

Christmas and New Year Issue
December 2008/ January 2009

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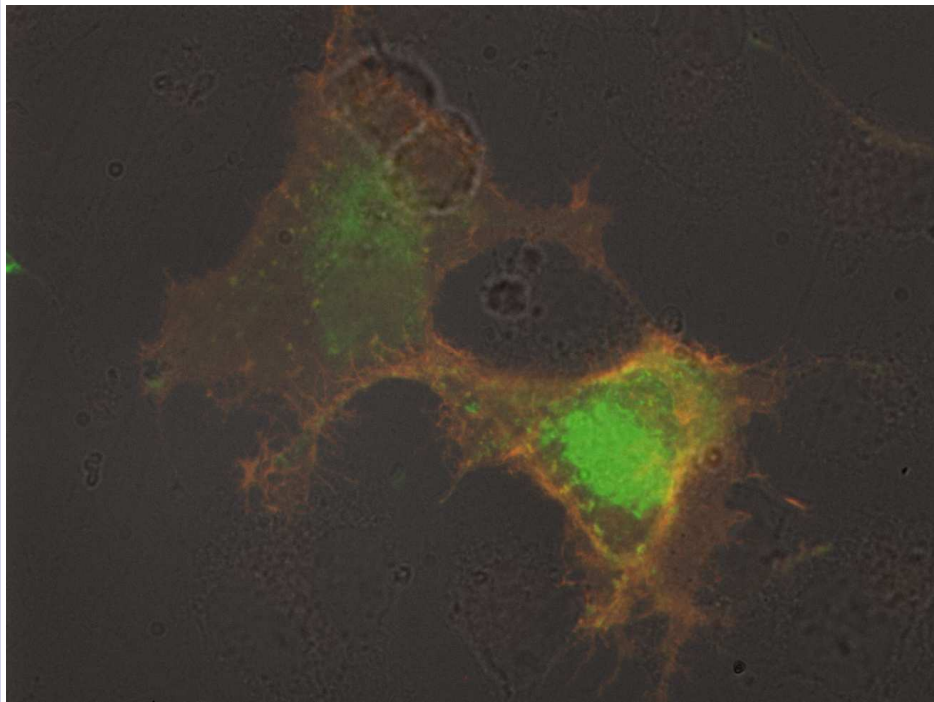
View from the Dean's Office

A Merry Xmas and Happy New Year to all our readers! Another term draws to an end and we all await the results of the RAE 2008 on 17th December—but more on that in the next issue. Here we report success in SPS where students made a successful bid to visit the Large Hadron Collider, and also celebrate the winners of our annual FIRST LEGO® LEAGUE competition. Well done Reigate St Mary's and Archers Court!

We also launch the Faculty Strategic Research Development Fund (<http://www.kent.ac.uk/stms/research/strategy.html>) which provides money to support research—now there's a useful Xmas present!

Seasons Greetings
Peter

Cetuximab binding to the Epidermal Growth Factor Receptor



This month's image is from the laboratory of Professor Bill Gullick. It shows two living cells showing the drug Cetuximab (in orange), which is used to treat colorectal cancer, binding to its target, the Epidermal Growth Factor Receptor. (Mariana Murphy and Bill Gullick).



Congregations-page 3



Why measles has come back to haunt us—page 7

Space Society students win a trip to 'Big Bang Machine'

The Space Society in the School of Physical Sciences has won a trip for 15 members to visit the European Organisation for Nuclear Research's headquarters in Geneva, where they will have an opportunity to privately tour and learn about the Large Hadron Collider (LHC), often referred to as the 'Big Bang Machine'.

The trip is part of their overall prize for winning the Institute of Physics' 'Best Overall Student Society' Competition 2008.

Affiliated with Kent Union, the Space Society has over 60 members drawn from a broad range of academic subject areas. For the competition, 4 of the committee had to give a presentation about the achievements of the society and answer questions to an audience of student members of the IOP.

Howard Phillips, President of the Space Society and a student on the Astrophysics programme at the University's School of Physical Sciences, said "We are delighted to have won this great prize, particularly since we were up against some very strong competition from Cambridge University, Imperial College London and Trinity College Dublin. We are all looking forward to our trip to Geneva and in particular the opportunity to see and learn more about one of the largest and most complex scientific instruments ever built."

Professor Paul Strange, Head of the School of Physical Sciences, was among the first to offer congratulations. 'I am pleased that Institute of Physics has recognised the enthusiasm, knowledge and commitment of the Space Society,' he said. 'Their first-prize visit to the Large Hadron Collider will be like a dream come true for these students, many of whom will have heard reports on it from those members of our School who were involved with it in the past.'



