

Spring 2010

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**Kent students take  
Maths to Brompton  
Academy**

Students from the University's Medway campus, have helped set up a maths club at nearby New Brompton College in Gillingham. The club runs once a week after school and provides Year 9 students with additional coaching as they prepare for their GCSE examinations.

Amy Scamell, the University's Volunteering and Skills Co-ordinator, said the scheme had been a big success for both sides. 'The feedback from the GCSE students has been really positive.

Alan Belsey, New Brompton College's Deputy Leader for Maths, added: "We are really pleased to be working with our lead sponsor, the University of Kent, as they are going to be pivotal in the development and progression of Brompton Academy."



**Brompton Academy,  
Gillingham, Kent**

**View from the Dean's Office**

The Dean's office has undergone some changes since the last issue, but the 'view' remains the same. Professor Jeffries has been seconded for 9 months to develop a health strategy for the University. You can rest assured that 'Sciences@Kent' will be an integral part of that strategy (see article on page 2 for example!) and that our collaborative interactions with the regional NHS are set to expand as the strategy rolls out. In the meantime, Professor Mark Burchell from the School of Physical Sciences has taken over the reins as Dean of Sciences for the interim period until 31st December.

**Best wishes  
Peter**



**Professor  
Mark Burchell**

**Astronomy student nominated for space 'Oscar'**

Ryan Laird, a PhD student at the School of Physical Sciences, has been shortlisted for a 'Sir Arthur C Clarke Award'.

These national awards provide recognition for those who have worked for the advancement of space exploration. During their five-year history, they have become known as the space equivalent of 'The Oscars'.

Ryan was nominated for his contribution to public outreach in astronomy and space science. This includes giving talks to astronomical societies, volunteering at Space School UK and representing the UK at the International Year of Astronomy 2009 opening ceremony in Paris, having been chosen by the Royal Astronomical Society.

Dr Stephen Lowry, Lecturer in Astronomy and Astrophysics at the University's School of Physical Sciences, said: "We are delighted for Ryan to be recognised in this way. He is a very promising young scientist with the astronomy research group here at the University of Kent. Ryan is also currently involved the University's SEPnet Astrodome project, which is one of Kent's most advanced mobile planetariums. I have no

doubt that he will continue to inspire groups of all ages to learn about astronomy and space."



**Ryan Laird, who has been shortlisted for a  
Sir Arthur C Clarke Award.**

## Obesity – endemic or exponential?

Obesity prevalence in Britain has trebled over the last 20 years in adults and children. The UK has been dubbed the 'fattest nation in Europe' by many, with 61%[1] of the total population recognized as being overweight or obese, compared to Luxembourg at 54.8%[1], Ireland at 51%[1] and both Italy and the Netherlands at 45.5%[1].

### What is obesity?

Obesity is a condition characterized by excess body fat. It is one of the biggest public health concerns of this century. Obesity reduces life expectancy by about nine years and is responsible for 9,000 premature deaths a year in the UK. The costs to the NHS of treatment for obesity and associated medical conditions run into billions of pounds.



### How is obesity defined?

The clinical definition of obesity is determined by the body mass index (BMI) which provides a crude measure of body fat i.e. weight in kilograms divided by the square of height in metres. Obesity is defined as a BMI of 30 Kg/m<sup>2</sup> whilst overweight is within the range of 25 Kg/m<sup>2</sup> and 30Kg/ m<sup>2</sup>. Weight circumference is another useful measure of adiposity. Central adiposity (also called as visceral or apple-shaped obesity) has been associated with the metabolic syndrome and cardiovascular diseases. It is defined as a waist circumference  $\geq$  94 cm in men and  $\geq$  80 cm in women.

### What are the causes of obesity

Obesity is caused by an imbalance between energy intake and expenditure, and involves a complex interplay between several factors.

Lifestyle behaviour is a significant driver of obesity. As a society, we often prefer to drive rather than to walk or cycle. This is compounded by a lack of environments that encourage and promote physical exercise. There is a need to create and manage more safe spaces for incidental and planned physical activity and to address any local concerns about safety and crime. Examples suggested by NICE [2] include cycling and walking routes,

cycle parking, safe play areas, better street lighting and walking schemes.

Many feel that tackling the causes of obesity is not just the responsibility of individuals, but should involve communities and the government. However, the existing obesity policy environment in the UK has been described as a "policy cacophony in which the noise is drowning out the symphony of effort" (Lang, 2007). Policy challenges are associated with several factors including the complexities in determining the causes of obesity, challenges of government interfering with human freedom by dictating lifestyle choices, the difficulties of expecting a quick fix solution and the paucity of evidence on effective interventions, especially over the long term. The challenges of tackling obesity are not helped by conflicting scientific information presented in the media.

