



Science and Technology

at Lancaster



ANNUAL REPORT 2011

www.lancs.ac.uk/sci-tech

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Professor Mary Smyth
Dean of The Faculty of Science & Technology

In 2010/11 Science and Technology consolidated its strengths in research, teaching, and student recruitment, and positioned itself for growth. Our A-level grades have continued to rise, our students are successful in their studies, find employment, and rate their experience highly in the National Student Survey. Yet again we have increased our numbers of undergraduate and postgraduate students and we have maintained a stimulating mix of students and staff from across the world. Our financial position remains robust and research income is being diversified to meet external challenges. At the time of the last report we had established a total of three doctoral training centres in which we paid a key part and we are now part of five. Responding to challenges and working with others across boundaries continue to be core qualities in Science and Technology.

Internationalisation continues to be one of our major themes. Our work with overseas partners especially Comsats in Pakistan, GD Goenka World Institute in India, and Sunway University Malaysia, continued during the year, with new engineering programmes established at Goenka. We have deepened our research links with China and developed a PhD programme with Brazil.

Energy Lancaster was formally opened in March 2011. This was followed by a sandpit event which brought together colleagues from across the university to focus on innovation in energy research. A second major research and innovation theme, Security Lancaster, has been developed, led by Professor Awais Rashid, Dr Dan Prince and Dr Paul Taylor. Colleagues from across the faculty have come together to set up an agenda which will establish Security Lancaster as a broad theme across the faculty and across the university.

A major new research facility in Physics, the Quantum Technology Centre was under development during the year. Professor Yuri Pashkin has been appointed to the new unit, and major investment in infrastructure was planned. The potential for further development in Engineering was recognised by the initiation of a major refurbishment programme for the Engineering Department and for a major expansion in staff numbers. A new degree in chemical engineering was established.

We restructured our business partnerships and enterprise activity during the year. Dr Mark Bacon was appointed Director of Business Partnerships and Enterprise and led an integrated bid to the university for HEIF funding to develop a comprehensive programme of business development across energy, security, ICT, health and human development, and quantum technology. This builds on and extends our commercialisation activities led by Professor Bahram Honary.

Outreach and work with schools is an important part of faculty activity. In 2010/11 we took part in the Big Bang Festival, National Science and Engineering week, and held a very successful science taster day for school students. Our student ambassador group (Lancaster University Science and Technology Ambassadors or LUSTA) played a very important role in helping to convey the positive aspects of study in science and technology in our outreach activities.

“We have had an extremely active year, and the remainder of this report describes some of our achievements and introduces some of the outstanding staff from around the Faculty who make these achievements possible. We hope that you are interested in the work of the Faculty this year. While the higher education landscape is changing quickly, we believe that Science and Technology at Lancaster is well placed to respond positively and to grow.”

Professor Mary Smyth
Dean of the Faculty of Science
and Technology

Excellence in Research Major Grants Awarded

The following major grants were awarded during 2010/11:

NAME	DEPARTMENT	FUNDER	TITLE	AMOUNT
Shaun Fisher	Physics	EPSRC	Quasiparticle imaging & superfluid flow experiments at ultralow temperatures	£935,986
Aneta Stefanovska	Physics	EPSRC	Physics of non autonomous systems in life sciences	£448,323
Tony Krier	Physics	EC	FP7: Prophet	£434,086
Idris Eckley	Maths & Statistics	EPSRC	LETS: Locally stationary energy time series	£272,981
Thomas Jaki	Maths & Statistics	NIHR	Career development fellowship	£320,292
Idris Eckley	Maths & Statistics	Unilever	Multiscale analysis of non stationary time series	£287,000
Hans Gellersen	Computing & Communications	EC	FP7: iCARENET	£422,084
Nigel Davies	Computing & Communications	EPSRC	FAITH	£306,824
Laurent Mathy	Computing & Communications	EC	FP7: CHANGE	£398,142
Colin Boxall	Engineering	EPSRC	MBASE	£275,852
Nick Hewitt	LEC	NERC	Trace gas emissions from Amazonia influence secondary organic aerosol (CLAIRE UK)	£489,263
Andy Jarvis	LEC	EPSRC	Integrated assessment of geoengineering proposals	£247,671

“The past year has seen Lancaster University moving up in the UK University rankings. This uplift is due to staff effort on multiple fronts, not least research. The Faculty of Science and Technology accounts for more than two-thirds of the research income of Lancaster University, testimony to the vibrant research environment the Faculty offers researchers.”

Professor Mike Kosch
Associate Dean for Research

Safety of Spent Nuclear Fuel

A consortium of universities including Lancaster University, University of Cambridge and Imperial College, have been awarded £770k to investigate the safety of spent nuclear fuel and its degradation in the environment. Professor Colin Boxall from the Engineering department will be looking specifically into the corrosion behaviour of the radioactive nuclear fuel material uranium dioxide over time in ground water. The study is funded by the EPSRC and the Nuclear Decommissioning Authority (NDA) and is the first of its kind to be funded in the UK.