Left to right: Howard Phillips, Chris Storey, Lindsey Bobrowski, Paul Locke are presented with their prize by Professor Sir Arnold Wolfendale, Professor of Experimental Physics with the Royal Institution of Great Britain

The £3.6 billion Large Hadron Collider is the highest energy particle accelerator in the world. Located 100m underground and running through both French and Swiss territory, it attracted world media attention when it was activated on 10 September 2008. The purpose of the accelerator is to smash protons moving at 99.999999% of the speed of light into each other and so recreate conditions a fraction of a second after the big bang.

Director of Channel 4's 'The Family' gives lecture to 'Multimedia' students

Jonathan Smith, a double BAFTA Award-winning documentary filmmaker and director of Channel 4's 'The Family', delivered a guest lecture to Multimedia Technology and Design students last month. His lecture, which was titled 'Life Behind the Lens', spoke to second year students who are studying Digital Filmmaking in the Department of Electronics.

It was a coup for the department since Jonathan was recently involved in 'The Family', a ground-breaking and technically innovative fly-on-the-wall documentary about the daily life of a family in Harbledown, Canterbury. Using an array of small remotely operated

cameras, he went on to capture almost 5000 hours worth of footage in what has become one of the most successful examinations of family life in modern Britain. The Family was shown as an eight-part series on Channel 4 in late 2008.

The lecture examined the relationship between the filmmaker and contributors in 'observational' documentaries. Jane Milton, Lecturer in Film and Video Production was also delighted that Simon Hughes, one of the key contributors from 'The Family' could also attend. She also invited students from Film Studies.

Jonathan Smith is currently working on a number of new projects, including a documentary about the debilitating effects of Alzheimer's Disease. Jane Milton said, "It was a great opportunity for the students to learn and be inspired by a successful filmmaker in a highly competitive industry. I've received some very positive feedback from the students. I'm also grateful that Jonathan was willing to give up his precious time so shortly after 'The Family'." was shown.

Taught by a team of experts in design, animation, film-making, photography, web technology and programming, Multimedia Technology & Design graduates are well-equipped to enter such fields as television, film, multimedia authoring, web development, web mastering, electronic games, mobile communications, electronic commerce, internet publishing, computer programming and network management.



Simon Hughes (left), key contributor from 'The Family' talking with lecturer Jane Milton and Filmmaker Jonathan Smith

November Congregations Ceremonies

The culmination of years of hard work resulted in Kent graduands donning their robes for the Congregation Ceremonies that took place in the magnificent cathedrals of Rochester and Canterbury in mid-November. Over four hundred students achieved awards, with doctorates conferred on eighteen students whose specialisms included Psychotherapy, Biochemistry, Statistics, Computing Science and Electronics Engineering.



Graduates Matthew Finn and Shaun Tottman both graduated with Foundation Degrees, photographed with Ray Fielder (centre), Head of the School of Advanced Technical Engineering at Mid-Kent College.

The highest number of students were from Mid-Kent College where one hundred and sixty five students successfully completed their courses including Science courses in Engineering, IT and Applied Chemistry at HNC, HND and Foundation Degree levels. They were all invited to attend the congregations ceremony at Rochester Cathedral to be presented with their awards by the Vice-Chancellor, Professor Julia Goodfellow on Wednesday 19 November.

On Friday 21 November, the Dean accompanied over two hundred students studying Science, Technology and Medical Studies programmes, to Canterbury Cathedral where they were presented with their awards and degrees by Kent's Chancellor, Sir Robert Worcester. Almost one hundred students were awarded with their MSc from all science departments with subjects including Actuarial Science,

Microbiology, Chemistry, Computer Animation and Biomedical Imaging.

The theme of science was strong at Canterbury Cathedral where Sir John Enderby, Professor of Physics and one of the country's most eminent scientists was presented with an Honorary Degree at the Canterbury Congregations. A former president of the Institute of Physics, Sir John is Emeritus Professor and Senior Researcher at the University of Bristol. His influential science career spans the Atlantic, first as Directeur-Adjoint at the Institut Laue-Langevin in Grenoble, France between 1985-88 before being appointed as Fellow of the Argonne National Laboratory, Illinois, USA. He has been a visiting professor at the University of Guelph in Ontario, Canada and at the University of Leiden in the Netherlands. He has been a Fellow of the Royal Society since 1985 where in 1997, he was appointed Humphrey Davy Lecturer. Sir John was presented to the Chancellor and the University to be admitted to the Degree of Doctor of Science, *Honoris Causa*, by Professor Simon Thompson, Head of the Computing Laboratory and Public Orator.

Sir John Enderby who was presented with an honorary degree at Canterbury Cathedral on 21 Nov



Dr Dan Grundy, awarded with a PhD in Computer Science (right) with Supervisor Dr Eerke Boiten

This year, almost two hundred students from Kent's Associate Colleges achieved awards ranging from Higher National Certificates, Higher National Diplomas, Foundation Degrees and Degrees.