### How much is too much?

The current daily guidelines are 2,000 calories for women and 2,500 for men. However, a recent report from the Scientific Advisory Committee on Nutrition (SACN), a committee of independent experts that advises the Food Standards Agency and Department of Health, stated that the existing recommended calorie intake appears to be too low for adults because earlier assumptions on physical activity were incorrect. The researchers estimated the average energy requirements for adults to be up to 16% higher than the original recommendations. But this is far too generic and the ability to burn calories varies between individuals. Many find it easy to become conditioned to the convenience of fast-foods and ready-made meals, often eaten at times that either don't coincide with, or don't form a regular eating pattern. Courted by advertising, society finds convenience food easily available at all times of the day, especially in areas of low socio-economic status. The food is cheap because of reduced taxation, and bulked-out with trans fats and large quantities of salt and sugar. Portion sizes are getting bigger which encourage us to eat larger quantities of food, often far in excess of our requirements. All these factors contribute to an unbalance diet.

### How does obesity effect us?

The negative implications associated with

obesity have physical (e.g. coronary heart disease), psychological (e.g. low self esteem) and social (discrimination and stigma) consequences. Weight loss in overweight and obese individuals requires a conscious effort to burn energy by physical activity and avoid excessive energy intake. Genes can influence appetite and metabolism but with health advice, the risk of developing obesity can be reduced.



### Prevention and Management of Obesity

NICE provides guidance on the prevention and management of obesity[2]. This covers individual, local authority, workplace and school approaches. Prevention involves encouraging healthy eating and increasing physical activity levels. Management involves lifestyle change, and pharmacotherapy or surgery, depending on level of obesity and other co-morbidities. With lifestyle management, people should not aim for a drastic loss, but rather a behavioural change towards adopting a healthy lifestyle.



Funmi Oduniyi is a Clinical Lecturer at the Medway School of Pharmacy. After graduating with a B.Pharm (Hons) at the University of Ife, Ile-Ife, Nigeria, she obtained a Part 1 Diploma in Clinical Pharmacy from

the School of Pharmacy, University of London. She then studied at Imperial College London where she was awarded an MBA, specializing in Entrepreneurship and Innovation with Distinction. She is a member of the Royal Pharmaceutical Society of Great Britain, Pharmaceutical Society of Nigeria and Nigerian Institute of Management.

Funmi's research interests include pharmaceutical care, medication safety and public health; focusing on hypertension, diabetes and obesity. She is a consultant for healthcare and management issues. Her work in the management of hypertension was presented at the ISH Conference in Maputo, Mozambique in 2006.

[1]. Source: Organisation for Economic Co-operation and Development (OECD) Health Data 2009 - Frequently Requested Data

[2] NICE (National Institute for Health and Clinical Excellence) guidance on the prevention and management of obesity—<http://guidance.nice.org.uk/CG43>

## Asteroid astronomers awarded 82 nights of research at the European Southern Observatory

An international team of astronomers led by Dr Stephen Lowry from the School of Physical Sciences have been awarded 82 nights of European Southern Observatory (ESO) telescope time.

This award, spread over 4 years, will enable Dr Lowry and his team to study how near-Earth asteroids (NEAs) react to a phenomenon known as the YORP effect [see note below]. It will also boost the national and international research profile of the University's Astronomy, Astrophysics and Space Sciences programmes.

ESO is the foremost inter-governmental astronomy organisation in Europe and the world's most productive astronomical observatory. It provides state-of-the-art research facilities to astronomers and is supported by most European countries, including the UK. Each year, about 2,000 proposals are made for the use of ESO telescopes, requesting between four and six times more nights than are available. Generally, an allocation of one to two nights in any given six-month period is considered to be a success for individual research astronomers.

Dr Lowry explained: 'With a provision of 82 nights telescope time, we expect to be able to monitor a large sample of near-Earth asteroids over many years and to look for signs of the YORP effect acting on them. We can also perform detailed studies of their surface properties to help understand the processes that drive the effect.' Dr Lowry also explained the benefits for UK planetary science. 'Over the next four years we expect some exciting results, leading to major developments in the field of near-Earth asteroid science. This will not only lead to additional awards of telescope time for studies in this area by UK astronomers, but will also boost the international profile of planetary science in the UK.'

