

enterprise

creativity

innovation

community

excellence

knowledge

collaboration

culture

# enterprise



Issue 4 2011

World-class solutions for real-world problems

Ruling the waves

Green light for South West smartcards

On course for cruise ship training

University of Plymouth  
the enterprise university





enterprise in action



Professor Wendy Purcell

# Welcome to the latest edition of *Enterprise* magazine

The University of Plymouth has a reputation for world-class research in key disciplines from the social sciences to marine and the environment, from the arts and humanities to medicine, civil engineering and computer science. The breadth and depth of our research was reflected in our performance in the 2008 Research Assessment Exercise, when we made the biggest jump in the rankings of any institution since 2001 and near doubled the number of staff returned.

In this issue we provide a snapshot of the diversity of research undertaken here at the University, how the outcomes of that research are used and how our research is making a real difference to society.

From the search for renewable energy sources in the marine sector to the use of robots in both language acquisition and coping with long-term illnesses – our community of researchers are responsible for leading a vast array of projects that impact upon our world. Our students are a key part of our thriving research community, bringing their curiosity to bear on research discovery, from solar powered bamboo radios to innovative designs for medicine dispensers. And we are very proud of our role in educating and training the next generation of researchers through our masters and PhD programmes of study.

Research starts with observation and requires a rigorous pursuit of truth through enquiry, passion for discovery and lots of diligent work – along with creativity in problem solving and some luck along the way. We encourage our researchers to tackle the big problems of society as well as those questions of interest to our local community.

We also encourage a spirit of interdisciplinary research given so many of the breakthrough discoveries happen at the edges of one discipline and another.

Our dedicated research institutes and University research centres provide a focus for our research with appropriate critical mass and an excellent research environment to drive quality. Our research locates itself around a number of broad thematic areas: from health, biomedicine and wellbeing, to environmental, social and economic sustainability.

Given our focus on internationalisation, our research partnerships across the world enrich our intellectual endeavours as well as our teaching and curriculum. We also enjoy strong relationships with government, the EU, UK research councils, medical charities and other funding agencies as well as with industry and the NHS.

Having invested over £150 million in our campus to date, our next projects see us developing a £19 million marine building to house the most advanced wave tank and testing equipment in the country, putting several million pounds into our biomedical diagnostics suite and further investment in a clinical trials unit. We plan to invest in building our position as a leading research institution distinguished by our contribution to society.

I hope that you find this edition of *Enterprise* magazine informative and also inspiring.

**Professor Wendy Purcell**  
**Vice-Chancellor and Chief Executive**



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# World-class solutions for real-world problems

Research at the University of Plymouth is world-leading. It is recognised around the globe for its originality, its rigour and its role in providing innovative solutions to the real-life issues that impact on regional, national and international businesses and communities.

Our collaborative approach and an emphasis on cross-society engagement help define practice and policy, promote economic development and create opportunity by harnessing the value of intellectual capital and the transfer of knowledge.

Since 2008, we have secured nearly £22 million of research funding from major awarding bodies and through commercial contracts. With continuing investment in our staff and facilities, and by focussing on key areas of excellence, our research income is set to double by 2013.

To help achieve our longer-term goals, in 2010 the University established five priority subject areas based on both our research strengths and regional economic priorities – marine and maritime, environment and sustainability, cultural creativity and design technologies, pedagogic research, and health and community wellbeing.

These priority areas underpin a comprehensive research and innovation strategy designed to encourage client-led interdisciplinary research, enhance partnership working on every level, and create a unique, dynamic student learning environment that fosters a culture of creativity, entrepreneurship and enterprise.



Professor John Scott

There are many examples in the pages of this edition of *Enterprise* that demonstrate the diverse nature of our recent research projects and achievements, along with the effects the outcomes have had on real lives – from helping safeguard our environment and improving healthcare, to expanding our cultural horizons and delivering sustainable improvement for enterprise.

In addition, during March this year, the University will stage a Festival of Research, showcasing our work and demonstrating areas of specific expertise. The festival, which runs from 14–24 March, coincides with National Science and Engineering Week and will be the first in a series of regular biennial events designed to strengthen our local business and community partnerships. Further information about the festival is available at [www.plymouth.ac.uk/festivalofresearch](http://www.plymouth.ac.uk/festivalofresearch).

The inaugural 2011 event will feature a wide variety of contributions and interactive sessions from the University's key research institutes. There will be exhibitions, conferences and lectures which are open to all, and workshops involving students from local primary and secondary schools. With themes ranging from politics and tourism to sport and technology, there's sure to be something to capture everyone's imagination.

Professor John Scott, Pro Vice-Chancellor (Research) believes the festival marks a major milestone for the University:

“ The Plymouth Festival of Research will help to further cement our credentials as a leading world-class centre for research and innovation – and at the same time it will provide a perfect platform to communicate our vision for the future. It's an ideal opportunity for local businesses and the local community to experience at first hand the breadth and depth of our research work and to better understand where and how we're making a positive difference to the economic and social issues that impact on us all. ”



"In April 2010 I was awarded a grant for €920,000 for a research project that brings academic research and commercial exploitation into a single project. The project will explore the relationship between creativity and innovation within the contemporary European media sector, and will deliver widely applicable conclusions relevant to the burgeoning globalisation of media cultures."

Professor Michael Punt, School of Art and Media

"I'm an art historian specialising in the visual culture of early 20th-century Vienna. With funding from the Arts and Humanities Research Council, I have recently completed a four-year collaborative study examining how the pace and excess of modern life is reflected in Plymouth's art and architecture. The findings were featured in a high profile exhibition called 'Madness & Modernity' and have contributed to a contemporary rethinking of the origins of the treatment of mental illness and its representations."

Dr Gemma Blackshaw, School of Humanities and Performing Arts

"My research area focusses on the delivery of high throughput molecular diagnostics and in particular the development of methods for non-invasive prenatal diagnosis, and molecular blood grouping. The methodology for delivery of this new generation diagnostics has been developed by my laboratory, and we are ensuring its timely delivery into the clinical setting via a University innovation centre located close to Derriford Hospital in Plymouth."

Professor Neil Avent, School of Biomedical and Biological Sciences

"Under the umbrella of 'Health and Community', research in the Faculty of Health includes work in health and social care, culture, community and society, and methodological innovation. With a multidisciplinary and transdisciplinary approach, research informs both our teaching, and clinical and social care practice. Working in collaborations across the University and with local, national and international partners, researchers have a wide range of interests and expertise and are recognised for their engagement with real-world issues and their theoretical and methodological developments."

Professor Gayle Letherby, School of Social Science and Social Work

Vice-Chancellor Wendy Purcell christening the University's new research vessel



# Celebrating enterprise excellence

enterprise in action

## The Vice-Chancellor's Enterprise Awards

The innovation, creativity and entrepreneurship we encourage throughout all our research, teaching and learning activities is fundamental to driving the future success of the University, the city of Plymouth and the entire South West region.

As part of this process, our annual Enterprise Awards have now become recognised as a showcase for celebrating the outstanding contributions and achievements of our staff, students, community and business partners in establishing Plymouth as *the* enterprise university.

The 2010 Awards saw some exceptional nominations and a host of worthy winners across a broad cross section of areas and a diverse range of projects.

The Social Entrepreneur Award, for example, went to one of our graduates, Korash Sanjideh for his pioneering work with Chew TV – a social enterprise started in 2007 by the Real Ideas Organisation. In just one year, Korash's expertise in creating interactive software experiences helped him build an innovative digital media company providing a leading convergent online media portal for young people around the world.