Information for Kent Alumni

When students have graduated from Kent, they become part of a community of 95,000 alumni in 200 countries worldwide. The University is very active in maintaining links with alumni and members can keep in touch through subscribing to the *KENT* magazine, Facebook—'University of Kent Alumni', a professional networking website called 'LinkedIn' on www.kent.ac.uk/alumni/in-touch/ or by the quarterly alumni e-newsletter. All information is detailed on the alumni website on www.kent.ac.uk/alumni.

Junior Chess Club

The Canterbury Junior Chess Club has been re-launched this term for children aged 10-14 years old. The new club is being run by Owen Lyne (Institute of Mathematics, Statistics and Actuarial Science - IMSAS) and John Dore (School of Physical Sciences - SPS) and meets fortnightly on Saturday mornings (10am to 12 noon) in the Peter Brown room, Darwin College.

These club meetings and training sessions form part of the IMSAS commitment to schools liaison/community outreach and engagement activities. The Canterbury Junior Chess Club was enormously popular in the 1980s when it was run by John Dore

and it is hoped that the re-launch of the Club will generate the same levels of interest and enthusiasm about chess with today's young players. Staff and students with children in the appropriate range, who have a basic knowledge of the rules, are very welcome to bring them along - please contact Owen Lyne (O.D.Lyne@kent.ac.uk) or John Dore (j.c.dore@kent.ac.uk) for further details. There is no charge for attendance.

Dates for next term: 2-4pm, fortnightly, starting on Sat Jan 24th (in the Peter Brown Room, Darwin, then Feb 21st, Mar 7th, March 21st and April 4th.

Italian Sojourn for Maths Lecturer

Dr Clare Dunning, Lecturer in Applied Mathematics in the Institute of Mathematics, Statistics and Actuarial Science, recently spent three weeks at the Galileo Galilei Institute for Theoretical Physics, Florence as part of the INSTANS (Interdisciplinary Statistical and Field Theory Approaches to Nanophysics and Low Dimensional Systems) program 'Low-dimensional Quantum Field Theories and Applications'. She presented a talk entitled 'On an application of the ODE/IM correspondence'.

While in Italy, she also spent a few days visiting her collaborator Dr. Roberto Tateo at the Department of Theoretical Physics, University of Torino.



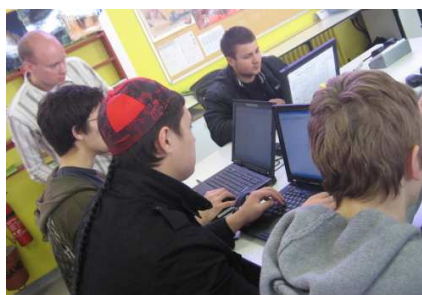
The house (near left) in Arcetri outside Florence in which Galileo Galilei spent the last eight years of his life, placed there in 1633 under house arrest by the Church for his Copernican views. In 1992 the Vatican finally admitted that Galileo had been right to believe that the Earth rotates around the sun.

Department of Biosciences Launch of MBP² project



December 3rd saw the launch of the Wellcome Trust-funded 'MBP² Project' a new outreach project set up between the Department of Biosciences and the Simon Langton School for Boys in Canterbury. A team of 10 staff, postdocs and postgraduate students from the Department spent the launch day at the school working with 50 talented and enthusiastic year 12 and 13 Langton students. The aim of the day was to teach the school students some of the basic skills required to carry out front-line research into human diseases – in this specific case Multiple Sclerosis (MS). In the longer term the school will then pass these skills onto other schools in the area through a series of 'master classes' with the help of members of the Department.

The funds from the Wellcome Trust (£30,000 in total) are allowing the school – which has Science Specialist Status - to set up the project which involves a study of a protein called myelin basic protein (MBP), changes in which lead to damage to the nervous system. The overall objective is to express human MBP in yeast and then to use the skills and technology available within the Department to help investigate the nature of post-translational modifications in MBP.



Tobias von der Haar and Simon Langton pupils

Stop Press

STMS Strategic Research Development Fund

Do you need funds to launch your next research project? Would you like to send your research staff abroad to learn a new technique? Need to finance a meeting with collaborators?

The Faculty has established a research fund to enable you to do all this and more! See <http://www.kent.ac.uk/stms/research/news/stories/2008/srdf2009.html>

Meet the Scientist

This month, we meet Dr Dirk Froebrich who is a physicist in the School of Physical Sciences. After leaving High School in Leipzig in 1993 and then spending one year in military service, Dirk went to Leipzig University from where he graduated in 2003 with a PhD in Pure Physics with a specialism in Astrophysics. He was immediately offered a place at the Dublin Institute for Advanced Studies as a postgraduate researcher in Astronomy and Astrophysics. In 2006, Dirk was appointed as a Lecturer at Kent and specialises in the properties of molecular clouds and the youngest protostars, and the formation of (clusters of) stars.



Dr Dirk Froebrich, Lecturer in Astronomy and Astrophysics in the School of Physical Sciences (he's the one on the right).

"How did you first get into science?"

