

March 2008

**In this Issue:**

Hong Kong Exchange	2
Biometrics joins training consortium	2
Maths collaboration with Canterbury Christ Church	3
Musician with talent for teaching	4
Mad Ideas Finalists	5
Pharmacy Student in Brazil	5
Honorary Fellowship	6
Faculty Directors appointed	6
Pharmacy Students Ass	7
Winners of FIRST LEGO® League National teamwork	7
New Targeted Treatments for Cancer	8
National ID Cards	9
Meet the Scientist	10
Travelling and visiting scientists	11
Seminars	12
News from the Centres	13
Grant Awards	15
Café Scientifique	16

**View from the Dean's Office**

Welcome to another bumper issue!

We lead off on page 2 with an article about our successful new exchange programme with City University, Hong Kong. We feel this unique opportunity to gain both work experience and the chance to spend a year abroad is a real boost to student CVs and hope to extend it to other programmes in the Faculty. We also feature a shorter, but equally rewarding, student placement in Brazil (page 4) - and tell you more about our research links overseas in our 'Travelling Scientists' feature.

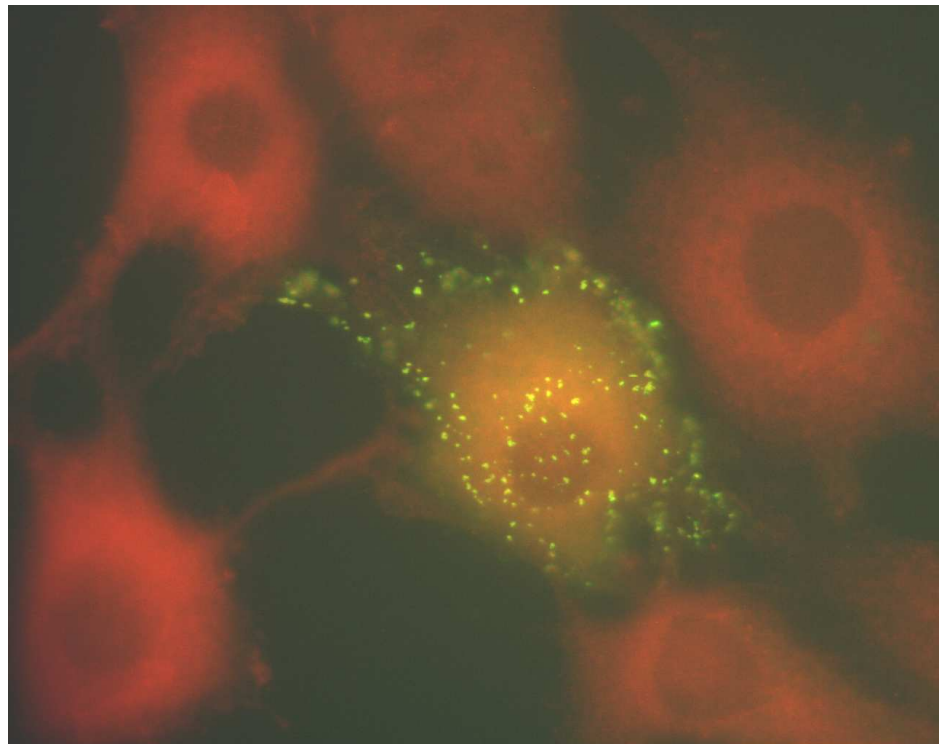
The saying 'be a scientist and see the world' certainly seems justifiable in this issue!

All the best

Peter

**Centre for Biomedical Informatics  
Image of the month**

This month's image is from the laboratory of Professor Bill Gullick. It shows a group of cells which all contain a protein called HER4 (red) which receives signals instructing them to divide when it is active. The single cell in the centre of the image has been made to make another protein called PI3Kinase (green) which helps to convey these signals to the nucleus. The experiment demonstrates that this process involves the formation of patches of both molecules (which appear yellow). These systems are often altered in human cancer cells and are the target for drugs such as Canertinib.



**Scientist gets gong  
Page 4**



**Kent winners at the 2007 FIRST LEGO® League (FLL) National Finals took place in February 2008 at the University of**

**See page 7 Birmingham.**

**Professor Bill Gullick features in this month's medical article on page 8**

## Computing students on Hong Kong exchange



**Joe Heaney and Richard Cohen Kent Computing Students on a one-year industrial placement in Hong Kong.**

Two Computer Science students are spending their industrial placement year in Hong Kong the Department of Computer Science at City University, Hong Kong (CityU), and the two departments have inaugurated a placements exchange programme this year, with two CityU students coming to the UK, and two Kent students working in Hong Kong.

### HSBC headquarters, in the heart of the Hong Kong financial district.



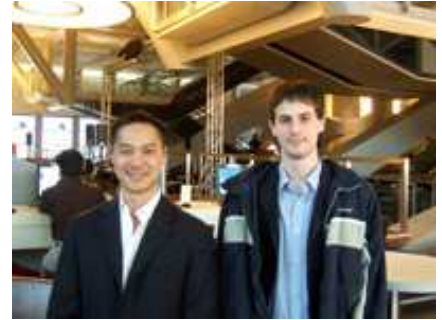
Joe Heaney and Richard Cohen have been in Hong Kong since July last year, and having a fantastic time. Richard is working on the trading floor at the HSBC headquarters in central Hong Kong, giving minute-by-minute support to the traders as well as developing new software when time permits. Joe works for JP Morgan in a software development team, building financial reporting software for countries in the Asia-Pacific region.

People work hard in Hong Kong: Richard typically works 11 hour days, for example, but they are both finding time to get to know Hong Kong and its people. This is helped by CityU, who have provided housing for Joe and

*"They are working incredibly hard, and also finding the time to get to know Hong Kong and its culture; they have learned enough Cantonese to banter very effectively, and will come back to the university with much technical, personal and cultural experience".*

*Professor Simon Thompson*

Richard in one of their dorms, together with students from all over the world. In exchange, the Computing Laboratory has welcomed CityU students, Tyler



**Richard with Raymond Lao, his boss at HSBC headquarters**

Chan and Raymond Cheng. They spent their first couple of months at Kent improving their English and now work at IBM Labs, Hursley.

Planning is already underway for next year's exchanges, and, as well as increasing the numbers on this exchange, Kent and CityU hope to expand this scheme to other departments in the coming years.

A one-year industrial placement - taken between the second and final years of a degree programme - is chosen by the majority of Computer Science students at Kent. The "sandwich" year gives students first-hand experience of how what they have learned at Kent fits into current industrial practice, as well as equipping them with "softer" skills, such as time management and negotiation skills. What is more, their performance in their final year reflects this, with a 7 percentage point premium over students who have not taken a placement.

## Kent Biometrics Joins CEESI-Training Consortium

The University of Kent has joined the CEESI-Training consortium (Continuing Education in Electronics Systems Integration) of eleven universities, contributing four new advanced modules in the area of security and biometrics; Foundations of Biometrics and Secure Systems; Industrial Context of Biometrics; Practical Biometric Systems; Advanced Biometrics. Winston Waller, Senior Lecturer in Electronic Engineering at Kent commented "Joining the CEESI-Training consortium is a very important development for the University. We are joining the leading consortium providing advanced training for industry in electronic engineering in

the UK. It will help the University deliver modules in biometrics and security to a larger proportion of the population of engineers in UK industry who require training in this new and fast developing area". Skills in biometrics are currently much in demand for developments such as identity cards and smart cards. The University of Kent is acknowledged to be a world expert in biometrics and is currently working with leading industrial companies such as Motorola.

