View from the Dean’s Office

I’ve been fortunate to have spent a fortnight in Thailand—not all of it holiday! I was able to visit a number of universities and also visit their Science Park in Bangkok. There was lots of enthusiasm to collaborate with the Faculty—watch this space! It was also a pleasure to meet several ex-students in my travels (all of whom had good things to say about us). The view from my office changed significantly during my absence—from April snow to May sunshine and from a quiet Easter vacation to the usual clamour as the undergraduates returned for their exams—you may also have noted changes in the Faculty webpage as we upgrade to new format. Our well-established postgraduate training package has morphed into the Researcher Skills Training Programme (http://www.kent.ac.uk/stms/skills/index.html) and the rest of the Faculty pages will follow shortly. Any comments would be appreciated...

All the best

Peter

Centre for Biomedical Informatics Image of the month

This month’s image is from the laboratory of Dr Dan Mulvihill. It shows live fission yeast cells expressing a green fluorescently labelled motor, responsible for transporting molecular cargoes throughout the cell, as well as a protein important for determining where cell growth will occur, which has been labelled red (Scale bar – 5 micrometres). Researchers in Dan Mulvihill’s lab (Department of Biosciences) are using these simultaneous tagging techniques to explore how these molecules move around in real time inside these small living cells and regulate cell growth.

Dr Dan Mulvihill has been at the University of Kent since 2003. One of the key questions his lab addresses is how the cellular motors and cargoes move throughout a cell, and how this changes in response to the cell’s environment. This has required the development of a dedicated state of the art live cell imaging system within his lab, which allows the simultaneous analysis of multiple proteins in a 4 dimensional context. These studies will not only further the understanding of how these motors work within a cell, but can also give an important insight into how mutations within equivalent molecules can result in congenital disorders in humans.

Dr Dan Mulvihill was a speaker at the 3rd CBMI Symposium on the 1st May—page 3
Multimedia students impress BBC with their documentary styles

Second year students on the Multimedia Design and Technology course in the Department of Electronics had the chance to impress the BBC this term. Reporter Neil Bell from BBC South East joined the students and their lecturers for the screening of their films. It was the culmination of six months’ work where teams had to produce and direct a ten-minute documentary. Students tackled a wide range of subjects from the Kent Coastguard, the redevelopment of the Marlowe Theatre and the Officer Training Corps at the University. The double module introduces them to the creative and technical skills of digital filmmaking. Experienced journalist Neil Bell said, “I was very impressed by the enthusiasm and ingenuity that the students demonstrated”. Lecturers Steve Kelly and Jane Milton, a documentary filmmaker, were delighted at the effort shown by the students and appreciated Neil’s contribution.

Scientists receive grant for research into renewable energy technologies

Yong Yan, Professor of Electronic Instrumentation and his colleagues Peter Lee and Gang Lu at the Department of Electronics have been awarded £411,147 by the Engineering and Physical Sciences Research Council (EPSRC) under the programme of Renewable Energy Technologies. This is part of an international collaborative project with partners from the Universities of Nottingham and Leeds and collaborators from Zhejiang, Xian Jiaotong and Tianjin Universities in China.

The overall support from the EPSRC for the consortium is nearly £900,000. Additionally, power generation organizations, including E.ON, RWE power, Alstom Power and China Datang Corporation, have agreed to provide a total in-kind support of more than £120,000 for the research. This project aims to optimise the operation of a biomass/coal fired power plant through integrated measurement and computational modelling. As the lead partner in the consortium, the Kent team will be responsible for the instrumentation and monitoring aspects of the project. These include on-line measurement of biomass/coal/air three-phase flow, on-line particle sizing, and continuous monitoring of burner conditions and flame stability under biomass/coal co-firing conditions. Coal is the main source of energy in many countries, so co-firing with biomass will help reduce global emissions of CO₂ and other greenhouse gases. This collaborative project provides a platform for the research groups from both UK and China to tackle the common co-firing challenges together, which will ultimately lead to significantly reduced emissions and efficient use of biomass from a diverse range of sources in a wide variety of forms on a much greater scale.

Actuarial Conference 3-4 July

The 2008 Actuarial Teachers’ and Researchers’ Conference will be hosted by the University of Kent, Canterbury, on 3rd and 4th July 2008. The first day of this international conference will focus on research into financial risk management, which is only too topical in the current markets. The second day will cover other research and educational issues.

