1. Introduction

Many thanks go to Nicola Best for organising this year’s newsletter and to Tracy Hackney at UCL Learning & Media Services for her help. We hope this newsletter gives a flavour of the exciting chemistry and family atmosphere achieved in the department. It is not an exhaustive document but can provide a number of contact points to the wide variety of activity that occurs in the department.

Welcome to the newsletter.

This year has been an exciting one in the Chemistry Department. We have continued to produce excellent research across all areas from understanding protein structure, new flame electrochemical routes for detecting pollen, new routes to capture carbon dioxide and devices to harness sunlight to split water. The department has continued to grow in size with the taught masters intake doubling and the number of postgraduate students well over 200; one of the highest in the college. Further we have over 380 undergraduates; not counting the natural sciences and biology teaching. Indeed this years intake of 120 chemistry undergraduates average better than AAA at A-level. Staff have strived and achieved excellence in many aspects of teaching and research. This is supported by a dedicated administrative team lead by Liz Read.

Chemistry has also fully embraced the enterprise agenda with a very wide range of activities including licences, materials supply agreements and patents. Indeed the department was awarded three of the four university enterprise awards to look at commercialisation of research. This has been spearheaded by Prof Jawwad Darr, the departments KT Champion and fostered by Prof Steve Caddick (VP Enterprise).

Research income through grants awarded has been strong this year; Chemistry has an EPSRC portfolio over £33M, as well as significant funding from Industry, ERC, EU, MRC and BBSRC sources. Maintaining Ph.D. numbers will be a challenge in the future due to research council changes, however, the department will have over 15 new Ph.D. students through the colleges impact scheme and will admit 64 new PhD / EngD students this year. Furthermore the publishing culture in the department has taken a shift, in part due to the REF exercise, towards high impact journals.

The department is also undergoing marked change in personal with the retirement of some long serving staff. David Knapp takes on retirement in September after over 40 years in the department. He has been a particular stalwart who will be hard to replace, encouraging all staff, always ready to help and also with an eye to help newly appointed staff get established. Robyn and Willie Motherwell also step down. Robyn has been an excellent Safety Officer for the department, handling crisis with calm assurances; even to putting out small scale fires herself. William has been appointed as an Emeritus Professor and promises me that he will generate some single author papers during his retirement as he plans to return the bench - students watch out for your glassware. We thank him for his guiding hand of the organic section over the last twenty years.

The department has been pushing the energy saving “green” agenda within college spearheaded by Prof Sella and John Hill who have managed to cut the departments water usage by 70% in the last year - a saving of over two Olympic sized swimming pools and ca £50K.

By Professor Ivan Parkin
Leavers

Dr David Pugh Research Associate
Dr Valerie Pons Administrator
Dr Stella Vallejos Vargas Research Assistant
Dr Mark Roydhouse Research Associate
Dr Sandy Desrat Research Associate
Dr Edward Bailey Research Associate
Dr Yan Zhang Research Associate
Mr Harpal Sandhu Mechanical Workshop Technician
Professor William Motherwell Professor of Organic Chemistry & Chemical Biology
Mr Dave Knapp Technical Services Manager
Dr Christina Mellor Centre for Computational Science Administrator
Dr Lisa Haigh Mass Spectrometry Technician
Dr Kerry Simmance KTS fellow
Dr Chris Tighe Research Associate

Promotions

Promotion to Professor

Alethea Tabor
Professor in Organic Chemistry and Chemical Biology

Research areas of interest include:
- Chemical Biology
- Confirmationally constrained peptides
- Lantibiotics
- Non-viral gene therapy

Alethea has made seminal contributions to the organic synthesis of peptides or unusual structure in particular the lipid binding of the lantibiotic minis.

Promotion to Reader

Ben Slater
Reader in Computational Chemistry

Research areas of interest include:
- Computational Chemistry
- Ab-initio and pair potential simulations
- Surface chemistry and crystal growth processes
- Nanoporous materials science – zeolites and MOFs
- Water ice structure and reactivity

Ben has excelled in the field of ab-initio and force-field approach for looking at the structure of materials, in particular to look at what happens at interfaces.

Chemistry’s New Cluster

Whilst such titles are normally followed by the exploits of inorganic chemists, 2011-12 sees the dawn of a new computing facility within the department. The new supercomputer, known as the IB-Server, is the result of a 7 research group collaboration with resident computing officer Dr Jörg Saßmannshausen. The project, begun in 2009, allows group members sole access to 420 cores with fast 'Infiniband' connections, dramatically shortening calculation times and enlarging the molecules and systems that can be investigated.

IB-Server joins the 5 pre-existing chemistry computer clusters in calculation for a wide range of projects. UCL has a long and excellent research record in computational chemistry, from crystal structure prediction (Professor Sally Price), to the modelling of selectively oxidative catalytic surfaces (Professor Nora de Leeuw). The impacts in terms of theoretical understanding, programming and contributions to on-going experimental investigations have been significant. Countless other computational researchers will benefit from IB-Server but the machine should also have a wider impact. As Dr Saßmannshausen explains, computational chemistry is a useful tool at the disposal of the whole department. Not only can computational screening highlight areas for further experimental research, but modelling allows insight into sometimes ‘unintelligible spectroscopic data’.

The cluster itself comprises of 40 boxes each housing 4 nodes, with each node having 4 dual core 'Intel L5630' processors. The key feature though is a low latency ‘Infiniband’ connection allowing swift transfer of data between nodes. The effect of the connection is exemplified by the recent benchmark test carried out using the CP2K code; on the gigabit network a standard calculation took two and a half days, whereas the new IB-Server machine reduces the calculation time to less than 12 hours. Benchmark test results also placed UCL chemistry computers above ‘HECTOR, the UK’s leading academic computational research facility. Practically, the reduction in calculation time will greatly increase throughput for parallelised codes such as ‘VASP’, ‘CASTEP’ and ‘Quantum ESPRESSO’ (all implementations of Density Functional Theory) and will allow much more challenging systems to be studied.

As use of the departmental clusters increases, Jörg’s role in keeping the machines functioning correctly will be supplemented by consolidating the data backup system and providing areas for the department’s keen code writers to store programming projects. One single entry point for the UCL computational chemistry community to access programs and support for new users are also being considered. In the meantime, chemists needing a chemist’s advice on programs, implementation and hardware have expert help available.

By Jane Yates
From the Conservative Party Conference (dated 03/10/11), a welcome announcement by the Chancellor, George Osborne, of investment in science, in the form of £145m to be invested to "make the UK a leader in supercomputing", a project in which UCL's Professor Peter Coveney has played a major part; and a further £50m will be used to start a Graphene Research and Technology Hub building on the Nobel-prize winning work undertaken by two Russian scientists now based at Manchester University.

Professor Ronald Gillespie was awarded the Order of Canada in 2007. Established in 1967 by Her Majesty Queen Elizabeth II, the Order of Canada is the centrepiece of Canada's honours system and recognizes a lifetime of outstanding achievement, dedication to the community and service to the nation. The Order recognizes people in all sectors of Canadian society. Their contributions are varied, yet they have all enriched the lives of others and made a difference to this country.

Congratulations go to Professor Andrea Sella on his election as an honorary fellow of the British Science Association.

To a meeting of the NZ Universities Graduates Association addressed by UCL’s Emeritus Professor Robin Clark on the theme of “Science meets Art”. He outlined how scientific analysis can be used to identify and authenticate artworks. He used the reference to the Lindisfarne Gospels, the Gutenberg Bibles and other priceless items, along with other items that had been shown up as forgeries. The talk was illustrated with key information relevant to artists’ palettes at different periods in history.

Professor Robin Clark, Chairman of the University of Canterbury Trust (UK Branch) and Chairman NZ Universities Graduates’ Association (UK Branch), met several times in the period 7-17 February 2012 with Jeff Field (the University of Canterbury’s Registrar), Graeme Steven (Alumni and Development Manager), and Brian Mann (former Chancellor) in Christchurch, NZ, and also with Margaret Austin (former Minister of Science in NZ) to discuss the distribution of funds raised in the UK by scholarship appeals for new applicants to the University of Canterbury. This is in response to the large number of earthquakes (>10000) in Christchurch over the past 18 months. He also had a meeting with Simon Leese, Headmaster of Christ’s College, on the earthquake damage to many buildings.