Social Networking Tool for Travellers

The School of Computing and Communications has been awarded £1.6m to develop a new travel information system. Our Travel will develop an application for mobile devices like iPhones so that road and rail users can share up-to-the-minute information with each other about their journey. The aim is to reduce congestion and improve the transport system as users will be able to decide how and when to travel based on the information provided. Our Travel is part funded by the Technology Strategy Board, and developed and trialled by Lancaster University in collaboration with In Touch Ltd and Carillion plc.

Excellence in Research Major Grants Awarded



Dr Mick Denton from the Space Plasma Environment and Radio Science (SPEARS) group at the Department of Physics

Collaboration with the British Antarctic Survey to Understand “Killer Electrons”

The British Antarctic Survey and Lancaster University are collaborating on a £400,000 project to understand how particles from space affect the Earth's atmosphere. The aim of the study is to find out more about so called “killer electrons” which are periodically discharged from the Van Allen radiation belt into the high atmosphere above the Earth, particularly at polar regions. These electrons and ions can change the chemistry of the atmosphere, with possible implications for climate change, and can damage orbiting satellites and spacecrafts. The five year project, which involves Dr Mick Denton from the Space Plasma Environment and Radio Science (SPEARS) group at the Department of Physics, will see two radio receivers installed in Antarctica as part of a global network of receivers set up by the AARDDVARK consortium of international universities from Australia to South Africa and Hungary.

European Knowledge Transfer Network

Lancaster University is playing a leading role in a new European knowledge transfer network. Part-funded by the European Union, the €8.5 million project brings together a partnership of universities, innovation support agencies and regional governments to provide innovation and technology support to Small and Medium Enterprises (SMEs) across North West Europe, boosting the region's competitiveness in global markets for low carbon and environmental goods and services. Lancaster Environment Centre and Lancaster University Management School are leading the work package overseeing the development of 300 transnational collaborative projects between universities, innovation support agencies and SMEs. Over the next three years, the partnership aims to grow membership of the network to over 500 organisations.

Excellence in Research New Research Developments

"In bringing together energy related research from Science and Technology, Management and Social Sciences we create a critical mass of researchers coming at the same problem from different angles. Energy Lancaster will give us another platform to share our ideas, knowledge and discoveries in this important field, ultimately enabling us to have a greater impact on the world around us."

Professor Colin Boxall
Director of Energy Lancaster



Energy Lancaster Launch

Energy Lancaster

Charles Hendry MP, Minister of State for Energy and Climate Change officially launched Energy Lancaster during an exhibition and symposium held in March 2011. The centre brings together expertise in areas including energy policy, nuclear energy, carbon management, wet renewables, photovoltaics and photocatalysis, e-Energy, transport and transport usage and energy economics. Researchers at Energy Lancaster are currently working on 47 energy-related projects worth in excess of £7m.



Charles Hendry MP
Minister of State for Energy & Climate Change

"The sort of problems the Centre will be taking on are key to the national drive to move to a low carbon economy. I hope that by bringing together our best and brightest on a wide range of energy research issues, the Centre's work will help us reduce emissions and deal with climate change at the same time as keeping the lights on."

Charles Hendry MP
Minister of State for Energy & Climate Change

Excellence in Research Research Success



From Left: Professor Jianhua Zhang, Vice Chancellor Professor Paul Wellings, Distinguished Professor Bill Davies, Dr John Kirkegaard and Matthew Reynolds

International Food Security

Lancaster University hosted the International Food Security and Safety Meeting from 13-15th September, where experts gathered to address the problems of global food production at a time of population growth and climate change.

Themes of the meeting included food security in China and Africa, sustainable intensification and Europe's response to the food security challenge. The plenary speaker was Dr Gebisa Ejeta from Purdue University, Winner of the 2009 World Food Prize, while other contributors included Lancaster alumnus Professor Jianhua Zhang from the Hong Kong Baptist University, who was featured as one of five crop researchers who could change the world in "Nature". Speakers from Science and Technology included Dr Saskia Vermeylen (LEC), Professor Felix Wackers (LEC) and Dr Ken Wilson (LEC).

The meeting was organised by Distinguished Professor Bill Davies (LEC) together with the Society for Experimental Biology, with support from the Royal Society, Research Councils UK, Waitrose, the Journal of Experimental Botany, The Horticultural Development Company and the British Council. This meeting has since led to the formation of an 'International Food Security Alliance' with Lancaster as the lead.

Find a Better Way

'Find a Better Way' is a new charity founded by Sir Bobby Charlton and was registered as a charity with the Charity Commission on 29 March 2011. The Engineering Department is a founder member of the scientific board and panel of experts, and Professor Mary Smyth serves on the Board of Trustees.

