DEPARTMENT OF CHEMISTRY

UNIVERSITY OF OXFORD

Outreach newsletter: May 2021

Welcome to our May edition. We hope that you have been able to enjoy the better weather and the easing of restrictions.

Please do pass this on to anyone who may be interested in receiving this bulletin. They are very welcome to subscribe using this link. If you wish to be removed, please email outreach@chem.ox.ac.uk.

With best wishes,

Dr Malcolm Stewart (Director of the Chemistry Teaching Laboratories) and Saskia O'Sullivan (Educational Outreach Officer)

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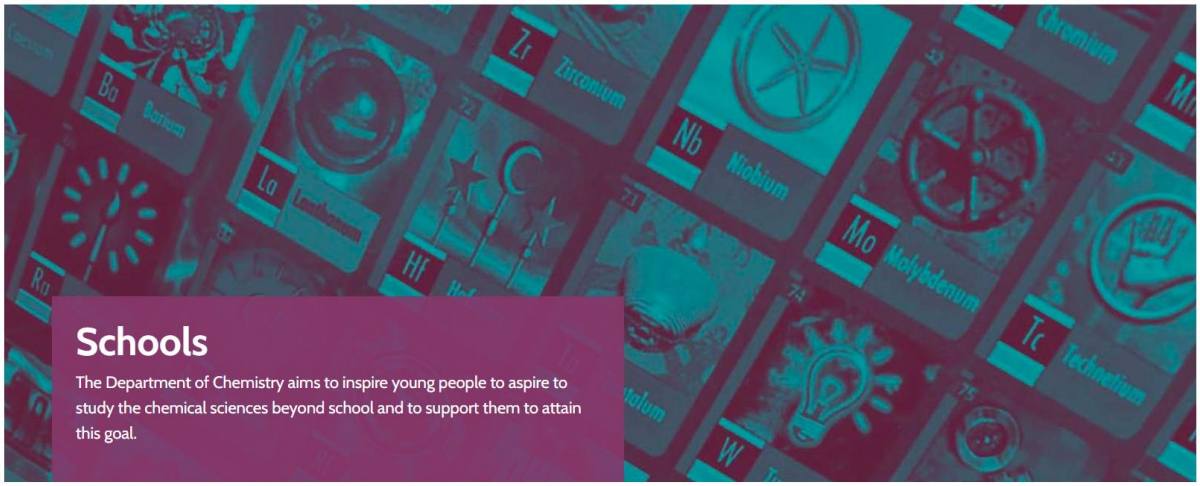
New Website [NEW]



The Department of Chemistry launched its brand-new website in May, along with a dedicated Schools section.

The new layout is designed to help you to easily find out about our events and programmes, as well as opportunities for work experience, when available, and some suggested resources to support learning.

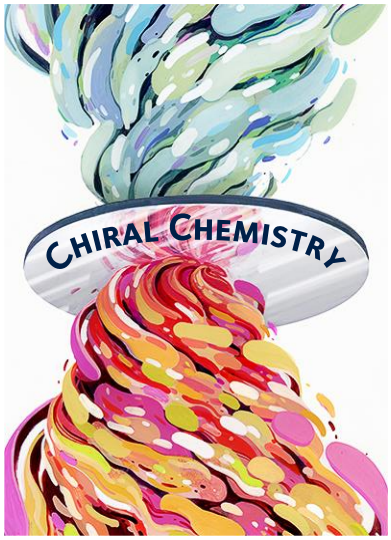
Upcoming events:

KS5 Chiral Chemistry Workshops [UPDATE]

2021-20211 dates/times designed to avoid the interruption of lessons have been added for our online workshop for UK state school KS5 Chemistry students, and teachers, which is delivered by our Department Ambassadors. The session focuses on 3D shapes, chirality, the role of chirality in biological systems and the resources available to research chemists looking at proteins, such as the main protease in SARS-CoV-2, the latter being an active area of research in our Department. There is also an opportunity to ask our Ambassadors questions about their research and their academic careers to date.