An item on the BBC website reports that students and enthusiasts attending a recording for Radio 4 have probably seen a new state of matter only recently discovered. They were at a demonstration lecture at UCL by Professor Andrea Sella (UCL Chemistry) being recorded for Bookpoints on Radio 4. The state of matter is a plasma like those in conventional nuclear fusion tests, but at higher densities. But far from needing expensive apparatus, the conditions can be achieved in a simple glass tube containing a routine liquid, costing around £10. Professor Sella demonstrated a phenomenon called sonoluminescence - flashes of light created by collapsing bubbles in a fluid. The flashes are extraordinarily faint, but in the darkened auditorium, those attending could see the evanescent sparks quite clearly. The report adds that physical Professor Rhodri Putnam of UCLA has also long been trying to understand the precise source of the light. Judging from its intensity and characteristics, the light demands a source containing billions upon billions of free electrons. He realised earlier this year that under these peculiar circumstances a kind of electrical cascade can take place. If a few electrons escape the embrace of their home atoms, their field makes it easier for further electrons to escape, and so on until the entire bubble interior has become ionised. He has confirmed that the conditions in Andrea Sella’s “pink tube” demonstration are precisely those needed to create this new state. This doesn’t mean that nuclear fusion is occurring inside the tubes. No-one has yet succeeded in generating nuclear fusion inside these bubbles. But he is seeking the trick that could boost the parameters by a factor of 10, to get it to the region of fusion.

Professor Robin Clark conferred with the Directors of the Jussieu and Louvre scientific laboratories in Paris on 24 January and spoke as Franklin-Lavoisier Medallist at the Annual Meeting of the Maison de la Chimie in Paris on 25 January 2012.

Matthew explained that he was proud to have won. He said: “The research I undertake is fundamental research and it makes me proud to see something like this come out on top, at a time when there’s such a big drive for research to deliver fast financial rewards.”

SET for Britain is a poster competition which is held in the House of Commons. It aims to help politicians understand more about the UK’s thriving science and engineering base and rewards some of the strongest scientific and engineering research being undertaken in the UK. This competition involves ~180 early stage or early career researchers and is judged by professional and academic experts. All presenters are entered into either the engineering, the biological and biomedical sciences, the physical sciences (chemistry), or the physical sciences (physics) session, depending on their specialism. Each session results in the reward of Bronze, Silver and Gold certificates.

The Parliamentary and Scientific Committee run the event in collaboration with The Royal Academy of Engineering, The Institute of Physics, the Society of Biology, The Royal Society of Chemistry, the Physiological Society, the Wellcome Trust and the Society of Chemical Industry, with financial support from BP, Airbus/EADS, The Institution of Engineering and Technology, AgChem Access, Oxford Instruments, IBMS and GE Hitachi.

Further information on this award can be found at http://www.rsc.org/AboutUs/News/PressReleases/2012/SET-for-Britain-2012.asp
**Life at UCL By Dr Susan Perkin**

It's hard to believe that it's been five years since I arrived at UCL as an RCUK Fellow. I can still remember the slightly overwhelming feeling of being confronted with an empty lab, a lecturing timetable and the expectation that I would now go ahead and start my career as an independent researcher. Those early years in academia are a strange mixture of rewards and challenges, and I feel very lucky to have negotiated them in UCL.

Perhaps the biggest obstacle facing any independent researcher is that of raising funds to continue one's research. This involves a number of skills and attributes: the ability to explain clearly the value of one's research to funding bodies, a nose for sniffing out new and unorthodox sources of funding and, in the current economic climate, the capacity to deal with the inevitable rejections which follow one's applications. But for those who are minded to pursue a career in academic science, the rewards should not be underestimated: nurturing and publishing one's own research, taking to colleagues around the world and contributing to our understanding of fundamental scientific phenomena - these are wonderful aspects to a career in academic science which cannot be replicated anywhere else.

I have been fortunate enough to receive funding from the Royal Society, the Leverhulme Trust and the US Office of Naval Research, amongst others. This has allowed me recruit my research team of group of 1 PhD student and 2 post-doctoral researchers. Together we have been pursuing the different strands of my research, which primarily concerns ionic liquids – salts which are liquid under ambient conditions – and their properties as electrolytes and in thin films. We carry out experiments to discover how the ions are organised in the few layers adjacent to a solid surface and how their properties differ from the bulk liquid. One important application of this work is the development of supercapacitors for energy storage and regeneration during breaking.

The most exciting event this academic year, however, has been the birth of my first child – Rosa – in September 2011. Returning to work from maternity leave has been made much easier by my receipt of a UCL post-break award; funding which is designed to assist with the transition back to work after a career break. This has allowed me leave from teaching duties along with assistance for childcare at conferences. This summer I will be presenting our research at a Gordon Research Conference in Maine and at the annual meeting of the International Society of Electrochemistry in Prague, so Rosa will be a seasoned conference before her first birthday!

I'll be leaving UCL this summer, to take up a position as a University Lecturer in the Department of Chemistry at Oxford, together with a Fellowship at Trinity College. UCL has been a wonderfully supportive and stimulating environment in which to begin my career, and I am very sad to be leaving my colleagues and students. But I look forward to continuing the collaborations and conversations that we have built up in future years.

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**Toxic Spill Closes Chemistry Building**

On 24th October 2011 the Chemistry Department was evacuated after a spill of vanadium tetrachloride – a volatile, aggressive oxidant that readily reacts with water to create hydrochloric acid, a highly corrosive compound which is harmful if inhaled.

The area was sealed off to make way for the emergency services as standard ventilation procedures were followed. The spill occurred on the 3rd floor, which houses the Materials Chemistry Centre.

Everybody followed the evacuation procedure and no one was injured. It took the emergency services two hours to clean up before the building was deemed safe to return.

By Nicola Best

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**The 1086**

The previous year was a very busy year for me. On the one hand, there was the technical support which I delivered. I spent quite some time to upgrade the existing five clusters to a more modern operating system (Debian Linux, codename ‘squeeze’). Furthermore, the planning and installation of the new cluster with a fast interconnect (InfiniBand) went accomplished as well. Right now the department’s computational clusters have in sum 1086 cores, hence the title.

A core is basically that part of the CPU which does all the work. In days gone by a CPU simply hosted one core but modern CPUs can host up to 12 cores. But there are more achievements: most of them were hidden from most users. For example: the upgrade of the existing backup system for the clusters. Now all the clusters are being backed up so users can retrieve accidentally deleted data provided the data is from the previous day.

With the help of ISD we are currently setting up an archive system. Here the research group leaders can store data locally for easy access and eventually this data can be moved into the (currently being installed) College archive system. In collaboration with ISD, I am now the local contact person for Legion. The idea here is to help local users with the local problems they might encounter when using the cluster. Similar to the departmental clusters, I can install programs on Legion now which hopefully will help the researchers to a simplified use of Legion. This role is quite recent and I am still growing into it.

There is of course research going on as well. Research not only in terms of chemistry but also in the development of new code which does the computation of chemical problems. For this researchers need, the latest tools to do that and over the summer, I am installing a test cluster for exactly that purpose: to test out code with different compilers and libraries. The code development means also some kind of subversion and that is part of the to-be-installed test cluster project.

On the other hand there is the chemistry side of research. As a fully trained chemist, I am still doing some research and I was quite lucky (and very happy indeed) to get the front Cover Page of a Dalton issue with my Perspective contribution entitled ‘Quo Vadis, agostic bonding?’. Meanwhile the answer can be given here: it goes into the Oxford Dictionary as Prof. M. L. H. Green told me in a private communication. This Perspective is a bit of a reflection of how agostic bonding has developed over the last decades from just a curiosity into a really powerful concept of bonding. For this the combination of spectroscopy (NMR, x-ray), new compound (Chemistry) and modern computational methods in Molecular Modeling (DFT, Bader Analysis, NBO) were essential, and this combination of methods are my current research interest as well.

In any case, it was a very busy year for me and I would like to take the opportunity to thank all the people who helped me along the way: my colleagues in the technical support and ISD on one hand and the academic colleagues for their help with my research on the other hand.

By Dr Jörg Saßmannshausen.

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**The ‘Laser Lock’ Device**

Professor Ivan Parkin and Professor Mike Wilson (Professor of Microbiology, Eastman Dental Institute) have designed a ground-breaking catheter that uses a laser to “lock out” and destroy bacteria responsible for one of the most common forms of hospital infections. The team devised a means of using light-sensitive agents embedded in the plastic tubing of the catheter to block bacteria from travelling into a patient’s urinary tract. The use of a catheter, which is interested into the patient to drain or administer fluid, is thought to cause more than 20 per cent of all hospital-acquired infections. The ‘laser lock’ device is the result of more than five years work, supported by grants from the Medical Research Council and the Biotechnology and Biological Science Research Council. The prototype is currently being worked on for completing by early 2013, when pre-clinical safety testing will start. Clinical trials will then follow a few months later.

