University of Kent

Volume 3, Issue 4

Summer 2010

Sciences@Kent

Earth from Orion: Scott James' Final Year Project

Inside this issue:

View From the Dean's Office

Prizes, grant, publications—all this and graduation too! The summer is a busy time. The exams were sat (by the students) and marked (by the staff). Results are out with another bumper year of success. I hope to see all the students and staff at graduation .

Meanwhile, Professor Spurgeon has won a major prize. Other colleagues are winning prizes: our students are winning prizes and grants are being won as well. Grants are the lifeblood of research in the Sciences, so winning them is vital. There are increasing opportunities for getting help with grant preparation, so please take advantage of them. Enterprise activity is also an increasing feature in the Faculty. We have won almost £1m in Enterprise related grants in the last year. And reaching out to the broader community is also going strong, Outreach activities hit a peak around the start of summer and young people pour onto the campus. And we support so much more than just visits. The Maths Teacher Scholarships (page 7) are another example of our impact on the community.

So enjoy the summer. As you read this, you will see how much we do, and get a sense of how much we benefit the world by doing it.

All the best

Mark
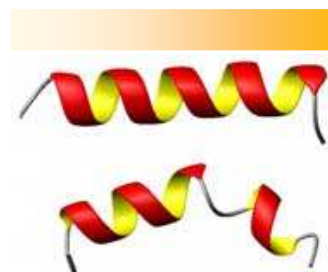
A model peptide that shows how chemical modification (lower image) can result in conformation change Project: Chemical and structural integrity of proteins in the glassy state – Protein formulation and stability

This project was a joint collaboration between Professor Mark Smales, Professor of Mammalian Biotechnology , and Dr. Mark J. Howard, Senior Lecturer in Biomolecular NMR Spectroscopy.

Science is not just about Bunsen Burners...

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Honeywell International Medal awarded to Professor Sarah Spurgeon

Professor Sarah Spurgeon, Head of the School of Engineering and Digital Arts at the University of Kent, has been awarded the 2010 Honeywell International Medal in recognition of her outstanding contribution to control theory and systems engineering.

The Honeywell Medal commemorates the granting of a Royal Charter to the Institute of Measurement and Control (InstMC) and is awarded annually to a chartered measurement and control technologist – described in the Royal Charter as a person engaged in the discipline of measurement and control and who may be a scientist, engineer or a mathematician.

Professor Sarah Spurgeon—full story page 6

Professor Lord May of Oxford Gives Talk at Kent

Professor Lord May of Oxford, OM, AC, Kt, FRS

Professor Lord May of Oxford, OM, AC, Kt, FRS visited Kent in early July to give the opening talk of the second International Statistical Ecology Conference organised by the National Centre for Statistical Ecology.

The conference took place in the Woolf Lecture Theatre and was opened by the Vice-Chancellor, Professor Dame Julia Goodfellow. Lord May delivered his talk entitled: 'Statistics, networks and banking systems' to a packed auditorium.

Robert, Lord May of Oxford, OM AC Kt FRS, was President of the Royal Society 2000-2005, and Chief Scientific Adviser to the UK Government and Head of its Office of Science and Technology 1995-2000. An undergraduate chemical engineer, he has held a Personal Chair in Theoretical Physics at Sydney University, the Class of 1877 Chair in Zoology at Princeton, and a Royal Society Research Professorship at Oxford and Imperial College. A systems biologist before the term became 'fashionable', his research interests include ecology, evolution and infectious diseases.

Lord May gave an overview of the advances in our understanding of the interplay between network patterns and effective control measures, ecosystem resilience and the overall stability of financial markets.

Byron Morgan, Professor of Applied Statistics at the University's School of Mathematics, Statistics and Actuarial Science, said: "Climate change and loss of biodiversity are just two reasons why statistical ecology is so important at present. We are delighted that Lord May presented the opening address."

Kent's First European Research Council Award

Professor Adrian Podoleanu

Kent has won its first prestigious European Research Council Award. Adrian Podoleanu, Professor of Biomedical Optics and Head of the Applied Optics Group in the School of Physical Sciences, has been awarded €2M for research entitled: 'Combined time domain and spectral domain coherence gating for imaging and biosensing (COGATIMABIO)'.

The Vice-Chancellor, Professor Dame Julia Goodfellow, congratulated Professor Podoleanu on his achievement. She said: "this is a substantial grant—perhaps the biggest individual research award that Kent has ever received—and is a great honour for Adrian, the School and the University. I appreciate all the work he has done in preparing the application, and of course the excellent research upon which it is based."

The research, funded by the European Research Council Award, will take place over the next five years.

Scientists Train South African Police Service

Dr Chris Solomon and Dr Stuart Gibson from the School of Physical Sciences travelled to Pretoria earlier this year to deliver a two week training course to South Africa's top 10 facial sketch artists. The visit was to deliver training in the use of Vision Metric's software that was purchased by the South African Police Service last year. The course was organised in collaboration with Superintendant Meliza Pretorius, National Coordinator for Facial Identification in the South African Police Service, and provided an intensive and thorough orientation of the system.

In addition to teaching all the required detail on the effective use of the E-Fit and E-Fit-V software, Dr Solomon and Dr Gibson also spent time training the group on effective interview techniques with respect to facial ID. Dr Gibson said: "We were very impressed by the competence and dedication of the South African facial composite operators/artists. Over the duration of our stay, it became clear to us that training programmes undertaken by police officers in the UK are regarded as second to none by police services worldwide."

Honeywell International Medal Award

Mr Alex Savage, a 3rd Year Computer Systems Engineering student, in the School of Engineering and Digital Arts, is this year's recipient of the Honeywell Award for Outstanding Academic Achievement from the Institute of Measurement and Control.

Alex was nominated by Professor Yong Yan, the School's Chair of the Instrumentation, Control and Embedded Systems Research Group and Fellow of the Institute of Measurement of Control. The award was for the work Alex did in his Final Year Project. His project supervisor, Winston Waller, provided the citation.

Alex worked for a local company in Kent during his Industrial Placement Year and became involved in supporting their range of security products. He decided to build on this experience through his final year project in which he developed a 'Contactless Security System using RFID'. The system uses a microcontroller-based reader within the door locking mechanism to read the RFID (Radio Frequency Identification) tag of the person attempting to gain access, contacting a remote SQL (Structured Query Language) Server via an Ethernet Link to check on the security status of the

person before either releasing the lock or refusing access.

The project was Alex's own idea and he has developed the RF circuitry, the embedded hardware and software as well as the PC software.

