SFI funded PhD Postgraduate Researcher position

University College Cork, Ireland
Department of Physics, School of Chemistry & Environmental Research Institute
College of Science, Engineering and Food Science

Topic: Radical detection and chemical modelling in Irish Atmospheric Simulation Chamber (IASC)

Supervisors/Principal Investigator: Prof. Andy Ruth

PhD Overview

The Center for Research into Atmospheric Chemistry (CRAC) in UCC is operating the Irish Atmospheric Simulation Chamber (IASC), a national facility for the simulation of atmospheric scenarios. IASC has recently received funding through the *SFI Frontier Award* programme for the development of several unique state-of-the-art methods for detecting atmospheric radicals, which are based on optical cavity-enhanced absorption detection schemes. For the associated research programme a PhD position is available jointly in the Physics Department and School of Chemistry at UCC.

The new spectroscopic set-ups will be tailored for the detection of important atmospheric radicals and will be used in a programme of simulation chamber experiments to investigate the atmospheric oxidation of volatile organic compounds formed through biogenic emissions (BVOCs) or biomass burning, which are major sources of emission that affect air pollution and also contribute to climate change. The spectroscopic instruments will uniquely allow day- and night-time atmospheric processes to be investigated and generate information which will be critical to the improvement of our understanding of the chemical mechanisms that account for VOC oxidation. The following specific aspects will be investigated; the fate of peroxy radicals in the night-time atmosphere and their impact on the associated radical chemistry, the atmospheric chemistry of organic nitrates for a range of relevant ambient conditions and secondary aerosol formation.

The PhD fellowship is funded through Science Foundation Ireland for a maximum of 4 years.

Expected Skill Set

We are seeking a strongly motivated, enthusiastic person with a high level of initiative, capable of working independently and within a team. The candidate should be fluent in English and have excellent communication, organization, planning and interpersonal skills, along with a strong scientific spirit.

The successful applicant should have a strong interest in experimental atmospheric chemistry and detection and monitoring of trace gases, especially radicals. Applicants should have good knowledge of atmospheric chemistry and an interest in chemical modelling for the investigation and description of reaction mechanisms. Ideally, applicants should also have a talent for experimental research involving instrumentation and spectroscopy for atmospheric applications. Experimental skills in optics, interfacing, electronics, as well as in data retrieval and analysis are very desirable.

Key Duties and Responsibilities

- The PhD candidate will conduct a specified programme of research under the supervision of Prof. Andy Ruth and Prof. John Wenger.
- Contribute to the design, construction and operation of new spectroscopy set-ups on IASC.
- Conduct experiments and tests as required by the research programme.
- Analyse, visualise and report data in model-useable formats.
- Use results to improve reaction mechanisms for the atmospheric oxidation of VOCs and the formation of SOA.
- Work with other CRAC researchers and research visitors.

Qualifications and Experience

- Minimum 2:1 undergraduate degree (or equivalent) in physics, chemistry, or a similar discipline.
- Appropriate technical competence and accomplishment, including the use of programming and analytical tools for data analysis and data visualisation.
- Basic understanding of spectroscopy, gases and aerosols.
- Some knowledge of atmospheric processes (pollutants, main sources, basic meteorological processes).
- Enthusiasm and an awareness of atmospheric science and air quality issues in society.
- A commitment to gaining practical experience working on a research project.
- Applicants whose first language is not English must show evidence of English proficiency, please check the minimum requirements at: https://www.ucc.ie/en/study/comparison/english/

Diversity
To help address gender under-representation in science, applications from female applicants are strongly encouraged, as are those from international students and other under-represented groups. This reflects UCC's commitment to providing a diverse and open environment for students and staff.

For informal enquiries on the position candidates should contact: Prof Andy Ruth, a.ruth–at–ucc.ie , +353-21-4902057

Funding details: €18,500 stipend per annum. EU tuition fees will be covered (for non-EU applicants additional fees may be incurred).
Duration: 48 Months
Envisaged Start Date: 1 Jan 2023 or 1 Apr 2023

To Apply
Please send:

1. Short cover letter describing your motivation for applying for the position and how your experience and expertise match the research topic.
2. CV, including lists of relevant courses taken, research/industry projects performed, relevant experience and any publications.
3. Contact details of two academic references.

to Prof A.Ruth, a.ruth–at–ucc.ie, quoting **"IASC PhD"** in the subject line of your email. **Closing date is 2 Dec 2022,** however, applications will be accepted until the post has been filled.

Supplementary Information on the Department/Research Centre is available at the following URL:
http://www.physics.ucc.ie/ https://www.ucc.ie/en/chemistry/ https://www.ucc.ie/en/crac/