To be honest I don't really know. It sort of just happened. I was always interested in Astronomy, Physics and Maths. This was probably helped by the brilliant night sky we had in the village I grew up in. and reading too much Sci-fi might also have contributed. Hence studying (Astro)physics seemed the only obvious choice at the time. However, if I ever start thinking of work when watching the stars, I'll look for a different job.

"What is the focus of your current research?"

The broad focus of my research is on star formation. In particular we are trying to understand if and how the physical, chemical and dynamical properties of molecular clouds influence where and how clusters or individual stars form within them. We also study the properties and distribution of the young forming stars and clusters. This will help us to deduce the physics responsible e.g. for the apparently universal mass distribution of stars and the rate at which they form in the Galaxy. We further investigate how the young clusters of forming stars interact with their environment via energetic radiation and ejection of material in jets and outflows. These feedback mechanisms are in part responsible for the properties

of the molecular clouds themselves.

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

The group currently consists of the PhD student Jonathan Rowles, me, and a number of international collaborators. Jonathan studies the distribution of material of molecular clouds in the Galaxy within about 20,000 light years from the Sun. He uses the 2 Micron All Sky Survey data and the fact that dust changes the colours and brightnesses of starlight to map the distribution of material. He is comparing this distribution with model predictions to learn about the governing physics in the clouds. With other colleagues we determine the properties (age, distance, chemical composition, etc.) of star clusters within the same 20,000 light year radius around the Sun. We are relating the properties of young forming star clusters to the properties of their parental molecular cloud. This led to the discovery of about 1000 so-far-unknown star clusters in the Milky Way, including some of the oldest known clusters in the Galaxy, as well as some rare Globular Clusters. Finally we investigate the feedback mechanism of young stars via jets and outflows, to learn about energy and momentum transfer into the molecular clouds and their small scale structure.

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

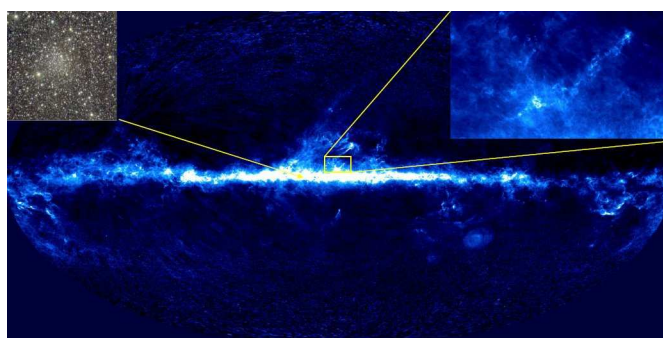
Astronomy, and in particular star formation research is in an extremely fortunate situation at the moment. For the first time in human history we have observational access to the entire electromagnetic spectrum from gamma rays to radio wavelengths. Deep, high spatial resolution, large area (all sky) surveys at various wavelengths are now publicly available for research. Furthermore, unprecedented computational resources are accessible to us to perform numerical modelling of star formation including the equations for all important physics, chemistry and dynamics.

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

Concerning star formation, five years ago we basically knew only the tip of the iceberg, i.e. the brightest and/or closest forming protostars. Due to extensive space based infrared surveys we now have pretty complete inventory of star formation in our 'back yard'. i.e. we now know all but the faintest forming stars within 1500 light years.

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

Given the wealth of observational data and computational resources available to us now requires new ideas, approaches and models to understand the detailed physics of star formation within the Galaxy. We need to realise that star formation is, in part, a stochastic, non-determinable process, including non-equilibrium physics and chemistry.



Distribution of dust clouds in our Galaxy. The insets show details of the Pipe Nebula and one of our newly discovered Globular Clusters.

Great Lives Archive

This year's 'great life' is Professor Ralph Louis Wain CBE whose contribution to science has left an enduring legacy in today's modern world of agricultural production. His enthusiasm for science was matched by his dedication throughout his life and, eight years after his death, his name is very much in minds of today's young scientists.



Louis Wain Photo: Courtesy of Ray Newsam

Professor Ralph Louis Wain C.B.E. (invariably known as Louis) was a chemist whose scientific research was fundamental to the importance of identifying the link between advancement in agricultural practice and developments in chemistry.

Born in Cheshire in 1911, Louis was a bright grammar school boy who won a scholarship to Sheffield University to study chemistry. When he left in 1935, he had been conferred with the title 'Dr', having achieved a first class honours degree and Master's along the way. Unable to secure a position in chemistry in either industry or academia, he went to Manchester University School of Medicine as a research associate. After a couple of years, the opportunity to once again take up a position in Chemistry was presented at the South Eastern Agricultural College at Wye in 1937, as Lecturer in Chemistry.

It was then, that the importance of trace elements in plant nutrition was beginning to be realised. Louis' experiments showed how acid soils and the cultivation atmosphere affected the chemical balance of the trace elements in plants, sometimes with disastrous consequences. This research was to lead to ground-breaking work in the development of herbicides.