Professor Paul Strange, Head of the School of Physical Sciences, commented:



Three of the four Unit Telescopes of ESO's Very Large Telescope (VLT) are shown here getting ready for another exceptional night of observations on top of Cerro Paranal, in Chile. Prior to every night, the engineers in charge go through a routine of manoeuvres to prepare the flagship facility of European astronomy. The VLT is the world's most advanced optical instrument, consisting of four Unit Telescopes with main mirrors of 8.2-metre diameter and four movable 1.8-metre diameter Auxiliary Telescopes. One of the Auxiliary Telescopes is shown on the right of the image.  
Credit: ESO/G.Hüdepohl (atacamaphoto.com)

'I congratulate Dr Lowry on obtaining this award. Such a large allocation of telescope time could only be gained by a truly world-class research project. This is a huge boost to the profile of planetary science in the School of Physical Sciences at Kent and to the South East Universities Physics Network of which Kent is a key member.'

Professor Peter Jeffries, Dean of the Faculty of Sciences, added: 'This important award recognises our commitment to the international research effort in Planetary Science. Stephen was appointed to Kent as part of our contribution to the South East Universities Physics Network. We are proud that his work has been recognised in this

way and look forward to some exciting observations as a result of this exceptional access to telescope time.'

The project will be conducted in collaboration with astronomers from Europe and the US. Team members include: Dr Simon Green, Dr Stephen Wolters and Ben Rozitis (Open University); Professor Alan Fitzsimmons and Samuel Duddy (Queen's University of Belfast); Dr Colin Snodgrass (Max Planck Institute for Solar System Research, Germany); Ryan Laird (University of Kent); and Dr Paul Weissman and Dr Michael Hicks (NASA's Jet Propulsion Laboratory, California, USA).

The **Yarkovsky-O'Keefe-Radzievskii-Paddack (YORP)** effect is believed to alter the way small asteroids in the solar system rotate. YORP is a torque due to sunlight hitting the surfaces of asteroids and meteoroids and warming their surfaces, leading to a gentle recoil effect as the heat is emitted. By analogy, if one were to shine light on a propeller over a long enough period, it would start spinning. Although this is an almost immeasurably weak force, astronomers believe it may be responsible for spinning some asteroids up so fast that they change shape or break apart, perhaps leading to the formation of binary asteroids. Others may be slowed down so that they take many days to rotate once. The YORP effect also plays an important role in changing the orbits of asteroids between Mars and Jupiter, including their delivery to planet-crossing orbits.

## University of Kent helps Canterbury Cathedral digitise archives



**Canterbury Cathedral**

A unique collaboration between the University of Kent, Canterbury Cathedral Archives and researchers in Rouen has laid the foundations for a new and exciting project through which Canterbury residents and visitors may in the future gain easy access to some of the older and/or more fragile documents held in the Cathedral Archives.

Known as *DocExplore*, the project aims to develop an interactive system which allows digitised versions of valuable historical documents to be explored via a

touch-screen, simulating, as far as possible, the experience of accessing the physical object itself. But users can see much more than the document – they can access translations and transcriptions, read more about the period in which it was written, its contents and who would have used it at the time by using the additional text, image, sound and video resources that are a feature of the system.

*DocExplore* will also capture the knowledge and expertise of the Archives' staff by allowing them to easily present any available digitised document.

If the second phase of this EU INTERREG IVA-funded project is agreed, *DocExplore* will ultimately offer manuscript readers an even wider variety of tools, invaluable for both for the casual visitor with an interest in researching these priceless documents, and for academic historians and literary scholars. For example, there will be tools to help readers to clarify annotations and to recover sections of the text which are damaged. It will also enable researchers to identify and compare writing samples from different writers and to investigate the nature of the paper on which documents are written.

The system was developed by Dr Richard Guest, Professor Michael Fairhurst and Dr Yiqing Liang from the School of Engineering and Digital Arts (EDA) at the University of

Kent; Dr Catherine Richardson from the University's Centre for Medieval and Early Modern Studies; Dr Malcolm Mercer and Dr Mark Bateson from Canterbury Cathedral Archives; and a team of researchers from the University of Rouen and the Bibliothèque de Rouen Archives.

Dr Yiqing Liang, the EDA-based researcher developing the system software, said: 'The scoping phase of *DocExplore* began in April 2009. However, on the 17th and 18th of March this year, local residents were given the opportunity to preview the ideas underpinning the proposed system at a two-day exhibition of the beautiful seventeenth century 'Travel Diary of John Bargrave' held in the Cathedral's archives. This exhibition and the feedback we received helped us learn a great deal more about how to build on the basic concept and will be useful for when we move on to the implementation of the ultimate system in the next phase of the project.'

Dr Liang was also encouraged to see such a high level of interest in the project from those who visited the exhibition. 'Canterbury Cathedral Archives continues a tradition of record-keeping that dates back at least 1300 years,' she said. 'We are proud and excited to be part of such an important tradition.'