Chew TV now hosts an international collection of social broadcasting websites run by and for young people aged 14–25. It provides a free global showcase for digital media talent, personal development opportunities and access to the media industry, and is a platform for young people to connect, communicate and share ideas.

Another success in the digital arena was recorded by Remode – the only game-producing company in the South West and winner of the Internship Provider of the Year Award. After providing a student internship for Marius Varga, the award acknowledges Remode's professionalism, constant innovation, flexible working practices and business passion. The directors are all ex-IDAT (Institute of Digital Art and Technology) students and Plymouth graduates and their commitment to providing Marius with high levels of technical and morale support has helped give him the confidence to progress in a very competitive industry.

In total, 32 winners received awards in seven different categories, reflecting the depth and diversity of achievements – from inspirational teaching and outstanding new businesses to exceptional international contributions and innovative local community engagement.



*Dr Jason Hall-Spencer (right) accepting his award*

### Focus on Research

The research category in the 2010 Awards was fiercely contested in each of its five sections, with the nominations demonstrating the vital role played by all kinds of research in underpinning the foundations for real-world progress on every level.

*Professor Steve Rowland and David Jones*





A full list of winners and their individual success stories together with details of the awards for 2011 is available at [www.plymouth.ac.uk/vcawards](http://www.plymouth.ac.uk/vcawards).

## Enterprising Research Award

Winners: Professor Eduardo Miranda, Faculty of Arts, and Simon Ible, Peninsula Arts

Eduardo and Simon showed outstanding enterprise through their co-direction of the 2010 Peninsula Arts Contemporary Music Festival and Plymouth Polish Festival, jointly hosted and promoted by the University under the title 'Continuum'. Featuring a wide range of events, the festival focussed on presenting innovative, emerging new talents set to shape the musical trends of the 21st century. Simon and Eduardo's work continues to establish a national and international profile for music and research at the University, attracting world-class performers, composers and curators to Plymouth.



Professor Eduardo Miranda and Simon Ible

## World Class Researcher Award

Winner: Dr Jason Hall-Spencer, Marine Institute

As one of the world's leading scientific researchers on critical marine issues, Dr Hall-Spencer is acclaimed as a pioneer in his field. His groundbreaking work in developing new ways to study ocean acidification, reef damage caused by deep water trawling, and to identify suitable sites for offshore Marine Protected Areas, combined with a determination to communicate vital issues to the wider public have resulted in Jason becoming an influential voice for policymakers around the globe – and an outstanding ambassador for the University.



Alexis Kirke (right) accepting his award

## Research Student of the Year Award

Winner: Alexis Kirke, Interdisciplinary Centre for Computer Music Research, Faculty of Arts

Having initiated the Peninsula Arts Contemporary Music Series, Plymouth Maths undergraduate, Alexis is now working on his second PhD at the University in the Interdisciplinary Centre for Computer Music Research. He earned national recognition for his contribution to last year's Peninsula Arts Contemporary Music Festival, turning the Roland Levinsky building into a musical instrument using light sensors and computers, and his enterprising approach has created a network of high profile, influential national and local contacts. Alexis has also had 12 pieces of research accepted for publication or conference.

## Research Team Award

Winner: Centre for Research in Biogeochemistry, School of Geography, Earth and Environmental Sciences

The Biogeochemistry Research Centre (BGC), led by Professor Steve Rowland, has earned a world-leading reputation for creating and applying innovative analytical techniques to investigate biogeochemical processes in aquatic and terrestrial environments. Having won more than £8 million of external funding since 2005, the BGC has trained 19 PhD students and 15 postdoctoral fellows, and the team's work in areas such as climate change, pollution and environmental sustainability informs private and public sector policymaking, and has been widely published in the world's leading scientific journals.



Dr Daniel Merrifield (right)

## Early Career Researcher Award

Winner: Dr Daniel Merrifield, School of Biomedical and Biological Sciences

At only 27 years of age, Dan has already gained extensive recognition in the international community as a scientist producing the highest quality work to answer fundamental biological questions and to meet the real needs of industry. Since working with industrial partner BASF during his PhD, he has achieved 15 publications in prestigious international journals, including collaborative articles involving senior European academic and industry scientists. Dan is also a teacher and mentor who has helped numerous students develop key techniques and an insight into applied science.



# Supporting our community

enterprise in action

## The 2010 Community Research Awards

This was the third year of our Community Research Awards, where the University's world-class researchers engage with the community to help research and address issues of importance to local organisations. As well as creating valuable opportunities for new research projects, the awards allow the University to use its skills and resources to make a positive impact at grass-roots level.

University Vice-Chancellor Wendy Purcell said:

“ A recent assessment exercise showed that the University of Plymouth is in the top 50 UK universities for its research performance, with 80 per cent of our research judged to be of international importance. It's fantastic not only that we are receiving recognition for our work, but that through the Community Research Awards we are able to apply our expertise to make a real difference within our local area. ”

Of the 60 charities and community groups from Devon and Cornwall that entered the programme, five impressive bids, developed in partnership with University academics who could help them deal with the particular challenges they face, were selected to receive an award of up to £10,000.

The five winners were: Macmillan Cancer Support; Friends of Par Beach; Choices Consultancy Service; DownSouth Down's Syndrome Support Group and Refugees First.



Judith Jolly  
(right), Macmillan  
Cancer Support



Roya Rafati,  
Refugees First

The 2010 Community Research Award winners







Moira Brooke-Williams, Choices Consultancy Service



Tessa Mumford, DownSouth Down's Syndrome Support Group

Macmillan Cancer Support runs the Mustard Tree Cancer Information Centre at Derriford Hospital which works to improve the lives of local people affected by cancer. It is dependent on volunteers both for fundraising and to run the operation. Their research project focusses on identifying and attracting potential volunteers and understanding what motivates them.

Par Beach receives more plastic and natural debris washed up on its shore than other beaches in the St Austell Bay area. The project for Friends of Par Beach will investigate the reasons for this and the physical elements that cause it. It will also look at whether the significant amount of seaweed washed up can be used as a resource, for example as fertiliser for local allotments. The study aims to assist in improving the quality of the beach for locals and visitors in an environmentally sustainable way.

Children with parents in prison face significant disadvantages. This project for the Choices Consultancy Service aims to explore the help schools in Plymouth offer to children whose fathers are in prison, and to identify both areas of good practice and ways in which support can be improved.

DownSouth Down's Syndrome Support Group is aiming to investigate the links between motor co-ordination abnormalities and sensory control of balance and other motor functions in those with Down's Syndrome. The findings will enable the group to appeal for local provision for these people.

Refugees First works to interact with the Plymouth community and dispel myths surrounding refugees. With its Community Research Award, it aims to make the transition from voluntary organisation to sustainable social enterprise, creating a model of the transition process for use by other organisations. It will also explore ways of assessing the impact of its work within the community.

For the selection process, each community group submitted a short application detailing the research questions they needed to address to help them achieve their goals. They then took part in a workshop to identify the appropriate areas of University expertise and to ensure that their scheme would have a beneficial long-term impact.

All projects applying for a Community Research Award have been offered support from the University to help them source alternative funding and invited to consider the potential role of student volunteers within their organisation.

For further information, visit [www.plymouth.ac.uk/cra](http://www.plymouth.ac.uk/cra).

|| We are absolutely delighted to receive this award... Although the work will take place in Plymouth, we hope it will have far reaching consequences across the country, for any organisation that relies upon volunteer support. ||

Judith Jolly,  
Area Fundraising Manager for  
Macmillan Cancer Support



# Figuring out statistics

These days, evaluation of data is vital for providing information that helps improve understanding of various economic, social, medical, environmental and business issues. But while accessing and interpreting secondary data may be straightforward enough for trained professionals, both access and interpretation can be more challenging for others. Consider community decision-makers trying to make sense of local circumstances in order to plan development strategies and deploy appropriate resources: how can official statistics add value?

