

Job Description

Job Title:	Research Associate in Plasmonic Photocatalysis
Department/Division/Faculty:	Department of Chemistry, Faculty of Natural Sciences
Campus/Location:	White City Campus
Job Family/Level:	Research Job Family, Research Associate* (Research salary scale)
Responsible to:	Dr. Andreas Kafizas
Key Working Relationships (Internal):	Working primarily within the Solar Coatings Group . On this project, there are other groups in the department and across the college, including the Durrant Group , Stephens Group , Xie Group , Maier Group , Lischner Group , etc.
Key Working Relationships (External):	This project is part of a wider EPSRC Programme Grant, New Perspectives in Photocatalysis and Near-Surface Chemistry: Catalysis Meets Plasmonics (CPLAS) . You will collaborate with research groups from other colleges also, including King's College London, University College London, and the Catalysis Hub. More details on the team can be found here .
Contract type:	Full time, fixed term for 1 year (with possibility of extension)

Purpose of the Post

The post is funded by the EPSRC Programme Grant (EP/W017075/1), New Perspectives in Photocatalysis and Near-Surface Chemistry: Catalysis Meets Plasmonics (CPLAS). The primary purpose of this post is to develop scalable synthetic routes to promising plasmocatalysts for energy (e.g. water splitting, CO₂ conversion, etc.) and environmental applications (e.g. NO_x remediation) identified earlier in the project. This will include the use of hydro/solvothermal and chemical vapour deposition synthetic routes.

The materials grown will be physically and functionally characterised using a suite of methods. For physical characterisation, this will include the use of thin-film X-ray diffraction (XRD), Raman spectroscopy, atomic force microscopy (AFM), scanning electron microscopy (SEM) and energy dispersive X-ray analysis (EDX), high-resolution transmission electron microscopy (HR-TEM), X-ray photoelectron microscopy (XPS), UV-visible transmission/ reflection spectroscopy, and transient absorption spectroscopy (TAS). For functional characterisation this will include photocatalytic NO_x conversion testing (in accordance with ISO 22197-1:2016) and photoelectrochemical water splitting testing (e.g. (photo)current-voltage curves, incident photon-to-current efficiency testing, chronoamperometry stability testing, Clark electrode/ GC measurement of H₂/ O₂ production, etc.)

The applicant should have strong experience in the use of the aforementioned synthetic techniques, and have experience in most of the physical and functional methods mentioned (with at least strong prior experience in one of the functional testing methods).

In this post, you will mentor PhD and Master's students in the Solar Coatings Group aligned to the project. You will work in multi-disciplinary teams within the chemistry department, college and universities involved in the CPLAS project. You will present regular updates on their project progress to the Solar Coatings Group and CPLAS team (typically bi-weekly). This will include presentations to company contacts involved in the CPLAS project (e.g. Pilkington NSG), which may involve visits to company sites across the UK.

You will also be expected to present your and related group findings at national and international conferences (at least one national and one international conference per annum). The applicant should work diligently to publish their work, and to work alongside their assigned mentees to publish their project work, in notable peer-reviewed scientific journals. The applicant will also be expected to work with their supervisor to attract external research funding.

Key Responsibilities

Research Duties:

- To undertake research, as outlined on the CPLAS EPSRC Programme Grant, and detailed above, to develop scalable synthetic routes to promising plasmocatalysts for energy and environmental applications:
 - You will be expected to work diligently, independently and bring your own unique creative thought to the project
 - You will be required to conduct high quality, detailed research at all times, to ensure the validity and reliability of your findings
 - You will be expected to conduct in-depth analysis of your findings. Alongside this endeavour you will be expected to maintain accurate and complete records of all findings (preferably on a digital resource)
- To mentor PhD and Master's research project students aligned with the CPLAS project, assisting with their supervision and training
- To work with the Laboratory Manager to manage the laboratory of the Solar Coatings Group (Labs B01 and B05, MSRH, White City); including the safety inductions of new researchers, maintenance of allotted items of equipment, monitoring of lab tidiness, and purchasing of chemicals where requirement
- To present regular updates on their project progress to the Solar Coatings Group and CPLAS team (typically bi-weekly)
- To present your and related group findings at national and international conferences (at least one national and one international conference per annum)
- To publish your project work, and to help their mentees publish their project work, in notable peer-reviewed scientific journals
- To work with your supervisor to attract external research funding (e.g. assist in writing bids for research grants)
- To attend relevant workshops and conferences as necessary
- To develop contacts and research collaborations within the College and the wider community
- To promote the reputation of the Group, the Department and the College
- To comply with the College, Division, and Unit safety practices and to attend courses on safety when appropriate