## First year computing student awarded BCS prize

Michael Carter, a student from the School of Computing, has been awarded the BCS, The Chartered Institute for IT (Kent Branch) prize for the best performance in Stage 1 Computing for 2008-09 academic year. Michael is now in his second year studying for a degree in Computer Science with a Year in Industry.

The prize was presented by Jose Casal-Gimenez, Chairman of the Kent branch, during the BCS monthly meeting on the 18th March held at the School of Computing.

The prize consisted of a four year membership to the BCS, a £150 cheque and a plaque.

Michael said:

" Thanks very much not only to the BCS, but to the excellent staff here at the University of Kent. I'm not used to receiving prizes so this really is extra special for me. I'm sure I'll find a worthwhile academic outlet for the winnings, and hope to remain a member of the BCS for a long time to come! "

The BCS is a chartered body which represents professionals working in IT and computing in the UK. It promotes wider social and economic progress through the advancement of information technology science and practice. It has over 70,000 members including practitioners, businesses, academics and students, in the UK and internationally.



**Michael Carter receives his prize from BCS Kent Branch Chairman, Jose Casal-Gimenez**

## Professional placements for computing students

The School of Computing has formed a new partnership with e-skills UK on their unique internship programme designed to boost the employability of UK graduates.

e-skills UK is the Sector Skills Council for Business and Information Technology and works on behalf of employers to ensure the UK has the technology skills it needs to succeed in a global digital economy.

The new, nationally recognised, internship programme will encourage students to undertake a work placement, provide a greater variety of quality placements and enable employers to recognise the skills typically developed by students. It will operate alongside the existing Year in Industry scheme run by the School's Placement Office.

Due to the success of its Year in Industry scheme, the School's Placement Office was invited to undertake benchmarking activities to help identify the key skills that will form the framework of a successful internship experience. University of Kent computing students currently on placement are taking part in the pilot programme, with an official launch planned for next year.

Three of the School's students already feature in a series of e-skills promotional films supporting internships. The students are: Gurmik Brainch, currently on placement with Select Software as a support analyst; Andrew Cassidy, a former student who did his placement with Select Software and is now employed by them as a software developer; and Rob Turner, who gained a placement at Kinetic Solutions and is now working on the support desk, helping to provide service support to over 130 clients. The School of Computing offers a Year in Industry option with all of its degree courses, and over half the students choose this option. Students go on placement between their second and final years of study. The Placement Office helps students to find suitable positions and supports them throughout.

Katie Van Sanden, a Placement Officer at the School, said: 'We are delighted to be taking part in the benchmarking activity with e-skills UK. Our expertise, gained over several years of supporting Year in Industry students at the University, means that we can offer first hand advice and bring back new ideas to help improve our own scheme.'

## Gifted school pupils attend maths masterclasses

Twenty gifted young mathematicians from across the county have attended a series of maths masterclasses at the School of Mathematics, Statistics and Actuarial Science.

As part of a Royal Institution of Great Britain scheme to encourage young mathematicians, the workshops brought together pupils aged 12-14 from eight different schools across Kent, ranging from Dover to Rochester.

For the past six weeks the highly interactive sessions at the University's School of Mathematics, Statistics and Actuarial Science have introduced students to aspects of maths which are not usually covered in the school curriculum. Topics included how to build a stable bridge with blocks, number puzzles and how to explain the curves obtained by cutting up an ice cream cone.

Pupils were awarded certificates from the Royal Institution of Great Britain at the last class of the series on Saturday 27 March. The final session was taken by Professor John Dore on 'A mathematical analysis of some games', with assistance from Isadora Antoniano-Villalobos, a

postgraduate student from Mexico who is taking a PhD in Statistics at Kent. The aim of these sessions is to challenge and inspire some of Kent's brightest young people, by developing their mathematical abilities, and encourage them to carry on studying mathematics and science to A-Level and beyond. The participants who attended the classes were extremely enthusiastic:

Sam Nimmo, from Dover Grammar School for Boys, said: 'I liked the maths puzzles and meeting other people.'; Ben Strachan, from Dover Grammar School for Boys, said: 'It was all good.'; Aaron Antrobus, from Hartsdown Technology College, commented that the University should 'do it again.'; Maidstone Girls Grammar School's Gabrielle Drew added: 'If you cut a cylinder in half you get a bracelet. A Mobius band cut in half gets you a necklace.';

Dr Andrew Hone, Reader in Applied Mathematics at the University's School of Mathematics, Statistics and Actuarial Science, said: 'It is very encouraging to see the commitment and enthusiasm of these bright young people, who have spent their Saturday afternoons stretching their mathematical imaginations.'