The outbreak of the Second World War in

1939 saw the South Eastern Agricultural College commandeered by General Montgomery for the army. Louis had a reserved occupation and he took a position with the Ministry of Agriculture at Long Ashton Research Station, part of the University of Bristol. There, in addition to his research work, he enlisted with the Home Guard and after training, served as Gas Identification Office for Somerset No. 1 Area. Shortly after arriving in Somerset, he met and married Joan, who also played a role in the Home Guard before the birth of their first child a few years later.

It was during Louis' work at Long Ashton during the Second World War that he started research on insecticides, including the synthetic pesticide DDT (Dichloro-Diphenyl-Trichloroethane).

After the war, the South Eastern Agricultural College was amalgamated with the Horticultural College for Women at Swanley and became an institution, Wye College, within the University of London. On Louis' return, he was appointed as Senior Lecturer and Head of the Chemistry Department. When he formally retired as Head 33 years later, the department had grown and housed a complement of around 40 staff including 14 academics. He was awarded the Fellowship of the Royal Society in 1960 and a C.B.E. six years later.

Louis' research into the role of natural and synthetic chemicals in the control of plant growth and development was of great interest to the agrochemical industry and his research has played an influential part in the development of herbicides. Louis registered patents throughout his career and in the late 1950s, set up The Wain Trust Fund with the royalties, which were considerable even at that time. The Trust was designed to provide young scientists with scholarships and fellowships to follow academic study.

Louis received many awards in his life, however, the John Scott (USA) International Award perhaps comes closest to Louis' life's work ethic and that was the concern for people whose survival depended on successful crop harvests. The award was made to Louis for 'research for the benefit, welfare and happiness of mankind'.

Louis took the many opportunities to travel that were presented to him by the University of London as Professor of Agricultural

Chemistry. He visited many HE institutions and universities in several countries in Africa including Kenya, Sudan and Tanzania where he gave advice about agricultural degree programmes to ensure that students from developing countries were provided as much as possible with the resources to develop their own expertise in agriculture and soils. In the 70s and 80s, he travelled as a Royal Society Visiting Professor and after he retired, became a Royal Society ambassador visiting institutions abroad in the USA, the Middle East and Far East.

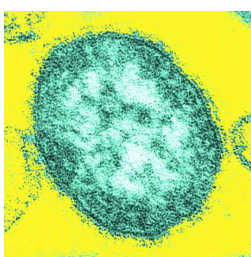
Louis was awarded four Honorary Doctorates during the 1960s and 1970s, from the Universities of Ghent, Kent, Lausanne and Sheffield. When he retired in 1978, Kent appointed him as an Honorary Professor in the Department of Chemistry and provided him with his own laboratory and the opportunity to give lecture to 100+ students, which he thoroughly enjoyed. Louis interacted with people of all ages and experience in Chemistry and Biosciences; he was genuinely interested in the work of others and a conversation with him was fun and always encouraging. It is not surprising, therefore, to know that Louis was still giving lectures in the last weeks of his life, and they were still full of the enthusiasm and spirit in which he had approached his life's work.

After Louis' death in December 2000 Joan and his family made a generous bequest of an endowment to Kent, which has established an annual Medal Lecture and Award in his memory. The Wain Medal is awarded to a young scientist doing exceptional research at the interface between biology and chemistry. Candidates for the award must be of British nationality, working in the United Kingdom or abroad. The Medal Lecture is a public lecture held at Kent and the lecturer is expected to emphasize public understanding in his/her presentation. In addition to the Medal, the successful candidate is given an Award of £1,000. The first award was made to Professor Greg Challis of the University of Warwick, and this year's Wain Medal was awarded to Professor Ben Davis from the Department of Chemistry, University of Oxford. (see newsletter October 2008)

Health Article

Measles cases are at their highest level for 20 years and they continue to rise. For example, there were 971 cases in England and Wales in 2007 and 739 cases in 2006, compared with 70 cases during 2001. In early December, the BBC reported that the Health Protection Agency in Cheshire was starting a mass vaccination of more than 10,000 children to head off a measles epidemic. So why are cases of measles increasing and why are there worries that this could result in an epidemic? With the advances in modern health care, surely this disease could be relegated to a minor health issue in the UK? This article by Funmi Oduniyi tackles all the health issues surrounding measles and how measles has once again, become endemic in the UK.

Measles is an acute viral infection caused by a morbillivirus in the Paramyxovirus family. It is also known as 'rubeola' which is not the same as 'rubella', more commonly known as German measles. Measles is a notifiable disease, hence it is a legal requirement that a doctor reports any suspected cases.