The workshop will be delivered on the following dates/times:

Tuesday 18th May 2021	15:30-16:30
Tuesday 15th June 2021	16:00-17:00
Tuesday 12th October 2021	16:00-17:00
Wednesday 10th November 2021	16:00-17:00
Thursday 2nd December 2021	16:00-17:00
Tuesday 11th January 2022	16:00-17:00
Wednesday 9th February 2022	16:00-17:00
Monday 14th March 2022	16:00-17:00
Thursday 28th April 2022	16:00-17:00



REQUEST A SPACE

Students may attend without a teacher, provided we have a teacher contact.

Please note, places are limited to students from state schools in the UK, Isle of Man and Channel Islands, and where we are oversubscribed, we will prioritise places for students who meet our widening participation and access criteria. Further information about this can be found at https://www.ox.ac.uk/about/increasing-access

RSC Women in Chemistry: Making the Difference [UPDATE]

Link UP! Our current challenge for **May** is the turn of the University of Durham and explores the fascinating process of gelation. Gels are formed when molecules link together to form networks, producing materials with interesting and useful properties. Participants can make their own gels which mimic those produced by some strains of bacteria, and explore the use of (wo)man-made gels in healthcare applications, such as the delivery of drugs.

The next **LIVE events** will be held on **Wednesday 19th May**, and **Thursday 27th May**, all **16:00-17:00**.

You can catch up on the **Tuesday 4th May** event via the website.

Proteam UP!

June's challenge will be set by Imperial College London and explores the importance of proteins in our lives. Participants will learn about what proteins are and what atoms they are made of, how to extract proteins from biological matter and also visualise real proteins with the power of computational chemistry.

There will be live events during the month to interact with the scientists involved. The first event will be 16:30 on Monday 7 June.

Please do share the website link as you see fit. The challenges, resources and events are designed for girls aged approx. 10-14 years (Upper KS2-KS3) and their supporters of any age!

https://makingthedifference.web.ox.ac.uk/home

Explore Chemistry – A super-curricular series [UPDATE]

KS5 UK state school students and their teachers are invited to sign up for this series of talks and Q&As. There will be a week to watch a pre-recorded talk (posted online), reflect and note any questions before joining a 45-minute online live Q&A session with the researcher presenting the talk.

Our next talk is entitled *Hypoxia: a new frontier in the fight against COVID-19* will be released on Thursday 10th June, with the Q&A on Thursday 17th June, 16:00-16:45.

Please note, places are limited to students from state schools in the UK, Isle of Man and Channel Islands, and where we are oversubscribed, we will prioritise places for students who meet our widening participation and access criteria. Further information about this can be found at https://www.ox.ac.uk/about/increasing-access

SIGN UP TO THE SERIES

'Ask a Chemist' – Conversations around careers for chemists [UPDATE]

SIGN UP

These sessions are open to all interested students of any age, and teaching staff who are invited to submit questions in advance or during the session. Sign up to receive reminders and updates about this series.

Our last session featured **Dr Marie Wong**. Marie has just finished her DPhil (PhD) with a wealth of research on developing chemical methods for the synthesis of complex molecules. She is particularly interested in techniques to synthesize chiral molecules for applications in industries such as pharmaceuticals, agrochemicals and materials.

Originally from Malaysia, Marie completed her MChem degree at the University of Oxford, as well as placements in the US at UC Berkeley focusing on palladium-catalysis with Prof. John Hartwig and at Yale University with Prof. Scott Miller, looking at peptide-catalysis. You can catch up on her session via our Q&A playlist.

Q&A PLAYLIST

JOIN IN!

Our next session features **Dr Bradley Cowie** who will be LIVE to answer your questions on **Tuesday 15th June, 13:00-14:00**.

Dr Bradley E. Cowie is a specialist in Inorganic Synthetic Chemistry; he obtained his Honours BSc degree and PhD in chemistry from McMaster University in Hamilton, Ontario, Canada. His PhD research focused on exploring ways in which new and highly reactive transition metal compounds may be used in catalysis. Following his PhD, Bradley moved to the UK to pursue Post-Doctoral research at The University of Edinburgh, where he explored the chemistry of uranium and the uranyl ion, $[U^{VI}O_2]^{2+}$. Given that the uranyl ion is the most abundant form of uranium in the environment, this research had direct implications in uranium waste remediation strategies. During this Post-Doctoral Research, Bradley also had the opportunity to travel to and live in Dresden, Germany, where he investigated the chemistry of neptunium, a highly toxic and highly radioactive f-block element of the periodic table.