This is the problem addressed by statisticians at Plymouth including Dr Paul Hewson, Aiste Kalinauskaite, Dr Julian Stander and Dr Yuzhi Cai after Stoke Damerel Parish Management Committee in Plymouth asked, "What's happening in Stoke?" as part of the Vice-Chancellor's Community Research Awards in 2008. The question reflected the committee's desire to offer services to all members of the Stoke community – but without a detailed knowledge of what services might be required.

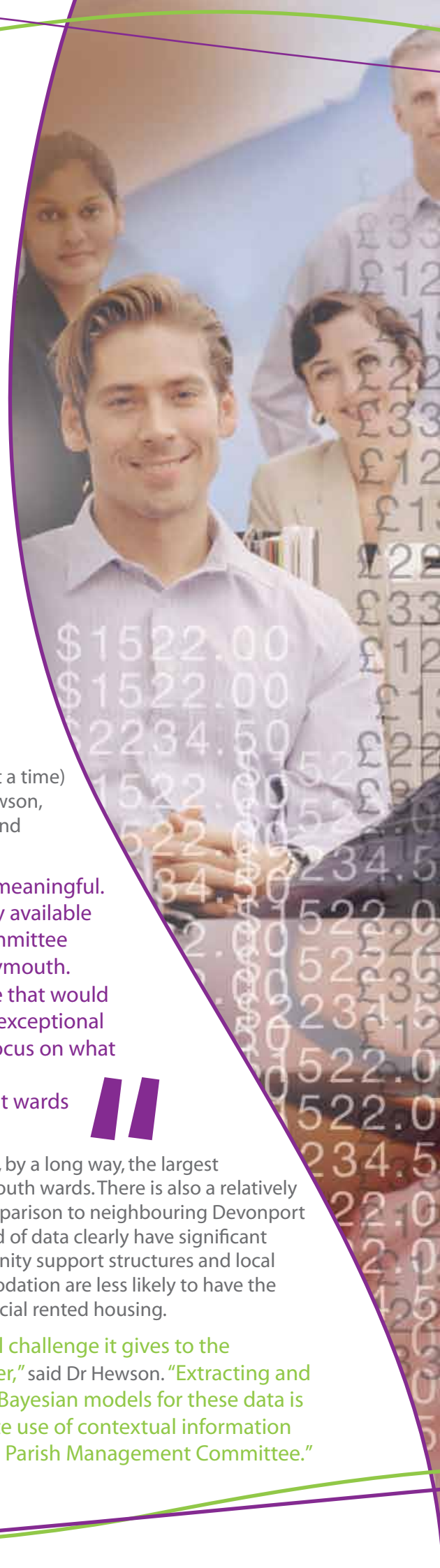
Since then, the University team has worked hard to establish ways of making important data available to the committee in formats which they can easily interpret and use to make informed decisions.

Although much of the data was already freely available (one location at a time) through the government's Neighbourhood Statistics website, as Dr Hewson, Project Leader pointed out, for non-specialists, assessing, interpreting and applying the information can be a challenging task:

**||** We wanted to make the data more accessible and more meaningful. It was clear that the usefulness of the information already available could be improved by giving it some context, so that committee members could compare Stoke's situation with other wards in Plymouth. We therefore developed tools using the world-leading R software that would allow us to do this. We can provide point and click web access to exceptional graphics and modelling functionality which allows our users to focus on what was going on in Stoke. Our system lets you select from a range of available neighbourhood statistics and extract data from adjacent wards in order to provide interpretable comparisons. **||**

Among other important findings, the project has shown that Stoke has, by a long way, the largest number of elderly residents living in nursing homes out of all the Plymouth wards. There is also a relatively high number of people living in private rented accommodation in comparison to neighbouring Devonport which has a high number of people in social rented housing. These kind of data clearly have significant implications for the committee in terms of understanding how community support structures and local services are developed. For example, people in private rented accommodation are less likely to have the neighbourhood support structures that are so often incorporated in social rented housing.

**"The success of a project should not be judged by the intellectual challenge it gives to the statistician, but by the practical use it has provided to the end-user,"** said Dr Hewson. **"Extracting and finding appropriate visual representation for data and providing Bayesian models for these data is not, by any stretch, complex statistical science, but the appropriate use of contextual information has been shown to be extremely important to the Stoke Damerel Parish Management Committee."**







enterprise in action

## Making sense of statistics

Leading academics from New Zealand and the USA visited the Royal Statistical Society (RSS) Centre for Statistical Education (CSE) at the University in October for getstats week – and the launch of a ten-year campaign to help people make more sense of statistics.

Kicking off with United Nations World Statistics Day on 20 October 2010, the week consisted of a series of events held in London and Plymouth. There was a Young Statisticians Day for teachers and sixth formers, workshops on improving the understanding and teaching of statistics in schools, colleges and universities, and a Workplace Day with presentations on how statistics can help businesses in the South West.

**“The RSS getstats campaign aims to help us use data and statistics more effectively,”** said Professor Neville Davies, Director of the RSSCSE in Plymouth. **“All the presentations focussed on how to make data more accessible and useful, explaining the concepts in easy to understand terms.”**

Professor David Hand, president of the RSS added:

**“**The getstats campaign is about giving everyone the skills and confidence to use numbers well, leading to informed individuals and an informed society. The RSSCSE at the University of Plymouth will play a vital role in our campaign, helping teachers, students and employers gain a confident understanding of statistics that they can apply throughout life. We were delighted with the exciting programme of events that the CSE arranged to help us launch the campaign. **”**

# Learning lessons from the past

Sometimes we need to investigate events in the past to get a better understanding of the environmental issues that impact on us now, and how they will affect our future.

That is why a lecturer from the University's Centre for Research in Earth Sciences, Dr Gregory Price, has been awarded a prestigious Leverhulme Research Fellowship that will allow him to conduct a detailed study of climate change focussing on the geological past.

Dr Price won £42,697 which will fund his 12-month project, 'Evaluating high latitude climate during the Cretaceous era'. The research will examine the geological evidence for abrupt climate change in sub-polar regions during globally warm intervals 135 to 65 million years ago when dinosaurs still roamed the planet. A proportion of the project will be spent conducting fieldwork in Australia and at the Department of Earth and Environmental Sciences, James Cook University in Queensland.

"The award will enable me to research the role of carbon dioxide as a driver of climate change over long timescales," said Dr Price. "It will also give me the opportunity to represent the University in Australia."



Dr Gregory Price

# Monkey business on Facebook

Legendary Nintendo star, Donkey Kong now has a new rival after a video game featuring Kodak, the capuchin monkey rescued from captivity, was recently released for download on Facebook.

Kodak's Jungle Rumble game has been developed by four University students as part of a second-year Digital Art and Technology project and is designed to highlight the plight of wild primates sold into captivity.

As well as being a video game star, Kodak is now also a celebrity at his new home in the Monkey Sanctuary near Looe, Cornwall. The sanctuary is run by charity Wild Futures, who worked closely with the student team to support the video game initiative. The team – including programmers Rebecca Veater and Christian Cook, and illustrator Paul Bird – spent considerable time at the sanctuary, observing behaviour and recording sound effects for the game, with the help of Kodak and his friends.

Project leader Gavin Jones explained:

"We learned a lot from our time at the sanctuary and right from the start it was clear that we needed to get across some powerful messages around conservation. We also wanted to create a game that was fun and playable like Donkey Kong – but based around Kodak's own story."