Chairman of the CEESI-Training Board of Management, David Rees, a leading electronic engineer and industrialist said "The consortium will be strengthened by

the addition of the world-class expertise and advanced training modules of the leading UK University in this field. The University of Kent is joining a group of other leading UK universities in providing excellent advanced training for the electronic engineering industry in a positive attempt to counteract the skills gap in the UK."



**Winston Waller, Department of Electronics**

## Kent and Christ Church collaboration to help address national shortage of mathematics teachers

The [Institute of Mathematics, Statistics and Actuarial Science](#) at the University of Kent and the [Department of Postgraduate Initial Teacher Education](#) at Canterbury Christ Church University have developed a unique course offering a shorter route to a teaching qualification in mathematics.

The three-year course, which starts in September 2008, will ensure that graduates are fully prepared to teach mathematics up to A level by offering a BSc (Hons) Mathematics with Secondary Education (Qualified Teacher Status [QTS]). It will also help address the much reported national shortage of mathematics teachers.

The first two years of the new programme will be spent at the University of Kent, where students will study aspects of mathematics such as calculus, linear algebra, mathematical computing, discrete mathematics, probability and statistics. They will also encounter topics requiring more abstract reasoning, including mathematical analysis, linear algebra, pure mathematics and applied mathematics.

For their third year, students will undertake the Postgraduate Certificate in Education (PGCE) at Canterbury

Christ Church University. Canterbury Christ Church University will also deliver the second year module Mathematics Education, which will involve students assisting a school mathematics teacher for a half-day per week for one term. Students will also be required to undertake a four week school placement in June/July.

Professor Malcolm Brown, Head of the Institute of Mathematics, Statistics and Actuarial Science at the University of Kent, said: 'Since secondary teaching of mathematics up to A level does not require most of the more specialised third year content of a 'standard' [mathematics degree](#), we have been able to create a single programme that provides a thorough grounding in mathematics and QTS.

William Stow, Acting Head of the Department of Postgraduate Initial Teacher Education at Canterbury Christ Church University, said: 'The benefit for students is that this degree will carry a QTS and a BSc after what is only a three-year programme. There will be an emphasis on ensuring that the students are fully prepared to teach mathematics up to A level, while at the same time enabling them to reduce their financial burden by reducing the time taken to



**Professor Malcolm Brown, Head of the Institute of Mathematics, Statistics and Actuarial Science**

qualify by a year.'

Further information on the BSc (Hons) Mathematics with Secondary Education (QTS) can be obtained from Dr Frank Sowrey ([F.E.Sowrey@kent.ac.uk](mailto:F.E.Sowrey@kent.ac.uk) / 01227 827181) or Loba Van Der Bijl ([L.Van-Der-Bijl@kent.ac.uk](mailto:L.Van-Der-Bijl@kent.ac.uk) / 01227 827181) at the University of Kent and Brian Morgan ([brian.morgan@canterbury.ac.uk](mailto:brian.morgan@canterbury.ac.uk) / 01227 767700 ext 2380) at Canterbury

## Further Mathematics Study Day held at Kent

The University played host to 'A' Level students from schools in Kent on 11 February when they spent the day at the Canterbury Campus on a study day as part of the Further Mathematics Network project. This is a national scheme that was initiated and funded by Department for Children, Schools and Families (DfES) in 2005. It aims to enhance provision of Further Mathematics nationally by creating Further Mathematics Centres involving Higher Education Institutions, local government and schools. The Kent and Medway Further Mathematics Centre currently provides tuition to over one hundred students, who would not otherwise have been able to study further mathematics in their schools. The Institute of Mathematics, Statistics

and Actuarial Science has been involved in the project from the initial stages of the proposal preparation to secure the funds required to provide support to the regional Centre. Loba Van der Bijl, lecturer in Actuarial Science and Outreach Coordinator is Chair of the steering committee which oversees the progress of the Centres, which includes representatives from the national network and the Medway and Kent County Councils.

Each term, the University of Kent hosts Further Mathematics Network study days and revision days. Students on the scheme receive tuition from school tutors and lectures from academics from the Institute of Mathematics, Statistics and Actuarial Science. This month, Loba Van der Bijl gave a talk on the range of

degree Mathematics, Statistics and Actuarial Science programmes offered by the department, and the career paths open to the graduates.

For more information about the Further Mathematics Network follow:- [www.fmnetwork.org.uk](http://www.fmnetwork.org.uk)

### From calculators to calculus



## Musician with a talent for teaching

Jonathan Vincent, lecturer in the Centre for Music Technology, has just released a tutorial DVD for Apple Logic Pro music production software. Available through a training company called 'Talented Pixie'), it is the first of 3 DVDs divided into 3 levels from beginner to expert.

Jonathan has been involved in music education for 16 years and is a senior examiner for the Music Technology A level at Edexcel. He is a media composer and classically trained percussionist and pianist as well as being proficient in a number of other instruments and studied music at

Goldsmiths' College where he specialised in electronic music and performance.

As a composer Jonathan has written music for multi-media productions, many short films and the stage. He is also a busy gigging musician working in both the pop and classical worlds on keyboards, vocals and percussion.

The Sky Propeller channel has shown interest in the tutorials and intends to broadcast some of the tutorials in the future.

To hear a sample of Jonathan's work, follow the link:-

<http://www.jonathanvincent.co.uk>



**Jonathan Vincent,  
Centre for Music Technology**

## BBC Radio Kent celebrates 50 years of LEGO®

On the 28th January 2008 Lego celebrated its 50th anniversary of the filing of the patent on its famous LEGO Brick. As part of these celebrations, Radio Kent invited Janet Linington, a Kent computing lecturer, to give an interview about her involvement with the use of LEGO Bricks to promote science and learning in schools across Kent. Radio Kent presenter, Andy Garland, broadcast the interview during his late afternoon show.

LEGO Bricks have been immensely popular with generations of children since their introduction by Ole Kirk Christiansen's LEGO company based in Denmark. In 2004, they were voted the best toy in the past 100 years. It is estimated that 400 million children and adults will play with LEGO Bricks this year world wide.

Janet, who is also the schools liaison officer for the Computing Laboratory, has been able to exploit the popularity and versatility of LEGO Bricks to engage children in science and to encourage an interest in computer programming. She has a wealth of experience

using LEGO Mindstorms with groups of school children: LEGO Mindstorms are particularly suited to educational activities because they incorporate sensors and a programmable brick (a computer) which means that they can detect things in their environment and can be controlled to respond in different ways. Janet said:

"We are delighted with the energetic and imaginative responses school students make to the challenges of designing and programming these robots. Using the equipment shows them an aspect of Computing that is very different from the office applications that they are already familiar with. "



**Janet Linington, Lecturer in  
Computer Science**



**Robot built using LEGO® Mindstorms**



**Business IT student Zal Asim, of  
the KITC's consultants at Medway**

The Kent IT Clinic (KITC) has expanded the award-winning service it provides to businesses with the launch of a Clinic at the Medway campus. The KITC, which has run at the University's Canterbury campus since 2004, was recently awarded Technology Enterprise Kent's Enterprise and Training Award for Excellence. In 2006 it was shortlisted for another major industry award, the VNU Business Publications Computing Awards for Excellence.