Academics, practitioners and regulators will deliver fourteen presentations, on topics ranging from investment risk and mortality to the latest developments in modelling financial variables and actuarial education.

Dr Pradip Tapadar, from the Actuarial Science Group in IMSAS, will report on his research into economic capital and risk-adjusted performance.

Full details, including a registration form, can be found on:
http://www.kent.ac.uk/ims/actuarial/newsevents/atrc.html

Left to right: Gang Lu, Yong Yan and Peter Lee.
Dr Rosie Cowell, newly appointed Research Council UK Academic Fellow in the Computing Laboratory, has received £4,100 from the Biotechnology and Biological Sciences Research Council (BBSRC) as a travel grant for her trip to California later this year.

Rosie has been invited to the University of California San Diego (UCSD) to spend six months working with Gary Cottrell, Professor of Computer Science and Engineering where they will conduct research into investigating how people perceive and remember other human faces and the brain systems underlying these abilities. The work will help to bridge a crucial gap between different techniques for understanding face processing including the use of behavioural experiments (measuring people’s face processing abilities), brain-imaging techniques (measuring people’s brain activity during face processing) and computational modelling (building theoretical, neural-network models of the mechanisms in the brain that underlie cognition).

Rosie said “I am really excited to have been awarded my first ever grant as a Principal Investigator. This funding will allow me to take advantage of a fantastic opportunity to spend six months in an extremely stimulating research environment, and also to travel to several high-profile conferences across the United States during my stay there.”

Annual Symposium Success for Centre for BioMedical Informatics

The Centre for BioMedical Informatics 3rd Annual Symposium took place on Thursday May 1st. Five speakers gave talks on the theme “Advanced Imaging Technologies”. These covered subjects ranging in scale from whole body MRI imaging (Professors Dorothee Auer from the University of Nottingham and Professor Derek Hill who is CEO of IXICO and holds an academic position at University College London), down to the dynamics of single molecules in living cells (Professor Justin Molloy, National Institute for Medical Research). Kent Academics, Professor Adrian Podoleanu, Professor of Biomedical Optics in the School of Physical Sciences and Dr Dan Mulvilhill from the Department of Biosciences gave talks on the use of Optical Coherence Tomography for imaging the working of hearts in fruitflies and the imaging of cytoskeletal processes in fission yeast.

Professor Mike Geeves, Head of the Department of Biosciences and prize winners Dr Carol McClelland and Ed Carter

The poster competition attracted a large number of entries from across the Faculty. Professor John Baldock sponsored the Pro-Vice Chancellor’s Prize for the best poster by a Post-Doctoral scientist and this was won by Dr Carol McClelland, who works with Professor Bill Gullick, for her work entitled “The role of neuregulins in the nucleus”. The Dean’s sponsored Prize for the best poster by a Post-Grad scientist was awarded to Ed Carter, who works with Dr Anthony Baines, for his poster “Protein 4.1R interacts with and modulates the activity of proteins that control heart beat”.

The meeting was a great success and attracted an audience that was the largest to date. Each of the Departments in the Faculty was represented in the audience and in the Poster Competition. The Centre for BioMedical Informatics continues to represent an important initiative across the Faculty of Science, Technology and Medical Studies to promote research communication and collaboration. The full programme for the Symposium is still available at http://www.kent.ac.uk/bio/cbmi/symp/08/
Royal Society Industrial Fellowship

Dr. Andy King, a Reader in Program Analysis in the Computing Laboratory, has been awarded a prestigious Royal Society Industrial Fellowship with funding totalling £112,237. The primary aim of the Royal Society Industry Fellowship Scheme is to enhance communication on science and technology between those in industry and those in universities, to the benefit of UK firms and higher education institutions, as well as the individual scientist.

This Industry Fellowship will allow Andy to continue his collaboration with Portcullis Computer Security Limited. Andy's work with Portcullis is currently funded by a grant from the EPSRC (£49,000) and this has allowed him to visit Portcullis and understand their most pressing technical problems. The Engineering and Physical Sciences Research Council (EPSRC) project is due to end in June 2008 and, with the Industrial Fellowship starting in October 2008 and running for four years, Andy will be able to continue to work at Portcullis's premises part-time. During the Fellowship Andy will explore how academic techniques in program analysis can help to detect flaws in computer programs which might be exploited by malicious hackers.