Wild Futures' patron and respected international conservationist, Ian Redmond OBE has been impressed by both the game concept and its execution, saying:

"It's a brilliant way to engage young minds that are often more in tune with virtual worlds than the real one. Individuals and schools should take advantage of such a powerful tool."

At the University, Senior Lecturer in Digital Arts, Hugo Derijke believes the experience will help his students secure placements and employment in this highly competitive commercial sector:

"It's provided them with invaluable experiential learning; they've had to take a brief from a customer and succeeded in creating something that's both fun and educational."

Kodak's Jungle Rumble game







Kodak the capuchin monkey

enterprise in action

# GAIN advantage

The University is at the heart of an exciting new strategic initiative designed to put Plymouth among the UK's top 20 innovation cities by 2020. GAIN, the Peninsula Growth Acceleration and Investment Network, has been created to super-charge economic growth across the region. It brings together educators, innovators, businesses and investors in a powerful, collaborative network to ensure knowledge, research and ideas translate into commercial and public service benefits.

Backed by £25 million of local, regional and national funding, the University is one of GAIN's co-founders, along with Plymouth City Council, the South West Regional Development Agency and Tamar Science Park.

Professor Julian Beer, Director of Research and Innovation and Pro Vice-Chancellor (Regional Enterprise) explained:

There are many organisations in Plymouth that create wealth and other social benefits, and as these organisations grow and generate new jobs, they look for innovations to improve their effectiveness and efficiency. GAIN is all about helping them achieve more by creating the relationships and support infrastructure required to successfully apply new knowledge and research.

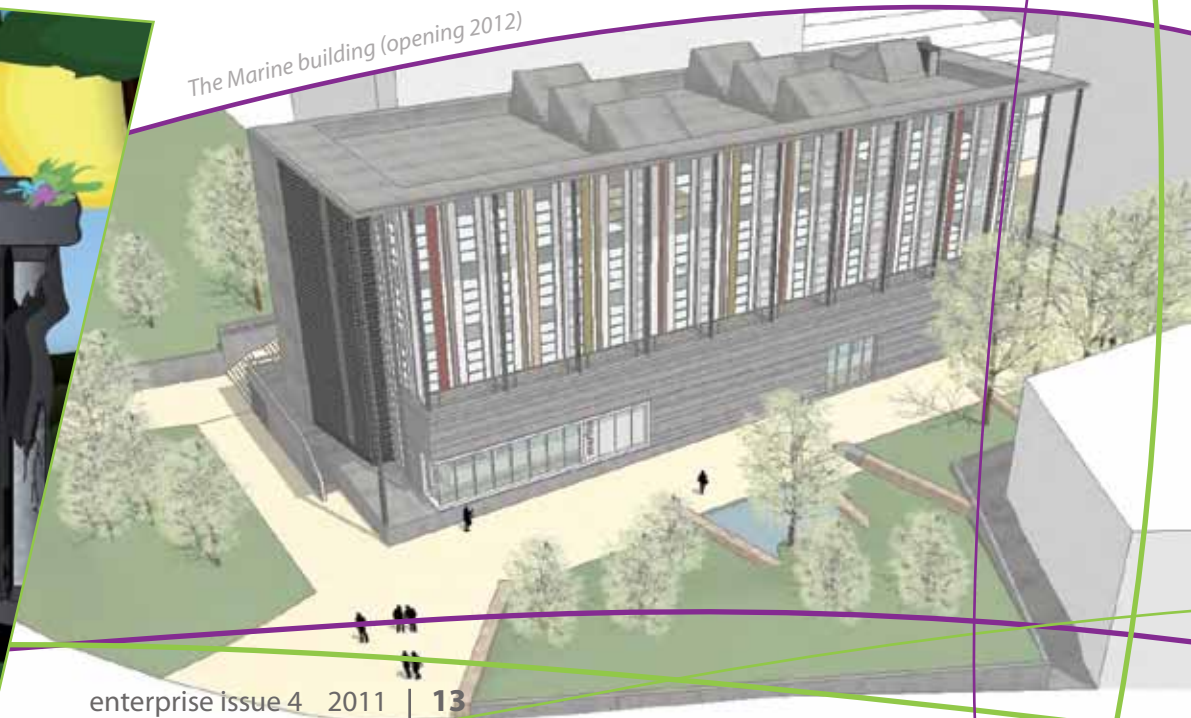
By engaging with a wide range of key local organisations, GAIN will support innovation in Plymouth and the South West region, helping to establish a substantially larger, high-value economy and providing a solid platform for sustained growth.

The marine, engineering, medical and creative sectors are an important focus for GAIN and a proportion of the initial funding is being used to create new world-class marine education and research facilities in Plymouth. The development, due to open in spring 2012, will provide space and resources for commercial networking, as well as support for marine business start-ups and new growth pathways to the Tamar Science Park.

*"As the economy recovers,"* said Professor Beer, *"GAIN will create new opportunities for innovation, development and growth through existing and new enterprises of all sorts. In addition to benefiting our own local communities, it's a model we are promoting for growth hubs in other cities and regions across the country."*



The Marine building (opening 2012)



## Total recall

Dr Tony Belpaeme is heading up a four-and-a-half year, multi-million pound European project to design a robot with social skills that can help children in hospital learn to manage conditions such as diabetes.

By breaking the current boundaries of artificial intelligence, this new kind of robot will be connected to internet-based programs with greater calculating power allowing it to retain memories and engage in social interaction.

Funded by the European Commission, the €8.3 million project is codenamed ALIZ-E and involves eight universities and institutions across the continent, as well as a hospital in Milan.

**The objective is to create robots capable of sustaining believable, in-depth social relationships with young users and to explore how human-robot interactions can be extended from minutes to days so that an ongoing relationship can be formed between the robot and the young user,** explained Dr Belpaeme.

The project aims to develop a realistic alternative to animal assisted therapy where children in hospital suffering from chronic illnesses are given animal companions.

Dr Belpaeme said:

**Children respond openly and imaginatively to artificial 'creatures'. When a child is in hospital and has to learn how to manage a long-term condition such as diabetes, it becomes very important to develop effective communication. The theory is that the robot acts as a companion and a communication channel between patient, parents and hospital staff.**

Each project partner has been selected for a specific role. The National Research Council in Italy will be developing speech recognition, the University of Hertfordshire recognition of emotion, and in France 'cloud' computing techniques at the heart of the memory system will be designed.

The University of Plymouth team will focus on memory-related aspects and hope to overcome the current limitations on memory formation to create a system allowing robots to store and recall information and adapt their behaviour on the basis of previous experiences.

There are currently 20 robots in production and they will be tested on young diabetic patients in the paediatric department of the San Raffaele hospital in Milan.







enterprise in action

## Climate change and building performance – the inside story

How will projected changes in climate impact on the future performance and functionality of buildings? This is the issue which Dr Pieter De Wilde, Reader in Building Science and Services at the University, has been investigating for the past two years.

The project has been funded by the UK's Engineering and Physical Sciences Research Council and reports on quantifying the risks that climate change poses to the thermal performance and critical functions of buildings over time.

Dr De Wilde and postdoctoral researcher Dr Wei Tian used the EnergyPlus computer simulation program to model scenarios in a variety of domestic and commercial buildings – including the Roland Levinsky building on the University campus.

Dr De Wilde explained:

“ We started with published meteorological predictions and applied a variety of change scenarios for each building and its operational conditions – things like changes in occupancy, intervention and renovation, as well as climate. Then we added the implications of climate change to calculate the risk factor. Prime targets were energy use, greenhouse gas emissions and overheating, although we also looked at more complex issues such as office work productivity.”

Full results of the study are due to be published soon, but the main findings show that it is possible to quantify the impact of climate change on building performance – but only on the assumption that the building's usage and systems configuration stay the same over time.