Business IT student Zal Asim, 21, one of the KITC's consultants at Medway, said the clinic's work was enhancing both her professional and personal development:

" Each new project means learning about new types of technology, so as consultants we have to broaden our knowledge all the time. "

## Pharmacy student's world-class experience in Brazil



**Allison Coll, 3rd Year Student at the Medway School of Pharmacy**

A Medway School of Pharmacy student has broadened both her academic and cultural horizons after undertaking a three-month work placement in Brazil.

Allison Coll, a third-year student reading for her MPharm at Medway, spent her placement at the Federal University of Vicosa, where she helped carry out a range of pharmaceutical research projects. Her duties included helping to develop a vaccine for Dengue fever, a viral infection transmissible to humans through bites from carrier mosquitoes, which represents a constant danger in Brazil.

Allison, a former winner of the British Pharmaceutical Students' Association (BPSA) Student of the Year competition, said she managed to overcome some initial problems – such as the language barrier – to make the most of her unique opportunity to see Brazilian pharmacy practice in action. 'The first month was quite difficult, knowing little Portuguese and being transported into a different culture, but I persevered and it paid off,' she said.

'Academically, it was a chance of a lifetime, to broaden the scope of my pharmacy-related learning. My placement

showed me the benefits of joining forces and sharing knowledge for the cause of progression in the world of science.

'Overall, my experience heightened my international awareness, and my personal and professional growth.'

Allison's trip was part of a programme run by IAESTE UK – the International Association for the Exchange of Students for Technical Experience – which selects students who can demonstrate they can help develop business opportunities or scientific studies abroad.

Her placement was sponsored by Medway School of Pharmacy, a unique collaboration between the University of Greenwich and the University of Kent, which is based at the institutions' shared campus at Chatham Maritime.

Allison also saw off competition from more than 400 students in Britain and Northern Ireland to make the final shortlist of ten for the IAESTE UK Trainee of the Year award, organised by

## Red Carpet Treatment at Buckingham Palace



Eminent physicist, Dr Cyril Isenberg went to Buckingham Palace earlier this month to receive the award of an MBE for his contribution to Physics. His work has been associated with both the Department of Electronics and The School of Physical Sciences.

*For full details, see the February 2008 newsletter*

## Kent students reach the finals of SEEDA sponsored Mad Ideas competition

Two Kent students have successfully won a place in the final of the Mad Ideas Competition. Emma Gardner, who is in her final year studying Biomedical Science and Amy Lilwall currently in her second year studying Cultural Studies with combined languages are one of 50 groups who have made it through to the final out of 224 who entered the competition, 12 of which were from the University of Kent.

Mad Ideas is sponsored by South East England Development Agency (SEEDA) and the competition, open to students, is all about creativity, innovation and entrepreneurship. It provides an opportunity to develop skills, not only on how to develop a social enterprise, but also to develop employability skills, such as team work, networking and presentation skills.

Emma and Amy could win part of a £10,000 prize to help them to transform their idea into reality. They attended the MAD Camp development day on Friday 29th February at the Institute of Directors (IOD) Southern Hub in Reading where they spent the day developing

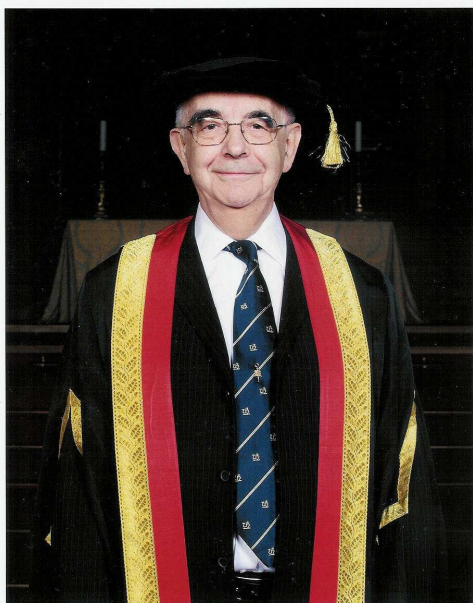
their entrepreneurial skills, creativity and innovation and met the mentor who will help them develop their ideas through to the final in Portsmouth on 23rd April.

Watch this space...



**Emma Gardner (left) and Amy Lilwall who have gone through the final stages of the Mad Ideas Competition. The winners of the Competition will be announced in April.**

## Honorary Fellowship Awarded to Kent Professor



Science and the academic and wider community, at the University's degree ceremonies earlier this month.

Professor John Todd is a former Master of Rutherford College (1975-85), Chairman of the Canterbury and Thanet Health Authority (1982-86), Director of the Chemical Laboratory and Head of the Chemistry Department (1991-94), Chairman of the Governors of St Edmund's School Canterbury (1996-2006), Chairman of the Management Advisory Panel of the EPSRC National Mass Spectrometry Service Centre, Swansea (1992-2007) and long term friend, supporter and former Governor of Canterbury Christ Church University.

After leaving Leeds Grammar School, he enrolled in the School of Chemistry at Leeds University. He achieved a first class honours degree and was awarded a studentship from the Science Research Council to work on his PhD studying gas phase radiation chemistry. His PhD thesis was awarded the JB Cohen Prize

for the most meritorious doctoral thesis of the year. Following completion of his doctorate he obtained a Fulbright Scholarship which funded his trip to take up a post doctoral position at Yale University. John remained in the United States for two years before being among the first members of staff appointed in 1965 to the newly built University of Kent where he has remained throughout his academic career.

*"Professor Todd is a Professor of Mass Spectroscopy whose enthusiasm and lifelong interest in the study of Chemistry has made a truly outstanding contribution to his scientific discipline."*

*Professor Sue Piotrowski  
Pro-Vice Chancellor (Academic)  
Canterbury Christ Church University*

John Todd, Emeritus Professor of Mass Spectroscopy in the School of Physical Sciences was made an honorary fellowship of Canterbury Christ Church University in recognition of his major contribution to

## New Faculty Director of Research appointed



**Professor Mike Fairhurst**

Professor Mike Fairhurst is currently Head of the Department of Electronics. His research interests focus on computational architectures and algorithms for image analysis and classification, with applications including handwritten text reading and document processing, medical image analysis and, especially, security and biometrics. Current projects include work on multimodal biometrics, on verification engines for biometrics, on assessing the

vulnerability of biometric identification techniques, and on the analysis of handwriting, both for identification purposes and to improve the effectiveness of automated processing for forensic applications. Biometric processing also underpins work which is investigating document encryption linked to biometric data. In related work, he is further developing work he pioneered at Kent which has established novel techniques for the assessment and monitoring of neurological conditions through the analysis of patients' writing and drawing abilities.

He is a member of the Biometrics Working Group (BWG), a group with UK and international membership charged with monitoring international developments in biometrics and security and, importantly, a member of The Government's Biometrics Assurance Group, advising Government on all national biometrics programmes. He is also a UK representative (and Vice-Chair) of the

Management Committee for COST Action 2101, and sits on the Steering Board of the UK Knowledge Transfer Network on Cyber Security.

Mike sits on numerous Conference and Workshop committees, and on the Editorial Boards of several international

Journals. He has published more than 350 papers in the scientific literature, and is an elected Fellow of the International Association for Pattern Recognition (IAPR), an award made explicitly for international excellence in the field of pattern recognition.

## New Faculty Director of Graduate Studies appointed

Professor of Space Science in the School of Physical Sciences, Mark Burchell has been appointed as the new Faculty Director of Graduate Studies and Sub-Dean of the Faculty of Science, Technology and Medical Studies.

