Postdoctoral Research Associate in the development of new analytical methods for atmospheric chemistry research

Department of Chemistry

Closing date: 11 November 2018

Interview date: w/c 3rd December 2018

Vacancy reference: 7064
INTRODUCTION

Over recent decades there have been continual suggestions that the chlorine atom could be a significant tropospheric oxidant, but a lack of observations capable of constraining its chemistry mean that its role remains highly uncertain. To date there are no observational techniques that can directly measure tropospheric chlorine atoms, due to their exceptionally low concentrations. Attempts to assess the impact of chlorine oxidation must therefore be based on indirect observations of more stable chlorine atom ‘reservoir’ species, which provide the feedstock from which chlorine atoms are produced. This project will focus on developing new analytical methods for the detection of these species. As part of a recently funded ERC project you will combine novel instrument development, field measurements and modelling to ultimately quantify the impact of chlorine atoms on key atmospheric processes.

The Wolfson Atmospheric Chemistry Laboratories are the largest dedicated atmospheric chemistry facility in the UK, providing an exceptional research environment with access to state of the art facilities and a wide range of interdisciplinary expertise.

The Department of Chemistry is one of the UK's leading Chemistry departments and we are renowned internationally for our research. This is combined with a commitment to teaching and outstanding student satisfaction, and we have been recognised consistently for our family-friendly policies and are proud of our Athena SWAN Gold Award: https://www.york.ac.uk/chemistry/ed/

As a Department we strive to provide a working environment which allows all staff and students to contribute fully, to flourish, and to excel. We aim to ensure that there is a supportive and egalitarian culture at all levels and across all staff groups. We promote good practice and a strong culture of equality in higher education. Further information can be found within this brief and on our website: www.york.ac.uk/chemistry/
Main purpose of the role

This role is primarily focused on the development of novel absorption spectroscopy based observational techniques, and the subsequent deployment of these new instruments in targeted field studies. The position is part of Dr Pete Edwards’ ERC funded research programme “Quantifying the impact of tropospheric chlorine oxidation chemistry”.

The recent development of commercially available hydrochloric acid absorption spectrometers, capable of low parts per trillion detection, allows the measurement of one component of the chlorine atom reservoir. In order to capture other important chlorine atom sources, this project will couple one of these detectors with two novel inlets capable of converting other chlorine reservoirs into hydrochloric acid. Thus this new instrument will be capable of constraining the entire chlorine atom reservoir. The successful applicant will lead on the development and characterization of the new instrument; generate and analyse the research data; and lead the production of research outputs. Instrument calibration methodologies will be developed with support from project collaborators at the National Oceanic Atmospheric Administration laboratories in Boulder, Colorado, and the University of Manchester. Once developed and characterized the instrument will be deployed as part of wider observational efforts to a range of different chemical environments (e.g. London, Cape Verde Islands) to explore how chlorine chemistry varies in different locations.

- To conduct research under the supervision of senior colleagues and to contribute to and/or lead the production of research output
- To assist in the identification and development of potential areas of research and the development of proposals for independent or collaborative research projects

Key responsibilities

(Role holders will be required to undertake some or all of the duties below)

- To conduct individual and collaborative research projects, duties to include: analysis and interpretation of research data; use of appropriate research techniques and methods; writing up of research results and dissemination through publications, seminar and conference presentations and public engagement and outreach activities; contributing to the identification of possible new areas of research
- To contribute to the preparation of research proposals and applications to external bodies
- To undertake appropriate organisational and administrative activities connected to the research project, including conference organisation, and the development of promotional or educational material including website maintenance and development
- To develop and initiate collaborative working internally and externally, duties to include: the building of internal contacts and participation in internal networks; collaboration with colleagues on joint projects as required; participation in and identification of external networks in order to share information and identify potential opportunities for collaboration and possible sources of funding; attendance at and contribution to relevant meetings
- To provide guidance to other staff and students, as required, as well as coordinating the work of small research teams
- To assist with undergraduate teaching in own area of expertise.
## PERSON SPECIFICATION