The objectives of the Charity are to:

- Carry out research to help individuals whose lives have been affected by conflict and war, and to disseminate the results of such research.
- Relieve suffering and distress and preserve and protect human health, throughout the world, particularly in areas which have been affected by conflict and war.
- Advance education, particularly in the area of alleviating suffering and distress which has resulted from conflict or war.



From Left: Mr Robert Mackin, Research Fellow, Engineering Department, Professor Malcolm Joyce, Head of Engineering Department, Sir Bobby Charlton, Vice Chancellor Professor Paul Wellings

Distinguished Lecture Series

The 2011 lecture in the Faculty's distinguished lecture series was given by Professor Christoph Gerber, Director for Scientific Communication, National Center of Competence in Research Nanoscale Science, University of Basel.

The Christmas Conference

Speakers at the 2010 Faculty Christmas conference included Julian Ellis from the European Commission who spoke about "Future and emerging technologies - pathfinder research in the EU" and Professor Rachel Cooper from LICA whose talk asked 'Why does the EPSRC fund design? Putting the D in STEM.'

Poster Session

The 2010 Christmas Conference postgraduate poster session offered a great opportunity for students to share their work, and practice communicating their research for future conferences. Sustained over-subscription to the event is testimony to the value of the session for all researchers at the beginning of their research journey.

“During 2010/11, programmes within Science and Technology have seen a significant increase in home/EU applications, approximately 36% up from the previous year. In particular, Mathematics and Statistics saw a record number of applications which represented a 70% increase on 2009/10. Our undergraduate provision continues to score highly in the National Student Survey, with final year Natural Science students indicating 100% satisfaction with their course. We continue to explore new ways of engaging with schools and with employers and 2011 saw the launch of LUSTA (Lancaster University Science and Technology Association) which aims to connect students and enterprises to respond to the science challenges of tomorrow.”

Dr Jane Taylor,
Associate Dean for
Undergraduate Teaching

League Table Success for Science and Technology

Lancaster University was ranked 7th out of 120 UK institutions in The Guardian Guide 2012. Individual Science and Technology subjects scored highly with: Physics, Geography and Environmental Sciences being ranked 4th in the UK, Mechanical Engineering ranked 5th, Mathematics ranked 6th and Computing and Communications ranked 11th in the UK. Physics scored 100% for course satisfaction and 96% for teaching. These subjects also ranked highly in the Times Good University Guide with Physics being ranked 3rd in the UK, Geography and Environmental Sciences ranked 6th and Mathematics ranked 9th. The guides assess Universities on everything from student/staff ratios, career prospects of graduates and how content final year students are with their course.

Science and Technology Vision Prize

Dr Coral Dando from Psychology was awarded this year's Faculty prize for Excellence in Teaching.



Dr Coral Dando



Science and Technology Schools Events

A number of events have run throughout the year designed to stimulate pupils' interest in Science and Technology subjects. During National Science and Engineering week, 160 pupils from seven local schools attended workshops and challenges across the Faculty including the Engineering and Physics Bottle Rocket Challenge and Enercities competition. The Science and Technology taster day gave 250 students from across Cumbria and Lancashire a chance

to meet current University students and get a taste of Science and Technology subjects through discussing the future of mobile phone applications to becoming a psychologist in a criminal investigation. A record number of 230 students attended the Physics Masterclass which included a discussion on the building blocks of the universe based on experiments taking place at the international laboratory CERN.



Lancashire STEM Symposium 2010/11

From October to December 2010 six STEM sessions were offered to students from in and around the Blackpool Fylde area. The project was funded by the HE STEM Collaboration (£10,000). The new symposium widened the positive impact of engagement with scientists and improved the links between Higher Education and schools/colleges along with championing STEM disciplines.

The project involved eleven schools and colleges from the area with around 500 pupils and teachers taking part.

Triple Science Network

Science and Technology at Lancaster have continued to support the North West Lancs/South Lakes Triple Science Network through a programme of teacher CPD activities, specific school visits and STEM competitions.

Big Bang Science Fair, London

For the first time the Faculty operated a joint stand at the Big Bang Science fair in London Excel. A student and staff team took a stand with three interactive activities including: a motion sensitive game designed by HighWire student John Hardy; a bike-powered Wii console designed by the Engineering Department, and the "Impossible" Hoopla designed by the Department of Mathematics and Statistics. The aim of the event was to engage young people with STEM subjects and raise awareness of career prospects. The Science and Technology stand proved very popular, with the team speaking to over 2,500 young people and 70 teachers over the three days.



New International Master's Degrees with a Year in China

This year the Lancaster Environment Centre has developed two innovative International Master's programmes in conjunction with the Chinese Academy of Science and the China Agricultural University. The International Master's Environmental Science and Technology and the International Master's Sustainable Agriculture and Food Security are designed primarily for international markets which favour two rather than one year Master's degrees. The degrees combine an initial year of taught courses based at Lancaster with the opportunity to spend a second research-focused year in China, hosted by the Chinese Academy of Science or the China Agricultural University.