Working in collaboration with NASA, Professor Burchell has carried out extensive work on the NASA Stardust space mission as well as other US collaborations e.g. new dust impact sensors for LEO and future lunar missions. He has also recently worked with staff at the European Space Agency on the Smart 1 mission to the Moon.

His teaching focuses on Spacecraft Systems, Rocket Propulsion, Human Spaceflight, Martian Planetary Science, Solar System Evolution, Extra Solar Planets, Life in Space and Experimental Particle Physics.

Professor Burchell is Chair of Astrobiology Society of Britain



**Professor Mark Burchell**

## Launch of Medway Pharmacy Students' Association

More than five hundred students came together to celebrate the launch of the Medway Pharmacy Students' Association (MPSA) at the Universities at Medway campus.

Medway School of Pharmacy, which was established in 2004, is a joint initiative between Greenwich and Kent universities and is sponsored by the international company Pfizer Limited, which is providing sponsorship worth £500,000 over a five-year period.

The new venture is the largest students' organisation at the campus and will also be a significant part of the existing Universities at Medway Students' Association.

Emmanuel Amponsah-Poku, President for MPSA's executive committee, said the new organisation gave the students more opportunities to get to know one another outside the lecture halls and classrooms. 'I'd like all the pharmacy students to feel they are part of a big family and to socialise together,' he said.

The launch at the Medway campus was a spectacular occasion, marked by sumo wrestling, indoor bungee jumping, competitions and a special lunch for all pharmacy students. Meanwhile the ten-strong executive committee are busy planning a host of other activities for later in the term.

All the students agreed they had received enormous support from their lecturers in setting up their own association.



**A few of the hundreds of Pharmacy students who took part in the launch**

Professor Iain Cumming, Head of Medway School of Pharmacy, said: 'It gives me great pleasure to be involved in the launch. This is another major milestone in the growth of the Medway School of Pharmacy and is a recognition of the fact that we now have more than 500 undergraduates studying with us on the Medway campus.'

'The students have put time and energy into creating a significant launch event. I know that they will continue to make this an active and creative association that will contribute to the continued expansion of an evolving and growing

campus. I wish them every success with this venture and their future careers.' Funding for the launch came primarily from the external lectures fees donated by the School's founding head, Professor Clare Mackie, who is now Pro Vice-Chancellor for Medway at the University of Kent. Pfizer also sponsored a set of T-shirts with the new union logo and name.

This summer will see another landmark for Medway School of Pharmacy as, for the first time, students who have studied on the full-time, four-year MPharm degree course will be graduating.

## Kent School Wins National Teamwork Prize By Janet Linington

The team from Invicta Grammar School in Maidstone won the Teamwork Cup at the National Finals of the FIRST LEGO® League competition held at the University of Birmingham on Saturday 2 February. This follows on from the successful regional trials held last November that were organized by the Computing Department. (see Christmas / New Year issue for more details) The Invicta team, called Leg-2-bot and consisting of six girls, beat the 23 other participating teams to bring home the cup. The Langton LEGO Lads from the Simon Langton Grammar School for Boys, also took part in the event and both teams had an exciting day together with about 150 other young people and their coaches from a mixture of primary and

secondary schools from as far afield as Devon and Northern Ireland.

The FIRST LEGO® League (FLL) is an international competition that sets exciting and demanding challenges in science and robotics to children between the ages of 9 and 16. This year's challenges all formed part of a "Power Puzzle" theme. As well as developing their teamwork skills, teams undertook an energy audit on a building and proposed ideas to reduce consumption. They also built a LEGO® robot, which included a brick containing a computer, and programmed it to perform sophisticated manoeuvres.

Professor Simon Thompson, Director of the Computing Laboratory at the university congratulated the team,

"We were delighted to learn of their splendid achievement. We are very pleased to see so many young people engaged in science and are enthusiastic in our support of the FLL."



**Leg-2-bot from Invicta Grammar School in Maidstone beat 23 other teams to win the Teamwork Cup.**

## New Targeted Treatments of Cancer

In the fourth of our medical articles, Professor Bill Gullick talks about the new targeted treatments of cancer.

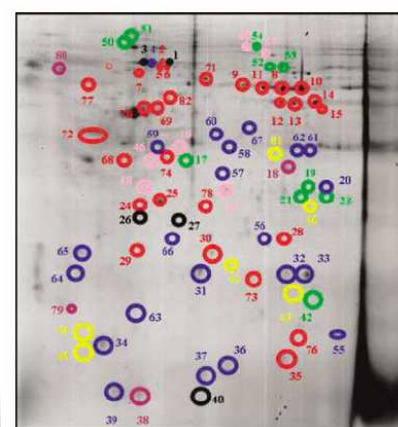
Cancer is a collection of about two hundred different diseases. They are grouped together as they share the property that cancer cells grow faster than they die. This results in an aberrant increase in cell numbers which form the lump or tumour. Some cancers such as leukaemias are termed liquid tumours as the cells are found throughout the blood and not in one particular site. The growing cell mass can cause damage to surrounding normal tissues (for example in the brain) and, in some cases can spread to other sites in the body by a process called metastasis where they also affect vital functions. Some cancers are very dangerous and difficult to treat while others are easily cured. The most common cancers are those arising in the lung, bowel, breast (mainly in women but occasionally in men) and in the prostate (men only). Well established treatments include surgery to remove the diseased tissue, radiotherapy to eradicate any remaining cancer cells and, if the disease has spread various forms of chemotherapy.

Chemotherapy arose from a chance observation that poison gas made and stored (but not used) in the Second World War caused reduction in white cell numbers in the blood in humans exposed to the agent. This led to trials in which it was given in small doses to lymphoma patients who have excessively large numbers of white cells in their blood (<http://en.wikipedia.org/wiki/Chemotherapy>). In the last fifty years more sophisticated, less toxic drugs have been produced but some tumours remain unresponsive to the currently available agents.

Research into how cells grow, and a comparison of these systems in normal cells and in cancer cells taken from patients, has shown that proteins called growth factors and their receptors are involved in controlling normal cell division and are overactive in most types of cancers. Various drugs, called signal transduction inhibitors, have been developed which switch off these processes which either slows down cell division or may cause the cancer cells to die. Examples of these are Herceptin, which is used to treat some (not all) breast cancer patients and Erlotinib which is used to treat some lung cancer patients. These drugs are much less toxic than those based on mustard gas (perhaps not surprisingly!) and can, in a fraction of treated patients, be very effective.

Our research involves trying to understand in more detail how one of these groups of receptors, called the EGF family, work in development and maintenance of normal tissues and how they go wrong in particular cancer types. From this knowledge we should be able to identify new targets and new approaches to anti-cancer drug development and, very importantly, which patients are most likely to respond to particular drugs. These agents are very expensive and since at present not all patients respond, if we can tailor them to treat the right patients they can be much more cost effective and affordable by the health service. We collaborate with other laboratories including Anthony Baines's group within the Department of Bioscience and with Colin Johnson and Emmet McIntyre in the Computing Laboratory. We also have a variety of useful interactions with cancer

doctors in the region including Dr Mark Hill, Consultant Oncologist at the Maidstone Oncology Centre. Finally, as we wish our work to assist in making new drugs available to cancer patients as rapidly as possible we interact with pharmaceutical companies such as GlaxoSmithKline, AstraZeneca and Pfizer.