By Nicola Best
Many congratulations go to the students who graduated with a First Class degree from Chemistry in 2011/12.

DEGREES

ANTHONY OVERY
MSci Chemistry

HANNO KOSSEN
BSc Chemistry

PAUL KOLEOSO
DARRYL HILL
BSc Chemistry

SAMANTHA GIBSON
MSci Chemistry

JAY BULLEN
MSci Chemistry

CHRIS BOWMAN
MSci Chemistry

MSci DEGREE’S

PARRUNG PHOLPIPATTANAPON
MSci Chemistry with Management Studies

THANASA SATIHITWITAYAKUL
BSc Chemistry

YING SOON
BSc Chemistry

ANDREW TRANTER
MSci Chemical Physics

JAMES VALE
MSci Chemistry

JINGYI WANG
BSc Chemistry

RONA WATSON
MSci Chemistry with Mathematics

JOSEPH WELLINGTON
MSci Chemistry

MSc DEGREE’S

KA LO CHI
MSc Materials for Energy and Environment

MARIA DEVETZOGLOU
MSc Materials for Energy and Environment

DANIEL MALONEY
MSc Materials for Energy and Environment

JENNIFER PASS
MSc Materials for Energy and Environment

PANAGIOTA PELEJANAKI
MSc Materials for Energy and Environment

ALI SHEHU
MSc Materials for Energy and Environment

FENG TAO
MSc Materials for Energy and Environment

ADEOLA THOMPSON
MSc Materials for Energy and Environment

JOLIE WU
MSc Materials for Energy and Environment

MENG YONG
MSc Materials for Energy and Environment

MRes DEGREE’S

BEN AHMADY
Simulations of crocosf® bilayers (Supervisor: Nora de Leeuw)

LIAM BENNETT
Redox properties of cerium oxide: a comparative study of F-block oxides and their oxygen storage capacities (Supervisor: Glenn Jones)

SAMUEL BRADLEY
Modelling the Pt/H2O2 interface for nonaqueous electrochemical applications (Supervisor: Alex Slusher)

MARIAN BREUER
Thermodynamics of electron flow in the bacterial decaheme cytochrome MinF (Supervisor: Jochen Blumberger)

YEE TIEH CHOW
Structural prediction of Na2clusters using Genetic Algorithm and basin hopping methods (Supervisor: Scott Wooley)

THOMAS DAILY
Mesoporous titanium dioxide: Development of a mesosporous support for heterogeneous catalysis (Supervisor: Gopinathan Sankar)

CHRISTOPHER DOWNING
Ab initio studies of zinc oxide, its polar surfaces and their defects (Supervisor: Richard Catlow)

TOMIWA OREOLUWA ERINOSHO
Ab initio studies of zinc oxide, its polar surfaces and their defects (Supervisor: Gopinathan Sankar)

YEE TIEH CHOW
Structural prediction of Na2clusters using Genetic Algorithm and basin hopping methods (Supervisor: Scott Wooley)

ENGD DEGREE’S

KATHRYN J GLASER
Computational studies of silica (Supervisor: Rob Bell)

ZEYNEP KURBAN
Electrospun nanostructured composite fibres for hydrogen storage applications (Supervisor: Neal Skipper)

HUSN-UBAYDA ISLAM
X-ray absorption spectroscopy of iron sulphides (Supervisor: Richard Catlow)

CLYDE FARE
An Ab initio investigation of the electronic structure of neutral vacancies of CaZnO3Si with respect to electrode like behaviour (Supervisor: Peter Sushko)

IMAN HASSAN
AAOVD of nanocomposite antimicrobial surfaces (Supervisor: Claire Carmalt)

HUSN-UBAYDA ISLAM
X-ray absorption spectroscopy of iron sulphides (Supervisor: Richard Catlow)

HENRY LANCASHIRE
Implantable electrodes for prosthetic control (Supervisor: Gordon Blunn)

MARIANNE MONTEFORT
Synthesis of FePt Nanoparticles for the characterisation of the internal structure (Supervisor: Ian Robinson)

ANUPRIYA JAI NAIAK
Metal oxide semiconductor gas sensors based on nanostructured tungsten oxide (Supervisor: Russell Binions)

PHD DEGREE’S

ASMAA AL-BAITAI
Computational studies of the interaction of pollutants with iron oxide surfaces (Supervisor: Nora de Leeuw)

SAMUEL ALEXANDER
Discovery of Herttenmolecular layered oxides using solid-state reactions of nano-preursors (Supervisor: Jawad Darr)

JOSEPHINE ARENDORF
A study of some non-covalent functional group-n interactions (Supervisor: William Matherwell)

LEANNE BLOOR
On the synthesis and chemical vapour deposition of group 13 precursors towards Mn-based nitride thin films (Supervisor: Claire Carmalt)

MATHILDE BUSSON
Towards Neocarzinostatin Chromophore (Supervisor: Stephen Caddick)

JADRANKA BUTORAC
Towards Neocarzinostatin Chromophore (Supervisor: Stephen Caddick)

DAVID CRAWTER
Topological constraints and ordering in model frustrated magnets (Supervisor: Ivan Parkin)

RACHEL HAZEL
High pressure studies in solid state chemistry and biology (Supervisor: Paul Milliman)

STUDENT HIGHLIGHTS & NEWS

YASMIN AL-HAMDANI
MSci Chemistry with Mathematics

KASRA AMINI
MSci Chemistry with Mathematics

ROSE BANNISTER
BSc Chemistry with Mathematics

JACK BESWICK
MSci Chemistry

BEN BLACKBURN
MSci Chemistry

CHRIS BOWMAN
MSci Chemistry

KATHRYN BRADLEY
MSci Chemistry

JAY BULLEN
MSci Chemistry

ADAM COGGINS
MSci Chemistry

ZILU FENG
MSci Chemistry with Mathematics

SAMANTHA GIBSON
MSci Medicinal Chemistry

ANNA GOULD
MSci Chemistry

TOMOS HARRIS
BSc Chemistry

DARRYL HILL
MSci Chemistry

PAUL KOLEOSO
BSc Chemistry

HANNO KOSSEN
MSci Chemistry

KATHERINE LAU
MSci Chemistry

CHRISTOPHE LYNCH
MSci Chemistry with a European Language

CONOR MCKEEVER
MSci Chemistry

ZAKIRI MIA
MSci Chemistry

ANTHONY OVERY
MSci Chemistry

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MSci Medicinal Chemistry

ANNA GOULD
MSci Chemistry

TOMOS HARRIS
BSc Chemistry

DARRYL HILL
MSci Chemistry

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JAY BULLEN
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ADAM COGGINS
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SAMANTHA GIBSON
MSci Medicinal Chemistry

ANNA GOULD
MSci Chemistry

TOMOS HARRIS
BSc Chemistry

DARRYL HILL
MSci Chemistry

PAUL KOLEOSO
BSc Chemistry

HANNO KOSSEN
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CHRISTOPHE LYNCH
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MSci Chemistry

ZAKIRI MIA
MSci Chemistry

ANTHONY OVERY
MSci Chemistry
**STUDENT HIGHLIGHTS & NEWS**

The following 2nd year PhD students won prizes at the Postgraduate Poster Competition, held on Tuesday 26th June 2012 in the Nyholm Room.

