| | | | |
|---|---|---|---|
| Job title | Postdoctoral Research Associate / Research Fellow in Ultrafast Chemical Dynamics | Job family and level | Research and Teaching Level 4/4A |
| School/ Department | Chemistry | Location | University Park Campus |

## Purpose of role

We are seeking an ambitious and creative experimental physical scientist to join our group as a founding member of the UKRI-funded Future Leaders Fellowship project 'Transition State Imaging'. The project will build a novel molecular anion spectrometer for time-resolved Coulomb explosion imaging experiments in our group's laboratory, an Anion Reaction Microscope. This instrument will generate a beam of mass-selected negative molecular and/or cluster ions and will image the ultrafast nuclear dynamics triggered by photodetachment of the excess electron, using a new high-repetition rate ytterbium laser system. These unique capabilities will advance our fundamental understanding of chemical reactivity, extending the time-resolved Coulomb explosion imaging technique beyond unimolecular photochemistry and towards new chemical contexts, e.g. bi-molecular reactions, solvent dynamics, and electron-induced chemistry.

The candidate must have (or be about to) complete a PhD in Chemistry, Physics, or a related discipline – with demonstratable expertise in one or more of the following areas: mass spectrometry techniques, ultrafast spectroscopy, charged particle detection/imaging, and/or scientific instrument development.

The project is supported by project partnerships with leading experimental and theoretical research groups in Europe and the UK, providing opportunity for collaboration, as well as the development of the candidates own research activities within the parameters of the project.

| | Main responsibilities<br>(Primary accountabilities and responsibilities expected to fulfil the role) | **% time per year** |
|---|---|---|
| 1 | **Instrument Development**<br>▪ Design, build, and commission the Anion Reaction Microscope<br>▪ Plan and construct new femtosecond laser system beamlines<br>▪ Develop instrument control and data acquisition systems | 60% |
| 2 | **Scientific Investigation**<br>▪ Plan and conduct femtosecond pump-probe experiments on prototypical molecular, and cluster anions<br>▪ Prepare results for publication in leading journals<br>▪ Present at national and international conferences | 30% |
| 3 | **Collaboration, Development, and Leadership**<br>▪ Contribute to knowledge-exchange visits, and collaborative with project partners, at EuXFEL-SQS, University of East Anglia, and University of Birmingham.<br>▪ Contribute positively to day-to-day running of the laboratory, including supporting the training of PhD and project students, and other duties commensurate with experience.<br>▪ Engage in independent career develop opportunities. | 10% |

## Person specification

| | Essential | Desirable |
|---|---|---|
| **Skills** | ▪ Hands-on experience in at least one of: femtosecond lasers and optics; high-vacuum instrumentation; charged-particle imaging; ion sources and ion optics<br>▪ Scientific programming for data acquisition and/or analysis, e.g. Python or similar | ▪ Anion photoelectron spectroscopy or photodetachment techniques<br>▪ Coincidence/Covariance imaging methods<br>▪ Event-driven detectors, e.g. TimePix/delay-line anodes; velocity map imaging or COLTRIMS<br>▪ Ion-optics simulations, e.g. SIMION; CAD, or electronics for instrument control. |
| **Knowledge and experience** | ▪ Sound understanding of molecular spectroscopy and/or reaction dynamics<br>▪ Demonstrated evidence of scientific publication in peer-reviewed journals commensurate with career stage<br>▪ Contribution to design and commissioning of, or substantial modification to experimental apparatus<br>▪ Working effectively as part of a research team, including technical support staff.<br>▪ Clear written and oral scientific communication skills<br>▪ Ability to plan and prioritise own work, solve problems creatively, and persist with technically demanding objectives<br>▪ A commitment to safe laboratory practices, and to fostering an inclusive and supportive research culture | ▪ Experiments at large-scale user facilities, e.g. XFELs<br>▪ Supervision or training of junior group members<br>▪ Preparation of standard operating procedures, and safety documentation<br>▪ Development of independent research ideas |
| **Qualifications, certification and training (relevant to role)** | ▪ PhD (awarded or close to completion of) in physical chemistry, chemical physics, atomic, molecular and optical physics, or a closely related discipline. | ▪ Any relevant professional accreditation, e.g. laser safety training. |


GENDER CHARTER
Athena Swan
Gold Award
RACE CHARTER
Race Equality Charter
Bronze Award
disability confident
EMPLOYER
Stonewall
DIVERSITY
CHAMPION
Signatory of
DORA

## Expectations and behaviours

The University has developed a clear set of core expectations and behaviours that our people should be demonstrating in their work, and as ambassadors of the University's strategy, vision and values. The following are essential to the role:

| | |
|---|---|
| **Valuing people** | Is friendly, engaging and receptive, putting others at ease. Actively listens to others and goes out of way to ensure people feel valued, developed and supported. |
| **Taking ownership** | Is clear on what needs to be done encouraging others to take ownership. Takes action when required, being mindful of important aspects such as Health & Safety, Equality, Diversity & Inclusion, and other considerations. |
| **Forward thinking** | Drives the development, sharing and implementation of new ideas and improvements to support strategic objectives. Engages others in the improvement process. |
| **Professional pride** | Is professional in approach and style, setting an example to others; strives to demonstrate excellence through development of self, others and effective working practices. |
| **Always inclusive** | Builds effective working relationships, recognising and including the contribution of others; promotes inclusion and inclusive practices within own work area. |

## Key relationships with others

