3 Try out one of our Edible Experiments
4 Research scholarships scheme for students
6 Using spectroscopy to sniff out explosives
7 MasterChef chemist’s kitchen experiments
There’s a bit of a food theme emerging here in Sheffield.

For this year’s Chemistry Week, Dr Joanna Buckley launched Edible Experiments, a new series of kitchen chemistry experiments you can try at home. Find out more on the opposite page, or turn to page seven to meet Sheffield chemist-turned-Masterchef contestant Dr Stuart Archer.

In this newsletter you can also learn about infrared lasers that can sniff out explosives, plus an incredible opportunity for new students to complete a paid work placement with one of our research groups.

If there is anything else we can help you with, just let us know.

Professor Mike Ward
Head of Department

Dr Joanna Buckley made this delicious chocolate periodic table to celebrate the naming of the four newest elements: Nihonium, Moscovium, Tennessine and Oganesson.
Try out one of our Edible Experiments

Dr Joanna Buckley has launched a new series of videos to explore the chemistry behind everyday foods. Her ‘Edible Experiments’ films feature experiments that you can try out in the kitchen.

Topics covered include the reasons why mustard burns your nasal passages but chillies don’t, the link between beetroot and camels, why you might taste boiled potatoes when you eat cheddar cheese or how beetles can make a surprising contribution to our food. Each video comes with a demo sheet explaining the underlying chemistry, and how you can illustrate it at home.

Jo is the Regional Coordinator for the Royal Society of Chemistry and organises chemistry activities across Yorkshire and the North-East of England. She works closely with the team that runs our dedicated Schools Lab, where undergraduate students get the chance to help run hands-on chemistry sessions for local schoolchildren.

You can also help Jo with a citizen science project she’s running with the Yorkshire Chemistry Outreach Group to test out the chemistry behind everyday life hacks – for example, can stainless steel really get rid of garlic smells? Follow @YorkshireChem on Twitter to find out how to take part.

Visit www.sheffield.ac.uk/chemistry/edibleexperiments
Research scholarships scheme for students

Great research skills are essential in chemistry, so we’ve launched a new opportunity for our undergraduate students to get even more lab experience with a paid summer research placement.

Students starting their degree in 2017 who meet the criteria will automatically be offered a placement to complete during the summer immediately before the final year of their course.

It’s a great chance for you to put your research skills into practice, and to get even more experience for your CV as you think about your future career.

Hannah Fowler completed a research placement last summer. She said:

“During the summer, I took part in a project within the theoretical chemistry group to investigate the most likely method of carbon dioxide breakdown by a new catalyst. The day-to-day experience of working within a research group was unlike anything I had experienced before. Not only was it technically interesting, it gave me a real insight into what investigative research could be like as a possible career.

“As a result of the positive experience I had, both with the project and the supportive team I worked in, it has put me on a future path to a career in research. In addition to developing new techniques within the field, I also cultivated the essential skills of delivering effective presentations and writing reports, which will be vital for future work. Furthermore, the project provided me with the opportunity to attend a conference at a nearby university, as well as the option to present a poster at a showcase event being held early next year; so the benefits extend well beyond the end of the project.

“However, the highlight of my time was that some of the work contributed towards a research paper and I was credited as a contributing author in the subsequent published paper – something I never imagined could happen to an undergraduate!”

You get:
- A six-week summer placement in one of our laboratories
- Payment of £180 per week

To qualify, you need:
- AAA or above at A level, or equivalent
- To maintain an average grade of 60% or higher during your degree
We’ve opened a new £2m laboratory that will allow scientists to analyse the structure of nanomaterials in unprecedented detail.

The Soft Matter Analytical Laboratory (SMALL) uses rheology and X-ray scattering techniques to study polymers, soft matter and colloids. These techniques are behind advances in many different industries, including medicine, energy, chemicals, cosmetics, engine oils, food and electronics.

The centrepiece of the new facility is a Small Angle X-ray Scattering (SAXS) instrument – the first of its kind in the UK to use a liquid gallium MetalJet X-ray source.

This state-of-the-art design produces a high-intensity X-ray beam that lets scientists study changes in larger structures over shorter time scales than was possible previously.

The facility has been part-funded by the Engineering and Physical Sciences Research Council.

Facility manager Dr Oleksandr Mykhaylyk said: “This new SMALL facility will ensure that Sheffield scientists remain at the forefront of research in polymer chemistry, soft matter physics and materials science for the next decade.”

“The day-to-day experience of working within a research group was unlike anything I had experienced before.”
Using spectroscopy to sniff out explosives

A team of Sheffield chemists have started a new project that uses lasers to detect traces of explosives. The technology could help with the detection and removal of land mines in warzones, replicating work often done by sniffer dogs.

Dr Michael Hippler, senior lecturer in physical chemistry, is leading the Mid-IR CERPAS for Humanitarian Demining project. The system works by tuning a laser to an area of the infrared spectrum known as the ‘fingerprint region’.

The tuned laser energy is absorbed when it comes into contact with molecules that are associated with explosives. Tracking where it is absorbed, therefore, makes it possible to ‘sniff out’ traces of explosive material, to flag up areas where a landmine or unexploded bomb may be near.

The challenge is to make a device sensitive enough to detect absolutely tiny amounts of explosive material, possibly as little as one part in one billion parts of air.

You’ll learn more about the chemistry and theory behind this research in the first, second, third and fourth year segments taught by Dr Michael Hippler and Dr Peter Portius.
MasterChef chemist’s kitchen experiments

Chemists often make good cooks. Our skills in the lab mean we’re great with measurements, mixtures, temperatures and timings. But University of Sheffield chemistry researcher Dr Stuart Archer has taken this to a whole new level.

Earlier this year, Stuart was a contestant on BBC One’s MasterChef, competing each week to take television’s top culinary crown. He made it to the final five, and since then he’s been sharing his cookery skills in kitchens around the region.

Stuart runs a private dining service through his website, The Culinary Chemist, where you can also find some of his favourite recipes. He’s contributed recipes to the latest edition of The Sheffield Cook Book too, and has plans to link up with The Sheffield College to teach students about the chemistry of food.

He’s still committed to life in the lab though. Stuart said: “I’m here until 2018 working with Professor Jim Thomas on organometallic complexes for binding and imaging of DNA structure, and I have no plans at the moment of giving up the chemistry for the food.

“I enjoy it too much and spent too long as a student to give it up now!”

www.theculinarychemist.com
Further information on all our courses can be found at www.sheffield.ac.uk/chemistry

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