New Engineering Programmes Launched in Goenka

Sir Christian Bonington CBE, visited GD Goenka World Institute of Higher Education for the first time in June to mark the expansion of the partnership between Lancaster University and GD Goenka World Institute of Higher Education (GDGWI) to include three engineering degrees. The new degrees, being offered in autumn 2011, will be in Mechanical Engineering, Electronic and Electrical Engineering and Computer Systems Engineering. These degree courses are based on the Lancaster University curriculum but will be taught by GD Goenka staff. The final degree will be awarded by Lancaster University and there will also be an option for undergraduates to study at Lancaster as part of their course.

Other New Courses Approved in 2010/11

- Postgraduate Certificate Energy and Fuels from Waste
- MEng/BEng Chemical Engineering
- BEng Computer System Engineering (delivered at COMSATS)
- MEng Mechanical Engineering, MEng Electronic and Electrical Engineering and MEng Computer Systems Engineering (delivered at GD Goenka)
- M.Sci Natural Sciences and M.Sci Natural Sciences / North America

First EngD for Lancaster

The Department of Engineering applied successfully to join the EPSRC Nuclear Engineering EngD consortium, led by Manchester University and Imperial College, enabling it to offer a four year doctoral programme, incorporating a significant component of engineering management training. The EngD offers a number of advantages compared to a traditional PhD including: a year of dedicated postgraduate training followed by 3-years' research typically based at the site of an industrial sponsor; generous stipends funded by the EPSRC and industrial supporters; and excellent access to real-world equipment. With a twenty year history behind it, the EngD is distinct from the standard PhD in the perception of the engineering profession, with many senior professional engineers in large engineering businesses being alumni of early EngD centre activities.

INTERNATIONAL NEWS

LEC deepens its relationship with prestigious Chinese partners

Vice Chancellor, Professor Paul Wellings, together with LEC staff Professor Bill Davies, Dr Merce Aloy, Dr Hong Li and Professor Kevin Jones, visited the Chinese Academy of Sciences (CAS) and China Agriculture University (CAU) in Beijing in late September 2010, to further strengthen collaborations with China. Since the signing of the formal Memorandum of Understanding in January 2010, collaborations over Masters and PhD programs, summer schools and conferences have been developed.

"Our postgraduate provision has continued to stand-out due to its strong focus on cross-disciplinary training. This is evidenced by the launch of the Master's in Cyber Security and strong intakes for the Highwire and STOR-i doctoral training centres as well as our partnership in the EngD in Nuclear Engineering."

Professor Awais Rashid
Associate Dean for Postgraduate Studies

From Spring 2011, the desired expansion of activity and resources offered by The Graduate School necessitated and enabled the successful appointment of a new Graduate School Administrator. This has allowed the opportunity for the Graduate School to begin assessing new opportunities for training that were previously offered centrally, with a view to expanding its programme and collaborations. It will also allow the School to build on its identity as a hub for all postgraduates within the Faculty.

Dean's Award for Excellence

This year also saw the first annual Dean's Awards for excellence in postgraduate studies. These were awarded to Erika Berenguer from LEC and Cherry Canovan from Physics (joint winners in the first year category), Kelum Gamage from Engineering (second year) and Dominik Schmidt from Computing and Communications (third year).



Research Development Programme

The Research Development Programme (RDP) has provided a diverse range of high-quality training to postgraduate and postdoctoral researchers in 2010/11, despite changes to the Roberts funding. This continues to be a high priority to the Faculty, which recognises the value of personal and professional development, in an increasingly competitive sector.

Courses are offered in collaboration with experts from outside and within the university, covering subjects such as communicating research, career planning and statistics. From summer 2011 we have started to broaden the programme to provide flexible, self-learning online courses, designed to provide flexible support in key software packages used widely across the departments. In addition, the Graduate School in partnership with the Faculty Student Learning Advisor has provided comprehensive support to international students - providing informal workshops for enhancing writing skills in English, whilst also giving students the opportunity to meet and support each other.

First Student Intake at STOR-i

The EPSRC funded STOR-i Doctoral Training Centre (DTC) also welcomed its first intake of 10 students in October 2010. The students will follow a pioneering four year doctoral programme aimed at developing a new generation of researchers at the interface of Statistics, Operational Research and industry. A highlight of this year was a communication skills workshop run by Michael Blastland (notable for devising and running More Or Less on Radio 4 and co-author of The Tiger That Isn't) on the use and abuse of numbers in the media, and included tricks of the trade for communicating quantitative evidence to people from non-quantitative backgrounds. The launch of STOR-i sees the Faculty now involved with five DTCs, including HighWire and NOWNANO.

Masters in Cyber Security Launched

October 2010 saw the first intake of students to the new, uniquely multi-disciplinary, MSc in Cyber Security, delivered by ICT Focus and accredited by the School of Computing and Communications. The government has named cyber crime as one of the key dangers to UK security and has recently allocated £500m to the National Security Strategy to strengthen protection of key infrastructure and assets. This Master's programme was set up to counter the skills gap in this area and will lead to a new generation of cyber security specialists.