This project covers a wide range of technologies and has required a great deal of research in various areas. The prototype system has been constructed to a very high standard and the device is of considerable interest to the local company who will be able to take the prototype system into production.
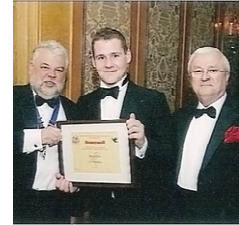
Alex Savage

Science Extravaganza

Students from 15 local schools in the Kent area enjoyed a Science Extravaganza at the University of Kent's Canterbury campus on 6 and 7 July.

The Extravaganza provided an insight into the worlds of science and technology. The Year-eight students had an opportunity to experience a number of practical activities, ranging from extracting DNA from peas in the Biosciences laboratories to trialling forensic techniques used by crime scene investigators.

During the mornings, students attended a "Making Faces" lecture

which explained the science of facial identification and demonstrate how advanced facial recognition software can be used. The students then took part in workshops held by all the Schools in the Faculty of Sciences.

Jane Anderson, Partnership Development Officer at the University, said: "The event organised by the University's Faculty of Sciences and Partnership Development Office has become so popular that this year we have expanded it to two days to accommodate more schools. Nearly 500 Year-eight

students visited the campus over the two days. We always receive excellent feedback from the schools and students. Previous participants have praised the University staff and described the day as a life changing experience which makes them view science in a whole new way."

The participating schools included: The Howard School, Strood Academy, Queen Elizabeth's Grammar School, Spires Academy, Chaucer Technology School, Maidstone Girls Grammar, Thomas Aveling and Dartford Technology College.

Professor of Pharmacology Presents Inaugural Lecture

Alistair Mathie, Professor of Pharmacology and Director of Research at the Medway School of Pharmacy, gave his Inaugural Lecture, entitled 'Exciting Nerve Cells' in Pilkington Lecture Theatre at Kent's Medway campus in late May.

Alistair gave a thoroughly engaging lecture about his laboratory research which has concentrated in the areas of

molecular and cellular neuroscience. His research group has published extensively in top neuroscience, physiological and pharmacological journals and received regular grant support from the MRC, BBSRC and the Wellcome Trust.

The main focus of Alistair's research is the determination of the roles of different ion channels in controlling the excitability and

firing of mammalian neurons. Such neuronal ion channels are important in a variety of clinical conditions, such as epilepsy, stroke, neuropathic pain and depression and represent major potential therapeutic targets for future research.

The Group collaborates with the pharmaceutical industry and other laboratories in the UK, Germany, Spain, Finland and Australia.

Professor Alistair Mathie presented his Inaugural Lecture at the Pilkington Lecture Theatre

New Health Strategy for University of Kent

Professor Peter Jeffries

The University of Kent is to introduce a new strategy to develop its current health-related teaching, research and enterprise activities, enabling it to become more responsive to the rapidly changing demands of the region's healthcare services and to strengthen its research activity in those areas where the University already has world-class expertise. The strategy will be sent out for widespread consultation over the next month before being launched in the autumn.

The strategy will build on existing strengths in social policy, mental health, biomedical sciences, sports sciences, pharmacy, research design and technical innovation. A key element will be 'Kent Health', an agency which would act as a one-stop shop in terms of promoting, providing and offering the University's health activities and its interface with the healthcare profession.

Professor Peter Jeffries, Acting Dean of Health, said: "We already have examples of excellence across the institution, such as the Centre for Health Services Studies and the Centre for Biomedical Informatics. However, after consultation with key players in the region we established there is a need for the University to have a much closer relationship with the Kent NHS, providing leadership in teaching and research across the region and helping revitalise its health economy."

The University's health strategy will be supported by the appointment of ten new academics and clinicians across the range of health-related disciplines, including biomedical sciences, cognitive neurosciences, pharmacy, and molecular processing.

SEPnet Provide New Conferencing Facilities

Scientists from all over the South East shared their research and news through the new video-conferencing facilities provided by the SEPnet (South East Physics Network) which is a consortium of six partner physics departments at the Universities of Kent, Queen Mary University of London, Royal Holloway University of London, Southampton, Surrey and Sussex working together to promote excellence in Physics, supported by a five-year HEFCE grant of £12.5m. Professor Sir William Wakeham, Chair of SEPnet, opened the launch that took place May.

This event has been prompted by the arrival of James West, the new SEPnet Executive Director and Fellow of the British Computer Society. He says "The Physics departments around the South East each have unique strengths, and together produce some of the country's most exciting research. This conference is a chance for the research to take the centre stage, and for successful collaborations to share best practice." Local school children attended the launch and Professor Jim Al-Khalili gave the key-note lecture live from Surrey, on Black Holes, Wormholes and Time Machines.

Charlotte Thorley, Director of Outreach explained: "SEPnet has an invaluable resource in its staff and students. We're making their knowledge and enthusiasm as accessible to schools as possible to promote STEM careers and qualification, particularly in Physics."

60th Annual ISOP-BSBP Joint Meeting

The 60th annual meeting of the International Society of Protistologists will be held jointly with the British Society of Protist Biology at the University of Kent campus, Canterbury from 18-23 July 2010. The meeting will cover a diverse range of topics related to protozoans including ecology, parasitology, biochemistry, physiology, genetics, and evolution. The multidisciplinary attitude to research engendered by this meeting will hopefully result in an unparalleled forum for sharing and integrating a wide spectrum of scientific information on these fascinating and important organisms.

The participants in the meeting will include students, young investigators, and established scientist from diverse backgrounds and both societies enthusiastically support young researchers by offering them the opportunity to present their work. In addition a visit to Down house, the home of

Charles Darwin, is included in this meeting.

For more information regarding this meeting please go to: http://www.uga.edu/ protozoa/meetings/ isop2010/home.html
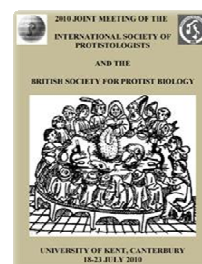
Pharmacy lecturer's mission to improve cancer treatments

Medway School of Pharmacy lecturer Dr Nathalie Lavignac has received a grant to improve drug targeting in cancer patients.

Traditional delivery of cancer drugs results in side-effects because the drugs used to kill the cancer cells also kill the good cells. The fastest-growing cells in the body are the cells lining the mouth, stomach and intestines, as well as hair. Hence many cancer drugs cause sore mouths, nausea, vomiting, diarrhoea and loss of hair, which is distressing for patients and their families.

Dr Lavignac, a Lecturer in Pharmaceutical Nanotechnology, works at the interface between chemistry and biology in the field of nanomedicine. She has developed a number of 'nanocarriers' to improve drug delivery and target only the cancerous cells - thus minimising the unpleasant side-effects often associated with cancer treatment.

Dr Lavignac received her research

grant from the Kent Cancer Trust charity and will use it to fund a PhD studentship, which will focus on this challenge for a period of three years.