**MATTHEW PENNY**
Studies of enolate directed carbometallation reactions
(Supervisor: William Motherwell)

**KERRY SIMMANCE**
The design and understanding of the mechanism of formation of nanoporous catalytic materials
(Supervisor: Gogishnan Sankar)

**ALASTAIR SMITH**
Structural and defect properties of titania nanotubes
(Supervisor: Richard Catlow)

**GYÖRGY SÁLÓKI**
Part I: Synthesis of novel purely planar chiral ferrocenes for asymmetric synthesis Part II: Synthesis of novel azaferrrocenylboronic acids
(Supervisor: Jim Anderson)

**QI WANG**
Investigations into electrocatalytic reduction of protons to hydrogen by complexes inspired by the FeFe hydrogenases enzyme active site
(Supervisor: Katherine Holt)

**DAVID UNWIN**
Investigations into the mechanism of reactive oxygen species production in the photodynamic killing of cancer cells.
(Supervisor: Stella Price)

**MICHAEL WARD**
Chemical synthesis of chiral organic compounds for asymmetric catalysis
(Supervisor: Stephen Price)

**CLYDE YIM**
Scanning probe and spectroscopy studies of rutile TiO2(110)
(Supervisor: Geoff Thornton)

**2011-2012 PRIZE WINNERS**

**JAMES VALE**
Neil Sharp Prize
- For Excellence in theoretical (including computational) Chemistry

**ADAM COGGINS**
Tuffnell Prize
- For the best student commencing a Ph.D. in the Department of Chemistry, UCL

**TRANG TRAN**
Tuffnell Prize
- For the best student commencing a Ph.D. in the Department of Chemistry, UCL

**SAMANTHA GIBSON**
Parke Davis Prize
- For Excellence in Medicinal Chemistry

**RONA WATSON**
Harry Poole Prize
- For Excellence in Physical Chemistry

**ANNA GOULD**
Ronald Gillespie Prize
- For best student in Inorganic/Materials Chemistry proceeding to a Ph.D. at UCL

**JAMES CUTHBERTSON**
Bader Prize
- For best student commencing a Ph.D. in Organic Chemistry

**HANNO KOSSEN**
Charles Vernon Prize
- Excellence in Biological Chemistry

**ADAM COGGINS**
Franz Sondheimer Prize
- For Excellence in Organic Chemistry

**JOE BARNETT**
CK Ingold Prize (Joint win – first year)
- For Excellence in Undergraduate Performance

**JINGY WANG**
CK Ingold Prize (Joint win – first year)
- For Excellence in Undergraduate Performance

**SEAN KENG RUI CHIA**
CK Ingold Prize (Joint win – first year)
- For Excellence in Undergraduate Performance

**MOHAMMED AZIZ KHAN**
CK Ingold Prize (Joint win – first year)
- For Excellence in Undergraduate Performance

**Outreach in the Chemistry Department**

By Laura Fenner

Here in the Chemistry Department at UCL, we have always done a great deal of events in the name of scientific outreach. Chemistry students have long been involved in going out to London based schools to present workshops. From Spectroscopy in a Suitcase (SIAS) to Carbon Dioxide – the Most Dangerous Molecule in the World? The chemistry department has also hosted a range of science events including Salter’s Festival of Chemistry, the UCL/LTCO Year 12 Advanced Seminar Series and demonstration lectures as well as a variety of other events.

**New Workshops**
In conjunction with UCL outreach, the department held their first ever Junior Masterclasses event. Organised by Milena Wobbe (2nd year PhD), 25 Year 9 students and their parents were introduced to the wonders of dry ice in workshop entitled “Carbon Dioxide – the most dangerous molecule in the world?” The event gained much positive feedback and was repeated at Riccardi’s Lodge High School and presented by Peter Merchand (3rd year PhD) as part of a daylong STEM extravaganza.

Milena Wobbe demonstrates the acidity of carbon dioxide to a group of Year 9 students visiting the department for our first Junior Masterclass session in Feb 2012.

Under- and postgraduate chemistry students have also come up with a variety of new and improved workshops. Hazel Kitching and Joe Manzi (2nd year EngDocs) have put together a Magnetism workshop with the help of Laura Fenner demonstrating how iron filings can be found in your breakfast cereal and grapes can be repelled. Kalypa Gupta, Rohan Merchant (4th & 3rd year UG) and Katharina Weiser (PostDoc) designed a Building Molecules workshop where students could build crystal structures using polystyrene balls and wooden skewers to demonstrate the allotropes of carbon.

**Future things**
We also have big and beautiful ideas for the coming academic year. One of these is to set up an audio/visual unit where students have the opportunity to learn to operate cameras and use editing software to document activities that go on in and around the department. This section will be headed by Anna Roffey (3rd year PhD).

This academic year the outreach committee will be headed by Hazel Kitching as the outreach coordinator. Organising school’s demonstrations and workshops is Jane Yates who will be continuing to send current and new workshops out to schools for children of all ages. Anna Roffey as the audio/visual officer and Kealan Fallon will continue as web officer. Penny Carmichael will continue to act as editor for the departmental blog and plans to expand with the opportunity to write longer, feature articles. And Joe Manzi as outreach events officer aims to get UCL Chemistry participating in the wonders of science around the country at various science festivals this year.

Jane Yates, Milena Wobbe, (2nd year PhDs) Imran Hassan and Anurupika Naik (3rd year EngDocs) created a workshop based on the process of soap and carbon dioxide. Getting students to be creative, the science behind soap making and bubble formation is explored. Finally Izak Fryer-Kanssen, Aaron John, Ashmita Shirazi and Olivia Lynes (4th year UGs) came up with a workshop to tackle the age old school experiment of titrations. Their workshop Hard Water and Zeolites gets students to explore different water samples and use titration with zeolites to determine the hardness of water.

**Website**
Our outreach website has had a make over! Thanks to the amazing skills and knowledge of Kealan Fallon (4th year UG), the Chemistry Department now have new webpages showcasing the range of schools workshops our students have to offer.

**Science writing**
In addition to our enhanced webpage we’ve also got students writing more articles for the departmental blog so that you and the general public can find out what we’ve been getting up to here in the department. Penny Carmichael, (1st year PhD) has acted as editor for the past academic year and received articles from a number of students. A series of articles entitled ‘A week in the life of…’ where undergrad and postgrad students introduced their writing skills by telling us about their weekly lives at UCL which you can read about in this newsletter. Clare Chew (2nd year PhD) has been reporting on several CPS talks this year and we have also seen reports on many of the workshops given at schools in the local area. Check out our articles at http://blogs.ucl.ac.uk/chemeddeptblog/
UCL CEPMaBC - Be A Polymath – 2012

In November 2011 UCL Outreach awarded Miss Aisha Rahman, a PhD student in the department and Dr Dewi Lewis, £5000 to organize and deliver a two-day Summer School. Never having been attempted before, the theme ‘Be A Polymath’ combined a range of disciplines and departments; Chemistry (naturally), Engineering, Physics, Mathematics, Biology and Computer Science. Students from Years 11 & 12 from non-selective state schools in London made up the vast majority of the limited 150 places, as well as attendance from international participants who were keen to try their hand at being a polymath. The Summer School was styled as a competition where students were put into teams of 5, where they had to compete to gain as many points as possible for each challenge. There were 5 challenges over the two days, each designed with a focus on one discipline and some ‘crossover’ in concepts with another discipline. For each challenge there were a core group of mentors on hand from departments across UCL (and beyond) and were necessary for the smooth running and grading the teams. From the Department of Chemistry, Marion Brooks-Bartlett and Nadia Abdul-Karim made excellent mentors and had great feedback from the participants.

A Week in the Life of UCL Chemists

Edited by Penny Carmichael

For those of you (and I’m sure there are many) who just can’t get enough of the UCL Chemistry Department, make sure to check out our lively blog. Here you will find an array of articles catering to your every need – missed a great event in the department and are keen to know what happened? Or simply bored and looking for something interesting to read? We have it all. We have been going for two years now and to celebrate we have compiled a few glimpses of undergraduate and postgraduate life in the Christopher Ingold Building. We at the UCL blog team believe that it is not just the amazing achievements and awards by members of the department that should be celebrated, but also the daily hard work from so many of our students. We hope that you enjoy reading these short pieces as much as we did!

Olivia Lynes is a second year undergraduate student reading Chemistry on the International programme

“I read chemistry with the International programme which never ceases to cause loads of confusion and slight horror, and for this year only my degree is part time. I have lectures for two chemistry modules; I don’t have labs and attend an evening class for Spanish.

My total contact time amounts to 10 hours - a dream for anyone completing a science degree. It’s also a massive contrast to last year when my timetable consisted of 20 hours of contact time. There really isn’t a typical week when you study at UCL. As the last week of term, this week combines final unit tests, final lectures and tutorials. Whatever is planned as an UCL Chemist there is never a shortage of ways to occupy your time; be that academic or otherwise!!

Izaak Fryer-Kanssen is a third year undergraduate student

“CAUTION! 2-Dimethylamine is toxic and readily absorbed through the skin.”