“Our ability to work effectively with business and other science and technology users to deliver demonstrable economic and societal impact is an increasingly critical measure of our success. A new strategy for business partnerships and enterprise aims to underpin this, by building on established areas and providing a new focus for emerging areas in science and technology with the potential for substantive partnership development.”

Dr Mark Bacon
Faculty Director for Business Partnerships and Enterprise



Mark Woodward, Sales Director of The Paper Cup Company with InfoLab21 Graduate Academy Member Ricardo de Sousa

InfoLab21 Project ISIS Transforms Over 100 Businesses

InfoLab21's Strategic Innovation Support Programme (ISIS) implemented technology which has transformed over 100 North West SMEs. Three of the companies assisted have been interviewed on a new film, available on the InfoLab21 website (www.infolab21.lancs.ac.uk/business/isis), which demonstrates new technology developed through ISIS, such as the 3D model of a paper cup which customers can design online at www.designacup.com.

Mark Woodward, the Paper Cup Company's Sales Director, said: "When we started the project, we employed 4 people and today we employ 7. Our turnover is up 42% year on year and we're the only company in the world to allow you to design a paper cup online."

The ISIS project has been delivered by teams of technology consultants at the InfoLab21 Graduate Academy and InfoLab21 Student Academy. Many of them over the last year have gone on to work for multi-nationals such as Hewlett Packard and IBM and the BBC. The project is part-funded by the European Regional Development Fund.

Other businesses assisted by the ISIS project include local chef Peter Sidwell, who's business was transformed through an iPhone and iPad app for customers with 20 recipes and video content which opened up a new market, and Safety Management UK in Burton-in-Kendal, a fire risk assessment and training company who's fire risk assessors now save time and complete assessments online in real-time thanks to their new web-based application.

Collaborative Success with Co-located Companies

Plant Impact PLC, a former Lancaster Environment Centre (LEC) resident company, has been working with LEC researchers Professor Nigel Paul and Dr Mike Roberts to develop novel products to improve crop yields such as Alethea – which reduces crop losses caused by environmental stress. The technology was part of a new generation of crop enhancement products developed by the company.

“Crop production globally is being threatened by a whole range of changes such as higher temperatures and less water availability. If the technology can work on this scale then it could really make a big contribution to sustaining crops in these environments.” Professor Nigel Paul

Plant Impact PLC have also been working with LEC as a company partner in a CASE (Collaborative Awards in Science and Engineering) PhD Studentship project. CASE awards are a key way in which companies have been working in collaboration with LEC, who over the last year have had 17 active PhD studentships through Industrial CASE awards from EPSRC (Engineering and Physical Science Research Council), BBSRC (Biotechnology and Biological Science Research Council) and NERC (Natural Environment Research Council).

For many students, initial project work with companies, particularly those co-located in LEC, has led to full-time employment. Siobhan Murphy did her placement module with The REACH Centre Ltd researching air pollution from paint and furniture within the context of home insulation. After completing the consultancy report Siobhan was offered a job, initially part time until she completed her MSc degree and then full time.

Jonathan Lutwyche, CEO for of The REACH Centre Ltd explained why he appoints LEC graduates. "The Lancaster graduates that we have employed have all demonstrated an excellent ability to adapt to the task in question and engage in providing new ideas and concepts and demonstrate a strong commercial awareness which is vital to our business success."



Professor Nigel Paul and Dr. Steve Adams, Plant Impact PLC

**SusDRaM Support
for Design and Rapid Manufacture**

The Lancaster Product Development Unit (LPDU), based in Engineering, has been successfully running the SusDRaM Project (Support for Design and Rapid Manufacturing) since 2009, assisting 60 companies in the last year. The SusDRaM Project is aimed at North West-based SMEs that can benefit from exploiting the opportunities afforded by using bespoke design and additive manufacturing technologies to develop and build new products.

One company to benefit over the last year includes Primera Ltd, a manufacturing company specialising in supplying anti-ligature locks to the health industry. They designed a new bespoke locking system, which integrated a fingerprint reader using SolidWorks 3D CAD to expand the company's product range. Fused Deposition Modelling additive manufacturing technology was used to manufacture the prototypes to check for fit, function and preliminary testing. The new prototype accommodated all the components the company required; greatly minimised the material used; reduced the manufacturing and assembly time, and saved material and labour costs.



The 8 Interreg IVB project partners meeting at Lancaster (June 2011)

**Lancaster Takes Leading Role in a
New European Network of Centres
Collaborating on Technology Transfer**

The LEC and Lancaster University Management School (LUMS) are leading the collaboration for Lancaster University on a new €8.5M Interreg IVB programme with 7 other European centres providing innovation and technology support to SMEs across North West Europe. The programme, part funded by the European Regional Development Fund, started in April 2011 and brought together the Paris Regional Innovation Centre, the Eco-design Centre in Wales, Delft University of Technology, University College Dublin, Business Support Kent, the University of Applied Sciences HTW Chur, Switzerland and Medien und Filmgesellschaft Baden-Württemberg, Germany, into a partnership which is building Europe's first organisation to enable SMEs to gain transnational access to technology and innovation support.