The project will be carried out in partnership with Dr Mark Hill, a clinical cancer specialist from Kent Oncology Centre at Maidstone Hospital.

Dr Lavignac said the results of her project could have far-reaching results in the treatment of cancer. "If successful, the research could lead to a new and improved treatment for patients with cancer. It's also possible the same method could be used to develop similar types of drugs to treat other diseases." she said.

Dr Mary Buchanan, Chair of Trustees for Kent Cancer Trust, said: "This research into anti-cancer drugs has great potential to transfer scientific developments from the laboratory to clinical practice for the benefit of patients. This

process, called translational research, is not only one of the main objectives of the charity but also could have considerable importance for the British economy.

"Doctors and scientists are also very conscious now that we need to make better treatments, and ensure that they are kinder to the patient, and for these reasons we decided to fund the project."

Medway School of Pharmacy is run jointly by the universities of Kent and Greenwich. In 2009 the School topped the table of higher education institutions in the National Student Survey, when students rated their education as the very best in the country.

The School has also established a reputation for high quality, internationally recognised research, investing more than £1 million in both research scholarships and research consumables as part of its current five-year plan for expansion.

Dr Nathalie Lavignac (left) and Dr Mary Buchanan, Chair of Trustees for Kent Cancer Trust

Kent researcher wins best paper at EuroGP Conference

Dr. Alberto Moraglio, Centre for Reasoning Research Fellow in the School of Computing received the best paper award at the European Conference on Genetic Programming in Istanbul.

The paper, 'Geometric Differential Evolution on the Space of Genetic Programs' and jointly written with Sara Silva from the Technical University of Lisbon in Portugal, was selected from over 40 papers submitted to the conference.

The key idea of the paper is to use geometrical methods to enhance genetic programming which is a

machine learning technique that takes inspiration from biological evolution and 'evolves' computer programs that perform required tasks.

Alberto said: "I am delighted to receive this prestigious award. It was a pleasure to work with Sara who is a great researcher. The work presented at the conference was just an example of the application of a general methodology" adding that he is writing a grant proposal with Dr Colin Johnson, the Head of the School of Computing to further

explore this promising avenue of research. "

A further paper by Dr. Moraglio and Dr. Colin Johnson, Head of the School of Computing, was shortlisted for an award at the co-located conference on Evolutionary Computation for Combinatorial Optimization.

The paper showed how an almost 50 year old algorithm for numerical optimization, the Nelder-Mead algorithm, could be modified to tackle challenging problems in combinatorial optimization.

Dr. Alberto Moraglio and Sara Silva being presented with their award at the European Conference on Genetic Programming in Istanbul

Kent hosts International Algebra Conference

The School of Mathematics, Statistics and Actuarial Science hosted the 'Kent Algebra Days' conference on 24—26 June 2010. Organised by Dr Stéphane Launois, Lecturer in Pure Mathematics, the conference brought together leading experts in

Algebra from Argentina, Belgium, France, Germany, UK and USA. Speakers included several algebraists, who have been invited to give presentations at the prestigious International Congress of Mathematicians, where the Fields

Medal—the equivalent of the Nobel Prize in Mathematics, is awarded. The workshop was supported by the Engineering and Physical Sciences Research Council (EPSRC) French-British Network in Representation Theory.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a},$$

Honeywell International Medal awarded to Professor Sarah Spurgeon (...continued from page 1)

Professor Spurgeon's main areas of expertise are the development of practically realisable nonlinear control strategies which yield robust performance in the presence of uncertainty, and the design of robust condition monitoring schemes. She will receive her Medal during a ceremony at the Royal Society on 20 October.

Professor Mark Burchell, Acting Dean of the Faculty of Sciences at the University, said: 'I was delighted to hear the news of this well deserved international prize for Professor Spurgeon. Sarah's track record speaks for itself and the University of Kent is proud of her many achievements.'

Professor Spurgeon commented: 'I am very honoured to receive this award from the Institute of Measurement and Control. Control and systems engineering is an exciting discipline at the heart of key problems of societal importance and I am very privileged to have the opportunity to work in areas as diverse as control of nuclear fusion, through control of biped robots to the development of tools for the assessment of upper limb movement throughout the rehabilitation process. My area is an interdisciplinary one and this medal is wonderful recognition of the great team of collaborators with whom I have had the privilege to work over the past twenty years.'

Professor Spurgeon FREng, FInstMC, FIET, FIMA, CEng, CMath joined the University of Kent in 2008. Chair of the UK Automatic Control Council, she also joined the International Federation of Automatic Control's (IFAC) Executive Publications Committee by invitation of IFAC Council in the same year. She is an Editor of the IMA Journal of Mathematical Control and Information, a member of the Editorial Board of the International Journal of Systems Science, a member of the Editorial Board of the Institute of Engineering and Technology (IET) Proceedings on Control Theory & Applications and a Subject Editor for the International Journal of Robust and Nonlinear Control.

Professor Spurgeon is an elected member of the EPSRC Engineering College and has received support from EPSRC and Leverhulme Trust as well as direct industrial support for her research work. She has provided consultancy and training services to a range of international companies including BAE Systems and Rolls Royce. She has supervised 15 successful PhD students, received in excess of £2.2 million to support her research work from EPSRC, the EU, the government and industry, and published some 250 refereed papers in internationally leading journals and the proceedings of international conferences. Professor Spurgeon is currently a member of the Standing Committee for Education and Training at the Royal Academy of Engineering.

In 2000 Professor Spurgeon was awarded an IEEE Millenium medal and in 2009 she was appointed an 'Engineering Ambassador' for the Royal Academy of Engineering.

Professor Sarah Spurgeon

Celebration of a Career in Science

A one-day symposium in recognition of and celebration of the career of Professor Alan V. Chadwick, who retired in the autumn of last year, was held at Canterbury Cathedral in late June.

The event, entitled: 'Structure and Dynamics in the Solid State', highlighted the many aspects of Alan's work including the synthesis and characterisation of functional materials and computational modelling. The invited speakers were some of Alan's former collaborators, who are all world leading researchers in the field of functional materials. They took a brief break from their current work, which includes: energy storage, catalysis, glasses, mineralogy/environmental sciences and nanomaterials and travelled from Spain, France and around the UK to make their presentations at the event which was organized by the Functional Materials Group (FMG) in the School of Physical Sciences.

When Alan retired, he was appointed as Emeritus Professor of the University of Kent and maintains an active role in the FMG. His research interests include: electrical transport in polar solids, nanocrystalline materials, computer modelling of solids and chemical sensor development.

Alan commented: "The research in my group is aimed at understanding the structure of point defects and the mechanisms of diffusion, information important to a wide range of technological processes, including corrosion, catalysis and many materials processing methods. The work of the group encompasses a broad spectrum of material types, from single crystal, inorganic solids to organic polymers, and employs a wide variety of techniques, including materials synthesis, electrical measurements, radiotracer methods, NMR, synchrotron radiation, neutron scattering and computer modelling."