Cool Physics Road Show taken to local schools

More than 500 pupils in years 7 to 9 were treated to demonstrations of physics experiments road-show style at the beginning of March when Kent's Cool Physics Road Show was hosted by schools throughout the county.

The Road Show, which is part of the University's 'Sciences@Kent' initiative which aims to raise the profile of science across schools in the region, was designed to present one-hour interactive experiments demonstrating expansion and contraction, changes of state, the effect of low temperature freezing on different substances and superconductivity. The experiments included organic material such as bananas and flowers being frozen in liquid nitrogen and solid carbon dioxide used to inflate balloons.

The event coordinators were Dr Gaby Roch, Subject Specialist and Steve Walls, a technician from the School of Physical Sciences.

The Road Show coincided with National Science and Engineering Week and to further promote the Road Show, undergraduate students acted as ambassadors for science in the schools.

Professor Peter Jeffries, Dean of the Faculty of Science, Technology & Medical Studies, said: "The Cool Physics Road Show demonstrated that science is fun as well as serious. The Road Show team provided engaging and excellent examples of how physics is relevant to us all."
Research into circadian rhythms is rapidly expanding within the field of neuroscience. Circadian rhythms cycle with an approximate 24-hour period and are conserved throughout evolution. Organisms from algae to humans possess internal clocks that synchronise to the Earth’s 24-hour rotational cycle. In the absence of environmental cues, such as the daily light-dark cycle, these clocks are able to maintain an approximate 24-hour pattern that gradually desynchronises with that of the Earth’s rotation. Hence the mechanisms that are responsible for maintaining this rhythm have been termed circadian clocks. In mammals, the master circadian clock/pacemaker is located in the brain within the hypothalamic region and is termed the suprachiasmatic nucleus (SCN).

The SCN is able to integrate both environmental (day-night cycle) and behavioural (social activities, e.g. meal times, exercise, etc) information and ultimately entrain to individual everyday lifestyles. Entrainment of the circadian clock is an extremely complex process, involving numerous neurotransmitters and signalling pathways within SCN neuronal cells. For example, the SCN receives day – night information via the photoreceptors located within the retina of the eyes, however social and behavioural inputs are conveyed through various regions of the brain that innervate the SCN, these include the thalamus and raphe nuclei. Typically, humans entrain with a diurnal (day-active) preference; however the SCN is able to rapidly adapt our physiological processes to function within nocturnal (night-active) parameters, thus allowing us to perform shift-work schedules e.g. factory workers, nurses, doctors, etc.

Modern lifestyles constantly require us to re-entrain and adapt our circadian rhythms, in most cases this is due to work or social-related demands. Desynchronisation of the circadian clock can result in a number of clinically related symptoms, for example nausea, headaches, tiredness, all of which are evident when suffering from jetlag, but are short-lived. Jetlag is the result of a rapid shift in the environmental light-dark cycle and behavioural routines such as meal times. However, the symptoms are short-lived due to the fact that the SCN is able to integrate the change in both environment and behaviour over a few days and physiological processes, including hormonal cycles, e.g. melatonin, cortisol, gastric secretion and all peripheral clocks located in organs such as the liver, kidneys and heart are re-entrained. More seriously, desynchronisation of the SCN can result in conditions such as seasonal affective disorder (S.A.D) which presents in sufferers during the winter months when day-time light levels and duration are low. Symptoms of S.A.D include sleep problems, depression, anxiety, mood changes and overeating. Through circadian research, treatments for S.A.D have been developed and include various light therapies, utilising light boxes, aimed at increasing the light stimulation to the SCN and circadian regulated exercise regimes.

Entrainment is also being carried out to investigate links with circadian disruption and cancer onset, tumour growth and progression and also effectiveness of treatment over circadian cycles. Our research focuses on trying to understand the mechanism by which the SCN is able to integrate both environmental and social information from receptor binding right through to the level of gene expression. The neurotransmitters of interest include glutamate, responsible for mediating light information to the SCN, and neuropeptide Y and serotonin, both of which convey behavioural information to the clock. Also, we aim to assess the viability of novel drug therapies in assisting in entrainment or increasing the rate of re-entrainment of the SCN, hence aiming to reduce the symptoms of conditions such as S.A.D or jetlag. Another area of interest lies in the role of the various photoreceptors located in the retina and their contribution to circadian entrainment. The photoreceptors of interest are rods, cones and the recently discovered melanopsin-containing retinal ganglion cells.

