Provisions for liabilities and charges</td>
<td>(1,232)</td>
<td>(1,194)</td>
</tr>
<tr>
<td>Total net assets</td>
<td>130,530</td>
<td>122,954</td>
</tr>
<tr>
<td>Deferred capital grants</td>
<td>24,271</td>
<td>16,061</td>
</tr>
<tr>
<td>Endowments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific</td>
<td>3,873</td>
<td>1,891</td>
</tr>
<tr>
<td>General</td>
<td>53,997</td>
<td>59,596</td>
</tr>
<tr>
<td>Endowments</td>
<td>57,870</td>
<td>61,487</td>
</tr>
<tr>
<td>Reserves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restricted reserves</td>
<td>1,018</td>
<td>1,166</td>
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<tr>
<td>Revaluation reserve</td>
<td>0</td>
<td>946</td>
</tr>
<tr>
<td>Income and expenditure account</td>
<td>46,534</td>
<td>43,284</td>
</tr>
<tr>
<td>Total funds before minority interests</td>
<td>129,693</td>
<td>122,944</td>
</tr>
<tr>
<td>Minority interests</td>
<td>53</td>
<td>10</td>
</tr>
<tr>
<td>Total funds</td>
<td>129,746</td>
<td>122,954</td>
</tr>
</tbody>
</table>
6,023 students undertook Continuing Professional Development provided by UniS or pursued other courses not leading to an award at the University.

At our Associated Institutions (not including University of Surrey Roehampton), 4,865 students were registered for awards of UniS.

* The majority of part-time undergraduate students are pursuing programmes in Combined Studies.

Students registered at the University of Surrey Roehampton gained 2,326 awards. 1,518 First Degrees, 22 Undergraduate Diplomas and Certificates, 595 Postgraduate Diplomas and Certificates, 168 Masters Degrees, 23 Doctorates.

In addition, students registered at our Associated Institutions gained 1,772 awards, 1,095 First Degrees, 185 Undergraduate Diplomas and Certificates, 335 Postgraduate Diplomas and Certificates, 153 Masters Degrees and 4 Doctorates.
The Federal University of Surrey

University of Surrey, Guildford, Surrey, GU2 7XH
University of Surrey Roehampton, Senate House, Roehampton Lane, London, SW15 5PU

USR Associated Institutions

Centre for British Teachers
• PGCE: Secondary by Distance Learning validated since 1996

School Centre Initial Teacher Training
• Consortium based in London, West Midlands and the South West
• PGCE Secondary in Design and Technology, Mathematics and Modern Foreign Languages validated since 1993

SCITT Devon Performing Arts
• Associated with Roehampton since 1990
• Offers PGCE Secondary in Music and Drama, validated by USR

HMS Sultan, Gosport, Naval Department
• MSc and PG Diploma validated by the University
• Associated institution since 1985

North-East Surrey College of Technology (INESCO)
• Specialises in vocational education with a full range of FE and HE programmes
• Associated institution since 1979
• BSc and MSc degrees validated by the University

The Pre-Retirement Association (PRA)
• Specialises in mid-career and pre-retirement education
• Associated institution since 1996
• Offers PG Certificate and MSc validated by the University

The Pre-Retirement Association (PRA) SCITT (Agency for Jewish Education)
• Associated with Roehampton since 2000
• Offers PGCE Primary, validated by Roehampton

Westminster Pastoral Foundation
• Associated with Roehampton since 1994
• Offers MA in Psychoanalytic Psychotherapy, Postgraduate Diploma MA in Supervision of Counselling and Psychotherapy, MA in Group Analytic Psychotherapy and Postgraduate Diploma MA in Psychodynamic Counselling validated by Roehampton

Southern Theological Education and Training Scheme (STETS)
• Certificate, Diploma and BA in Christian Ministry and Mission validated by the University
• Associated institution since 1999

St John’s Seminary
• Course of preparation for the Roman Catholic priesthood, including Bachelor of Theology validated by the University
• Associated institution since 1984

St Mary’s College – A College of the University of Surrey
• Catholic college of HE established 1850
• College of the University since 1992, accredited 1996
• BA, BA IT, BSc, PGCE, MA and MSc degrees accredited by the University

Wimbledon School of Art
• Specialist school of art and design
• Accredited institution since 1994
• BA and MA degrees accredited by the University

USR Associated Institutions

• Offers PGCE Secondary in Music and Drama, validated by the University
• Associated institution since 1996

Farnborough College of Technology
• Vocationally orientated institution offering a wide range of FE and HE programmes
• Accredited institution since 2002
• Foundation, BA, BSc and MSc degrees validated by the University

The Advanced Technology Institute

Research & Enterprise

Staff

Teaching & Learning

Contents

Vice-Chancellor’s Introduction

Focus on:

- Teaching & Learning
- Staff
- Research & Enterprise

World-Class Research Excellence:
The Advanced Technology Institute

Contribution to a Healthier Society

In Tune with Society’s Needs

Serving our Region’s Needs:

Graduate Employment

Springboard for Success on the World Stage

The Healthcare Workforce Research Centre

Survey in Space

Sport and Culture at Surrey

The Year in Brief

Preliminary Financial Statements

Faiths & Figures

The Federal University of Surrey

AN INTERNATIONAL UNIVERSITY SERVING A WORLD-CLASS REGION