Dr De Wilde added:

“ The problem is, there are so many uncontrollable variables that affect the behaviour of a building over its lifetime. If we start to bring things like renovation and potential changes in building usage into the equation, then these become dominant and make the usefulness of predictions very limited. In real terms, this means any conscious engineering efforts to address the possible future impact of climate change on the performance of a building will be based on a lot of assumptions.”



Dr Tony Belpaeme

# Ruling the waves

Plymouth's reputation as the UK's greenest university and its leadership in the field of marine conservation and environmental research has been further cemented by its selection as the only UK-based full partner for MARES (MARine EcoSystem health and conservation) – a prestigious new European marine doctoral programme.

Vice-Chancellor, Professor Wendy Purcell explained:


Our involvement in the MARES programme places us at the centre of marine ecosystem health and Europe. This exciting appointment means 11 full partners and 13 associated member institutions across Europe. The participants will have the unique advantage with the benefits of exchanging ideas and findings with

Associate Professor Murray Brown, coordinator of the University's participation in the programme, said:

Our leadership in developing the marine research and education experts of tomorrow will contribute to a better understanding and management of our ocean resources on a global scale.







through our University's Marine Institute will position and conservation research and education in the UK ns that the University will be one of a consortium of as in 14 countries offering the doctoral programme in age of studying in a pan-European environment ith colleagues studying at the other institutions.



The first MARES candidates will begin their studies in September 2011 and will study with two of the partner institutions over the three-year programme to obtain a joint PhD in Marine Sciences. The programme will focus on six key areas: future oceans, understanding biodiversity, biological invasions, natural resources, ocean noise pollution, and habitat loss.



One of MARES' main aims is to create future experts who can lead and influence issues relating to worldwide marine conservation and ecosystem health which are fundamental to the sustainability of the planet,



added Associate Professor Murray Brown.



Transport Minister, Norman Baker with the South West smartcard

enterprise in action

## Green light for South West smartcards

Four years of collaboration between the University's Centre for Sustainable Transport (CST) and regional stakeholders has resulted in the creation of Europe's first open access regional smartcard back office system – paving the way for a ticketing revolution that could transform travel in the South West.

Launched by Transport Minister, Norman Baker in Exeter during October 2010, the Integrated Transport Smartcard Organisation (ITSO) backed system will allow different travel operating companies and local authorities to link up and offer a single, multi-purpose smartcard for transport ticketing, potentially replacing traditional paper tickets altogether.

Professor Jon Shaw of the CST said:

Everyone wins with an ITSO system such as this. The operational efficiencies will ensure faster and more reliable services, which will have a beneficial effect on transport flows and carbon emissions. And the consumer will benefit from better services and the flexibility to add tickets on their cards in, say, Bristol, to use on buses in Devon, Somerset, Cornwall and Dorset.

There are four main elements to the project: a £4 million capital investment programme, including a £1.85 million scheme to upgrade buses in South West England with ITSO smart ticketing equipment and back office facilities; an official launch ceremony, hosted by the West of England Partnership, for the region's 'pay as you go' scheme – the first of its kind in Europe; the establishment of a new mutual company, South West Smart Applications Ltd, by bus companies and local authorities to deliver the smart ticketing; and a free ITSO Consultancy Support Programme, worth £120,000, for South West local authorities and bus operators.

I'm delighted to launch this government supported scheme in the South West of England... My personal vision is to see seamless travel on one ticket throughout the whole country by 2020, and I am confident that we will see far more passengers using public transport as smart ticketing becomes the norm.

Norman Baker MP



# Local initiative earns national recognition

Students and Refugees Together (START) is a social care initiative and registered charity created in 2001 by University of Plymouth Associate Professor of Social Work, Avril Bellinger.

As part of the Plymouth Asylum Seeker and Refugee Consortium, START works with families, individuals and institutions to help refugees in the city reach their potential and make a positive contribution to the communities where they settle.

Students from a variety of fields including social work, occupational therapy, geography and community development provide START with the time and energy to support refugees to access their rights as they move into new communities and different locations.

START provides an individually-tailored casebook service, co-ordinates community activities that reduce social isolation, promotes healthy living and provides opportunities for volunteering. At the same time, the students benefit from challenging and powerful learning experiences that equip them to work nationally and internationally.

Since it began, more than 150 students have participated in START and the programme has attracted interest from all around the world.

Most recently, START has achieved national recognition for service delivery and best practice from the Social Care Institute for Excellence (SCIE), funded by the Department of Health.

SCIE was set up to identify and disseminate the knowledge that drives good practice in all aspects of social care throughout the UK in order that services can be improved and the status of the social care workforce raised. Only 12 schemes nationwide received this SCIE accolade and START is the only programme of its kind in the South West region.

Professor Bellinger said:

Recognition by the SCIE is very important to us because it validates the unique approach we have taken to involving students in the help and support of asylum seekers and refugees in and around Plymouth.

Her aim now is to build on this success. She added:

"I want to grow the impact and reputation of START by working with the Students in Free Enterprise project and continuing to spread the word about the initiative around the world."

START student volunteers with some of the refugees they have helped





Andrew Coghill

enterprise in action

## The sweet taste of success

It's the simple solutions to the everyday difficulties of modern living that often make the biggest difference to the most people.

Take the issue of ingesting medication, for example. Research has shown that around 40 per cent of patients struggle to swallow the tablets and medicine they have been prescribed – which means a compromised quality of life for many users.

This prompted University of Plymouth third-year Product Design student, Andrew Coghill, to investigate how the awkward process of taking medication could be made more palatable. His innovative solution went down so well with the judges at the 2010 Royal Society of Arts' Design Directions programme that Andrew, 21, walked away with the prestigious Aircraft Medical Award.

"I questioned whether there could be a different way of taking medicine that would involve more natural methods such as chewing and sucking," said Andrew. "The results show that by using a combination of methodologies, we can come up with designs that meet some of the real needs for today."

Andrew's three new product ideas – Parajam, Penicine and Ouch – are all designed to make taking medication a much more pleasant experience. Parajam, a mixture of paracetamol and jam, comes in wrapped segments and can be spread on bread or jam. Penicine has the appearance of a lollipop but contains a 1gm dosage of penicillin. And Ouch is a vacuum-sealed container that allows medicine to be downed in one quick movement – like an alcoholic 'shot'.





The Design Directions programme encourages students and recent graduates to create solutions that tackle the real-life social and service issues inherent in contemporary living. There were over 800 entries across a variety of categories, and with past winners including Jonathan Ive, designer of the iPod, and Betty Jackson, fashion designer, Andrew's success puts him in distinguished company.

Professor Roberto Fraquelli from the University's School of Architecture, Design and Environment said:

**Andrew's designs were inspirational and showed great imagination. His approach and project outcome was world-class and this is great recognition of a lot of hard work.**

Along with the award, Andrew picked up a prize fund of £1,250 and his work was displayed at both the New Designers Show in London and in the Design Directions Online Exhibition.



enterprise in action

## Opening minds to mental health

Our work in the development of graduate mental health training in the UK has led to the launch of a pan-European community health training programme in conjunction with the leading mental health charity, Plymouth Mind.

Working with partners in Poland, Lithuania, Slovenia and Greece, the project aims to enhance the skills of frontline social workers and primary care workers in the voluntary sector.

Funded by a European Union grant of €376,000, the project will create a flexible, educational framework to deliver vocational training in different countries, allowing healthcare professionals to pinpoint any weaknesses in service provision and improve community support for those on mental health waiting lists.