Measles Virus

Image courtesy of <http://www.wales.nhs.uk/sites3/page.cfm?orgId=719&pid=23148>

Measles is spread by direct contact with an infected person or air droplet transmission of secretions containing virus particles through coughs and sneezes. It is so infectious that 90% of people without immunity sharing a house with an infected person will catch it. In temperate areas, the peak incidence of infection occurs during late winter and early spring. The incubation period is about 10 days (ranging between 7 and 18 days). Symptoms include a prodromal fever, malaise, cough, coryza and conjunctivitis (the three Cs); followed by an erythematous maculopapular (red) rash which usually starts at the head and spreads to the trunk. A characteristic marker of measles is 'Koplik's spots', small red spots with blue-white centres that appear inside the mouth.



Koplik spots

Image courtesy of <http://www.nlm.nih.gov/edlineplus/ency/imagepages/2558.htm> (US National Library of Medicine Website)

The entire course of uncomplicated measles, from late prodrome to resolution of fever and rash is usually 7-10 days. Infection confers life-long immunity. Patients are contagious 3-5 days before the appearance of the rash to 4 days after the onset of rash.

Child with a rash characteristic of the fourth day

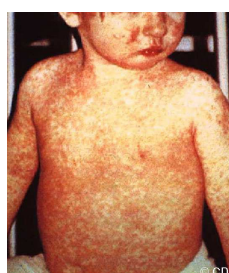


Image courtesy of Red Book Online http://aapredbook.aappublications.org/week/079_12.jpg (American Academy of Paediatrics Red book Online)

The problem with measles is that it is so infectious that the sheer number of people who would suffer complications in an outbreak would quickly overwhelm available hospital resources. 10% of cases in the UK lead to hospital admissions and 1 in 5000 cases are fatal. The most effective method of controlling measles is by maintaining high levels of immunization. MMR vaccines are preparations containing live attenuated strains of measles, mumps and rubella viruses. A course consists of two doses. The first dose is given at 13 months and the second is administered between 3 and 5 years of age just before starting school. Before the introduction of the first measles vaccine in 1968, there were between 160,000 and 800,000 measles notifications per year in the UK. Following the introduction of MMR vaccine in October 1988 and the achievement of coverage levels of about 92%, notifications of measles fell progressively and the spread of measles was effectively halted by the mid 1990s. However, there has been an increase in

the number of confirmed cases and 2006 saw the first reported death from measles in the UK for 14 years.

This rise in reported cases has been attributed to a plunge in uptake of the MMR vaccine following a publication claiming a link between the MMR vaccine and autism. However, several studies undertaken to investigate this claim found no such association. There was also a comeback in the 'measles party', a dangerous practice where parents deliberately infect the child with measles to build up the child's immunity without an injection.

The following groups are particularly at risk: children with immunodeficiency due to HIV or AIDS; those with leukemia and drug-induced immunosuppression; and those who travel to or have contact with travellers from endemic areas.

Children aged under 5 years or adults over the age of 20 are more likely to have complications. The most common complications of measles infection are otitis media, pneumonia, diarrhoea and febrile convulsions. Other rare but serious complications include encephalitis (1 in 1000 cases) and sub-acute sclerosing pan-encephalitis (SSPE), a devastating but very rare degenerative CNS (central nervous system) disease which may develop many years after measles and is eventually fatal (1 in 100,000 cases). Complications are worse in the malnourished or those with a weakened immune system, vitamin A deficiency and in pregnancy where it may lead to miscarriage or premature delivery. It is very important that awareness is raised about the fact that measles is now endemic in the UK and all children should be immunized accordingly, as should susceptible health care workers.



Funmi Oduniyi is a Clinical Lecturer in the Medway School of Pharmacy. She obtained her B.Pharm (Hons) in 1986 at the University of Ife, Ile-Ife, Nigeria. She later obtained a Part 1 Diploma in Clinical Pharmacy from the School of Pharmacy, University of London and then an MBA from the Imperial College, University of London specializing in Entrepreneurship and Innovation with Distinction. She is a member of the Royal Pharmaceutical Society of Great Britain, Pharmaceutical Society of Nigeria and Nigerian Institute of Management. Funmi has over 15 years experience as a clinical pharmacist. Her clinical experience spans the hospital and community sectors. She was also involved in the founding of Pharmaklinic Healthcare Ltd, an innovative clinical pharmacy outfit based in Nigeria, where she undertook evidence based practice research and training in pharmaceutical care.

Winners of the FIRST LEGO® League



Medway champions:

Climate Savers from Reigate St Mary's School

Two teams battled their way through tough competition to become the contest winner in each of the two regional finals of FIRST LEGO® League (FLL) held at our Canterbury campus. Climate Savers from Reigate St Mary's School clinched first place in the Medway regional finals held on Monday 24 November. The Arrows from Archers Court Maths & Computing College, Dover fought magnificently to take the champion's title at the Kent regional final held on Tuesday 25 November.