**Many proteins are made by cancer cells. This picture shows a two-dimensional gel separation where we can detect those altered by the drug Iressa which is used to treat lung cancer. The position of the individual proteins analysed are shown by the coloured circles. This information can help to measure the effect of the drug and in the future could be used in the clinic to monitor how individual patients are responding (see McClelland and Gullick, *British Journal of Cancer* 2007,96,284).**



Bill Gullick, Ph.D., FRCPath. is Professor of Cancer Biology in the Department of Biosciences at the University of Kent, U.K. He trained at the University of Leeds and then did postdoctoral research at the Salk Institute in San Diego and then at the Imperial Cancer Research Fund. He worked for eleven years as a Principal Scientist at the ICRF Molecular Oncology Unit at the Hammersmith Hospital and as Professor of Molecular Oncology at the Imperial College School of Medicine before moving to the University of Kent in 2000. Professor Gullick's research interests include investigations of the role of growth factor receptors in signal transduction, both from the experimental, laboratory perspective but also as a target for the development of new, designed, anti-cancer drugs. His principle area of research is the involvement of the EGF family of ligands and receptors in cancer and their use as prognostic factors and as targets for new treatments. He has been the President of the Federation of European Cancer Societies and is currently the Past President of the European Association for Cancer Research.

### April issue:

In next month's article, Dr Gurprit Lall from the Medway School of Pharmacy will be talking about circadian rhythms and our natural biological clock.

## National ID Cards: Secure data capture or identity escape route? By Professor Mike Fairhurst, Department of Electronics

"ID card scheme put off until after the election"  
(Guardian, 23<sup>rd</sup> January, 2008)

So why has there been such a fuss about the National ID Card programme? Of course, one reason is that it provides a focus for some political football playing among the different Parties, but maybe there is more to it than that. Perhaps it is because ideas of personal identity, privacy, individual liberty and so on are so important to us as human beings. But maybe even this is not the whole story, and it could be useful to scratch the surface of another component in what has become an increasingly heated debate.

Not surprisingly, what really distinguishes the current ID card proposals is that the card will use "biometrics" (measures of personal physiological or behavioural characteristics which can be matched to previously acquired samples) as the means of establishing and checking identity, and this tends to spark a big debate in itself. Questions like "Can we trust biometrics?", "Can we be sure that biometric data can be protected", "Are we confident that the characteristics being used are the right ones?", and indeed many others, quickly come up in any discussion in this area.

There seem to be two principal issues about the proposed scheme which most frequently exercise writers in the popular press. The first goes along the lines of "It's too expensive" while the second takes the general form of "Biometrics don't work". It is the second of these two issues on which we focus here but even this question is not as simple as it might appear and, in the end, it is more important to promote an informed discussion than to pretend that simple answers are adequate.

Of course, the reliability and effectiveness of any biometrics-based system will depend on many factors. For example, different application scenarios have different performance criteria which must be met, and we would expect a performance analysis of a system, say, to check student lecture attendance to be fundamentally different from that of a system to check on-line access to the same students' medical records, for example. In the former case, the potential user population is likely to be quite large, and a few interlopers can be readily tolerated, a more important criterion being not to deny entry to a student who really should be present. In the latter case, the potential population of users needing to access a specific record is likely to be much more restricted, and here

the more important criterion is to deny access to anyone whose claim for access is in any way in doubt.

Thus, generalised judgements can be misleading, but it is also important to observe two further important factors. First, there is a wide range of options from which we can choose in building an identity-checking system, each based on a different sort of information. Some of these available *modalities* use information which is derived from basic physiological features of an individual (facial image, fingerprint, iris pattern, etc) while others rely on repeatable patterns of behaviour (the handwritten signature is a good example). Clearly, there is a "horses for courses" judgement to be made here - a requirement for a system to operate over a distance would be likely to rule out handwritten interaction or fingerprinting, for example, but should be a more viable proposition if capturing a facial image is possible. Likewise, we need to recognise that the biometric data sample and its evaluation is only one component of an overall system, and system acceptability might depend just as much on security of the data captured as on the quality of the sample matching operation.



**Capturing the pattern of the iris for personal identification**

However, even focussing on the small part of the system dealing with the biometric samples raises some issues which are still challenging for researchers. So, as a contribution to the on-going debate, here is a brief guide to some developments to watch out for in the future:

**Multibiometrics:** It is now generally recognised that depending on a single source of biometric data can be unreliable, unacceptable or inappropriate in some circumstances. We will see an increasing move towards exploiting multiple data sources to support identification.

**Exception handling:** For systems to be more generally deployed, greater efforts

will have to be made to ensure that all potential users can benefit equally. Systems will have to handle individuals who represent outliers in the measurement distributions in a particular user population. (In fact, multibiometrics have a role to play here.)

**Intelligent interfaces:** A strong biometric matching algorithm is of little use if the captured samples are degraded or distorted. More attention needs to be given to optimising user-system interaction.

**Understanding vulnerabilities:** The more widespread the deployment of automated identity checking becomes, the more incentive there is to attack systems. Identifying vulnerabilities and providing countermeasures to attack is vital. Many will have seen newspaper reports of artefacts successfully being used to attack fingerprint and iris checking systems.

**Standards:** Work must continue to develop international standards for biometric systems. This will support interoperability and natural market growth. Of course, even as researchers find better solutions to some of the problems sketched out here, other questions will still remain. There will always, for example, be an issue about how much information Governments should routinely hold about citizens, what steps it is reasonable to take to protect privacy, and what sort of obligations citizens should have imposed on them. However, what is equally clear is that wherever technology is invoked in addressing a problem, it is important that users have confidence that performance and reliability are adequate for the given task, and understanding what the issues are is often a good starting point in trying to satisfy ourselves that such criteria have been met.

So what about the questions we started with? Well, probably the answer to all of these should be "Maybe"! What is clear is that the technologies which underpin the development of biometric identity checking have matured very quickly in recent years, to the point where, in appropriate circumstances, it is now perfectly possible to deploy them effectively. We must, however, know what questions we should be asking if we are to be the masters, not the servants, of technology.

## Meet the Scientist

Each month, we focus on one of our scientists who describes their interest in science and how they are inspired. This month, we meet Professor Alistair Mathie, Professor of Pharmacology and Director of Research in the Medway School of Pharmacy.



**Professor Alistair Mathie**, Professor of Pharmacology and Director of Research in the Medway School of Pharmacy

*"How did you first get into science?"*

It took me a while. I wasn't that keen on science at school at all. I was dead set on being a lawyer, or a professional footballer (despite a notable lack of talent). I didn't study Biology until I went to University, but even then it didn't fully capture my imagination until my final year specialising in Pharmacology and my research project. The whole process of coming up with ideas of my own, having the time and resources to test them and then discussing the results with my supervisor and others won me over. Interesting new data still excite me.

*"What is the focus of your current research?"*

I'm interested in neurons (nerve cells), how they communicate with each other and how chemicals, especially therapeutically useful compounds, can interfere with these processes. In particular I study ion channels, proteins which allow ions to cross neuronal membranes generating an electrical signal. A single ion channel carries very small currents (picoamps) but if you concentrate a few of them together in a small space they can surprise and shock you – electric fish have shown us that.

*"Can you tell us about your current research group, what the group is working on and the purpose of the research?"*

Having moved to the Medway School of Pharmacy less than a year ago from Imperial, I'm just beginning to establish my group here. We are studying the functional properties and

localisation of a particular family of ion channels that are selective for potassium ions using a variety of experimental approaches. Our main expertise is in electrophysiological recordings of the currents through these channels. There is increasing evidence that these channels are important in controlling how neurons function. When they go wrong, this can lead to disease states such as epilepsy, depression and stroke. We are trying to work out how this happens and how we can correct the defect, either through the use of novel drugs or, perhaps, through genetic approaches.