Graham Nicholls, Financial Controller at Plymouth and District Mind Association explained:

**The European picture is a mixed one in terms of the standards of mental healthcare provision, with some countries almost 15 years behind the UK. By working in partnership with education experts at the University of Plymouth and the different organisations in Europe, we will run a pilot phase and create best practice toolkits that will be available for use in countries across the EU.**

Graham Russell, Lecturer in Health Psychology at the University of Plymouth is providing consultancy/quality assurance for the project and developing a primary care toolkit to support future mental training initiatives in the EU. He said:

**"We are planning to map the training programme onto the EU qualifications framework to provide accredited and bona fide mental health credentials to people in a wide range of professions to raise awareness, competencies and know-how, across the board."**

enterprise in action



Karol Kwiatek

## Charles Church on film

Inspired by his time at the University, the creativity of current student Karol Kwiatek was on display in Plymouth during the Innovation for the Creative and Cultural Industries (ICCI) 360 Festival last September. Polish student Karol, who won a scholarship from the University in 2007 to study for a PhD in interactive 360 degree narratives, has made a computer generated interactive movie set in the dramatic Charles Church ruin, recreating the church in its former glory.

'Wartime Wedding' is a panoramic film telling the story of the wedding of Ken and Phyllis Beer, which took place on 20 March 1941, the day before the church was bombed in air raids. As the blitz starts above the church, viewers of the interactive movie can decide whether to run away or to continue watching the ceremony.

"I was intrigued by the ruined church and inspired to find out about its history," explained Karol. "My home town of Krakow didn't suffer from bombing during the Second World War."

Today, Charles Church stands as a monument to the citizens of Plymouth who died in the Second World War.

Among Karol's other achievements are the creation of an interactive game for children about the Launceston poet Charles Causley, receiving the Creative Award in the University's Business Ideas Challenge, and helping to organise the International Panotools Conference 2010 held at the University. He was also shortlisted in the Vice-Chancellor's Enterprise Awards 2010 for Postgraduate Research Student of the Year. Karol has also presented his research on the 360 degree screen at a conference in Seoul, South Korea and ran workshops for students in Hong Kong in October 2010.

Martin Woolner, Associate Professor at the ICCL, said:

Karol has made a major contribution to the Faculty of Arts, both in terms of his research and in his support of others. His work on Charles Church and Charles Causley was developed through collaborative partnerships and they demonstrate the opportunities that interactive 360 imaging can provide.

Project website: [www.charles3d.info/church](http://www.charles3d.info/church)  
Karol's website: [www.360stories.net](http://www.360stories.net)

Charles Church recreated





# Creative talent to meet business needs

Finding and recruiting the right calibre people can be a difficult challenge for any business. But with the University's Plymouth Graduate Internship Programme (PGIP), employers from across Devon and Cornwall have been able to benefit from a service that provides direct access to talented individuals with a diverse range of skills and knowledge.

PGIP was launched in response to the University winning funding from the Higher Education Funding Council for England to place 274 recent graduates into paid internships. Demand was such that the target was achieved within eight months of the project starting and is now ongoing.

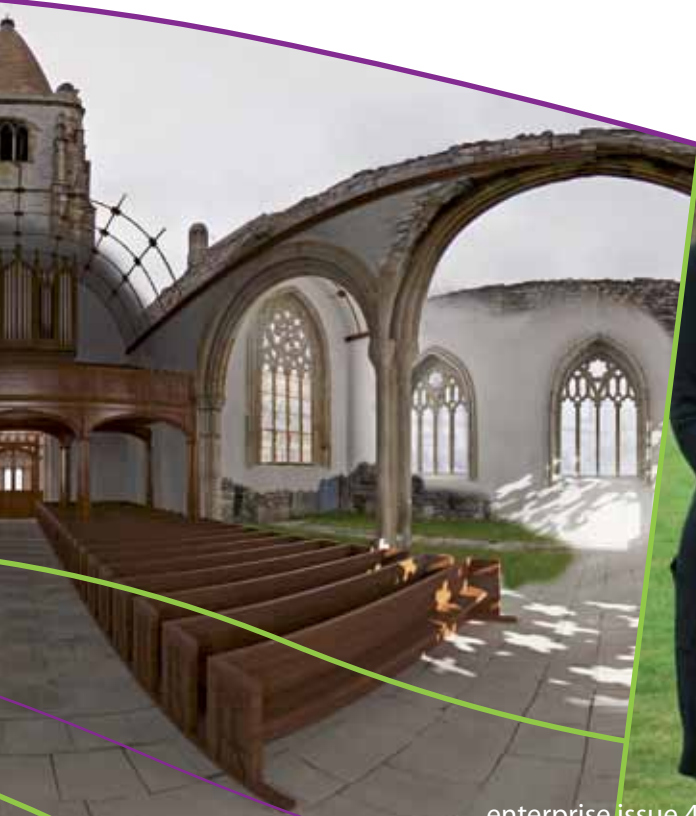
So when Plymouth-based brand communications agency Bluestone360 Ltd needed additional resources to meet client demand, they were able to work in partnership with the University of Plymouth and PGIP to recruit six recent graduates, in addition to accessing funding to assist with salary costs.

Bluestone360 Ltd creates marketing strategies to deliver a consistent and powerful brand to companies and to date have recruited six graduates to fulfil a variety of vital roles including John Downie as a Digital Developer, Mark Grant and Joel Avery as Junior Designers, Angie Chan as a Junior Designer, Sadie Majer as a Copywriter and Rhianna Morton as an Account Executive.

Mervyn Orchard, Director at Bluestone360, said:

Our long-term relationship with the University of Plymouth paid off when in early 2010 we needed to grow our multimedia design team. Through the PGIP we have been able to recruit six talented graduates, who have brought with them cutting-edge ideas and talents, which are driving up our capabilities and resulting in increased demand from existing and new clients. Through our talented and fresh creative team, we are able to ensure that work for clients such as Gerber, Ginsters and First Devon & Cornwall is of the highest calibre and quality that they expect. The graduate interns are benefiting from gaining relevant workplace experience, earning a graduate-level salary, in addition to being able to make a tangible impact on a fast-paced business.