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<th>Qualifications</th>
<th>Essential / Desirable</th>
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<tr>
<td>First degree in any STEM discipline</td>
<td>Essential</td>
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<td>PhD in Atmospheric Science, Physics, Chemistry, or related field or equivalent experience</td>
<td>Essential</td>
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<tr>
<th>Knowledge</th>
<th>Essential / Desirable</th>
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<tr>
<td>Knowledge in spectroscopic detection methodologies to engage in high quality research</td>
<td>Essential</td>
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<td>Knowledge of a range of advanced measurement techniques used for atmospheric chemistry research</td>
<td>Essential</td>
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<td>Has research expertise in an area that will complement and enhance the department’s research strategy and goals</td>
<td>Essential</td>
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<th>Skills, abilities and competencies</th>
<th>Essential / Desirable</th>
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<td>Highly developed communication skills to engage effectively with a wide ranging audience, both orally and in writing, using a range of media</td>
<td>Essential</td>
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<td>Ability to write up research work for publication in high profile journals and engage in public dissemination</td>
<td>Essential</td>
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<td>Ability to develop research objectives, projects and proposals for own and joint research, with the assistance of a mentor if required</td>
<td>Essential</td>
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<td>Competency to conduct individual and collaborative research projects</td>
<td>Essential</td>
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<td>Ability to identify sources of funding and contribute to the process of securing funds, with collaborators if required</td>
<td>Essential</td>
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<td>Well-developed analytical measurement skills</td>
<td>Essential</td>
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<td>Competency to make presentations at internationally recognised conferences or exhibit work in other appropriate events</td>
<td>Essential</td>
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## PERSON SPECIFICATION

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<th>Experience</th>
<th>Essential / Desirable</th>
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<tr>
<td>Experience of carrying out both independent and collaborative research</td>
<td>Essential</td>
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<td>Experience of writing up research work for publication</td>
<td>Essential</td>
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<td>Ability to work as part of a team and also to work independently using own initiative</td>
<td>Essential</td>
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<td>Experience with spectroscopic observations of gas phase compounds</td>
<td>Desirable</td>
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<td>Proficiency in analysis of large datasets and scientific programming</td>
<td>Desirable</td>
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<td>Experience with atmospheric chemical measurements, calibration, and field studies</td>
<td>Desirable</td>
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<td>Ability to plan, conduct and lead a research project and supervise the work of others</td>
<td>Desirable</td>
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### Personal attributes

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<tr>
<td>Attention to detail and commitment to high quality measurements</td>
<td>Essential</td>
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<td>Collaborative ethos</td>
<td>Essential</td>
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<td>Interest in and enthusiasm for the subject matter of the project</td>
<td>Essential</td>
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<td>Positive attitude to colleagues and students</td>
<td>Essential</td>
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<td>Willingness to work proactively with colleagues in other work areas/institutions</td>
<td>Essential</td>
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<td>Ability to plan and prioritise own work in order to meet deadlines, including using initiative to plan research programmes</td>
<td>Essential</td>
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<td>Commitment to personal development and updating of knowledge and skills</td>
<td>Essential</td>
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The Department

The Wolfson Atmospheric Chemistry Laboratories

The Wolfson Atmospheric Chemistry Laboratories are home to more than 65 researchers with interests in all aspects of atmospheric chemistry, from stratospheric ozone, through to urban pollution, personal exposure and health. The laboratories comprise more than 1200 m3 of new offices and labs, the most recent extension to the building being completed in April 2018. The labs support an exceptional environment for research, have access to state of the art facilities and include a range of different disciplines and researchers. The National Centre for Atmospheric Science is co-located with university staff and NCAS provide long-term support to a range of analytical and model facilities. The labs also host a number of joint academic appointments with Defra and Ricardo plc.

Atmospheric chemistry research at York has generated more than 200 publications in the last 5 years including in journals such as Nature, Science and PNAS, and received more than £14M in external research funding, including more than £4M for equipment and high performance computing infrastructure. The research at York focuses on fundamental atmospheric processes but with emphasis on translation of basic research to policy and practice. For example research on natural emissions from trees was used by the UK Government to inform policy on summertime smog episodes, whilst new understanding of exchange of halogen compounds from the ocean has had a major impact on the UN stratospheric ozone assessment and the parties to the Montreal protocol. The atmospheric research at York also connects with industrial and commercial organisations in areas such as measurement technology, emissions characterization and security partnering with global organisations such as BP, Unilever, Givaudan, and DuPont, as well as a range of UK small and medium size companies.