Emeritus Professor Alan Chadwick

PhD Student wins Sony Digital Camera for Best Poster

Mohammad Nasiri Avanaki was awarded with the top prize of a Sony Cyber-shot Digital Camera for his poster titled: 'Optical Parameter Extraction towards Skin Cancer Diagnosis', exhibited at the MICROSCIENCE 2010 International Conference in June.

MICROSCIENCE is the leading European Exhibition devoted exclusively to the interests of microscopy equipment

manufacturers, imaging software suppliers, printer companies and their customers. This year, ExCeL, the exhibition and conference centre in London's Docklands, played host to MICROSCIENCE 2010, Europe's largest exhibition showing the latest equipment in microscopy and imaging.

Mohammad is PhD student working on OCT (Optical Coherence Tomography) image

enhancement for tissue characterization. The project is collaboration between the Neurosciences and Medical Image Computing group in the School of Biosciences, and the Applied Optics Group in the School of Physical Sciences. The project is jointly supervised by Professor Adrian Podoleanu and Dr. Ali Hojjat, whose collaboration is within the activities of the Centre for Biomedical Informatics.

Mohammad Nasiri Avanaki (right) is presented with his prize by Dean Edwards of Carl Zeiss SMT

Maths Teacher Scholarships

The School of Mathematics, Statistics and Actuarial Science is offering two scholarships for promising teachers of Mathematics. The Gravesend Grammar School Teacher Scholarship and the Longfield Academy Teacher Scholarship are for a part-time MSc in

Mathematics by Research in Pure or Applied Mathematics and will be offered to successful candidates who have at least a 2(i) BSc in Mathematics or MPhys from a UK institution.

The MSc by research is a part-time, two-year program. At the end of

the courses, students will produce a thesis which must show the ability to conduct an independent study and to understand the relationship between maths and a wider field of knowledge.

Enquiries to: Dr Steffan Krusch, 01227 827675

Guest lecture by world-leading visual effects company

Hannes Ricklefs, R&D lead and Head of Pipeline at the The Moving Picture Company (MPC) and Kent computing graduate, gave an animation-packed presentation covering the latest research and development at MPC as demonstrated in recent movies such as Clash of the Titans and The Chronicles of Narnia.

He described the production process, explaining how the different artistic and technical departments work together to create visual effects such as

physically-based simulations, and crowd animations.

He explained how every character and every environment is modeled in minute detail taking inspiration from the natural world. Eyes, ears, mouths, skin, scales, feathers and fur of real animals are studied and adapted for creating credible fantasy characters. Realistic motion and flexibility is applied during the rigging process when skeleton, muscle and tendons are added to the model to give the characteristic movement and

mobility. Scenes are then built up by combining layout, animation, lighting and compositing.

Peter Kenny, who supervised Hannes' final year undergraduate project at Kent, said: "It's always a pleasure when former students return to give guest lectures, especially when the subject is so interesting. Hannes' successful career in the visual effects industry demonstrates the value and versatility of a degree in computer science."
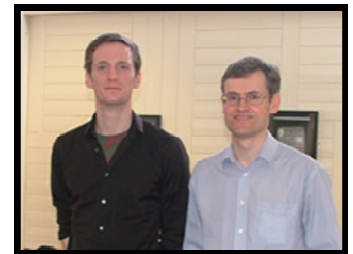
Hannes Ricklefs (left) with former supervisor, Dr Peter Kenny in the School of Computing

New Master's in Architectural Visualisation

The MA in Architectural Visualisation at is offered and jointly taught by Kent School of Architecture and the School of Engineering and Digital Arts. Building on the successful Master's programmes in Computer Animation and Digital Visual Effects, this unique MA will enable students to develop at an advanced level the skills, knowledge and understanding of digital simulation and 3D modelling

which will equip them to become highly skilled professionals in architectural visualisation.

The opportunities for the digital visualisation of architecture and urban environments have grown exponentially in both the Architectural and Film Industries. As the need for skilled modellers and animators with an awareness of architectural, as well as cinematic, influences increases in both Architecture and Film, the

MA in Architectural Visualisation builds on the connections between these two industries. In this contemporary programme the professions of architecture, film and animation fuse together, providing students with the ability and understanding to work in each or all of them.

For more information contact: Howard Griffin, Programme Director, at h.griffin@kent.ac.uk or call +44 (0)1227 824695.
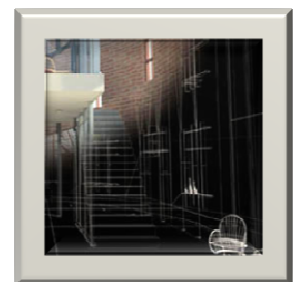
Visualisation Example

Scientists Survey the Galactic Plane

Example of the 1st semester data. Colour image of the outflow from a massive star forming region (left) and an HII region around a massive star (right) in the filters J (blue), K (green) and H2 (red). J and K data are taken from UKIDSS GPS

The largest ever systematic and unbiased survey for jets and outflows from young stars using molecular hydrogen emission lines started last year and the first results are being obtained. Dr Dirk Froebrich from the Centre for Astrophysics and Planetary Science (CAPS) leads a 20+ people strong international team to conduct an unbiased search for molecular hydrogen emission at 2.122micron along the Galactic Plane using the UK Infrared Telescope at Hawaii. The project has been granted 222hours of observing time distributed over four semesters. It aims to image 150 square degrees to identify jets and outflows from young stellar objects.

PhD student Georgios Ioannidis is responsible for the main data analysis and interpretation. Over the last few months he has preliminarily analysed the first semester data, covering 30 square degrees. He identified about 350 candidate outflows in about 50 star forming regions observed to date. Hence the estimated total for the entire survey stands at above 2000 hydrogen emission line objects, more than trebling the total number known. He is now starting to identify the driving sources of the jets and outflows as well as to analyse the properties (brightness, length, position angle) and statistical distribution on the sky. This will help the team to understand how stars form and interact with their surroundings due to feedback of energy and momentum.

Like any large survey of this nature, it will also provide the team with serendipitous discoveries. They have already discovered five so far unknown planetary nebula and five new star clusters in the images. The most surprising result so far has been the identification of a large number of stars with highly variable brightness. More such surprises are definitely in store, in particular when the team starts to combine their data with surveys taken at other wavelengths to build up an even more complete picture of the formation of stars in our Galaxy.

Guitar Playing Robot
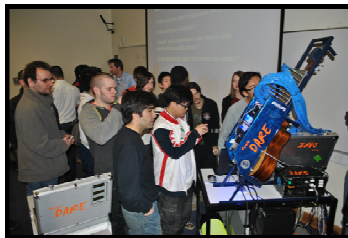
Budding Engineers in the School of Engineering and Digital Arts inspect the complex guitar playing robot.