bluestone360®



Mervyn Orchard (centre) with some of his University interns

enterprise in action

# The power of music

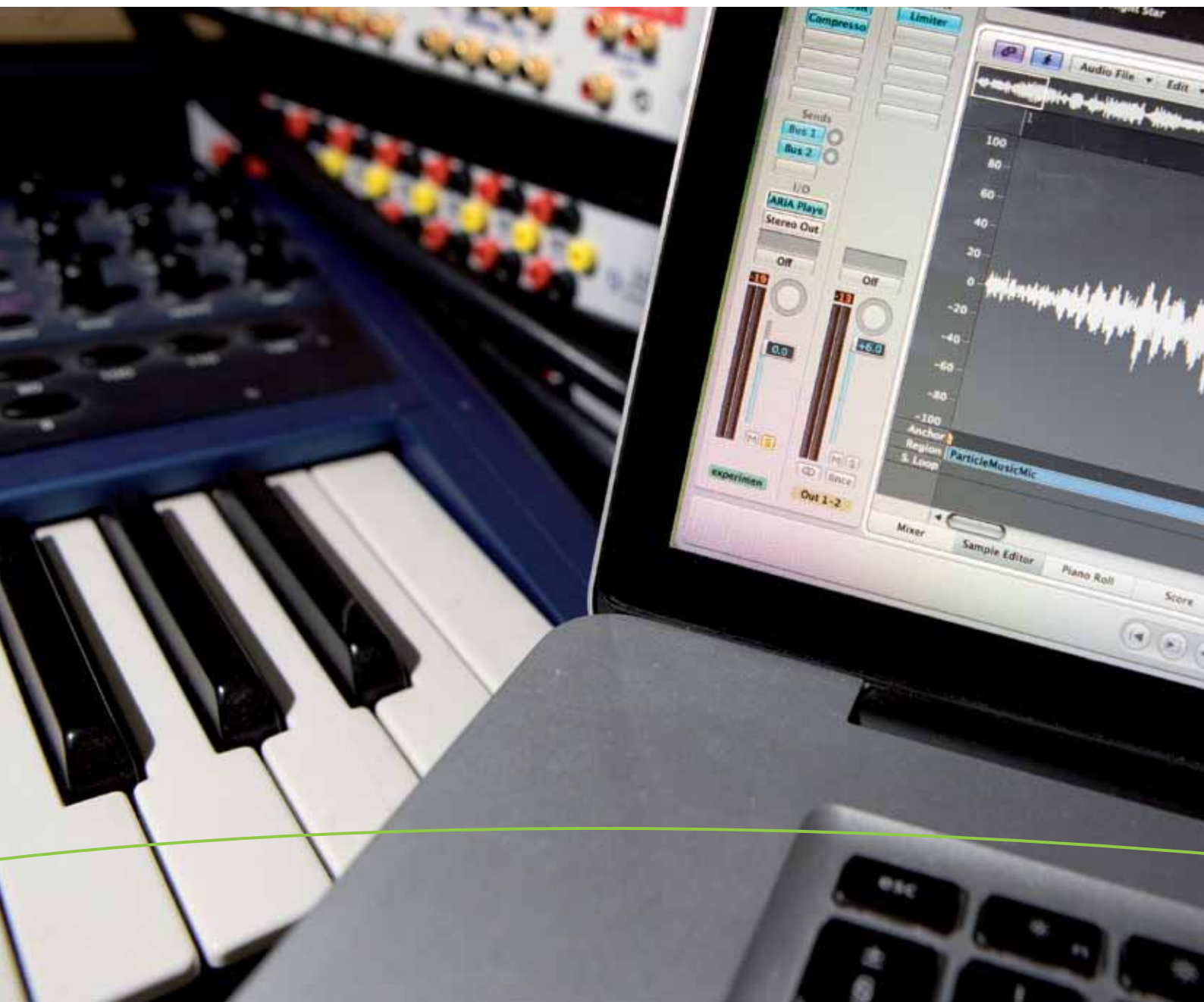
The Interdisciplinary Centre for Computer Music Research (ICCMR) at the University has been involved in an exciting pilot study across four countries to demonstrate how computer music technologies can inspire young people to learn at school and help reduce drop-out rates.

The E-motion project was conducted in collaboration with partners in the UK, Romania, Italy and Spain and used methods designed by the ICCMR to engage young people and teach them techniques that could help with subjects like maths and science.

Eduardo Miranda, Professor of Computer Music and project co-ordinator for the Plymouth team, explained:

Music embodies examples of concepts that teachers can use in class. Many of the pupils we worked with were demotivated and in danger of dropping out of mainstream education. The electronic music was used to help teach maths and science with significant results – the maths scores of Romanian pupils, for example, improved by more than ten per cent and in the UK both maths and science scores improved dramatically.

The results of the project were presented at a conference in November 2010 attended by teachers from Liverpool, Bucharest and Rome.







Professor Eduardo Miranda

enterprise in action

## Festival app is a hit

Music festival goers around the world are now able to access the information they need to get the most out of every major show by downloading the new iFest app developed by University of Plymouth digital arts student, Chris Blackmore.

Launched at Glastonbury last year, iFest combines information already in the public domain with a bespoke database designed by Chris, allowing you to view band details and line-ups, stage maps, directions, and Met Office weather updates – with the option to easily share information through an integrated Facebook feature. Its GPS technology will even help you locate your tent!

During the festival, the app received thousands of hits at the iTunes Store, prompting Apple to officially promote it. Chris said:

“ I’ve always found it difficult to access information at festivals and had this idea of tapping into the proliferation of smart phones. I was at Glastonbury and by the end we had nearly 3,500 downloads. ”

The development of iFest was part of Chris’s final-year project and he had to submit his application to Apple’s tough vetting process before the app went live a week before the start of Glastonbury. Its success has inspired Chris to design updates and new features that support other major festivals such as V, Leeds, Reading and Bestival.

Gianni Corino, Programme Lead for the Digital Arts and Technology course put the project into perspective:

“ This is a wonderfully creative idea that also has the rigour to withstand Apple’s exceptionally high design and commercial standards. ”



# Chemistry student wins Trainee of the Year for international placement

The University has always encouraged international collaboration in its research and learning activities, so when second-year Chemistry student Charlotte Levy discovered the International Association for the Exchange of Students for Technical Experience programme (IAESTE) in 2009, she received all the support necessary to secure a placement in Buenos Aires, Argentina.

Since 1948, the British Council's IAESTE programme has organised over 330,000 exchanges for students around the world, and after a demanding application process, Charlotte was selected to work on a water quality assessment project involving the investigation of organic compounds and trace metals in surface waters inhabited by the Argentinean Pejerrey fish. Her research was designed to help maintain fish species and protect human health in relation to fish consumption.

Working with a researcher, PhD student and another undergraduate, Charlotte found that her Chemistry course had already equipped her with many of the skills demanded by the project.

**"It felt like a real job," she said. "I was given tasks to complete without supervision, although my mentor was around if I needed help, and this helped to build my sense of competence and professionalism in the laboratory."**

As well as enjoying the experience of working abroad, Charlotte spent her free time immersing herself in South American culture and lifestyle, dramatically improving her Spanish and becoming an active member of the local community. She commented:

**Now I'm back at University and have plenty of coursework to do, but I feel rich in lifelong lessons and for the excellent scientific and cultural experience that was made available to me by the IAESTE programme.**

On her return to Plymouth, Charlotte produced a report of her experience in Argentina which won her the UK Trainee of the Year Award 2010, ahead of submissions from 20 other students around the UK. The judges were very impressed by Charlotte's work, but also by her holistic view of the experience and the way she embraced Argentinian life.

Year 2 Scientific and Professional Skills Coordinator for Chemistry at the University, Dr Mark Fitzsimons, was delighted with the results of the IAESTE programme – for both Charlotte and Plymouth's visiting Czech student, Jiri Vaclavik, saying:

**The IAESTE is definitely an elite training programme and these kinds of placement experiences are key in developing engineers and scientists able to make their mark in the world.**



Charlotte with Professor Simon Belt



# Cool research for the competitive edge

Groundbreaking new research at the University of Plymouth could give top athletes a competitive edge by helping them manage injuries more effectively and stay in peak physical condition for longer.

Academics and students from the University are investigating the best ways of removing heat from the body to cool muscle damage and ease pain and inflammation after strenuous sports activity.

The use of cryotherapy techniques is being tested between training sessions on a group of high performance swimmers from Plymouth Leander – including double Commonwealth Games medallist and University student, Antony James.

The six-month project is the first research of its kind to focus on swimmers in this way, with post-exercise ice baths, funded by a £7,500 grant from the University's Marine Institute, being compared to other kinds of cool-down activities such as recovery swimming and stretching. The swimmers' pain ratings and blood lactate levels will be measured to establish the most effective and fastest method of recovery.

The findings could help Antony and other top swimmers in their quest to win medals for Britain in competitions like the Olympics and other prestigious sporting events. They will be able to manage their bodies based on tried and trusted scientific evidence, backed up by hard facts, to ensure they are in peak physical fitness to compete at the highest level.

Although the research is particularly focussed on helping swimmers recover during competitions where they have more than one heat in a day, it could equally apply to any high intensity sprinting sport requiring multiple explosive repetitions.