FLL is an international programme for school pupils aged nine to sixteen years that combines a hands-on, interactive robotics programme with a sports-like atmosphere using LEGO® programmable bricks. Teams consist of up to 10 players with the focus on team-building, problem-solving, creativity and analytical thinking. As part of the challenge, teams must research, plan, build, programme and test a fully autonomous robot capable of accomplishing that challenge within eight weeks. Climate Connections was the title of this year's theme and challenge. Teams also undertook a Climate Connections project where they performed research into how climate change affects their local community, culminating in a presentation before a judging panel. Several awards, consisting of LEGO® cups, were presented.

The Medway regional final results:

Champions of the Medway regional finals

Climate Savers from Reigate St Mary's School

Climate Connections Award

LEGO Lightning from Whitfield and Aspen School, Dover

Team Spirit

Techbotics from Tunbridge Wells Grammar School for boys

Teamwork Award

Mindstorm from Cornwallis Academy, Maidstone

Robot Design Award

Byron Bodgers from Byron School, Medway

Robot Performance Award

Team ASAP from Croydon

Judges Special Award

Team A from Dartford Technology College

The Kent regional final results:

Champions of the Kent regional finals

The Arrows from Archers Court Maths & Computing College, Dover

Climate Connections Award

Manwood Maniacs from Sir Roger Manwood's School, Sandwich

Team Spirit

Team Extreme from Hereson School, Broadstairs

Teamwork Award

Sandwich Tech Teckies from Sandwich Technology School

Robot Design Award

Langton LEGO Lads from Simon Langton Grammar School for Boys, Canterbury

Robot Performance Award

KES Allstars from King Ethelbert School, Birchington

Judges Special Award

St Andrew's Robo Squad from St Andrew's School, Surrey

The two winning teams go on to the UK National Finals at Loughborough on Saturday 24 January 2009. The winner of that competition will go to the international event in the US.

The participating schools for the Medway regional finals were: Byron Primary School; Byron School; Cornwallis Academy; Dartford Technology College; Invicta Grammar School; Reigate St Mary's; SAP Community Team; Tunbridge Wells Grammar School for Boys; and Whitfield and Aspen School.

The participating schools for the Kent regional finals were: Archers Court Maths and Computing College; Brockhill Robotic Team; Chatham House Grammar School; Hereson School; Highested Grammar School; King Ethelbert School; Sandwich Technology School; Simon Langton School for Boys; Sir Roger Manwood's School; and St Andrew's School from Surrey.

Sponsored by the Kent Branch of the British Computer Society and Medway Education Business Partnership, the event is hosted by the Computing Laboratory at the University of Kent.



Kent champions: The Arrows from Archers Court Maths & Computing College, Dover

Recent Published Papers

Department of Electronics

Yan, X.G., Edwards, C. "Fault Estimation for Single Output Nonlinear Systems using an Adaptive Sliding Mode Observer" (2008) in Proc. 17th IFAC World Congress, Korea.

Zhou, Z., Chindaro, S., Deravi, F., "Non-Linear Fusion of Local Matching Scores for Face Verification" (2008) in Proceedings of the 8th IEEE International Conference on Automatic Face and Gesture Recognition, Amsterdam, The Netherlands.

Twiddle, J.A., Jones, N.B., Spurgeon, S. K. "Fuzzy Model-Based Condition Monitoring of a Dry Vacuum Pump via Time and Frequency Analysis of the Exhaust Pressure Signal" (2008) in Proceedings of the I MECH E Part C Journal of Mechanical Engineering Science, 222, 287-293.

Oven, R. "Mapping Method for the Comparison of Mode Data from Field Assisted Ion Diffused Guides" (2008) in Optical Materials, 31, 291-295, 0925-3467/DOI: 10.1016.

Yan, X.G., Edwards, C. "Fault Estimation for Single Output Nonlinear Systems using an Adaptive Sliding Mode Estimator" (2008) in IET Control Theory and Applications, 2, 10.

Yan, X.G., Edwards, C. "Robust Decentralised Actuator Fault Detection and Estimation for Large-Scale Systems using a Sliding Mode Observer" (2008) in International Journal of Control, 81, 4.

Yan, X.G., Edwards, C. "Robust Sliding Mode Observer-Based Actuator Fault Detection and Isolation for a Class of Nonlinear Systems" (2008) in International Journal of System Science, 39, 4.

The School of Physical Sciences

Strange P., Szotec Z., Temmerman W.M. "Electronic and Magnetic Properties of the Heavy Lanthanides: A Combined Spectroscopic and Theoretical Investigation" (2008) in Frontiers 2008, 24-25.

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Recent Published Papers Computing Laboratory

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King, A. (ed). "Logic-based program synthesis and transformation" Kongens Lyngby, Denmark, (2007), revised selected papers. Number 4915 in *Lecture Notes in Computer Science* series. Springer-Verlag, March 2008.

Kölling, M., Barnes, D. (2008) "Apprentice-based learning." in Jens Bennedsen, Michael E Caspersen, and Michael Kölling, editors, *Reflections on the Teaching of Programming*, *Lecture Notes in Computer Science*, Springer, 4821, 29-43.