(left) Professor Sarah Spurgeon, Head of School (centre) Dr. Nai-One Lai and (right) Dr. Heico Sandee

Students in The School of Engineering and Digital Arts were inspired by a joint presentation by the School's Royal Academy of Engineering Visiting Teaching Fellow, Dr. Nai-One Lai from Goldman Sachs, and Dr. Heico Sandee, Robotics Project Manager, Eindhoven University of Technology.

Nai-One, who has a PhD in Control Engineering, gave her presentation on project management and career paths. Heico brought along his guitar-playing robot as a 'live' example of the development of a complex robot.

The development of high-tech robots requires close interdisciplinary collaboration and students experienced this first hand. Both Nai-One and Heico are industrial engineers who are at the cutting edge of current developments. By making a joint presentation, they illustrated how to motivate and inspire the next generation of engineers through demonstrating their current projects and sharing their experience of how their group project work at University helped them in their roles in the workplace.

Alex Savage, whose Stage 3 modules include 'Digital Control and Robotics', said: "We all find it very inspiring to experience what can be done with the knowledge acquired from your time at university."

Scientists Contribute to 'Clean Vehicles Generation'

Kent played host in late June, to the bi-annual meeting of the ALISTORE ERI (European Research Institute), based in Amiens, France. ALISTORE is a scientific network which brings together the core competency of 16 excellent European University research groups to build a new integrated collaborative research structure with major European battery and car manufacturers. It was created in 2004 to promote European research on new battery materials, something crucial for future energy policies, and has received over 5 million euros of funding from the European Commission.

The Functional Materials Group in the School of Physical Sciences is one of the partners in ALISTORE, and its lead delegate is Dr Maria Alfredsson, Lecturer in Theoretical Materials. Other members of Group participating in the conference are Professor Alan Chadwick, Dr Serena Corr and Dr Gavin Mountjoy.

Dr Mountjoy commented: "This new generation of batteries could play an important role in the clean vehicles generation and the management of renewable energy. It would put Europe, currently dominated by Japan and China in this field, on the international scene."

Google Summer of Code for Computing Postgraduate

Laurence Hellyer, a PhD student in the School of Computing, has won a $5000 studentship from Google for the 2010 Summer of Code. Laurence will be developing an 'On the fly' copying garbage collector for the Jikes Research Virtual Machine (Jikes RVM) project.

The Google Summer of Code is a global scheme that supports students to work on leading open source (freely available software) projects over the summer. Each year, Google selects the best research entries. Since its inception in 2005, Google Summer of Code has supported over 3000 projects involving 100 countries.

Jikes RVM is widely used for research into programming language implementation and has led to almost 200 academic papers being published. The widely used programming language is written almost completely in Java.

Garbage collection automatically recycles program memory when it is no longer required, without programmer intervention, and is a vital technology supporting applications from e-commerce to games on mobile phones. However, the recycling process can lead to temporary pauses as the program runs. Laurence's approach will eliminate these hiccups.

Laurence said: " I am thrilled to have been accepted for the Summer of Code and excited to have as project mentors two world experts, Prof Eliot Moss from the University of Massachusetts and Dr Daniel Frampton from the Australian National University. "

Laurence's supervisor, Richard Jones, sits on the Steering Committee of the Jikes RVM project and is the organiser of its Summer of Code involvement. Richard Jones said: " We are extremely grateful to Google for awarding Jikes RVM four studentships. Personally, I am delighted that Laurence has been awarded one of them. "

Laurence Hellyer (left) & Richard Jones

Professor Bob Newport Awarded Sciences Teaching Prize

Bob Newport, Professor of Materials Physics in the School of Physical Sciences has been awarded a Faculty of Sciences Teaching Prize of £5,000 for his work in engaging students on the Foundation-Year Physics programme.

This highly successful programme has evolved from its early beginnings, almost two decades ago, as one of the country's very

first foundation year courses in Physics. It currently recruits 35-40 students each year and has a progression rate of over 80% which is significantly higher than the national average for such courses.

A novel aspect to Bob's teaching has been the extensive use of movie clips, press cuttings, computer games and other media in promoting physics-based

discussion and as prompts for the consideration of basic physical principles. The prize money is to be spent on the further development of the learning and teaching activity within the School.

Although Bob has yet to finalise his spending priorities in this regard, the money will most probably go towards the purchase of equipment to allow students to generate their own film clips.

Professor Bob Newport, winner of the Faculty of Sciences 2009 Teaching Prize

Centre for Biomedical Informatics 5th Annual Symposium

The Centre for Biomedical Informatics (CBMI) hosted its 5th Annual Symposium in June entitled: 'The Computational Brain: Interactions between Computer Sciences and Brain Sciences'. Eminent speakers gave lively presentations from differing theme perspectives.

Dr. Francisco Sepulveda from the University of Essex talked about the brain as a computer Interface, Dr. Andy Simmons from Kings

College London talked about magnetic resonance imaging of the brain, Dr Ken Revett from the University of Westminster talked about Cognitive Biometrics, Kent's own Dr. David Wilkinson talked about enhanced visual perception following electrical stimulation of the inner ear and finally Dr. Tristan Bekinschtein from Cambridge University talked about behaviour and neurodynamics in Disorders of consciousness patients.

Winners of the Dean's and Pro-Vice-Chancellor's prizes for best posters were (1st) Alem S. Gabriel, Postgraduate in the School of Biosciences for his poster entitled: 'Karyomapping': Next generation genetic screening of IVF embryos' and (2nd) Nagulan Ratnarajah, Postgraduate in the School of Biosciences for his poster entitled: 'A Novel White Matter Fibre Tracking Algorithm using Probabilistic Tractography and Average Curves'.

Nagulan Ratnarajah (left) and Alem Gabriel (right) receive their prizes from the Pro-Vice– Chancellor for Research Professor John Baldock

# SAIC Biometrics Grand Challenge at the University

Kent has been chosen to host the Biometrics Grand Challenge, which has been organised and supported by SAIC (Science Applications International Corporation) in the USA.

Managed by the University's business development unit, Kent Innovation and Enterprise, and the School of Engineering and Digital Arts (EDA), the competition seeks to uncover potentially influential concepts in biometrics from up-and-coming UK researchers currently working toward their PhD in the field.

For the competition, students must submit research papers describing their work in biometrics and its potential impact and benefits to the industry. An expert panel of judges will review and select papers for presentation during a workshop at the Canterbury campus on 15 July where the winners will be announced. The winning student will be flown to the USA to participate with SAIC in the 2010 Biometrics Consortium Conference and Biometric Technology Expo, held 21-23 September in Tampa, Florida. Students will also visit SAIC's headquarters in McLean, Virginia, to present their project to SAIC executives.