**Science and Technology Staff Win
University Prizes**

There was recognition for Faculty staff at the University Staff Awards ceremony:

Dr Steve Quayle from the Department of Engineering was recognised for his work as Admissions Tutor and Part 1 Director of Studies, where he has worked to increase student applications and UCAS points entry tariffs.

Dr Saskia Vermeylen from the Lancaster Environment Centre received the prize for her work as an international legal scholar, investigating the land rights of people in Africa and leading projects directed towards improving their livelihoods.

An across campus team, including faculty members: **Dr Lisa Norton**, **Dr Stephen Maberly** and **Dr Ian Winfield** from the Centre for Ecology and Hydrology in the Lancaster Environment Centre and **Dr Nigel Watson** from the Lancaster Environment Centre, were awarded a prize in the 'Above and Beyond' category for their project "Understanding and Acting in Loweswater". The project involved working with members of a rural community to investigate water quality problems and other environmental changes related to land use in the Loweswater catchment in North West Cumbria. The prize of £1000 was donated to the Loweswater Care Project (LCP).



Ian Mercer from the Department of Physics was presented with Science and Technology's new Ian Miller prize for Technical staff. The prize recognises the vital role skilled technicians play in supporting top class science in Science and Technology at Lancaster. Ian Mercer won the prize for his invaluable support to academic and research staff in the Lancaster particle physics group working on two large international experiments of very different nature; CERN and JPARC (Japan). Ian provided technical expertise and took significant responsibility for some aspects of the work, including liaising with research and technical staff at external laboratories in the UK and CERN. The work required Ian to display an exceptionally broad range of technician skills and to problem solve on a regular basis as one technical set-back after another had to be overcome.



Prize Winners 2011

NEW CHAIRS AND READERSHIPS

Readerships were awarded to: Dr Kostas Dimopoulos (Physics), Dr Anupam Mazumdar (Physics), Dr Ed McCann (Physics), Dr Mila Mihaylova (Computing and Communications), Dr Plamen Angelov (Computing and Communications), Dr Jim Wild (Physics) and Dr Crispin Halsall (LEC).

New Professors

Personal chairs were awarded to Dr Pete Sawyer (School of Computing and Communications), Dr Ken Wilson (LEC) and Dr Frank Martin (LEC).

Distinguished Professors

Two Science and Technology staff became distinguished professors: Vladimir Falko, Professor of Theoretical Physics, and Kevin Jones, Director of Lancaster Environment Centre.

Awards and Distinctions Science and Technology

Professor Bill Davies of the Lancaster Environment Centre was awarded a CBE for services to science in the Queen's birthday honours list.

Professor Davies' research has addressed one of the most significant global challenges of the present age; how to feed seven billion people against a background of climate change. The prize was for the development of water saving techniques for agriculture which has resulted in increased food production and improved the quality of life for farmers living in some of the driest regions of the world. These techniques should help sustain food production in light of the challenges posed by climate change.



Dr Guennadi Borissov of the Department of Physics received the annual award in the Division of Nuclear and Particle Physics from the Institute of Physics. The prize recognises his significant contribution to the physics of subatomic particles containing the "bottom quark" or B physics.

Dr Borissov, a member of the DZero team (an international team of scientists at the Fermi National Accelerator Laboratory, US) has developed sophisticated software for tracking B particles after they are produced in collisions allowing the team to make exciting new discoveries in the way subatomic particles behave. These discoveries could help rewrite the current theory, the Standard Model of particle physics, and may bring physicists one step closer to understanding the existence of the Universe.



Professor Vladimir Falko of the Department of Physics received a Royal Society Wolfson Research Merit Award in recognition of his achievements in nanoscience.

The prize recognises Professor Falko's work on the electronic properties of nanostructures and low-dimensional materials, such as graphene. The Professor, with his research team, has been a significant contributor to the field of nanoscience ever since the emergence of graphene in 2004. They have identified the unique electronic properties of bilayer crystals; predicted unusual transport characteristics of graphene p-n junctions; and laid the foundations for the understanding of the transport and optical properties of this new material.

Awards and Distinctions Science and Technology

Dr Rob Graham of the Lancaster Environment Centre has been awarded a prestigious Marie Curie International Outgoing Fellowship worth €268,824 (£233,683).

Dr Graham's research will focus on the Australian Plague Locust and aims to develop an understanding of population dynamics, disease transmission and immune function. The project, "LOCDIS - Safety in Numbers or Beware Thy Neighbour: Collective Motion and Disease Transmission in a Migratory Pest" will involve Dr Graham spending two years at the University of Sydney Australia, working with Professor Stephen Simpson FAA, and then returning to work at Lancaster Environment Centre with Professor Kenneth Wilson.