## How atoms in glass vibrate

Scientists from the Functional Materials Group at the University of Kent's School of Physical Sciences (SPS) have expanded the potential uses of glass by developing an experimental technique that reveals more clearly how atoms in glass vibrate.

This new technique will make a significant contribution to the Functional Materials Group's current research into the use of glass as a material for applications such as nuclear waste immobilisation and as a biomaterial. Specific applications for the latter include the development of a biodegradable glass for bone regeneration.

The team's experiment, described in a recent editor's choice paper by the journal *Physical Review B*, involved using several types of glass containing different isotopes of oxygen which, due to the difference in mass between the isotopes, vibrate at different speeds. The speed of these vibrations was then measured via a technique known as inelastic neutron scattering.

Dr Gavin Mountjoy, Head of the Functional Materials Group and principal investigator on the project, explained: 'Knowledge of how atoms vibrate in solids is fundamental for explaining the thermal properties of materials; for example, in materials used for energy production, which operate at high temperatures. However, it has always been difficult to study atoms vibrating in glasses because the atoms are not arranged in a regular, predictable way as they are in crystals. To date, the understanding of this phenomenon has been heavily reliant on computer simulations.'

Co-investigator Bob Newport, Professor of Materials Physics at SPS, added: 'Since a new methodology has been established, it can be exploited to study a range of different glasses.'

The research was funded by the Engineering and Physical Sciences Research Council (EPSRC).

### Research Topics of Dr. G. Mountjoy

- Experimental characterisation of glass structures
- X-ray absorption spectroscopy of nanocrystalline materials
- Modelling of oxide glasses

**Café Scientifique  
Ye Olde Beverlie,  
St Stephen's Green, Canterbury**

**Café Scientifique is a place where, for the price of a cup of coffee or a glass of wine, anyone can come to explore the latest ideas in science and technology. Meetings take place in cafés, bars, restaurants and even theatres, but always outside a traditional academic context.**

**Tuesday 9 March 2010—7pm**

**Dr. Jim Ang, School of Engineering and Digital Arts, University of Kent: Let's Get Serious About Games**



Playing computer games has always been traditionally seen as a young male activity which is confined within an individual, isolated space. This stereotypical view is further exacerbated by the violent content in computer games, supported by a plethora of research in games and violent behaviour. However, as the gaming industry is moving towards maturity, we are witnessing a gradual but significant change in public perceptions, the demographics of players, and the industry's effort in developing games with "serious" content, e.g. games that deal with social political issues. Within academia, we are intrigued by the potential of this new interactive medium in various disciplines. Already, there has been research in the use of computer games in healthcare (virtual therapy, rehabilitation, behaviour intervention programmes), education (game-based learning, e-learning in 3D virtual worlds, virtual experiments and scientific exploration), interactive storytelling (story simulators, Janet Murray's vision of "Hamlet on the Holodeck"), artistic expressions (game art exhibition perhaps?), just to name a few. I will talk about serious and innovative uses of computer games which will have an impact on people's life and the society at large.

**Tuesday 20 April 2010—7pm**

**Dr. Lavinia Mitton, Lecturer in Social Policy, School of Sociology and Social Research  
University of Kent:**

**The integration of ethnic minorities into British society: what we know and what we need to know**

There is a strong interest among policy-makers in the integration of Britain's ethnic minorities, but what does 'integration' mean and why have some minority ethnic groups integrated further than others? This talk will discuss the way in which social policy analysts study questions such as this, and how this research interacts with the development of policy and practice in this area.



**Tuesday 11 May 2010—7pm**

**Dr. Roger Giner-Sorolla, Senior Lecturer in Psychology, School of Psychology,  
University of Kent:  
That's Disgusting!**



Disgust is an interesting emotion because it is so many-faceted. We express disgust in many situations; worms can be disgusting, but so can corrupt politicians. But are these really all the same emotion? I will make the case that there are many levels of disgust and not all of them are exactly the same. Along the way I will also talk about research in my lab and elsewhere showing some of the unique characteristics of moral decisions that are made based on disgust, versus anger. This will help answer the question of whether we should listen to our disgusted reactions, or try to put them aside, when making moral decisions in

**University of  
Kent**  
**www.kent.ac.uk**

Editor— Joanna Walpole  
University of Kent  
Marlowe Building  
Canterbury  
Kent  
CT2 7NR

For further information contact:  
J.L.Walpole@kent.ac.uk  
01227 82 7833  
For back issues follow the link:-