As research into circadian rhythms progresses, the importance of such rhythms and their regulation becomes more evident, with recent findings including the discoveries of slave clocks located in a number of mammalian organs which are all synchronised to and by the SCN, the master circadian pacemaker. We hope that our research can add to the growing wealth of knowledge in understanding the underlying mechanism of mammalian circadian entrainment and hence promote the development of possible drug targets for the treatment of circadian-related disorders.

Gurprit Lall, Ph.D., is a lecturer in neurophysiology at the Medway School of Pharmacy, University of Kent. He trained at the University of Glasgow within the field of circadian rhythms. His first postdoctoral position at Smith College, Massachusetts, USA focused on investigating the role of various neural inputs of the circadian clock. His second postdoctoral position at the University of Manchester, UK, involved work on the contribution of classic and novel photoreceptors in conveying/ regulating circadian function. Gurprit took up his position at the Medway School of Pharmacy in August 2006 and is currently setting up his own research group. (g.lall@kent.ac.uk).
**K e n t P h a r m a c i s t j u d g e d a s b e s t o f t h e b e s t n a t i o n a l l y a n d i n t e r n a t i o n a l l y**

Dr Ali Nokhodchi from Medway School of Pharmacy and his collaborator Dr Javadzadeh from the Tabriz School of Pharmacy were awarded a top prize at the British Pharmaceutical Conference in Manchester for their poster entitled "Effect of pH of the crystallization medium on the physicomechanical properties of carbamazepine crystals". Judged as one of the top three posters in the competition by the Academy of Pharmaceutical Sciences, the poster explained crystallization techniques developed by the authors for the improvement of the drug bioavailability. The bioavailability of carbamazepine, a drug used routinely in the treatment of epilepsy, is limited by the poor dissolution rate. The crystallization method was able to increase the dissolution rate and hence bioavailability.

Before travelling to Manchester, Dr Nokhodchi and his PhD student, Hamed Hamishekar, flew to Beijing to attend the 67th International Congress of the International Pharmaceutical Federation. Their poster entitled "A new method for preparation of insulin-loaded poly (D,L-Lactic-Coglycolic acid) microsphere: release and stability study of protein" was again awarded the top prize by the judges in the Industrial Pharmacy section. The poster described achievements in preparation of insulin-loaded microspheres with high encapsulation efficiency and constant insulin release rate.

**K e n t c o m p u t i n g p r o f e s s o r a w a r d e d € 9 4 2 , 5 3 4 E C g r a n t**

David Chadwick, Professor of Information Systems Security at the University of Kent, has been awarded a grant of €942,534 as part of the European Commission (EC) funded Trusted Architecture for Securely Shared Services (TAS3) project. Kent is one of 18 collaboration partners from across Europe who is being funded as part of the European Commission FP7 funding programme to work on this project, which will run for four years and receive total funding of €9,400,000 from the EC.

TAS3 is an Integrated Project that will be developed to manage and process personal information. It will be designed to be dependable, robust, cost-effective, reliable and be cross-domain applicable. Its primary uses will be in the e-health and employability sectors for both users and service providers to manage lifelong generated personal information. For example, within the employability sector, the lifelong personal information about workers, such as career history and professional interests, could be used to propose future career paths that are both compatible with their ambitions and meet European Parliament objectives on establishing a Community Programme for Employment and Social Solidarity. The role of Professor Chadwick is to lead the Work Package 7, entitled Identity Management and Authorization and Authentication. Its function is to ensure that users of the TAS3 infrastructure are properly authenticated and authorised before they are granted access to the personal information they have requested although a Break the Glass policy, where users who would not ordinarily have access to a particular individual’s records, would be granted access in emergency situations.

**B i g i n J a p a n**

Dr Benito Sanz of the Department of Electronics was presented with an award for a Poster entitled ‘A Dual Band Belt Antenna’ which details his work with John Batchelor. The award was made at the Institute of Electrical and Electronics Engineers (IEEE) International Workshop on Antenna Technology hosted at Chiba University, Japan. The poster described part of the wearable wireless systems work being carried out in the Antennas Laboratory in Electronics.