Cherry Canovan a PhD student in the Department of Physics was named as Very Early Career Woman Physicist of the Year.

The £1000 prize recognises Cherry's published work on problems in classical electrodynamics as well as her enthusiasm for helping other women get involved in physics. The award was presented by Amanda Cooper-Sarker, Professor of Particle Physics at Oxford University at a ceremony in London organised by the Institute of Physics and sponsored by Shell.



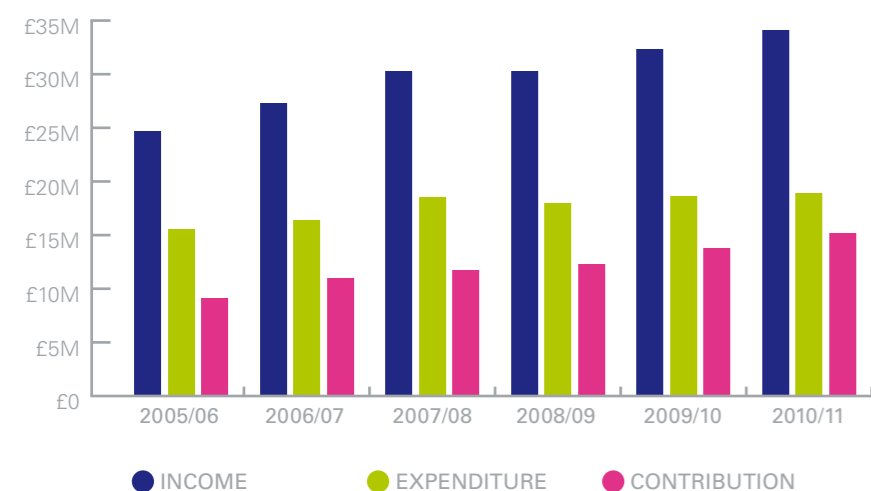
Professor Farideh Honary of the Department of Physics was short-listed for the 2011 First Women Awards.

These awards recognise women who are at the leading edge of their industry. Professor Honary, who was short-listed for the Science and Technology category, was nominated for her "exceptional career." Currently Professor of Space Plasma Environment and Radio Science and Vice President of the Royal Astronomical Society, Professor Honary's research has led to the development of AuroraWatch, a popular service which alerts its 40,000 subscribers of possible sightings of the northern lights in the UK.

Income, Expenditure and Contribution

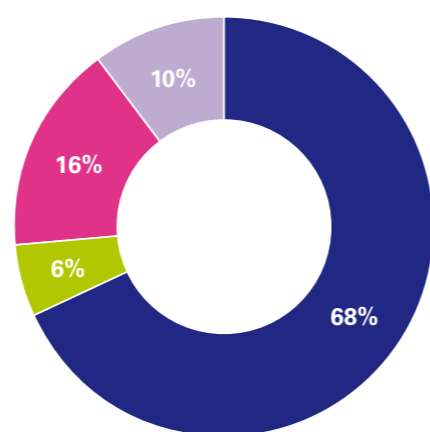
Income has increased steadily each year, with a 5.4% growth from 2009/10 to 2010/11. Expenditure has been well controlled, increasing by only 1.6% for the same period. Contribution to the University's operating surplus increased by 10.4% (£1.43m) on the previous year.

Note: 2008/09 and 2009/10 figures do not include the BLS half of Biology, which moved to the School of Health and Medicine.



Research Income

In 2010/11 Science and Technology brought in £18,425,960 of research income. The university total was £27,014,384 of which the Faculty accounted for 68% - the same proportion as in 2009/10.

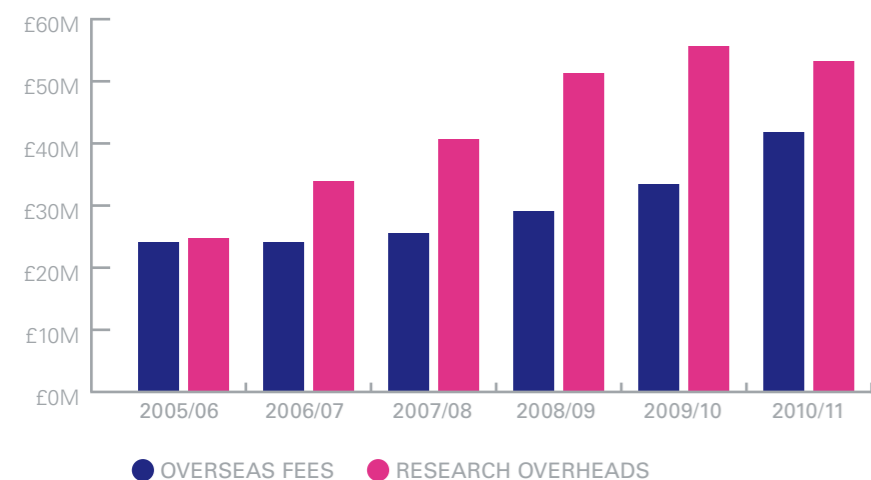


- FST (£18,425,960)
- LUMS (£1,499,566)
- FASS (£4,363,947)
- SHM (£2,724,911)