Further information about the Wolfson Atmospheric Chemistry Laboratories is available at: https://www.york.ac.uk/chemistry/research/wacl/

The Department of Chemistry

The Department of Chemistry: http://www.york.ac.uk/chemistry is one of the largest and most successful academic departments at York. The Department was placed in the top ten UK universities for Research Power by the 2014 Research Excellence Framework exercise (REF). Amongst our academic staff we have five Fellows of the Royal Society and many national and international prize winners, contributing to a dynamic and thriving department. The excellence of
Chemistry at York was recognised in the 2019 Guardian League Table Guide, 2019 Complete University Guide and 2018 Times University League Table where it achieved outstanding 3rd, 6th and 4th places respectively.

The Department has nearly 60 academic staff (including teaching-only staff), more than 600 undergraduate students, approximately 160 graduate students (mainly studying for PhDs) and over 80 research associates and fellows. The Department has a group of coherent laboratories, recently extended and modernised, which provide an excellent environment for both teaching and research; £35M has been spent on new buildings and equipment in the last seven years.

Staff in the Department of Chemistry undertake research in a wide range of fields and there are particular strengths in analytical and archaeological science, atmospheric chemistry, chemical and structural biology, green chemistry, materials chemistry, metallproteins, organometallic and catalytic chemistry, synthetic organic chemistry and time-resolved spectroscopy.

We have nearly 30 administrative staff (including those funded externally), as well as over 50 technical staff who provide assistance in the teaching and research laboratories and maintain the workshops (mechanical, glass and electronics) supporting these activities.

The undergraduate programmes, which typically attract over 1200 applications for the ca 180 places, have a flexible, modular structure with opportunities for specialisation in environmental, industrial and medicinal chemistry. There are three-year (BSc) and four-year (MChem) courses with opportunities for students to spend a year at one of a number of overseas universities or in industry. Students rated the Department with an overall satisfaction rating of 97% in the National Student Survey 2018.

The Gold Award from Athena SWAN: https://www.york.ac.uk/chemistry/ed/ for promoting women in science was won by the Department of Chemistry in 2007 and renewed in 2010 and 2015. This was the first Gold award made in this scheme. The Athena SWAN Charter recognises and celebrates good employment practice for women working in science, engineering and technology (SET) in higher education and research.

The Department provides support for all categories of staff in their applications for promotion, role reviews, awards, prizes and rewarding excellence nominations. Staff are encouraged to attend training events and take up opportunities for professional development including those offered by the award-winning University Learning and Development Team: http://www.york.ac.uk/admin/hr/training/. The Department strives to address diversity inequalities to ensure that there is a culture that supports equality and encourages better representation throughout the Department. Support for all staff at all stages of their career is recognised as being extremely important; individuals will be allocated a specific mentor to help support them in future career development. Social events are also held regularly for members of staff.

Opportunities for employment for partners exist across the University, Science City York or within the City of York. The Department recognises that employment for partners can be an issue for new employees and will be understanding if you raise this and will do its best to help.

The Department is committed to establishing a culture of environmental good practice and all staff are asked to go about their duties in a resource efficient way and minimise impacts to the environment wherever possible.

The University has recently invested heavily in Chemistry. The Dorothy Hodgkin Building was completed in two phases. The first, housing Analytical Science and Synthetic Chemistry, opened in 2005, while the second phase housing catalytic, materials and synthetic chemistry was completed in 2012. The department is exceptionally well equipped for NMR spectroscopy and departmental instruments are housed in a purpose-built building opened in 2006, while the Wellcome-Wolfson-funded Centre for Hyperpolarisation in Magnetic Resonance (CHyM) was completed in October 2012. The Wolfson Atmospheric Chemistry Laboratories were opened in 2013 and have recently been extended (2018 and a two-storey building housing new teaching and research laboratories (to house Green Chemistry) and offices was completed in March 2014. The department has recently secured funding from the Wellcome Trust, the Wolfson Foundation, a generous alumnus and the university to acquire a 200 kV cryo-electron microscope and a building in which to house it. Construction and installation are anticipated in 2018.
A place where we can ALL be ourselves #EqualityatYork

THE UNIVERSITY

Founded on principles of excellence, equality and opportunity for all, the University of York opened in 1963 with just 230 students. In 2018 it is the home of more than 17,000 students across more than 30 academic departments and research centres. Since opening over fifty years ago, we have become one of the world’s leading universities and a member of the prestigious Russell Group.