Michael Fairhurst, Professor of Computer Vision at EDA and a founder of the United Kingdom Biometrics Institute (UKBI), said: "We welcome and appreciate the support of SAIC for the Biometrics Grand Challenge. This competition will encourage students to work with industry to adopt innovative and creative solutions, think strategically and use project management skills. It will also help position these students to pursue careers in biometrics and leverage their abilities to help solve some of the world's most complex problems."

Scientists turn Bacteria into 'Mini—Factories'
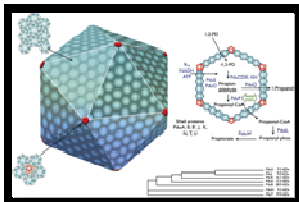
The Bacterial Microcompartment and the Associated Shell Proteins

Scientists at the University of Kent and University College Cork have manipulated simple bacteria into constructing internal compartments where biofuels and vaccines can be produced.

These micro-compartments eventually occupy almost 70 percent of the available space in a bacteria cell, enabling segregation of metabolic activities and, in the era of synthetic biology, representing an important tool by which defined micro-environments can be created for specific metabolic functions.

Martin Warren, Professor of Biochemistry at the School of Biosciences, explained: "Synthetic biology is really exciting because we can produce some important and useful products that can be difficult and expensive to make using traditional chemistry techniques. Bacteria can make these things very easily and in large quantities if we develop bacteria with the right characteristics to do so efficiently.

"What we often do is to make sure that the desired product is made within one or more tiny compartments that already exist inside the bacteria. This means that the process doesn't get caught up or slowed down by everything else that is going on in the cell and so is much more efficient."

The research was funded by the Biotechnology and Biological Sciences Research Council (BBSRC) and Science Foundation Ireland.

World-Class Science at ISIS by Dr Donna Arnold

Research by Dr Donna Arnold, Lecturer in Forensic Science in the School of Physical Sciences, on Bismuth Ferrite ($BiFeO_3$) has been considered to represent some of the world-class science conducted at the ISIS Neutron and Muon Facility in Oxford and was included in the science highlights section of their annual report (2009).

Dr Arnold conducted high temperature neutron diffraction experiments at ISIS to investigate the structure of $BiFeO_3$. Bismuth Ferrite is an important material as it is considered to be a room temperature multiferroic. This means that it exhibits both ferroelectric and magnetic ordering above room temperature making it potentially useful for the next generation of electrical devices such as memory.

Dr Arnold says: "Understanding how the structure of Bismuth Ferrite behaves with temperature is an important step if we are to be able to understand the functional properties of multiferroic materials and ultimately exploit these materials in the next generation of electrical devices."

Dr Donna Arnold

Orion High Altitude Balloon Project

As I reached my final year in Computer Systems Engineering, I was faced with the daunting task of choosing my final-year project which carried a large weight of my final degree mark. My School presented us with a list of example areas on which previous projects had been based. However nothing on the list completely inspired me, so I was left with two options; the first being to pick a topic which did not completely grab me; the second to choose a completely new project deviating from the example list. Choosing the former would have in many ways have been the simpler and easier option but by choosing the latter I would be able to research and discover an area of great interest to me. I chose the latter and took on the extra work of sifting through a variety of areas in Computing Systems Engineering in order to find a topic I wanted to pursue for my project and found supervisors willing to support me through it. Taking on the extra work at the start really paid off in the long run.

The area of science that most inspired me was space, and so I decided to create my final-year project around that and set to work straight away. My project consisted of sending a payload (a polystyrene box containing scientific instruments) which included two digital HD cameras into near space, over 30,000 meters up from Earth, along with light and temperature sensors. I programmed the cameras and sensors to take data readings and images at 20 second intervals and

sent it up which was then attached to a parachute and in turn a sounding balloon.

After weeks and weeks spent in the electronics workshop, it was finally ready to be tested in an environmental chamber to check whether everything worked accordingly before sending it up. Following a successful testing at -63℃, I took it up to Cambridge University where, having collaborated with Churchill College throughout the building of my project, I was able to send the payload up into near space.

The sounding balloon was filled with helium and carefully released. The feeling I got as I watched it lift off was exhilarating. It was a mixture of anxiety and excitement. It was the moment I'd been preparing for after months and months of work but I had just set it off into the air attached to a weather balloon… would it all work and would I get to see it again?! Acquiring all my results rested on me being able to successfully track my payload. It was here where a GPS tracking device, that I had built kicked in once the payload was in range. The payload also carried a backup GPS device devised by Cambridge, which initiated live tracking and helped when the GPS was out of range.

I was able to send it text messages to which the device would text me back with the coordinates of its location. There was a moment where the GPS lost signal due to the altitude it was at,

which meant we were following it blind and hope was placed into landing predictions made. Anxiety levels reached a new height. Thankfully it kicked back in when it came back down into altitude signal range.

The high altitude process causes the balloon to expand with increasing altitude until it reaches a bursting point, where it cannot expand any further and bursts.

After the balloon had burst the parachute took over, bringing the payload safely back down to the Earth. With the text messages from the GPS system inside the payload, I was able to track it down and pick it up where it landed, 147 miles away from Cambridge in Nuffield. Pure relief filled me when I found it lying in a field, still in once piece with everything still intact. The images and data came out perfectly and data had been collected for one very successful project. It was a completely novel project for my department, no student had yet before had involved near space in their project. I had created more work for myself in choosing it but the love and interest I had for the subject area gave me the drive I needed to get through all the hard work and it was what made it successful.

I was also lucky to have found great support in my supervisors and School when needed. It has also been very beneficial in helping me realize my career aims and will also be a major help in my job hunting for these careers.

Scott James has just completed the final year of his degree programme—BEng Computer Systems Engineering in the School of Engineering and Digital Arts. He describes the hard work and rewards of his Final Year Project.

Payload—2 digital HD cameras

Sounding balloon that was filled with helium

Scott at Cambridge preparing for the launch

Project Supervisor, Dr John Batchelor, Senior Lecturer in Electronic Engineering said: "Right from the outset I was impressed by Scott's dedication to his project. He worked really hard to get his equipment launched and I think the results look fantastic."

Further High Altitude Projects are in development, with improvements to the existing payload, ultimately

aiming to reach a stratospheric 330,000 meters.

Special thanks go to the CUSE team, Kent's mechanical workshop and the students who spent their own personal time to help out with the flight.