Currently, Bradley is a Post-Doctoral Research Associate at the University of Oxford whose work focuses on the use of Cu_2S nanoparticles for photoelectrochemical CO_2 reduction. This work has the potential to recycle carbon dioxide, a highly abundant greenhouse gas, and transform it into new and useful molecules.

Salters' Institute Festivals of Chemistry

This year, the Salters' Institute Festivals of Chemistry are moving online with a series of six regional Festivals across the UK: Festival Scotland, Festival NW, Festival NE, Festival SE, Festival SW, and Festival Wales. The Festivals are aimed at 14-16 years olds and their teachers and technicians.

Salters' Institute

Salters' Institute FESTIVALS OF CHEMISTRY

CHEMISTRY FeSTiVAlS

the salters' institute chemistry events

FESTIVALS 2021

The **Salters' Institute Festivals of Chemistry** have traditionally been one-day events for students aged 11-14, involving teams of students visiting their local universities to take part in Salters' Chemistry Challenges and other chemistry-related activities.

This year, due to the coronavirus pandemic, **we are taking our Festivals of Chemistry online**. Our focus this year will be regional with six Festivals across the UK: **Festival Scotland**, **Festival NW**, **Festival NE**, **Festival SE**, **Festival SW** and **Festival Wales**. Students, teachers and technicians in Northern Ireland will be able to join any of the Festivals 2021 Programme remotely.

Festival Scotland will launch online in mid-June, with the other Festivals going live from late June to mid-July 2021. Each Festival will run for approximately one week and content from universities within that region will be hosted online on our Festivals 2021 platform. **Festivals 2021 will focus on students aged 14-16 and their teachers and technicians**, given the disruption to education across the UK in 2020/21. There will be two main objectives:
1) to inspire students and **2) to support and empower teachers**.

The Festivals Programme will include recorded experiments, virtual tours of labs and campuses, mini talks and lectures, CPD sessions and much more. To register your interest and to reserve teacher and student passes, please contact **festivals@salters.co.uk**.

We look forward to welcoming you online in the summer!

www.saltersinstitute.co.uk

Future events:

Chemistry Teacher and Technician Conference, w/c 5th July 2021 [UPDATE]

Our Chemistry Teacher and Technician Conference which would have taken place in July 2021 will now be held on 7-8 July 2022, instead.

We can confirm, however, that we will be working with members from Prof. Harry Anderson's Group to run two sessions for teachers during the w/c 5th July 2021, which will also form part of the Salters' South-East Festival of Science. Additionally, we will be offering an admissions session for teachers. Exact dates/times once confirmed will be posted on our website and circulated in our next newsletter.

Trinity Enrichment Talks: The Future of Plastics: Environmental Challenges and Everyday Life [REPEAT]

On Thursday 8th July, 4pm, there will be an enrichment session aimed at state school students in Year 9-13 and their teachers looking at why plastics have become so important in our everyday lives, the chemistry that underpins them and why their persistence in the environment is so problematic. During the session, DPhil Kam Poon (Williams Group) will cover the latest developments in the field of polymer chemistry, relating the core themes to content covered in GCSE and A-Level chemistry.

Preceding the talk, there will be a short discussion of the importance of super-curricular engagement and financing university from the Trinity College access team. Throughout, there will be opportunities for questions, both on the talk as well as applying to university in general.

REQUEST A SPACE

Chemistry Teaching Laboratory (CTL) Workshops [UPDATE]

Despite an easing of lockdown restrictions, we now do not anticipate a return to CTL visits until **Jan 2022**. As soon as availability is confirmed, dates will be posted on our website and publicised through the usual channels.