*"How has research in your area changed over the past few years?"*

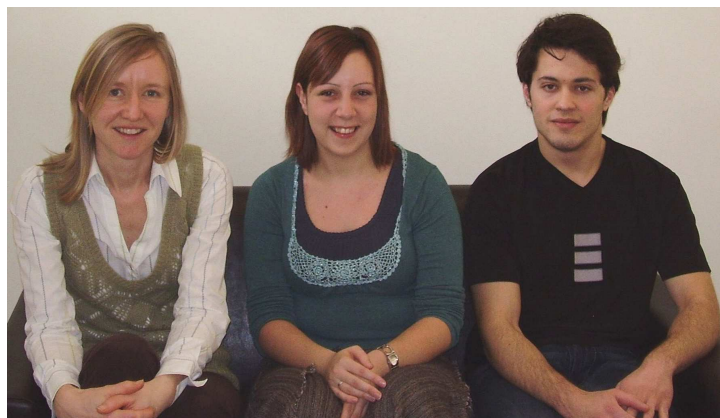
The explosion in information arising from the cloning of the human genome has shaped our thinking and our experiments enormously. We can now identify the unique regions of the proteins that we study, where useful drugs might act.

*"What do you consider is the most significant accomplishment in research in your area in the last few years?"*

The wonderful crystallography experiments of the American Biophysicist, Rod MacKinnon, showed for the first time how ion channels really worked. He won the Nobel Prize in Chemistry for this work in 2003. He runs a comparatively small laboratory and they make advances through thinking about a problem, not throwing money at it. I admire that hugely.

*"What kind of challenges do you see lie ahead in your specialism in the future?"*

I'm an unashamed reductionist. I can only really deal with one experimental variable at a time. Nevertheless, I was inspired by a talk by the Oxford Physiologist, Dennis Noble, a few months ago (and recently published - Noble D (2008) *Exp Physiol* **93**: 16-26), which has almost convinced me that the big challenge now, is to relate the information we've gathered at the molecular level to what is going on in an entire system; perhaps at the level of a cell, or an organ, or me, or you. He is trying hard to reinvigorate the classical sciences of Physiology and Pharmacology and I'm drawn to support him. The difficult yet interesting bit, is designing the experiments to allow us to do this.



**Members of the current research group. From left to right, Emma Veale, Kate Rees and Mickael El Hachmane**

### April Issue:

Dr Maria Alfredsson from the School of Physical Sciences describes how she is inspired by science.

## Travelling and Visiting Scientists

### Department of Electronics



Professor Ted Parker  
Emeritus Professor of Radio Communications

Ted Parker and John Batchelor in the Department of Electronics will be travelling to New Zealand again in May, continuing their collaboration with the Electrical Engineering department at the University of Auckland, on an Engineering and Physical Sciences Research Council (EPSRC) and police-funded project involving the application of frequency selective surfaces to buildings.



Dr John Batchelor  
Senior Lecturer in Electronic Engineering



Dr. Benito Sanz-Izquierdo is currently attending the 2008 IEEE International Workshop on Antenna Technology (iWAT2008) held in Chiba, Japan from March 4th to the 6th, 2008. Dr.Sanz presented the academic papers: "Small FSS arrays for Indoor Communications" and "A Dual Band Belt Antenna". Dr. Sanz is currently working on an Engineering and Physical Sciences Research Council (EPSRC) project titled "Frequency Selective Structures for long wavelengths" which studies Frequency Selective Surfaces applied to Building Environments.

### Computing Laboratory



#### Richard Jones

Richard Jones, a Senior Lecturer in the Computing Laboratory has been awarded £26,456 funding from the Engineering and

Physical Sciences Research Council (EPSRC) for a visiting researcher, Dr Tony Hosking, between May and October 2008.

Dr Hosking is Associate Professor of Computer Science at Purdue University. He has worked in the area of programming language design and implementation since 1986 and is internationally recognised as a leading researcher. He has a unique combination of expertise in garbage collection (GC), a technique for automatically recycling memory no longer used by a computer program and

transactional memory and concurrency, a technology that offers one of the most promising solutions for the construction of correct, yet efficient, concurrent programs.

Most processors today use multicore or multiprocessor architectures, and programs are increasingly multi-threaded. The need for efficient, correct and concurrent garbage collection is urgent. During his visit to Kent, Dr Hosking will take part in an open seminar series in the Computing Laboratory aimed at educating and training researchers in transactional memory techniques. In addition, Dr Hosking will take his expertise in transactional memory to other Higher Education Institutions (HEIs) in the UK by making a series of short visits to hold seminars and give lectures. Dr Hosking's visit will also provide the opportunity for him to collaborate with Richard Jones in writing the long-overdue successor to Richard Jones's 1996 book on Garbage Collection - one focus will

be concurrent garbage collection. It is anticipated that Dr Hosking's visit will create a great deal of interest within the UK computing science research community, and amongst GC researchers in particular. Details of all the events marking Dr Hosking's visit will be widely advertised within the university nearer the time - all will be welcome.



Dr Tony Hosking

## Forthcoming Lectures and Seminars – March

Date	Time	Speaker and Lecture Title	Lecture Theatre
3 Mar	2.30pm	Nicole Snashall (Leicester) ' <b>Hochschild cohomology and support varieties of module</b> '.	IMSAS, McVittie Library
3 Mar	4pm	Dr. Will Wood, Department of Biology and Biochemistry, University of Bath, ' <b>Macrophage migration and chemotaxis in Drosophila embryos</b> '.	Biosciences LT1
4 Mar	4pm	Simon Peyton Jones, Microsoft Research Ltd ' <b>Static contract checking for Haskell</b> '	Computing Brian Spratt Rm
5 Mar	2pm	Professor Elias Brinks, University of Hertfordshire ' <b>The Nearby Universe</b> '	Physical Sciences 110
7 Mar	2pm	David Mitchell ' <b>Novel Approaches to the Electronic Delivery of Learning Materials</b> ', (Computing Education Group)	Computing S110B
7 Mar	3pm	Anne-Sophie Kaloghiros (Cambridge) ' <b>The topology of some algebraic varieties</b> '.	IMSAS, Mathematics Lecture Theatre
10 Mar	2.30pm	Paul Fendley (Virginia) ' <b>Quantum Topology and the Chromatic Polynomial</b> '.	IMSAS, McVittie Library
10 Mar	4pm	Simon Thompson, Alex Freitas, Carol Moran, <b>Research Funding Meeting</b>	Computing S110B
10 Mar	4pm	Dr. Enrique (Fadri) Martinez-Perez, Department of Molecular Biology and Biotechnology, University of Sheffield ' <b>Pairing and segregation of homologous chromosomes during C. elegans meiosis</b> '.	Biosciences LT1
11 Mar	2pm	Adam Sampson—Title not known at time of going to print, Applied and Interdisciplinary Informatics Group	Computing SW101
12 Mar	1pm	CBMI LECTURE Dr Colin Johnson-Computing Laboratory, Dr Konstantinos Sirlantzis-Department of Electronics ' <b>Classification of Images of Cancer Patients</b> '.	Marlowe LT2
14 Mar	3pm	Ashley Hobson (Kent) ' <b>SL<sub>2</sub> invariants of the third symmetric power representation</b> '.	IMSAS, Mathematics Lecture Theatre
17 Mar	2.30pm	Shalom Eliahou (Littoral, Calais) ' <b>Finite Sumsets in Groups</b> '.	IMSAS, McVittie Library
17 Mar	4pm	Dr. Louise Serpell, Department of Biochemistry, School of Life Sciences, University of Sussex ' <b>What does the architecture of amyloid tell us about protein misfolding diseases?</b> '	Biosciences LT1
19 Mar	2pm	Dr Phil Lucas, University of Hertfordshire, ' <b>A Survey of the Galactic Plane and Planetpol</b> '.	Physical Sciences 110
19 Mar	2pm	Mr Alexander-Mathias Stoeckle, Department of Electronics Embedded Systems and Instrumentation Group, <b>Research Seminar</b>	Elec Sem 1
26 Mar	1pm	CBMI lecture Dr Anthony Baines-Department of Biosciences, Dr Martin Ridout Institute of Mathematics, Statistics and Actuarial Science ' <b>Analysis of the Evolution of Genes</b> '.	Marlowe LT2
28 Mar	3pm	Peter Clarkson ' <b>Vortices and Polynomials</b> '.	IMSAS, Mathematics Lecture Theatre
31 Mar	4pm	Dr. Dan Mulvihill, Department of Biosciences, University of Kent, ' <b>BENT, STIFF &amp; LEGLESS – an analysis of cytoskeleton function in fission yeast</b> '.	Biosciences LT1