More detailed information about the project can be found at: http://ukhas.org.uk/projects:orion

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Research and Enterprise Awards

Biosciences

Investigator	Amount	Project	Awarding Body
Dr Mark Howard (PI) Professor Mike Geeves Professor Mark Smales Professor Martin Warren Dr Richard Williamson	£456,741	Expansion of the Wellcome Trust NMR Facility at Kent	Wellcome Trust
Professor Mick Tuite Dr Tobias von der Haar	£334,231.78	Modelling yeast prion dynamics in the living cell	BBSRC Biotechnology and Biological Sciences Research Council
Professor Peter Jeffries	£49,091	Developing biocontrol methods and their integration in sustainable pest and disease management in plum and cherry production	East Malling Research
Dr Anthony Baines	£33,103.20	Enhancing understanding of a phenotypic development of dorsal root ganglion cultures	BBSRC Biotechnology and Biological Sciences Research Council
Dr Gary Robinson Ms Jenny Oliver	£19,440	Detection of biofilm formation in the environmental and medical sectors using surface Plasmon resonance (SPR) Sensors	Daphne Jackson Memorial Fellowships Trust
Professor Peter Jeffries	£15,000	Developing biocontrol methods and their integration in sustainable pest and disease management in plum and cherry production	DEFRA via East Malling Research
Dr Tobias von der Haar	£12,960	The regulation of mRNA decoding accuracy in mammalian cells	Royal Society
Dr Ian Blomfield	£1,530	Vacation studentship for Kayleigh Bassiri	Society for General Microbiology
Professor Mike Geeves	£1,440	Kinetic analysis of myosin inhibitors	Wellcome Trust
Professor Mark Smales	£1,265	How clean is your classroom – RCUK National Science and Engineering Week Award 2010	EPSRC Engineering and Physical Sciences Research Council
TOTAL	£924,801.98		

Centre for Molecular Processing

Investigator	Amount	Project	Awarding Body
Professor Martin Warren Dr Dan Mulvihill Dr Ian Blomfield	£862,067.15	Synthetic biology approaches to compartmentalisation in bacteria and the construction of novel bioreactors	BBSRC Biotechnology and Biological Sciences Research Council
Professor Mick Tuite Dr Tobias von der Haar Professor Martin Ridout Professor Byron Morgan	£589,288.92	Modelling yeast prion dynamics in the living cell	BBSRC Biotechnology and Biological Sciences Research Council
TOTAL	£1,451,356.07		

Computing

Investigator	Amount	Project	Awarding Body
Richard Jones Dr Fred Barnes	£383,969.60	Garbage collection for multicore platforms	EPSRC Engineering and Physical Sciences Research Council
Professor Simon Thompson	£93,436	Knowledge Transfer Partnership, E-Learning Project	AEA Group, Oxford
Professor Simon Thompson	£46,021	Knowledge Transfer Partnership, E-Learning Project	Erlang Training Consulting Ltd
Dr Colin Johnson	£37,631.67	Development of eKura telehealth system	Axon Ltd
David Soud	£5,850	Website development	Early Start Languages Ltd
Faisal Humayun	£2,800	Migration of the existing PhoneCoach calling system	PhoneCoach Ltd
Dr Andy King	£1,440	Reverse engineering optimised and obfuscated binary code	Nuffield Foundation
Faisal Humayun	£1,000	Creation of an Audible Notification on Driver Phone	Text-A-Car Ltd
Dr Andy King	£571.20	Knitting together model checking and abstract interpretation	Royal Society
Dr Andy King	£482.53	International conference on verification, model checking and abstract interpretation (VMCAI 2010)	Royal Society
Dr Andy King	£364	Fostering collaboration with geometers in Berlin	The London Mathematical Society
TOTAL	£573,566.00		

Research and Enterprise Awards

Engineering and Digital Arts

Investigators	Amount	Project	Awarding Body
	£86,833	Knowledge Transfer Partnership—Timeplan Ltd	AEA Group, Oxford
Peter Lee	£42,769	Knowledge Transfer Partnership—Timeplan Ltd	Timeplan Ltd, Guildford Surrey
Winston Waller	£39,810	Knowledge Transfer Partnership – Martec Ltd	AEA Group, Oxford
Dr John Batchelor	£80,826	Knowledge Transfer Partnership – Martec Ltd	Martec Ltd
Professor Sarah Spurgeon	£48,224.50	Digital Media Hub	UoK Ideas Factory
Dr John Batchelor	£42,000	Body worn antennas and FSS	Defence Science and Technology Laboratory (DSTL)
Clive Birch	£25,990.29	Mechanical Workshop	Naneum Ltd
Dr Shykyri Haxha Ms Jenny Oliver	£20,355	Detection of biofilm formation in the environmental and medical sectors using surface Plasmon resonance (SPR) Sensors	Daphne Jackson Memorial Fellowships Trust
Dr John Batchelor	£19,250	Antenna Optimisation and the Physics of near field coupling	Defence Science and Technology Laboratory (DSTL)
Dr John Batchelor Professor Ted Parker	£17,971.20	Furthering electromagnetic architecture of buildings – an international travel application	EPSRC Engineering and Physical Sciences Research Council
Professor Yong Yan	£12,000	Carbon capture and storage	Medical Research Council
Dr Jim Ang	£2,200	User interface interactive design	Argent Ram Media
Winston Waller	£1,600	Introduction to programming in C and the PIC	Defence Science and Technology Laboratory (DSTL)
Nigel Simpson	£450	Testing in the EMC chamber	Defence Science and Technology Laboratory (DSTL)
TOTAL	£440,278.99		

Investigators	Amount	Project	Awarding Body
Dr Nathan Gomes	€276,606	OPTOSAT	Global Invacom Ltd
Dr John Batchelor Dr Adam Jastrzebski Dr Paul Young	€135,214	Tecs: Time Domain Electromagnetic characterisation and simulation for EMC	Managing Authority Interreg 4A
TOTAL EUROs	€411,820		

Engineering and Digital Arts and School of Physical Sciences

Investigators	Amount	Project	Awarding Body
Winston Waller (EDA)	£79,430	Knowledge Transfer Partnership - Development of single board RF Smoke Detector	AEA Group, Oxford
Dr Jingqi Miao(SPS)	£42,067	Knowledge Transfer Partnership - Development of single board RF Smoke Detector	EMS Radio Fire & Security Systems Limited
	£121,497.00		

Research and Enterprise Awards

Medway School of Pharmacy

Investigators	Amount	Project	Awarding Body
Professor Iain Cumming	£199,800	To work collaboratively to develop and deliver a suite of bespoke Foundation Degrees for the Polymer, Chemicals, Petrochemicals and Bioscience/Pharmaceutical sectors	Working Higher (University of Hull, Cogent and the HE Academy Physical Sciences Centre)
Professor Alistair Mathie	£158,697.20	The role of two pore domain potassium channels in primary sensory neurons (Royal Society Industry fellowship with Pfizer Ltd)	Royal Society
Dr Nathalie Lavignac	£59,510	Poly(amidoamine)s for the delivery of Bcl-2 antisenses	Kent Cancer Trust
Dr Bernhard Gibbs	£5,684	Award increase -original award £8,000. Pathophysical subtypes in chronic ordinary urticaria and their biomarkers: a prospective observational study	Norfolk and Norwich University Hospitals
Professor Alistair Mathie	£27,060	Industry CASE Partnership Grant – Investigation of K2P channels on Primary Sensory Neurons	Pfizer
TOTAL	£450,751.20		