Kölling, M. (2008) "Using BlueJ to Introduce Programming." in Jens Bennedsen, Michael E Caspersen, and Michael Kölling, editors, *Reflections on the Teaching of Programming*, *Lecture Notes in Computer Science*, Springer, 4821, 121-140.

Otero, F.E.B., Freitas, A.A., Johnson, C.G. (2008) "cAnt-Miner: an ant colony classification algorithm to cope with continuous attributes." in M. Dorigo et al., editor, *Ant Colony Optimization and Swarm Intelligence (Proc. ANTS 2008)*, Springer, LNCS 5217, 48-59.

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Department of Biosciences

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D.S. Pearson, D.R. Swartz & M.A. Geeves. (2008) "Fast pressure jumps can perturb calcium and magnesium binding to troponin C F29W". *Biochemistry* 47, 12146-12158.

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Recent Grants Awarded

Department of Biosciences

Dr Ian Blomfield has been awarded £248,692 for a project entitled 'Activation of type 1 fimbriation by SlyA, NagC and NanR by The Wellcome Trust.

Dr Mark Smales has been awarded £20,440 for a project entitled 'Manipulation of signal peptide sequences for enhanced synthesis and secretion of biotherapeutic monoclonal antibodies by Medimmune.

Institute of Mathematics, Statistics and Actuarial Science

Professor Byron Morgan and Mr Martin Ridout have been awarded £38,500 for a project entitled 'Statistical analysis and modelling of benthic data' by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS).

Department of Electronics

Dr John Batchelor and Professor Jiangzhou Wang have been awarded £5,360 for a Distinguished Visiting Fellowship for Professor V Bhargava from the University of British Columbia by the Royal Academy of Engineering.

Medway School of Pharmacy

Dr Bernhard Gibbs has been awarded £8,000 for a project entitled 'Pathophysiological subtypes in chronic ordinary urticaria and their biomarkers: a prospective observational study' by Norfolk and Norwich University Hospitals.

Computing Laboratory

Gavin Topley has been awarded £2,085 for a project entitled 'Taxi Booking' by Allport Cars.

Dr Colin Johnson has been awarded £3,600 for a project entitled 'Identifying cracked rails using ultrasound and machine learning' by NESTA via University of Warwick.



The Eagle Nebula: The Pillars of Creation



The Eagle Nebula is a very young star formation region containing dark columns of cold molecular gas and dust dubbed the "Pillars of Creation".

On the tip of a pillar, as shown in this image, many small Evaporating Gaseous Globules (i.e. EGGs) have been detected. Most of the EGGs appear to be empty: only about 15% show evidence for young stars or brown dwarfs (objects which fail to fuse hydrogen).

This structure was formed by the interaction of interstellar clouds with multiple supernova explosions and stellar winds from massive stars near the plane of our rotating Galactic disc. These act to compress the clumps which become exposed, thus triggering star formation. Exactly

how this happens and where the dividing line between creation and destruction lies is being investigated by members of the Centre for Astrophysics and Planetary Science. The image displayed here was presented and discussed in Professor Michael Smith's book 'The Origin of Stars'. It has also been studied by second-year undergraduates in Physical Sciences who are given the opportunity to apply Astrogrid and Virtual Observatory software to investigate for themselves (Hubble Space Telescope image courtesy of NASA).

Professor Michael Smith,
Professor of Astronomy,
School of Physical Sciences

Café Scientifique Ye Olde Beverlie, St Stephen's Green, Canterbury Tuesday 9th December 2008

Professor Martin Warren: The Medical Mystery of King George III

King George III was one of the country's longest serving monarchs who is best remembered for losing the American colonies and for his bouts of madness that triggered the regency crisis in 1789. Did he suffer from manic depressive psychosis or were his bouts of mental incapacity due to an organic illness? Evidence for the latter will be presented, demonstrating that it is likely that the King suffered with a rare metabolic disorder. The nature, symptoms and causes of this inherited illness will be described. By examination of some of the King's hair it has also been shown that he was being accidentally poisoned by his own physicians. The role of science in the emerging discipline of scientific historiography will be discussed. Martin Warren is professor of biochemistry and a research fellow in the department of Biosciences at the University of Kent. His research interests are the so-called "pigments of life" that are associated with the colours found in grass and blood.



Professor Martin Warren

New Host at Café Scientifique

After organising and hosting an extremely successful series of Café Scientifique presentations over the past two years, Dominique Chu is handing over the reins to Colin Johnson from January 2009. For more information on becoming a presenter at Café Scientifique, contact Colin on C.G.Johnson@kent.ac.uk



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For back issues follow the link:-

Café Scientifique in 2008/9

Jan 13, 2009

Dr. Alison Edwards, Medway School of Pharmacy: Carbohydrates: Some Sweet Chemistry