### Mathematics

#### Applied Mathematics Discussion Group

During the Spring Term, Barry Vowden will present a variety of topics from Modern Analysis: measure theory,  $L_p$  spaces and Banach spaces, distributions, the Fourier transform, some topology, Stone-Weierstrass.

#### Pure Mathematics Discussion Group

The pure maths discussion group meets on Wednesdays at 13.00 in McVittie for one hour. The topic for discussion this term is semi-invariants of quivers.

We will be guided by the notes of Harm Derksen and by Bill Crawley-Boevey's "Lectures on representations of quivers" and "More lectures on representations of quivers"

#### Geometry and Physics Discussion Group

Differential Geometry and Physics:

We meet on Tuesday 11.00 to 12.00 in the McVittie Library.

Steffen Krusch and Andy Hone will talk about selected topics in Differential Geometry and applications to Physics. We'll also introduce various concepts from Topology.

#### Algebraic Geometry Discussion Group

Meets on Wednesday 11:00 to 12:00 in the McVittie Library.

## News from the Centres



"Space science has never had greater impact. From watching the beginning of the Universe to manned spaceflight to global communication. Opportunities for young people in space science, astronomy, industry and commerce have never been better. Space School provides an intensive two-day experience aimed at introducing 11-14 and 15-18 year olds to the many different fields of space activity, and giving them an awareness of the course and career profiles on which they could embark to become tomorrow's space professionals."

### Course fees and registration

The fees for the Space School are unchanged from last year thanks to the generous support of our sponsors. £39 non-residential, and £59 residential.

**Applicants will hear within three weeks whether their applications are successful. Successful applicants will receive full details and the Space School timetable around June.**

### Staffing

Academics from the School of Physical Sciences with assistance from undergraduate and postgraduate students will be on duty at all times.

For further information or to apply please contact:

Director, [Prof. Michael D. Smith](mailto:Prof.Michael.D.Smith)

Professor of Astronomy

Space School, School of Physical Sciences, University of Kent, Canterbury, Kent, CT2 7NH,

Email [spaceschool@kent.ac.uk](mailto:spaceschool@kent.ac.uk)

Mrs Sharon Humm

Telephone 01227-823759



## 3rd Annual Symposium 2008

Thursday 1st May 1.30pm—5.30pm

**Theme: Advanced Imaging Technologies**

Speakers include:

Professor Adrian Podoleanu, Professor of Biomedical Optics, School of Physical Sciences, Kent

Professor Dorothee Auer, Professor of Neuroimaging, University of Nottingham

Professor Derek Hill, Centre for Medical Image Computing, University College London

Professor Justin Malloy, MRC National Institute for Medical Research at Mill Hill.

**Poster Competition**—postgraduate and post-doctoral students are invited to submit posters on the theme of the symposium which will be entered into a competition for sponsored prizes from the Dean of the STMS Faculty and the Pro-Vice-Chancellor for Research.

To register entries please contact: Joanna Walpole ([J.L.Walpole@Kent.ac.uk](mailto:J.L.Walpole@Kent.ac.uk)) ( 7833.

To obtain further information about submitting posters please contact:

Dr Colin Johnson ([C.G.Johnson@Kent.ac.uk](mailto:C.G.Johnson@Kent.ac.uk)) ( 7562

Or

Dr Anthony Baines ([A.J.Baines@Kent.ac.uk](mailto:A.J.Baines@Kent.ac.uk)) ( 3462

## Recent Published Papers

### School of Physical Sciences

**Froeblich D**, Ahmic M, Jayawardhana R, Brandeker A, Scholz A, Kerkwijk MH van, Delgado-Donate E, Multiplicity Among Young Brown Dwarfs and Very Low Mass Stars (2007) *The Astrophysical Journal American Astronomical Society* 6712074-2081

**Froeblich D**, Meusinger H, Davis CJ, FSR 0190: another old distant Galactic cluster *Monthly Notices of the Royal Astronomical Society* (2008) **383**, L45-L49

**Burchell M.J.**, Ishii HA, Bradley JP, Dai ZR, Chi M, Kearsley AT, Browning ND, Molster F Comparison of Comet 81P/Wild 2 Dust with Interplanetary Dust from Comets *Science* (2008) *The American Association for the Advancement of Science*, **31**, 9447-450

**Webber B.**, **Dore J.C.**, Neutron Diffraction Cryoporometry - A measurement technique for studying mesoporous materials and the phases of contained liquids and their crystalline forms *Nuclear Inst. And Methods in Physics Research* (2008) Elsevier 586 356-366 Institute Laue Langevin, Grenoble, France

### Department of Electronics

T. Gorman, **S. Haxha**, Thin Layer Design of X-Cut Lithium Niobate Electrooptic Modulator with Slotted SiO<sub>2</sub> Substrate (2008) *IEEE Photonics Technology Letters*, **20**, No.2, 111-113.

Y. Zouine, I. Dayoub, **S. Haxha**, J.M. Rouvaen, Analyses of Constraints on High Speed Optical Code Division Multiplexing Access (OCDMA) Link Parameters due to Fibre Optic Chromatic Dispersion (2008) *Journal of Optics Communications*, **281**, 1030-1036

T. Gorman, **S. Haxha** Optimisation of Z-Cut Lithium Niobate Electrooptic Modulator with Profiled Metal Electrodes and Waveguides (2007) *IEEE Journal of Lightwave Technology*, **25**, No. 12, 3722-3729

Y.L. Huang, **J. Wang** Two-Stage Acquisition in Time-Hopping Impulse Radio Systems to UWB Communications (2007) *IEEE Transactions on Wireless Communications* **6**, 3578-3588

Y.L. Hung, **J. Wang**, K. Higuchi, M. Sawahashi Iterative Signal Processing for Coded LSTF Architectures (2008) *IEEE Transactions on Wireless Communications* **6**, 3712-3716