**C h i n a T a l k s**

Dr Shyqyri Haxha from the Department of Electronics attended the Symposium on ‘Progress in Electromagnetics Research (PIERS) 2008’ in Hangzhou, China in March where he gave a talk on “Novel Lens based on Negative Refractive Index”. This device is based on the theory originally proposed by Professor V.G. Veselago in 1967, a world leading scientist who chaired the session. Dr. Haxha was able to spend some time with Professor Veselago to discuss his current research into metamaterial devices used for telecommunication and sensing applications.
Meet the Scientist

Dr Maria Alfredsson, Lecturer of Theoretical Materials Chemistry, School of Physical Sciences.

"How did you first get into science?"
My interest in chemistry goes back a long time. By the age of 11, I was determined to become a chemist. At university I was unsure whether I wanted to specialise in Inorganic or Physical Chemistry. I liked the mathematical aspects of both subjects. On the other hand I also liked theoretical Organic chemistry. The solution came by listening to a talk by Professor Roald Hoffmann (1981 Nobel Prize Laureate in Chemistry). The title of his Noble lecture had been 'Building Bridges between Inorganic and Organic Chemistry', and the seminar I attended was on the same topic. He introduced me to theoretical chemistry.

"What is the focus of your current research?"
In most of my research I employ computational modelling to study chemical processes and materials properties at an atomic level. I use a combination of classical and quantum-mechanical calculations. I am particularly interested in finding solutions to environmental problems. This includes searching for new and better remediation techniques of contaminated soils and aquifers, as well as materials for new sustainable energy resources. I am also interested in systems under high pressures and temperatures, such as deep Earth conditions.

"Can you tell us about your current research group, what the group is working on and the purpose of the research?"
Having just been recently appointed as a lecturer in the School of Physical Sciences, my research group is small. Currently we are working on two types of problems: weathering of Bolivian mine tailings (work by David Kossoff, a PhD student at Birkbeck College, London, who I co-supervise) and Iron-oxide nanoparticles as a new material in Li-ion batteries (work by See Yuen Beh who is an MSc Student I also co-supervise).
I am also working on pyrite ash, which can be described as finely grained iron-oxide soils containing high levels of arsenic. By studying surface processes of iron oxides we aim to determine the dissolution processes and the mobility of arsenic, cadmium and lead in iron-rich soils, so that the clean-up procedure of contaminated sites can be improved. The project on pyrite ash is exciting because I am not only doing the calculations, but getting involved in process of collecting soil samples and renting a mini-digger.

"How has research in your area changed over the past few years?"
When I started my PhD in 1993 I remember that a single point calculation on an HCN (Hydrogen Cyanide) molecule took ca. 22 minutes on our Silicon Graphics computer. Now the same calculation takes less than 2 minutes on my PC. Faster computers have made it possible to study larger and more realistic systems, and more experimentalists find computer modelling a useful tool in their research.

"What do you consider is the most significant accomplishment in research in your area in the last few years?"
Again, I come back to the possibility of modelling larger and more realistic systems. These allow us not only to aid the experimentalist to interpret their data, but also, in some situations, to replace experiments. For example, our understanding of the deep Earth is often based on computational models. Finally, I think theoretical chemistry was accepted by a wider community after the Noble Prizes to Professors W. Kohn and J.A. Pople in 1998.

"What kind of challenges do you see lie ahead in your specialism in the future?"
I see two challenges in the near future. One is to model real chemical processes by considering thermodynamics to include kinetic and entropy effects. Secondly, with the progress of e-sciences I believe data storage is a future challenge.