Overseas Fee Income and Research Overheads

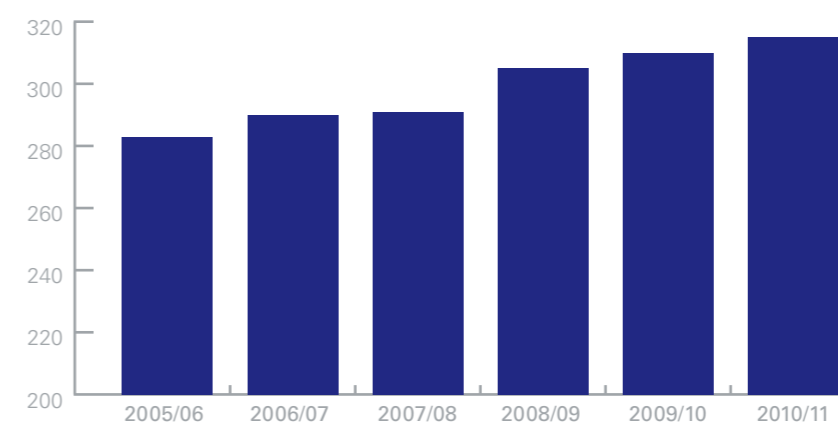
Overseas fees income increased by 25% in 2010/11 on the previous year. Research overheads decreased by 4% for the same period.

Research overheads include recovery of full economic costs and payroll credits.



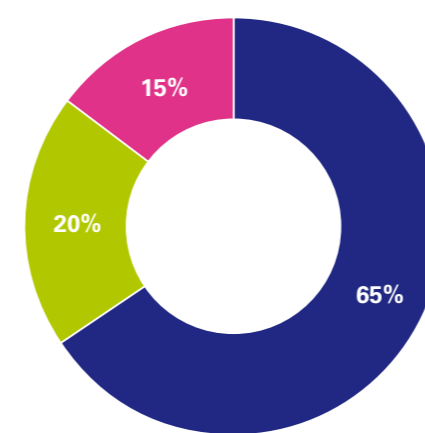
A-Level Grades

The A-level grades achieved by undergraduates admitted to the Faculty continue to increase each year. In 2010/11 37% of new students had achieved grades of AAA - AAB or above at A-level (an increase of 5% on 2009/10) and the average UCAS points tariff for a new undergraduate student was 317.



Student Numbers

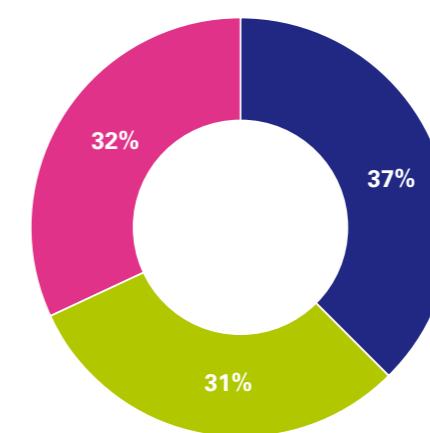
There were a total of 3,302 registered students in the Faculty in 2010/11



- UNDERGRADUATE (2,171)
- POSTGRADUATE TAUGHT (651)
- POSTGRADUATE RESEARCH (480)

Overseas Students

There were a total of 413 overseas students in the Faculty in 2010/11

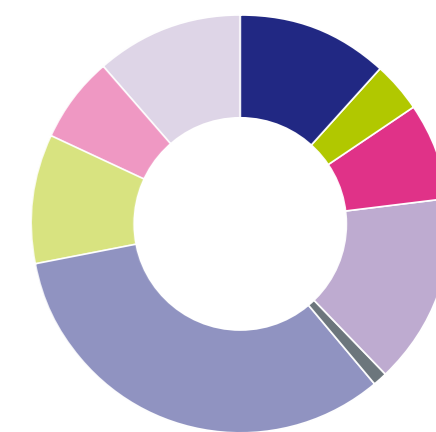


- UNDERGRADUATE (155)
- POSTGRADUATE TAUGHT (127)
- POSTGRADUATE RESEARCH (131)

Staff Profile and Promotions

There were 30 promotions within the Faculty last year. The numbers by category were:

- 3 - Promotion to a Personal Chair
- 6 - Promotion to a Readership
- 8 - Promotion to Senior Lecturer
- 2 - Promotion from Lecturer 7 to Lecturer 8
- 3 - Administrative/Professional
- 2 - Research
- 2 - Clerical
- 4 - Technical





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