**S. Haxha**, H. Ademgil Novel Design of Photonic Crystal Fibres with Low Confinement Losses, Nearly Zero Ultra-Flatted Chromatic Dispersion, Negative Chromatic Dispersion and Improved Effective Mode Area (2008) *Journal of Optics Communications*, **281**, 278-286

R.M. Carter, **Y. Yan** On-line Non-Intrusive Particle Size Measurement of Pulverised Fuel through Digital Imaging (2007) *Chinese Journal of Scientific Instruments*, **28**, 1942-1946

J.Q. Shao, J. Krabicka, **Y. Yan** Comparative Studies of Electrostatic Sensors with Circular and Probe Electrodes for the Velocity Measurement of Pulverised Coal (2007) *Chinese Journal of Scientific Instruments*, **28**, No.11, 1921-1926

L.H. Peng, Y. Zhang, **Y. Yan** Characterization of Electrostatic Sensors for Flow Measurement of Particulate Solids in Square-Shaped Pneumatic Conveying (2008) *Sensors and Actuators A: Physical*, **141**, No.1, 59-67

W. Aroua, F. Ouerghi, **S. Haxha**, F. Abdelmalek, M. Mejatty, H. Bouchriha, V. Haxha, Analysis and Optimisation of High-Density Photonic Crystal Devices in a Subsystem by Use of Finite Difference Time Domain (2008) *Optoelectronics, IET*, **2**, Issue 1, 10-15

## Recent Published Papers cont...

### Computing

J. C. van Hooff, K. C. Dietz, D. Sharma and **H. Bowman**. Neural correlates of intrusion of emotion words in a modified Stroop task (2008) *International Journal of Psychophysiology*, **67**(1):23-34.

### Institute of Mathematics, Statistics and Actuarial Science

J. E. Griffin and M. F. J. Steel, Flexible Mixture Modelling of Stochastic Frontier (2008), *Journal of Productivity Analysis*, **29**, 33-50

Morgan B.J.T., Palmer, K.J. and Ridout, M.S., Negative score test statistic (2007) *The American Statistician*, **61**, 285-288.

Ridout M.S., Wan, Y. & Xu X.-M. Sampling schemes for Fusarium head blight (2007), *Annals of Applied Biology*, **151**, 341-347

Catchpole, E.A., Morgan, B.J.T. and Tavecchia, G., A new method for analysing discrete life history data with missing covariate values (2008) *J. Roy. Stat. Soc B*, **70**, 445-460.

---

## Recent Grants Awarded

Dr J.R Shank and Dr S Launois-Institute of Mathematics, Statistics and Actuarial Science £45,000.00 for a project entitled 'Poisson algebras, deformation and resolutions of signatories', from The European Commission.

Dr Steffen Krusch-Institute of Mathematics, Statistics and Actuarial Science £1,100.00 funding to travel to Russia to attend QUARKS 2008 (15th international seminar on high energy physics), from The Royal Society.

Professor Peter Fleischmann-Institute of Mathematics, Statistics and Actuarial Science £2,000.00 funding for the Finite groups and representations conference, Kaikoura, New Zealand, from The Royal Society.

Dr Nathan Gomes-Department of Electronics €594,733 for a project entitled 'Fibre optic networks for distributed and extendible heterogenous radio architectures (FUTON)', from the European Commission FP7.

Dr Andrew Hone-Institute of Mathematics, Statistics and Actuarial Science £3,982 for a visit by Dr Senthilvelan Murugaian, India for a project entitled 'Exact solutions in 2+1 dimensional equations of Camassa-Holm type', from The Royal Society.

Dr Hone has also been awarded a Biotechnical and Biological Sciences Research Council Vacation Bursary to support an undergraduate summer research project on Mathematical Biology.

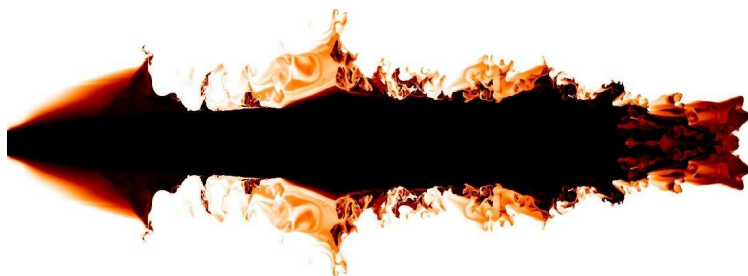
Dr Clare Dunning, Dr Steffen Krusch and Dr John Merriman-Institute of Mathematics, Statistics and Actuarial Science £1000 for a project entitled 'Computer Aided Assessment in Mathematics', from the Higher Education Funding Council for England's Challenge Fund administered by Unit for the Enhancement of Learning and Teaching.

Dr John Batchelor-Department of Electronics £11,670.00 for a project entitled 'The development of an Integrated TV Antenna with Switchable Function', from Mitsubishi Electric Information Technology Centre Europe BV.

Professor David Chadwick-Computing Laboratory €941,534 for a project entitled 'Trusted Architecture for Securely Shared Services (TAS3)', from the European Commission FP7.

Richard Jones-Computing Laboratory has been awarded £26,456.00 for funding for a visiting researcher Dr Tony Hosking between May and October 2008, from the Engineering and Physical Sciences Research Council.

---



This is a computer simulation of material being ejected by a very young star. At birth, the growing star is called a proto-star. For gravity to win, some material must be expelled. This is simulated here by injecting a stream of fast moving atoms into a clumpy proto-stellar environment. The environment is assumed to be cold and molecular. The picture displays the molecular material (white) and the atomic material (black), thus one can determine where molecules have been partly destroyed in the interaction (orange). The simulations, to be published this year in the Monthly Notices of the Royal astronomical Society, provide insight into the environments of observed stars during their birth pangs. CAPS is also involved in complementary observations of protostars with space and earth-based telescopes, such as the Spitzer Space Telescope and the European Southern Observatory's (ESO) Very Large Telescope. **Professor Michael Smith, Professor of Astronomy.**

## Cool Physics Road Show

10th—14th March 2008

For National Science and Engineering week only, let Cool Physics come to you!  
A free one hour interactive show aimed at KS2–4.

Amazing things happen at  $-196^{\circ}\text{C}$ . This demonstration deals with expansion and contraction, change of state, effects of low temperature freezing on different substances and superconductivity.

To book please contact  
Dr Gaby Roch:  
g.roch@kent.ac.uk.

Dates and times are limited so booking is on a first come first served basis.

University of  
**Kent**  
Sciences  
@ Kent



Dr Andy King

Tuesday March 11, 2008

Dr Andy King:

**Tick-bites and odd-bods: Using science to hack computer systems**

In mid-life you are supposed to have a crisis when you do something crazy like buy a big motorbike and don leathers. The crazy thing that I have done is to give up my secure academic day job as theoretic computer scientist to learn about the dirty world of computer hacking from a bunch of hackers that are typically half my age. I will describe a bit of my experience and why the worlds of hacking and theoretical computer science are more closely related than one would initially think.

Café Scientifique  
Ye Olde Beverlie,  
St Stephen's Green,  
Canterbury at 7pm.

University of  
**Kent**

[www.kent.ac.uk](http://www.kent.ac.uk)

### Café Scientifique in 2008

April 8, 2008

Prof. Fritz Mühlischlegel: Staying healthy in the hospital

May 13, 2008

Dr. Sarah Johns: Risk, Reproduction, and Teenage Motherhood: An evolutionary approach

June 13, 2008

Dr. Arnaud Wisman: Facing Death: How do we regulate the awareness of our own mortality

Edited by 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:-