We are consistently recognised as one of the leading Higher Education Institutes and are ranked 16th in the Times & Sunday Times league table (2017). The University of York has won six Times Higher Education (THE) Awards and five Queen’s Anniversary Prizes.

The University is proud of its association with Athena SWAN, holding 12 awards in support of gender equality, representation and success for all, with gold awards for Chemistry and Biology and a University-wide bronze award.

Of 154 universities that took part in the Research Excellence Framework (REF) in 2014, The University of York ranked 14th overall and 10th for the impact of our research. The University is consistently in the top ten UK research universities and attracts over £60m a year of funding from research alone.

Our vision is to make the University of York a world leader in the creation of knowledge through fundamental and applied research, the sharing of knowledge by teaching students from varied backgrounds and the application of knowledge for the health, prosperity and well-being of people and society.
Attractive workplace

Centred around the picturesque village of Heslington on the edge of the city of York, our colleges are set in an attractive landscaped campus. York enjoys a safe, friendly atmosphere with facilities including bars, shops, theatres and concert halls all within easy walking distance.

The University has undergone an unprecedented period of expansion and renewal since 2000. We have invested in twenty new buildings on the original campus and have completed the first and second phases of a £750m campus expansion. Our investment in new colleges, teaching and learning spaces, laboratories, research facilities and a new sports village mean there has never been a better time to join us.

During this period of change we've worked hard to retain our friendly, informal and collegiate atmosphere, which is important to our core values of inclusivity and interdisciplinarity.

We have a thriving international community and are committed to providing staff moving to York with as much support as possible through our Relocation Package and Welcome Officers.

The University is committed to promoting a diverse and inclusive community - a place where we can all be ourselves and succeed on merit. We offer a range of family friendly, inclusive employment policies, flexible working arrangements, staff engagement forums, campus facilities and services to support staff from different backgrounds.

For further information please visit our employee benefit pages.
The City of York

Internationally acclaimed for its rich heritage and historic architecture, York’s bustling streets are filled with visitors from all over the world. Within its medieval walls you will find the iconic gothic Minster, Clifford’s Tower and the Shambles - just a few of the many attractions.

But York isn’t just a great place to visit - it’s also a great place to live and work. While nourishing a vibrant cosmopolitan atmosphere, York still maintains the friendly sense of community unique to a small city.

Visit www.visityork.org for more information on the city of York.

Shopping, culture and entertainment

York boasts specialist and unique boutiques but also all the high street stores on its busy shopping streets. Alongside them you will find cinemas, theatres, an opera house, art galleries, a vast range of restaurants, live music venues and clubs. York is particularly renowned for its multitude of pubs and bars, from the modern to the medieval.

Housing and schools

Whether you choose to live close to the city, in one of the surrounding villages or further afield, you will find a wide range of housing within comfortable distance of York and the University. For families, the area has a range of excellent schools both in the state and independent sector.

Great location

York is one of Britain’s best-connected cities. Halfway between London and Edinburgh on the East Coast mainline, on intercity trains you can reach London King’s Cross in less than two hours and Edinburgh in two and a half hours. York is also well served by road links, and it is easily accessible from the A1, M1 and the M62.

For those travelling from overseas, Manchester Airport is two hours away and Heathrow Airport just three and a half. Flights from nearby Leeds Bradford Airport provide easy access to mainland Europe. By Eurostar from London St Pancras, Paris is just over six hours away.

Yorkshire

The Lonely Planet guide recently declared Yorkshire the third best region in the world to visit. There is something to cater to every taste, whether it be the rugged landscapes of the Moors or the Dales, the picturesque seaside towns of Scarborough and Robin Hoods Bay, the gothic architecture of Whitby or the vibrancy of cosmopolitan Leeds.
Apply online

- Go to https://jobs.york.ac.uk
- Find this job using reference 7064
- Complete the online application form

You will need to submit your completed application by midnight (local UK time) on 11 November 2018

What will I need?

You will need to upload:

- your CV
- a letter describing how you meet the requirements of the job

You will also need details of 2 referees.

Help and assistance

Direct any informal queries to Dr Pete Edwards (pete.edwards@york.ac.uk).

If you have any questions about your application, contact the HR Services team:

recruitment@york.ac.uk
+44 (0)1904 324835