The figure shows theoretical crystal shapes of Sphalerite (a Zink Sulphide mineral), demonstrating how Cd impurities stabilise more reactive surfaces of the mineral. The result is that the dissolution (weathering) rate of the mineral increases, realising Cd faster into the environment. (Work by David Kossoff)
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Speaker and Lecture Title</th>
<th>Lecture Theatre</th>
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<tbody>
<tr>
<td>9 May</td>
<td>2pm</td>
<td>Janet Linington, Computing Laboratory 'The TOPS Project'.</td>
<td>Computing S110B</td>
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<tr>
<td>7 May</td>
<td>4.15pm</td>
<td>Centre for Cognitive Neuroscience and Cognitive Systems, Margherita Giorgi &amp; Adrian Bonner: Open discussion.</td>
<td>Computing S110B</td>
</tr>
<tr>
<td>8 May</td>
<td>1pm</td>
<td>FIREBio - QIagen: Success factors in protein expression and purification.</td>
<td>Biosciences LT1</td>
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<tr>
<td>9 May</td>
<td>3pm</td>
<td>Pure and Applied Mathematics, Peter Clarkson (Kent) 'Vortices and Polynomials'.</td>
<td>IMSAS, Maths LT</td>
</tr>
<tr>
<td>12 May</td>
<td>2.30pm</td>
<td>Pure and Applied Mathematics, Dr Will Turner (Oxford), 'From Picasso to Brauer: Cubism in representation theory'.</td>
<td>IMSAS, McVittie Library</td>
</tr>
<tr>
<td>12 May</td>
<td>4pm</td>
<td>Dr. Pauline Phelan - Department of Biosciences, 'Making an escape: Gap junctions and electrical synapses'.</td>
<td>Biosciences LT1</td>
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<tr>
<td>14 May</td>
<td>1pm</td>
<td>Centre for BioMedical Informatics, Dr Alex Freitas: 'Hierarchical prediction of G-protein-coupled receptors (GPCR) functions with data mining techniques and Dr Ali Hojjat: 'Feature analysis for automatic detection of calcifications in mammograms'.</td>
<td>Marlowe LT 2</td>
</tr>
<tr>
<td>14 May</td>
<td>2pm</td>
<td>Dr. Jennifer Hatchell, School of Physics, University of Exeter, 'Star formation in Perseus'.</td>
<td>Ingram 110</td>
</tr>
<tr>
<td>14 May</td>
<td>4.15pm</td>
<td>Centre for Cognitive Neuroscience and Cognitive Systems, Kristina Dietz, 'Modelling Recognition Memory – Simple Memory Trace-Strength or Likelihood-Evaluation.</td>
<td>Computing S110B</td>
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<tr>
<td>15 May</td>
<td>1pm</td>
<td>FIREBio - Pfizer: The use of Mass Spectrometry in the discovery of Pharmaceuticals.</td>
<td>Biosciences LT1</td>
</tr>
<tr>
<td>16 May</td>
<td>2pm</td>
<td>Satnam Singh, Microsoft Research Cambridge, 'An Overview of Programming in Haksell'.</td>
<td>Computing Brian Spratt Room,</td>
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<tr>
<td>16 May</td>
<td>3pm</td>
<td>Pure and Applied Mathematics, Steffen Krusch (Kent) 'Recent Developments in the Skyrme Model'.</td>
<td>IMSAS, Maths LT</td>
</tr>
<tr>
<td>19 May</td>
<td>2.30pm</td>
<td>Pure and Applied Mathematics, Maciej Dunajski (Cambridge) 'Metrisability in projective differential geometry'.</td>
<td>IMSAS, McVittie Library</td>
</tr>
<tr>
<td>19 May</td>
<td>4pm</td>
<td>Professor Neil Hunter - Department of Molecular Biology and Biotechnology, University of Sheffield. 'Chlorophyll-proteins: from global photosynthesis to nanopatterning'.</td>
<td>Biosciences LT1</td>
</tr>
<tr>
<td>22 May</td>
<td>1pm</td>
<td>FIREBio - The CAMPSAP Labs: Anthony Baines/Marcus Allen.</td>
<td>Biosciences LT1</td>
</tr>
<tr>
<td>27 May</td>
<td>4.15pm</td>
<td>Centre for Cognitive Neuroscience and Cognitive Systems, Andrew Derrington, Dean of Social Sciences, 'Human visual motion perception, why do we make so many errors?'</td>
<td>Computing S110B</td>
</tr>
<tr>
<td>28 May</td>
<td>1pm</td>
<td>Centre for BioMedical Informatics, TBC</td>
<td>Marlowe LT2</td>
</tr>
<tr>
<td>29 May</td>
<td>1pm</td>
<td>FIREBio - Gullick Lab.</td>
<td>Biosciences LT1</td>
</tr>
<tr>
<td>30 May</td>
<td>3pm</td>
<td>Pure and Applied Mathematics, Dr Sibylle Schroll (Oxford) 'Chebyshev polynomials, linear algebra and representation theory'.</td>
<td>IMSAS, Maths LT</td>
</tr>
</tbody>
</table>

**Applied Discussion Group**
Seminars will take place in the McVittie Library, Fridays 10-11.
In week 6 of the Summer term, Stijn Lievens will talk on "A=B", by Petkovsek, Wilf and Zeilberger