Mathematics, Statistics and Actuarial Science

Investigators	Amount	Project	Awarding Body
Professor Martin Ridout Professor Byron Morgan	£255,057.14	Modelling yeast prion dynamics in the living cell	BBSRC Biotechnology and Biological Sciences Research Council
Professor Phil Brown Dr Alexa Lawrence	£39,323	South East Research Design Service (RDS) (Year 2 of 5 year project)	Department of Health
Professor Byron Morgan	£7,122	New Statistical Methods for wildlife population demography	Royal Society
Dr Owen Lyne	£3,810.64	Do working practices within government organisations and NGOs maintain biosecurity for native crayfish against crayfish plague	David Rogers Associates
Dr Andy Hone	£3,170	Elliptic difference Painleve equations and beyond: autonomous limits and conserved quantities	Royal Society
Dr Clare Dunning	£1,970	ICFT10: 14th UK meeting on integrable models, conformal field theory and related topics	London Mathematical Society
Dr Clare Dunning	£800	ICTF10: 14th UK meeting on the integrable models, conformal field theory and related topics	Institute of Physics
	£311,252.78		

Physical Sciences

Investigators	Amount	Project	Awarding Body
Dr Stephen Lowry	£315,259.88	Observational detection of the asteroidal YORP effect	Science and Technology Facilities Council (STFC)
Dr Maria Alfredsson Dr Gavin Mountjoy Professor Alan Chadwick	£74,994	Knowledge Transfer Partnership – Hilger Crystals Ltd	Hilger Crystals Ltd
	£74,994	Knowledge Transfer Partnership – Hilger Crystals Ltd	AEA Group, Oxford
Dr Maria Alfredsson	£72,490.40	Computer modelling of nano-materials for negative electrodes in Li-ion batteries	EPSRC Engineering and Physical Sciences Research Council
Professor Adrian Podoleanu	£27,000	PhD Studentship part funded by Naneuym Ltd	Naneuym Ltd
Professor Alan Chadwick	£11,970	Nanoparticles as agents in conservation	Leverhulme trust
Dr Dirk Froebrich	£1,980	Narrow-bank imaging survey of the inner galactic plane	Science & Technologies Facilities Council
Dr Stuart Gibson	£1,440	Forensic camera identification for mobile phones	Nuffield Foundation
TOTAL	£580,128.28		

| Investigators	Amount	Project	Awarding Body
Professor Adrian Podoleanu	€1,999,241	Combined time domain and spectral domain coherence gating for imaging and biosensing (COGATIMABIO) **SEE PAGE 2 OF THIS ISSUE FOR MORE DETAILS OF THIS AWARD**	European Commission via European Research Council Executive Agency
Dr Maria Alfredsson Dr Gavin Mountjoy Professor Alan Chadwick	€109,810	2-Seas Technology Centre for clean environment (CleanTech)	Managing Authority Interreg 4A (North)
TOTAL EUROs	€2,109,051		

University of Kent

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Spaceschool 2010

7 - 8 August (age range: 11-14)
14 - 15 August (age range: 15-18)

We are now recruiting for the 2010 Space School. It will be held on the University of Kent campus on the first two weekends of August. We have planned weekends of diverse activities, which will include rocket science, the Astrodome sky simulator, astronomical observing sessions using the university telescopes, examinations of NASA moon rocks and fascinating talks on space science from world experts. For further details please contact us: spaceschool@kent.ac.uk 01227 823759 or write to: Sharon Humm (Spaceschool Administrator) School of Physical Sciences Ingram Building, University of Kent Canterbury, CT2 7NH
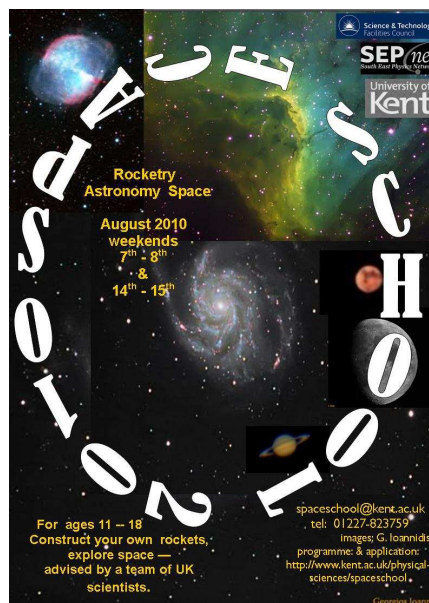
Sciences@Kent Outreach Activities

Above are rockets ıtman (the overall winner), Parashoot, Psycho and this is not just any rocket this is an M&S rocket (possibly the rocket with the longest name we have ever seen)

Best decorated—'Tigers'

Rob before launch on the left and below Rob after his crash landing on the field.

Rocket Day at Bexley Grammar School

The sky, literally, was the limit (well, up to a height of 30 metres!) for Bexley Grammar School's Year 8 students, when the Outreach Team from the School of Physical Sciences descended on the School's laboratories at the end of June.

Five groups of students built their own rockets out of cardboard tubes, bin bags, string and glue. The idea behind the design of the rockets is to launch and recover a quail's egg, which is placed in the rocket's cone, without breaking it, whilst at the same time, have a beautiful looking rocket that flies perfectly.

A small compressed block of solid propellant is placed in the cardboard tube, then an electrical charge ignites the primer. The chemical then burns, producing a hot gas that is emitted through an exhaust, which launches the rocket. When the rocket reaches its maximum height of around 30 metres, parachutes, which are made from bin bags and string, deploy, enabling the rocket to land safely, without breaking the egg in the cone. All the rockets were superb and most launched and flew well—with one exception where a parachute did not deploy!

Junior Chess Club Autumn 2010

The Canterbury Junior Chess Club is aimed at children aged 9-16 years old. The club is run by Owen Lyne (School of Mathematics, Statistics and Actuarial Science - SMSAS) and John Dore (School of Physical Sciences - SPS) and meets fortnightly on Saturday afternoons from 2pm to 4pm in the Peter Brown room, Darwin College. In Autumn 2010 the dates will be Saturdays:

18 September

2 October

16 October

30 October

13 November

27 November

11 December

Please contact Owen Lyne (O.D.Lyne@kent.ac.uk) or John Dore (j.c.dore@kent.ac.uk) for further details.