Izaak was a little taken aback by this warning that my professor said reagent into my Erlenmeyer flask. I’m feeling pretty glad that I rushed out of the lab. Admittedly, my main motivation for doing so was that I fancied being one of the few students coming obscene on the back for a while, but not having a hole on my right elbow is a pretty good reason too. Precipitation of the amide is virtually instantaneous, according to my student notes. I’ve cooked it. I hope it is; because it’s been three and a half hours already and before that was a lengthly (yet surprisingly interesting) double lecture on surfactants.

I’m knackered. Nothing a quick coffee dash won’t fix; however, looking over the synthesis, it seems I’ve only got a couple more steps to go before I obtain my assigned target molecule – the anesthetics Lidocaine or 2-(cyclohexylamino)-N-(2-dimethylaminoethyl)acetamide. I take some pride and taking considerable care not to spill three weeks of work all over myself for the final push. I finish today I can dedicate Thursday and Friday to analysis (NMR, IR and mass spectrometry) hopefully coinciding with the cheap night at the union bar. Now that’s motivation!”

Emily Glover is a fourth year undergraduate student

Being a fourth year MSc Chemistry undergraduate is akin to sitting in the limbo between life and death. Not that graduation should be considered as the end of your life entirely, but it is definitely the end of your life as a student. Since most other students graduate after three years of lectures, seminars and exams, to be considered an undergraduate while you’re working a nine to five in the lab, alternating lectures alongside research group meetings and juggling ‘sports night’ (why do I even go?) and ‘work drinks’ on a Thursday, leaves one in an extraordinary state of confusion.

Having said this, the gratifying feeling of being allowed to run free in the lab, write up your own original research and do what ‘real’ chemists do every day is immense. Boring concepts suddenly could be the MOST IMPORTANT SCIENTIFIC EQUATION YOU’VE EVER SEEN! Lectures feel like a way of breaking up the monotony of the lab. Professor Whatshisname. All in all, the limbo is confusing yes, but I guess the benefit is a link to an association with multiple worldly planes!.

Jane Yates is a first year PhD student studying computational chemistry under Glenn Jones

With a world platinum shortage, American Density of Energy targets and an R&D department keen to start work on new catalysts, what does a week in the life of a chemist who’s trying to create a robust hydrogen fuel cell look like? Firstly, I must confess that my project will not solve any energy crisis on its own, but that’s the way with science. Each small section of research fits into a bigger scheme to further our understanding and ability to use science.

So, after a week of crazing for green energy solutions will eventually involve sitting at a desk, modelling transition metal carbides and attempting to get layers of metal to bond (and still be catalytically active). That is, when the supercomputers are working. When they’re not, the chalkboard (or the computer) fill the gap. Group time is always useful for ironing out problems, deciding how to progress and what to do, and that there are bigger things afoot than queuing problems. Glamorous it’s in but we’ll get there, one calculation at a time.

Marion Brooks-Bartlett is a first year PhD student studying computational chemistry under Dr Simon Banks and Prof Björnvin Hjorvarsson

Monday starts with the terrible battle through London Underground after a weekend of catching up with my social life. I get through the chemistry doors and through London Underground after a weekend of catching up with my social life. I get through the chemistry doors and looking for something interesting to do. Boredom is confusing yes, but I guess the benefit is a link to an association with multiple worldly planes!

The new committee for 2012/13, (L-R) Hazel Katching (outreach coordinator), Jane Yates (schools coordinator), Penny Carmichael (science writing editor), Anna Roboty (audio/visual officer), Joe Maranz (outreach events officer) and Naomi Fallon (website officer, not pictured).

Outreach is a great way to inspire younger minds as well as the general public in the world of science. Being part of chemistry outreach can offer you a wide range of experience especially in science communication and teaching. If you would like to find out more about chemistry outreach this year, please get in touch with one of the committee members or see the website for more details.

http://www.ucl.ac.uk/chemistry/outreach

Participants taking part in the chemistry challenge

The Chemistry based challenge was a particular hit, where the participants were given dry ice, soap solution and a beaker, then set the task to demonstrate that CO2 is heavier than air, and show how the model could be used to explain the greenhouse effect. The participants during Day 2, within a strict 2 min time limit, with a panel of 4 judges marking the clarity of presentation and originality of the ideas. The standards were very high.

Steve Gray (UCL Centre for Advanced Spatial Analysis and also a phenomenal mentor) kicked off the Computer Science challenge with a presentation as to why his discipline is a great area for research. The challenge was then set and run by Microsoft (specially invited to the Summer School) who gave a real insight into the design process faced by Engineers. The ideas were presented to the rest of the participants.

The Summer School received the support of the Royal Academy of Engineering, London Mathematical Society, Institute of Physics, Society of Biology, Microsoft, JDF, and of course the Royal Society of Chemistry. We would like to thank these societies for their support and believing in the CEPMaBC concept and especially UCL Outreach for making it possible with the funding.

Student Highlights & News

http://www.ucl.ac.uk/chemistry/outreach

Or see the website for more details.

Being part of chemistry outreach this year, please get in touch with one of the committee members or see the website for more details.

http://www.ucl.ac.uk/chemistry/outreach

Participants arriving and signing in to receive their goody bags
STUDENT HIGHLIGHTS & NEWS

Can you find the UCL departmental blog at http://www.ucl.ac.uk/chemistry/blog

We are looking for writers. Anyone who is interested in writing for the blog, please contact Penny Carmichael (p.carmichael.11@ucl.ac.uk)

STUDENT HIGHLIGHTS & NEWS

Chemists Learn a Different Kind of Science

On a sunny winter’s afternoon a group of UCL’s chemists arrived at the King William IV pub in Leyton for some purely ‘academic pursuits’. We were greeted by a roaring fire and Dr. Louise Price’s other half, who’s enthusiasm for ‘Brodie’s Beers’ led Louise to organising the tour of the brewery for UCL’s Chemistry real ale drinkers.

Two pints (a steal at £1.99) later we were off on our tour of the brewery which was just next to the pub, in a large cold shed full of large metal tanks. Our guide proceeded to explain their brewing process, telling us about the various experiments in the creation of new and different tastes and aromas of the beers, whilst enthusiastically producing bags of hops for us to sniff. Following this we traipsed back into the warm pub for a beer tasting of the 14 beers on sale.

Brodie’s brewery is named after the James and Lizzie Brodie who took over this east London brewery back in 2008. Their tasty beers proved so popular they’ve now expanded to three pubs in London and their beers are soon to be distributed across England and Scotland.

By Penny Carmichael

Beat the Banana

When I agreed to do the Sport Relief mile with my mum in March I thought I would just do a bit of training, run the mile and then not bother with running again. But although my first training session made me feel awful and I had to hobble over the finish line on the big day because I’d got a pretty bad stitch in the last 100 metres, I realised that I really enjoyed running and was not actually that bad at it. So, soon after Sport Relief I signed up to do the 5km (3.1 miles) Beat the Banana fun run in Hyde Park on 17th May 2012, an annual event that raises money for World Cancer Research Fund.

This occurrence happens more than moments (has ‘errors’ and ‘segmentation faults’ - a programmer’s worst enemy). It was tough but enjoyable, and I realised that it is a great way to fit some quick but very effective exercise into a busy schedule.

Due to the terrible weather that we’d been having in the weeks before Beat the Banana! I didn’t manage to get enough practice sessions in to increase my distance up to the full 5km – the furthest that I’d done was 2.6 miles. Despite this, however, I was feeling confident about the run – the weather on the day was fairly good for running, I seemed to have stopped getting the stitches that had been bothering me for a few weeks, and I was determined to run the whole distance no matter how worn I got!

As the name of the run implies, participants are supposed to try to beat a man dressed as a giant banana around the course. I wasn’t expecting to beat him – I knew the banana would be a fast runner – but I’d set myself a target of 30 minutes in which to complete the run. I had been great at running, but on this occasion I was running around Hyde Park alongside loads of other people wearing yellow t-shirts. During the run I managed to keep going at a good, steady pace and I even had some energy left to speed up for the last half a kilometre and then sprint over the finish line. I was really pleased with my performance – I didn’t beat the banana (he only took 20 minutes!) but I finished in about 27 minutes, well under my 30 minute target. I must thank my equally enthusiastic friends who also came along to support me on the day.

Leanne Bloom

For more information, follow the link:

HELLO – www.ucl.ac.uk/advances
InnerZap – www.InnerZap.com

By Charlie Dunhill

InnerZap

UCL Advances, the centre for entrepreneurship for UCL students, runs a project called “Higher Education in London Outreach”. HELLO Small Businesses can apply for help from an academic and get a small number of hours of free consultancy to solve a specific problem as well as having access to students who are after coursework placements and up for the challenge!”