School / Community / Oxford College Workshops [NEW]

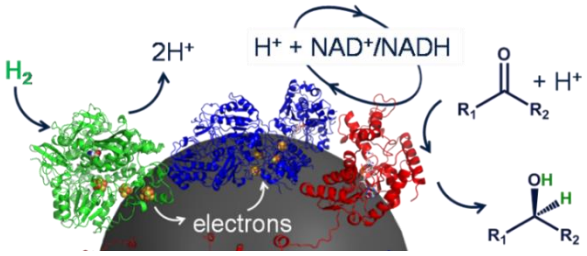
All our face-to-face outreach is suspended at present and, regrettably, we are unable to accommodate requests for visits. We expect a further update in September 2021.

Learning Resources [NEW]

We would like to draw your attention to the The Story of HydRegen which may be of interest as an extension resource for KS5 students during a topic on redox or catalysis, not only for the biochemistry, but also to highlight how a fourth-year Oxford MChem research project led to a spin-out company! This may also be useful for colleagues teaching Biology at A level (or equivalent).

Further resources are linked to the article.

If you are aware of resources that have been beneficial and would like us to include these in our future mailings, please do get in touch with us at outreach@chem.ox.ac.uk.



Competitions

Air Quality Research and Presentation Skills National Competition [REPEAT]

We are delighted to share with you the details of a National Competition being organised by the team at Bristol ChemLabS:

As you will have seen on the news from time to time the Covid-19 pandemic has impacted on air quality. Your students might be wondering how much of an impact Lockdowns have had. They can find out! We have created an extensive resource that allows students to interrogate the UK's (Defra's) Air Quality database (>400 million data points) to carry out their own research. The resource, for technical reasons, is kindly being hosted by the Primary Science Teaching Trust (PSTT), https://pstt.org.uk/resources/curriculum-materials/post-16-citizen-science-air-pollution

We have devised a competition, following on from trials in the summer 2020, using this resource, that will:

- support the Year 11 and 12 students' learning,
- give an opportunity to do some real research via data mining,
- allow the display of students' soft skills in teamwork and presentation,
- give some additional 'ammunition' for eventual university application's (UCAS) personal statements.

Please give some consideration of passing this to your students and let the Administrator, Lauren Smith chem-net@bristol.ac.uk know if your school is participating. Many thanks.

The criteria for the competition and the competition rules are given below.

Air Quality Competition Rules

1. This is for groups of up to 3 students in Year 12. Individuals may apply.
2. Each school to contact chem-net@bristol.ac.uk to notify that the school is participating by 01 June 2021.
3. The schools pre-select the best presentation (one presentation per school) that are to be put forward.
4. The deadline for submission of schools' entries is 20 July 2021
5. Winners announced by end of September 2021. Winning students and their teachers will be contacted by this date.
6. There will be cash prizes and certificates for the at least the best 5 winning entries.
7. Schools participating will distribute a follow up digital (anonymous) survey of their participating students to inform future competitions and to possibly be used in a follow up educational research paper.
8. The judges' decisions are final.

Assumptions and prior IT skill requirements

- Target audience: Year 11 and 12 students

- IT skills: Students know how to use the web, PowerPoint (or similar), spreadsheet manipulation and can organise web conferencing with each other (if working in a small group).
- Additional IT skills, the students can make speech or video inserts into presentation.

Web resource location

https://pstt.org.uk/resources/curriculum-materials/post-16-citizen-science-air-pollution

Criteria for Presentation

- The resource that is to be written should target students in Key Stage 4 (i.e. students aged 14-16)
- Using the school's presentation format (if there is one), include a title of the research presentation.
- The names of the authors' first name, initials, family name.
- Date of submission of presentation.
- Reason why the pollutant(s) and area(s) were chosen.
- Compulsory research. How does the concentration of (named pollutant) vary during Jan-June 2020 for (a named area) compared with the same period in 2019.
- How data needed to answer the scientific research question was gained. Fully referenced.
- Information as to the challenge posed by the named pollutant(s). Referenced (authors (surname, initials),' Title' (Year). Journal, volume, (pages) or web reference and date accessed.
- Research may be used outside of resource to find regional, national or world limit levels for named pollutants.
- Graphs to be drawn to include title, axis titles, units (where relevant), key (where relevant), caption for the graph/chart.
- Conclusion(s).
- Acknowledgements, if any.
- Final page of presentation to include email of corresponding author(s), their roles in the production of the presentation (if more than 1 student) and of the email address of the link chemistry/science teacher.