**Pure 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".

**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**
Meets on Wednesday 11.00 to 12.00 in the McVittie Library.
Hamid Ahmadinezhad and Gavin Brown will talk on Topics in Birational Geometry and Mori Theory.
'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
Professor of Astronomy
Space School, School of Physical Sciences, University of Kent, Canterbury, Kent, CT2 7NH,
Email: spaceschool@kent.ac.uk
Mrs Sharon Humm
Telephone: 01227-823759

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**Advance Notice - Key Events - May**

**KIMHS—Kent Institute of Medicine and Health Sciences**

**Symptom Management in Non-Malignant Disease**
Wednesday 14th May 2008
From 10.00am – 5.00pm
£50 payable in advance **
VENUE: MEDWAY CAMPUS
MEDWAY BUILDING - ROOM M1-22
CHATHAM
A day to join with Master’s degree students on the Symptom Management module in Palliative and Supportive Care looking at evidenced based symptom control.
Topics will include ‘Nausea and Vomiting’, ‘Fatigue’, and a Pain Control Symposium with experts in pharmacogenetics, nerve blocks and neuropathic pain.
For further information and payment please contact
Sue Brickland 01227 827312; s.brickland@kent.ac.uk
or
Dr Helen McGee: helen.mcgee@hospiceintheweald.org.uk

**Symptom and Pain Control**
Wednesday 21st May 2008
from 9.30am – 4.30pm
£50 payable in advance **
VENUE: MEDWAY CAMPUS
MEDWAY BUILDING - ROOM M1-22
CHATHAM
A day to join Master’s degree students on the Symptom Management module in Palliative and Supportive Care looking at provision of evidenced based symptom control in non-malignant disease.
Topics will include ‘Disease Trajectories’, ‘Respiratory Disease’, ‘Renal disease’, ‘Heart Disease’ and ‘Neurological Disease’.
For further information and payment please contact
Sue Brickland 01227 827312; s.brickland@kent.ac.uk
or
Dr Jackie Fisher at jackie.fisher@medwaypct.nhs.uk
Recent Published Papers

Department of Biosciences

Nancy Adamek, Lynne M. Coluccio and Michael A. Geeves (2008) "Calcium sensitivity of the cross-bridge cycle of Myo1c, the adaptation motor in the inner ear". PNAS, 105, 15, 5710-5715.


Department of Electronics


Patent Applications


Recent Published Papers

Medway School of Pharmacy


Computing Laboratory


Congratulations to Computing PhD student Nick Holden, whose paper (details above) received the best paper award in an European conference about data mining and bioinformatics. This conference received 63 submitted papers, 18 of which were accepted for publication.

Papers Presented at Conferences

Kent Institute of Medicine and Health Sciences

Dr. Axel Klein, Lecturer in the Study of Addictive Behaviour, "Regulating Khat - Dilemmas and Opportunities" at the second conference of the International Society for the Study of Drug Policy which took place in Lisbon, Portugal on 3—4 April 2008.

Department of Electronics

Dr Les Walczowski, Senior Lecturer presented a paper on the new Web Portal that he and Mark Ellis, Computer Systems Manager in the Department, have developed at INTED 2008, the International Technology, Education and Development Conference which took place in Valencia, Spain in March 2008.

Dr. Shyqyri Haxha, Lecturer in Communication Systems attended SPIE Europe-Photonics Europe – 7-11 April 2008 – Strasbourg where he presented the following papers:-
"Novel design of photonic crystal dense wavelength multiplexer based on phononic crystals". Paper No. 6989-49.
"Novel multiplexer/demultiplexer based on photonic crystal superprism". Paper No. 6989-56.
"Design of photonic crystal fibres with improved effective mode area". Paper No. 6990-34.
"Novel design of Z-cut lithium niobate electroptic modulator". Paper No. 6992-46.
Recent Grants Awarded

Department of Biosciences

Professor William Gullick-Department of Biosciences has been awarded £15,412 for a project entitled ‘Detection of the splice variants of the NRG3 gene in breast cancer’, from the Breast Cancer Campaign.

Dr Peter Nicholls, Dr Dan Lloyd and Professor Phil Blower-Department of Biosciences have been awarded £417,396 for a project entitled ‘Development and testing of novel radiolabelled antibodies for the targeted therapy of myeloid leukaemia, from the Leukaemia Research Fund.