One of the projects that I have been involved with was an issue concerning the stability of our group of businesses, they had a new energy shot. The company was trying to produce an energy drink that had all the active ingredients of a standard full sized energy drink, concentrated, not into an 80 ml shot as is normal but into a 20 ml shot:

“All the power of a traditional energy drink but in a single gulp”

This proved interesting as a chemical project as at high concentration and low temperatures you get crystallisation of active ingredients which results in a crunchy drink. The main target taurine is an amino acid and has a rather unique ion formation and is therefore variable with changing pH. The solution was to balance the pH so that the taurine stays solution, even if kept in the fridge.

Following the successful completion of the project, I was approached to see if I would join the company as a partner. Hence I now have a new hobby which involves bringing in a new way of doing things to beket. This has been a huge learning curve involving all aspects of business, sales and marketing, as well as technical aspects. Energel shots are now available in shops and online so look out for our tubes in the UCL Union shops and ULU cafe.

Sarah Stokes completed a BSc in Chemistry at UCL in 2007 and went on to graduate from Birbeck (University of London) in 2010 with an MSc in Analytical Chemistry. Sarah is now working as an Assistant Production Editor for Future Medicine.

Alexander Smith was awarded the prize for best poster contribution at the Royal Society of Chemistry Faraday Discussion meeting in Southampton, 2-4th April 2012, with his poster titled ‘Tonic liquids as lubricants and additives: structure and friction of molecularly confined films’.

Our colleagues Richard Briggs and Michael Warwick took part in Movember and helped to raise £3838 for prostate and testicular cancer. Movember is responsible for the spawning of thousands of thousands of men’s faces in the UK and around the world. The aim of which is to raise vital funds and awareness for men’s health, specifically prostate cancer and other cancers that affect men. Well done guys!

Felix Hall (BSc’2009) is in the third year of his PhD at Basel University, Switzerland and his first paper has been published in Physical review letters.

Gabriele Ciocci was awarded the poster prize at the 32nd Annual Graduate Student Meeting of the Royal Society of Chemistry, 13th-17th August, Florianopolis, Brazil.

Kim Barrett has been elected President of the American Physiological Society. She graduated from this Department with a Medicinal Chemistry degree in 1978 and completed a Ph.D. with Fred Pearce, and is now Dean of Graduate Studies at UC San Diego.

On the 7th February Aisha Rahman and Marion Brooks-Bartlett attended the AkzoNobel Poster Competition as one of the five shortlisted finalists at RSC’s Burlington House. They delivered a 5 minute elevator pitch before spending an hour defending their poster and idea “Water: the fuel to power our future”. Their ideas were well received and they were awarded places as runners up. The judges were so impressed with their idea that they decided at the last minute to issue them with a monetary prize. Further details of the event can be found at http://blogs.ucl.ac.uk/chemdep/blog/
London Marathon 2012
Sujata Kundu Postgraduate Student in Chemistry

On Sunday 24th April 2012, I completed my first Marathon. Those of you that know me will be aware of the fact that I am perhaps UCL Chemistry’s most diminutive member, known throughout the undergraduate and graduate communities as the girl who always be heard resonating around the lab. I finally won a ballot place in October, having initially decided to apply for the London Marathon in 2006, when my extremely tight first-year timetable left me with little time to train. I still skipped the gym and went for a run instead. I was advised that the marathon was to run for ten minutes and walk for five, thus reducing the impact on your body, however, I decided to stick to my plan of running only listening to three songs, each of which was during a bit of a low point, because I knew the first song, ‘Journey’, and my absolute new favourite ‘Marathon memory song’, ‘500 Miles’ by The Proclaimers. When we were running past the pubs playing this, the crowd were cheering us on as they were doing this first ‘Da ba de la’-tailed off by the runners, arms akimbo, echoing them. It was an amazing experience, and a beautiful sight to see all of these people of different ages, from different backgrounds and professions united in song, running and atrocious dance moves!

I had a run-walk strategy, and I was conscious of not burning out too soon so that I could run key parts of the course, like Tower Bridge and the finish, and I also made sure that I stretched out and ate some dinner before the finish. It was time to refuel which, after 26.2 miles, is an absolute necessity. I collected my medal and goodie bag, and retrieved my belongings, which meant I could finally put a pair of heels back on! My knees may have been up, but my tara was still firmly in place, along with that smile. It was time to refuel which, after 26.2 miles, meant eating all the cake I could manage. I got home, had a bath, stretched out and ate some dinner before the painkillers wore off and I was in real agony. I went to bed with my medal still around my neck.

The pain lasted two days, but by Wednesday morning I was walking more or less normally. It was worth all the pain, for I had a mass of friends and family, I have raised some important funds for the British Heart Foundation, thanks also to the BHF Marathon, and raised some £25k for the British Heart Foundation. Thanks also to the BHF for their support, to Full Potential for the training plans and advice and last but not least to John’s Ambulance, without whose help I would have never completed the course.

No amount of training can really prepare you for a Marathon. This is a marathon that I believe that you should all try it once. It was worth the pain, but it is something that will remain with me forever.
You may have heard of BBC One's television programme Bang Goes the Theory, an educational science show with presenters Dallas Campbell, Liz Bonnin, Jim Starfield and Dr. Yan Wong. Alongside the TV show runs a roadshow of the same name, touring the country and bringing awe-inspiring science to general public. It involves a LIVE show by the presenters where they demonstrate and get the audience to participate in explosive stage experiments that wow spectators whilst getting across scientific concepts that hope to inspire the future generation into a scientific career. Alongside the LIVE shows is a giant, inflatable, interactive tent which hosts a variety of hands on demonstrations provided by both the BBC and their partners.

I myself volunteered at the Bang events as a science busker for the BBC that I had gotten into via the STEM ambassador scheme during 2011. Demonstrating a series of ‘street science’ experiments, we would stand outside our tent and allure bystanders inside to see the wondrous experiments going on, showcased by the BBC’s partners. Up until the end of 2011, these partners included the Open University, Society of Biology and the Institute of Physics. I had joined the Bang team for their shows at the Cheltenham science festival, Coventry Godiva festival and Creembar show and as a chemist I felt under represented with the lack of Chemistry presence and wondered if the Royal Society of Chemistry could get involved. By the Manchester science festival in October 2011 I organised a bunch of local enthusiastic chemists to demonstrate a range of specifically chemistry based experiments to go along side biology and physics. The BBC show was finally scientifically balanced!

The show was a success! After speaking to around 4,000 people and left with no voice, the BBC’s Bang team asked us back again in December 2011 for a one off sports special event and signed the RSC up for the 2012 tour. This year we have visited the BBC’s Bang team asked us back again in December 2011 for a one off sports special event and signed the RSC up for the 2012 tour. This year we have visited the Royal Society of Chemistry could get involved. By the Manchester science festival in October 2011 I organised a bunch of local enthusiastic chemists to demonstrate a range of specifically chemistry based experiments to go along side biology and physics. The BBC show was finally scientifically balanced!

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Do you like this smell? And later explaining the concept of optical isomerism to this kid using his hands as an example of objects that aren’t super imposable.

The RSC team at BBC’s Bang LIVE. Manchester Science Festival, October 2012 during the International Year of Chemistry.
ALUMNI MATTERS

Dr Ray F.M. White 1927-2012

We also regret having to announce the death of Dr Ray White who sadly passed away on 1st May 2012, at the age of 85.

Ray graduated from the department in 1956 and carried out research with Prof. Ron Gillespie. They introduced the new technique of NMR spectroscopy to the department by the purchase of a Varian V4300 spectrometer operating at 40 MHz. Ray’s expertise was much in demand and he collaborated with others in the department (John Ridd, Allyn Davies, Leslie Fowden, Charles Vernon, Albert Wasserman) on a variety of problems ranging through amino acids, p-alkyl-metabolites, organic peroxides, and organomagnesium compounds.

Ray was very proud of having been at UCL. His son Crispin can remember as a young child being taken with his twin, Danny, on a Saturday outing to see Jeremy Bentham. He would take them off for the morning, whilst their mother shopped in Oxford Street. Crispin also remembers several trips to UCL to visit Ray’s labs and the huge NMR machine he used in the basement of Sir John Cass College.