Matt Barlow, an Exercise Physiologist at the University is leading the research:

Even a small gain in performance could mean the difference between first and second place. The University could be contributing to the future success of the nation's sports stars as the research will also have relevance to other sports.

Students with the new ice baths





# On course for cruise ship training

Our world-class marine-based courses and groundbreaking research activities are internationally recognised and highly acclaimed. So too is our work in the tourism sector. Combined, these two areas of expertise contributed to the University being the first in the UK to offer the BSc (Hons) in Cruise Management – and our standards have since been judged by the Quality Assurance Agency to be among the best in the country.

Over the last two years, our experience in this specialist field has returned an impressive track record of employment, with all graduates being offered full-time positions by their work placement providers.

Now, the University's success in cruise hospitality has been further acknowledged by the Marine Hotel Association's (MHA) announcement that we will be the first organisation outside the US licensed to deliver their High Performance Leadership Programme (HPLP) – the world's top professional cruise industry training scheme.

The MHA is a not-for-profit organisation representing the interests of the cruise line marine hotel industry and its supply chain. Its HPLP is a five-day intensive workshop designed to strengthen the leadership skills and teambuilding abilities of managers working within the industry. The course covers topics such as leadership style, strategic problem solving, motivational theory, performance management and effective goal setting.

Course Director, Dr Philip Gibson of the Plymouth Business School, is delighted with the appointment:

Our expertise has been recognised by one of the most prestigious organisations in the industry. The HPLP will provide a vital addition to the offering available to those already working in the cruise sector.







Becky Barber

enterprise in action

## Designing a sustainable future

The real-world application of design, innovation and enterprise are powerful drivers behind much of the University's research. At home and further afield, our work is helping to make a positive and lasting contribution to the quality of lives around the world in many different ways.

The nature of this contribution is reflected in a broad diversity of projects and includes an inspirational idea created by Plymouth student, Becky Barber. After many visits to Madagascar where her parents have spent the last 26 years working for charities, Becky, 22, has designed a solar powered radio made entirely from bamboo – with the aim of creating social enterprise and an educational resource in one of the world's poorest communities.

Aid organisations have been very receptive to the initiative, recognising that the radios could enable them to contact remote villages to provide important health updates, and also act as educational channels.

The radios are being marketed in both Madagascar and the UK by Becky's company, BOO Enterprise, with the intention of using the revenue to fund further social enterprise projects. Sales in the UK have already started to take off and there is considerable interest from a number of retailers across the country. What's more, because of the abundance of bamboo, production costs can be kept relatively low. Becky commented:

“It's an amazing material with many of the properties of hardwood, but it takes a fraction of the time to grow. And because of its natural structure, it produces a fantastic sonorous quality. If this takes off, we could establish workshops in the country, provide good salaries, and put the means of production into their hands.”

“Over two-thirds of the population exist below the poverty line, earning around £1 per day, so I've been really motivated to develop a project that would use the education I have been lucky enough to enjoy, and the resources of the University, to provide opportunities for those not so lucky. By using sustainable and naturally occurring resources in the construction of the radios, we can provide jobs and opportunities for people in Madagascar.”

Becky Barber, BOO Enterprise

The radios have been exhibited at the University of Plymouth Arts Degree Show and at the New Designers Show in London, and their designs won Becky the Social Enterprise Award at the University's Business Ideas Challenge. As well as the radio, she also exhibited a low-tech refrigeration system that uses evaporation to cool food, and a parasol that protects from the sun during the day, but provides a solar powered light at night.

Most recently, Becky won the runner-up prize at the South West University's Enterprise Awards after a gruelling pitching process held in Exeter. She was also one of three nominations for the Plymouth Herald Youth Awards in the Young Social Entrepreneur of the Year category.

Professor Roberto Fraquelli, of the University's School of Architecture, Design and Environment summed up Becky's achievements by saying: “This is another fantastic example of how our students are taking real issues and problems and using them as the inspiration for their designs. Once again, it is the real-world application of innovation that sets the University apart.”

# Putting design into perspective

When Devon Guild of Craftsmen co-director Sarah James visited the University's Arts Degree Show, she was so impressed with the quality of design work it inspired her to create a new annual award for the best pieces.

One year later, the first ever University of Plymouth / Devon Guild of Craftsmen 'Designer Maker Prize' has been awarded to final-year 3D Design student, Mike Charlton, for his innovative bamboo furniture.

**“We were impressed by Mike’s eye for design, his use of sustainable material, and his sense of direction,**

said judge, Philippa de Burret, Education Officer at the Devon Guild.

As a result, Mike’s work was showcased for a month at the guild’s Bovey Tracey gallery, appearing with an exhibition featuring the diverse work of eminent furniture maker and designer, John Makepeace OBE. Mike commented:

**“Bamboo is a material that’s only just starting to be used in the production of furniture. I really wanted to design a range of furniture that made best use of its features – not just as an alternative to wood. Winning this competition was a real bonus as I’m hoping to start my own business designing and making bamboo furniture. To be able to display my work alongside that of John Makepeace couldn’t have given me a better start.”**



Mike Charlton



# Top of the table

The National Environment Research Council (NERC) is responsible for funding world-class science research in universities and research centres, with the aim of increasing knowledge and improving understanding of the natural world. The focus is on supporting work that addresses major 21st century environmental issues – such as climate change, biodiversity and natural hazards.

Marine themed research is a fundamental part of the council’s remit, and the University of Plymouth’s leadership in this area is reflected in the proportion of marine responsive grants we have been awarded over recent years.

Plymouth is one of only a handful of universities to have received NERC marine research grants every year since 2005. In fact, University of Plymouth Marine Institute

staff have won nearly ten per cent of all the 197 marine-related NERC grants awarded during this time. At 19 grants, this puts us on top of the awards table, together with the University of Southampton, and is almost double the achievement of any other university.

Director of the Marine Institute and Professor of Marine Ecology at Plymouth, Martin Attrill, thinks the figures speak for themselves:

**“The number of NERC marine-related research grants awarded to the University is a clear indication of our exceptional expertise in the marine area, and a reflection of our genuine commitment and pioneering approach to tackling the real-world environmental issues that affect us all. You can’t argue with the facts.”**



enterprise in action

## Into the unknown

Unmanned waterborne vehicles – or USVs – are often used by the military in dangerous areas or on surveillance missions, and are also essential tools for hydrographic and survey operations in environments where it's too risky for people to work. But because USVs rely on GPS navigation systems to manoeuvre, their capabilities can be compromised if satellite signals are blocked by terrain or jamming equipment.

This has led to the University leading a three-and-a-half year project to create a new form of USV navigation system that works in areas without satellite coverage. Working in collaboration with Atlantic Inertial Systems, part of the Goodrich Corporation, the programme is being funded by a £350,000 grant from the Engineering and Physical Science Council.

Professor Robert Sutton and Dr Sanjay Sharma from the School of Marine Science and Engineering will be designing an intelligent adaptive autopilot system, while their colleague Dr Phil Culverhouse from the School of Computing and Mathematics will be developing a navigation subsystem based on visual localisation and mapping techniques. The results of their combined approach will be tested in the University's *Springer* USV at Roadford Reservoir and in Plymouth Sound.

Professor Sutton commented:

**This is a very exciting project as the developed techniques will allow USVs to operate in truly autonomous modes in unstructured environments and hence further enhance their operational capabilities. It's also a perfect example of how universities and businesses can combine their resources to create solutions to real-world problems.**



*Springer, the University's USV*



*Professor Robert Sutton, Dr Sanjay Sharma and Dr Phil Culverhouse*



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