Dr Mark Smale-Department of Biosciences has been awarded £462,095 for a project entitled ‘Enhancing global and mRNA specific translation for improved recombinant protein expression in vitro cultured mammalian cells’, from Biotechnology and Biological Sciences Research Council (BBSRC).

Computing Laboratory

David Soud-Kent IT Clinic, Computing Laboratory has been awarded £400 for a support contract for Edwina Bell, from Rochester Cathedral.

David Soud-Kent IT Clinic, Computing Laboratory has been awarded £42,360 for LITC support in the Channel Corridor Partnership, from Shepway District Council.

Gavin Topley-Kent IT Clinic, Computing Laboratory has been awarded £940 for funding for telephone and computer remote support, from Amacsports Limited.

Gavin Topley-Kent IT Clinic, Computing Laboratory has been awarded £2,290 for a project entitled ‘Developing bespoke software receptive Language Assessment’, from Speech Link Multimedia Limited.

Gavin Topley-Kent IT Clinic, Computing Laboratory has been awarded £975 for a project entitled ‘Development of Community Adult Living Program (CALP)’, from The Royal School for Deaf Children in Margate.

Dr Rosie Cowell-Computing Laboratory has been awarded £4,100 as a travel grant for her visit to California to conduct research into ‘Connectionist modelling of face and object processing in the brain’, from the Biotechnology and Biological Sciences Research Council (BBSRC). (See page 3 of this newsletter).

Department of Electronics

Professor Yong Yan, Mr Peter Lee and Dr Gang Lu-Department of Electronics have been awarded £411,147 for a project entitled ‘Optimisation of Biomass/Coal Co-firing processes through integrated measurement and computational modeling’, from the Engineering and Physical Sciences Research Council (EPSRC).

Harvey Twyman-Department of Electronics has been awarded £400.00 in consultancy fees from KJC Microwaves Limited.

Kent Institute of Medicine and Health Sciences

Dr Adrian Bonner-Kent Institute of Medicine and Health Sciences has been awarded £467,706 for Biomedical support for the social programme of the Salvation Army UKI, from The Salvation Army.

School of Physical Sciences

Professor Mark Burchell-School of Physical Sciences has been awarded £543,624 funding for a project entitled ‘Minor icy bodies (origin and evolution) and cosmic dust’, from The Science and Technologies Facilities Council (STFC).
Risk, Reproduction, and Teenage Motherhood: An evolutionary approach

Teenage pregnancy and motherhood are considered to be pressing social concerns in the United Kingdom today, and are often viewed as problems in need of solutions. Although a plethora of studies across different disciplines have identified social correlates such as abuse, poverty, peer pressure, alcohol use etc. the underlying causes remain elusive (why should these correlates lead to teenage motherhood?). Policies aimed at helping teenage mothers and preventing teenage motherhood are often disjointed. An evolutionary approach, however, appears to be a useful way of answering the ‘why’ question. Research within an evolutionary framework suggests that having a child as a teenager is an evolved reproductive strategy which some girls pursue when they are faced with conditions of environmental uncertainty and risk; conditions they perceive will affect their chances of experiencing a long and fortunate life. This perspective can help us to understand why particular environments or social situations should lead to teenage motherhood by exploring how risk and uncertainty are related to reproductive timing.

A spectacular manifestation of star birth is displayed in this image. Birth cannot take place without the placenta being ejected. In this case, the waste material carries away the excess spin which would otherwise hold up the birth process. Shown here in red, appropriately, is an image of the ejected and excited molecular material. It is driven into these small regions by flow along two opposite channels which penetrate through the maternal clump which embeds the forming star. The greyscale image shows the surrounding stars projected onto this region and demonstrates that the actual star-to-be remains invisible even at these infrared wavelengths of light. For this reason, the discovery of the ejected material is crucial to our knowledge of how stars originate. This particular outflow was discovered by Professor Michael Smith and collaborators while surveying a wide region of Sky in Ophiuchus.

Professor Michael Smith, Professor of Astronomy.
http://astro.kent.ac.uk/mds/mdsmith.htm

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

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Café Scientifique in 2008

June 13, 2008
Dr. Arnaud Wisman: Facing Death: How do we regulate the awareness of our own mortality
http://www.cs.kent.ac.uk/people/staff/dfc/site/CS/