Crispin remarks “From time to time when we were at junior school, certain chemicals would appear at home, no questions asked, for an afternoon’s session in the garden shed. Both Danny and I followed Dad into chemistry, although not with his level of dedication, as both of us have ended up as accountants. I once asked him if our failure to progress into chemical research longer term was a disappointment to him. His response was interesting - “I didn’t ever expect either of you to follow research longer term, you don’t have the right temperament, too much curiosity and not enough single-mindedness to stick to the point for long enough. The important thing is that in life you have made good use of the educational opportunities you enjoyed.”

Ray was the first in the White family to go to university and as far as the family can establish its first chemist. Over the years he traced the family line back for some two hundred years and was amused to report that like Arthur Dent in the Hitchhiker’s Guide to the Galaxy “we are descended from a long and distinguished race of hairdressers”, as the White family which had lived round Farringdon in Oxfordshire for most of that time earning their living as barbers and innkeepers.

Ray himself was born in London in 1926. Towards the end of 1940, the family moved out of London to Bucks, living first in Hazlemere, the resting place of Sir William Ramsey, formerly Professor of Chemistry at UCL awarded the Nobel Prize for Chemistry in 1921 for his discoveries of the inert gases. Ramsey seems to have been one of Ray’s inspirations to study chemistry. He attended the Royal Grammar School in nearby High Wycombe and recalled that the School’s Physics Department had a vacuum pump carrying a brass plaque noting that it had been used by Ramsay in his prize winning research work on the nobelium. Ray also admitted that, notwithstanding wartime supply restrictions, he was able to get hold of chemicals and equipment to enable him to pursue his own experiments in the garden shed.

Whilst he was in the sixth form, he was introduced to Ingold’s work on reaction mechanisms and from some old correspondence with his former teacher, he learned that the Bunsen burner was an inspired invention of the Chemist who had worked on the discovery of the noble gases.

Ray used his time on national service in Egypt well. He quickly worked out that volunteering to man the stones over-night gave him complete freedom to do as he liked during the day with plenty of uninterrupted study time both day and night. As he explained, it wasn’t necessary to keep awake all night, only to be on call if required, in practice a relatively infrequent event. It proved a cushy billet, giving him access to the best beds and bedding available, his own private quarters and food and drink at all hours.

He was reticent about access to laboratory facilities, but from the odd hints he dropped, it is believed the surrounding sands may have been used for the conduct of a number of more volatile reactions, which may have involved certain reagents culled from the extensive redundant medical stores on site.

Ray spent his career on the staff at Sir John Cass College, continuing to do research in NMR spectroscopy. Until recent years, he was a regular attendee at the Chemistry Lab Dinner. Crispin remarked on his love of books and bookshops at his funeral, and had kindly agreed to keep an eye on the annual collection of books on sale in the Lecture Theatre. His collection of books on chemistry was extensive and diverse.

In addition to the generous donors listed, a further 13 chose to make their gifts anonymously. We have made every attempt to ensure the information contained in this list is accurate and up to date. Should you have any queries, please contact Mr. James Davis from the Alumni and Relations Department via email at james.davis@ucl.ac.uk

To join your colleagues already enhancing the lives of students and staff in the Chemistry Department please visit the alumni pages on the Chemistry website http://www.ucl.ac.uk/chemistry/alumni and follow the ‘give a gift link’. You can also download a gift form from the following link: http://www.ucl.ac.uk/makeyoumark/how-to-give

Donations 1 August 2010 to 21 May 2012

Those UCL Alumni and friends who have supported the department directly help us to build on our international reputation for teaching and research and make a range of exciting activity possible. Your kind contributions have a direct impact upon our students and staff and we are very grateful.

Many of the contributions we receive help to fund our awards and student prizes, for example our Ronald Gillespie Award for Inorganic Chemistry and The Viola Horsell legacy is being used to support a number of Impact Scholarships.

We continue to provide an excellent education and training environment for undergraduate and postgraduate students in Chemistry and all of my colleagues are developing innovative methods to inspire and instruct. It is great to know that we have your support and assistance as we work to do this.

We would like to thank the following UCL Alumni Donors for their help to date:-

Dr Peter Geoffrey Allies - graduated in 1965
Dr Douglas Ambrose, OBE - graduated in 1939 and 1949
Dr John Henry Aupers - graduated in 1965
Dr David Baxendale - graduated in 1965
Mr Gary Belchem - graduated in 1993
Mr Eric Allan Hill Bell - graduated in 1966
Dr Adrian Bradley - graduated in 1997
Mr Andrew William Fraser Brown - graduated in 1984
Mr Gordon Hugh Brown - graduated in 1953
Mrs Molly Bradenell - graduated in 1957
Dr Gabriel J Riuta - graduated in 1951 and 1954
Professor Erwin Buncel - graduated in 1966
Professor Joseph F Bunnett - graduated in 1950
Sir Stuart Burgess CUN - graduated in 1950 and 1953
Squ Leader Peter Claridge - graduated in 1956
Professor Shawn Doanan - graduated in 1962 and 1966
Mr Michael James Edwards - graduated in 1992
Dr Jack David Forrestor - graduated in 1960
Professor Peter W. Foster - graduated in 1951 and 1954
Mrs Hanna Friedenstein-Chandler - graduated in 1941
Dr Anthony C Gibly - graduated in 1962
Professor Ronald J. Gillespie, FRS - graduated in 1944
Professor Robert D Gordon - graduated in 1964
Dr Charles Dennis Hall - graduated in 1959
Dr Maurice J C Harding - graduated in 1960
Mr Frank William Haslam - graduated in 1962 and 1966
Mr Norman Alan Hewson - graduated in 1972
Professor Hans Martin Rudolf Hoffmann - graduated in 1976

Dr J Michael Hollas - graduated in 1956 and 1959
Miss Tsu Yee Hon - graduated in 2002
Dr Patricia Margaret Jackson - graduated in 1957
Dr Andreas G. Kafizas - graduated in 2007 and 2011
Dr John Robert Arthur Kennedy BSc, PhD, MRCOS - graduated in 1954
Mrs Tracy Ann Kergon - graduated in 1989
Dr Natalie Lambert - graduated in 2005
Dr Susan Christine Mangels - graduated in 2002 and 2006
Dr Dominic Peter Mann - graduated in 2005
Mrs Ann E McKeown - graduated in 1971
Mr Benjamin John Merrifield - graduated in 2003
Mr B. de Vries - graduated in 1985
Mrs Susan Pamela Peters - graduated in 1988
Mr Mervyn L Rudkins - graduated in 1957
Mr Derrick Arthur Russell - graduated in 1966
Professor Agha A. Salam - graduated in 1993
Professor John Ernest Salmon - graduated in 1942
Mrs Pamela Zoe Self - graduated in 1943
Mr Geoffrey Francis Smith - graduated in 1957
Dr Adam Ian Sotowicz - graduated in 1993
Mr Ian P. Steeples - graduated in 1976
Professor Thomas W Swadline - graduated in 1958
Mr Richard H Unthank - graduated in 1983
Dr John Wells - graduated in 1965
Mr Michael James Edwards - graduated in 1953 and 1956
Dr Susan Wilkinson - graduated in 1977
Dr Michael Robert Young - graduated in 1972

Mr Benjamin John Merrifield - graduated in 1985
Mr Geoffray Francis Smith - graduated in 1957
Mr Bernard Talbot - graduated in 1957
Mr R. Lunt - graduated in 1957
Mr Mervyn L Rudkins - graduated in 1957
Mr Derrick Arthur Russell - graduated in 1966
Professor Agha A. Salam - graduated in 1993
Professor John Ernest Salmon - graduated in 1942
Mrs Pamela Zoe Self - graduated in 1943
Mr Geoffrey Francis Smith - graduated in 1957
Dr Adam Ian Sotowicz - graduated in 1993
Mr Ian P. Steeples - graduated in 1976
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ALUMNI MATTERS

The History of UCL Chemistry Department
By Alwyn Davies & Peter Garratt.

As many of you will know, at Steve Caddick’s instigation, we (Peter Garratt and Alwyn Davies) are writing a book on the history of the Department. This is not aimed to be a work of scholarship, but rather, we hope, a useful record of life and work in the Department which alumni and others will find interesting and readable.

We have made reasonable progress. For nearly the first century, the story is fairly straightforward. There is one major figure (Turner, Graham, William Hamson, Ramsay) with their one clear-cut line of research, which is well documented. But the story now is that as soon as our memory and has not yet congealed to a single line of research, we have a section finished, we come to the problem of course is that as soon as Ramsay’s words in a song which he wrote and sang at a Lab Dinner.

In Cheltenham his mission lay. To train the girls in science. And demonstrate to them each day Some chemical appliance. But weariness on him did press. And deepest melancholy. Right glad was he to come to me Our friend J. Norman Collie.

Collie left in 1897 to be Professor of Chemistry at the Pharmaceutical College in Bloomsbury Square, but returned in 1902 to be our first Professor of Organic Chemistry. From 1912 he was Head of Department until he retired in 1923. He worked with Ramsay on the noble gases, and the photograph in Figure 1, which has just come to light in the archives, shows him contemplating a discharge in neon.

He had so many interests outside chemistry that he was accused of being a chemist only in his spare time. In the words of C.R. Bailey, at a speech at the 1966 Lab Dinner “He climbed most of the peaks in the Rockies and named half of them. He was a beautiful water colourist, a first class fisherman, a jolly good shot, an expert mechanic, a very good tile maker and a very good carpenter. It is difficult to believe that he was a chemist only in his spare time. The example of Ramsay’s words in a song which he wrote and sang at a Lab Dinner is a fine one.”

Outside chemistry he is best known as a pioneering mountaineer, and he was President of the Alpine Club from 1920-22. He was climbing on Nanga Parbat in the Himalayas with Hastings and Mummery in 1885 when Mummery and two Sherpas were killed.

Within chemistry, he was a marvellous experimenter and inventor. Ramsay’s work on the noble gases required the construction of elaborate apparatus in soda glass. Everyone did their own glass blowing but Collie was called on as the recognised expert when a particularly difficult job had to be carried out. Some of Collie’s inventions are shown here.

Ramsay’s method of isolating argon from air was to pass aerobic nitrogen over red hot magnesium, which removes the nitrogen as solid magnesium nitride and leaves the inert gaseous “impurity”. Ramsay did this by a batchwise technique which required constant attention. Collie turned this into a continuous process in which the nitrogen was continually recirculated over the magnesium.

Figure 2 shows the apparatus which Collie designed and built.

Figure 3. Collie’s device for isolating argon

Atmospheric nitrogen, from which the oxygen had been removed, is contained over water in the large reservoir B and connected to the glass circuit, where, at C, it passes over CuO (to remove any oxygen and hydrogen), then through D which contains P2O5 and an absorbent (to remove the red hot magnesium and CO2), then finally over the red hot magnesium in E where the nitrogen reacts. On the left is a modified Sprengel pump in which falling drops of mercury at A entrap the gas in the circuit and pump it round in a clockwise direction, so that it repeatedly passes over the magnesium. The water pump at the top left lifts the mercury back to the top of the Sprengel pump.

Figure 4. The forerunner of the modern argon pump

Figure 5. The forerunner of the modern argon pump

Figure 6. Collie’s X-ray image of a snake.

Figure 7. The solenoidal argon pump

This greatly speeded up the operation and made it possible to isolate enough argon to examine its properties in detail. Ramsay discovered argon in August 1894, and as early as November of that year he used Collie’s apparatus to demonstrate the isolation of the gas during an undergraduate lecture.

Collie was fascinated by the fact that when neon bubbled up through mercury, each bubble showed a fire-red glow. The phenomenon is called triboluminescence. He made many sealed tubes containing mercury and neon which showed the discharge when they were shaken. Figure 3 shows Professor Sellia’s copy of one of Collie’s designs. When the ring is held horizontally, and rocked, the pools of mercury break over the indentations in the tube, and flash with the characteristic neon glow.

Ramsay sealed his noble gases at low pressure in simple tubes and used their different characteristic discharge spectra as identifying fingerprints. Collie was a painter and connoisseur of art. The colours touched his aesthetic sense and he made a number of convoluted discharge tubes to see what patterns he could draw. These tubes were the forerunners of our present “neon” display signs. One of his designs is shown in Figure 4.

He had done his Ph.D. in Wurzburg and was back visiting there in November 1885 when Röntgen accidentally discovered the penetrating power of X-rays. Immediately he got back to London he began X-raying any likely object which came to hand, such as a fish, lizard, snake, hand, or human foetus. Figure 5 shows his picture of a snake.

There was a great controversy at the end of the nineteenth century about the structure of benzene. A simple cyclohexadiene structure could not account for its non-oilieric properties nor the absence of some expected isomers of substituted benzene. Many different structures were proposed such as Kekulé’s dynamic model (1), Dewar’s with a para link (2), Claus’s centric formula (3), or Ladenburg’s prism (4). Collie proposed that the necessary equivalence between different positions could be achieved in a dynamic model which allowed for the interconversion of the two planar Kekulé forms through a structure in which the carbon and hydrogen atoms adopted non-planar arrangements.

In the Department, Collie’s structure was called the Collywobble. In the words of a 1922 Lab Dinner song by O.L. Brady:

Of the formulae for benzene
There are some I can’t recall
But the Old Man’s is the best one
For it wobbles ‘twixt them all
True to form, he built mechanical wood and wire models to illustrate this and a picture from a contemporary text book is shown in Figure 7.

Edward Turner
When the Department was opened in 1826, the first Professor to be appointed was Edward Turner. He was born in Jamaica in 1796 but came with his family to England with his family when he was a boy. He graduated in medicine in Edinburgh, but in 1820 decided to follow a career in chemistry, and at the time he was appointed at UCL he was Professor of Chemistry in Edinburgh. He died in 1837 at the young age of 41 and no engraving or portrait of him appears to have been made, the only image being the bust which his students commissioned after he had died, which presides over the teaching laboratory.

Professor Robert Lancashire of the University of the West Indies has been searching the local records for information of the Turner family and has come across the following picture which formed part of an advertisement by ICI in the local paper, The Daily Gleaner, on 30 August 1948, about the time when the UWI was founded.

ICI May of course have copied the image from ours, but it does provide the faint possibility that some picture of Turner exists elsewhere.
John William Draper
When the College opened in 1828, the Professor of Chemistry who was appointed was Edward Turner. One of his students was John William Draper who later emigrated to the United States and became Professor of Chemistry at New York University. He had a distinguished career, particularly in the new field of photography. He was the first to photograph the moon (1840) and the Great Orion Galaxy (1880), and he is known as the first astrophotographer.

In 1876, Draper was the Founding President of the American Chemical Society; this happens to be the year of our Chemical and Physical Society was founded. To commemorate the 125th anniversary of their founding, and as part of their National Historic Chemical Landmarks programme, the ACS struck a medal carry Draper’s image, and they have presented one to this department. It is shown below:

Graham Doggett
has retired from the Mathematics Department at the University of York and is now living in Berkhamsted. He is fighting a rare form of Alzheimer’s disease and he and the author Terry Pratchett, who is similarly afflicted, have been active in the Alzheimer’s Society’s campaign (see Google). The second edition of his book with Martin Crockett, Maths for Chemists (ISBN 978-1-84873-359-5), has just been published in the Royal Society of Chemistry’s Tutorial Chemistry Texts series.

Dr. Jonathan Dann
Since graduating in 1996, Jonathan now has three daughters (twins Esmé and Isobel and recent arrival Edie). Jonathan now works as a Managing Director at Bear Stearns in equity research covering the telecom sector.

Dr. Gregory Smith
is now Andrew W. Mellon Assistant Professor of Conservation Science in the Department of Conservation Science, Buffalo State College, Buffalo, NY, USA. (at UCL c. 2000)

John Bloodworth
was a B.Sc. and Ph.D. student in the Department and then a Ramsay Fellow, and a member of the staff from 1968 to 1998. He is living in Southampton where his wife, Sally, is on the staff of the University’s Chemistry Department.

Wang Chan
who graduated in 1983, teaches chemistry in a secondary school run by the Tung Wah Group of Hospitals, a not-for-profit charity in Hong Kong. His daughter Elizabeth is doing a statistics degree here at UCL.

Kai Ng
(P.D. with Alwyn Davies in 1990) is at Hong Kong University of Science and Technology where his research involves collaborative industrial projects with local companies in technology development and transfer. He will be visiting the Department this August.

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Linda Lim
(now Linda Lim Biaw Leng) who graduated B.Sc in 1987 and Ph.D. with David Octin in 1990, is a Senior Lecturer at the University of Brunei Darussalam. They started a degree programme in Chemistry in 2005 and she has been busy building up the research facilities and establishing a research programme focussing on indigenous natural products and biosyn.

Dr. Loraine Foley
is a PDRA at the Department of Biochemistry, University of Cambridge. (at UCL c. 2000)
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