Other Duties:

- To undertake any necessary training and/or personal development through the [Imperial PostDoc and Fellows Development Centre](#)
- To undertake appropriate administrative tasks associated with the project
- To undertake any other duties commensurate with the grade of the post as directed by line manager / supervisor

Where Imperial or funder conditions necessitate, you will be required to complete timesheets for your work on projects in a timely manner.

Person Specification

Requirements	Essential (E)/ Desirable (D)
Candidates/post holders will be expected to demonstrate the following:	
Education	
Hold a PhD in Chemistry or a closely related discipline, or equivalent research, industrial or commercial experience <i>*Candidates who have not yet been officially awarded their PhD will be appointed as Research Assistant.</i>	E
Experience	
Experience working independently and as part of a team of researchers to deliver project goals	E
Experience in bringing your own creative thought to a research project	E
Experience in problem solving a spectrum of issues that can arise during a research project	E
Experience conducting research of the highest quality, ensuring the validity and reliability of their findings	E
Experience conducting in-depth analysis, thinking deeply about their findings	E
Experience mentoring students	E
Experience managing the day-to-day operations of a research laboratory (including the safety inductions of new researchers, maintenance of allotted items of equipment, monitoring of lab tidiness, and purchasing of chemicals where requirement)	D
Experience presenting your research at group meetings, and conferences	E
Experience working with other research groups on a collaborative research project	E
Experience publishing their research in notable peer-reviewed scientific journals	E
Experience attracting external research funding	D
Knowledge	
General knowledge of the field of photocatalysis	E
Knowledge of the field of photoelectrocatalytic water splitting and/or photocatalytic NO _x conversion	E
Knowledge of plasmocatalytic materials	D
Skills & Abilities	
Synthetic Expertise - Chemical vapour deposition	E
Synthetic Expertise - Hydro/ Solvothermal synthesis	E
Physical Characterisation Expertise in at least 5 of the 8 methods detailed below: (i) thin-film X-ray diffraction (XRD) (ii) Raman spectroscopy (iii) atomic force microscopy (AFM) (iv) scanning electron microscopy (SEM) and energy dispersive X-ray analysis (EDX) (v) X-ray photoelectron microscopy (XPS) (vi) high-resolution transmission electron microscopy (HR-TEM) (vii) UV-visible transmission/ reflection spectroscopy (viii) transient absorption spectroscopy (TAS)	E
Functional Characterisation Expertise in at least one of the following: (i) Photocatalytic NO _x conversion testing (in accordance with ISO 22197-1:2016) (ii) Photoelectrochemical water splitting testing (e.g. (photo)current-voltage curves, incident photon-to-current efficiency testing, chronoamperometry stability testing, Clark electrode/ GC measurement of H ₂ / O ₂ production, etc.)	E

The ability to develop and apply new concepts	E
A creative approach to problem-solving	E
Excellent verbal communication skills and the ability to deal with a wide range of people	E
Excellent written communication skills and the ability to write clearly and succinctly for publication	E
Ability to organise own work with minimal supervision	E
Ability to prioritise own work in response to deadlines	E
Advanced computer skills, including word-processing, spreadsheets and the Internet	E
Ability to direct the work of a small research team and motivate others to produce a high standard of work	E
Other	
Willingness to work as part of a team and to be open-minded and cooperative	E
Flexible attitude towards work	E
Discipline and regard for confidentiality and security at all times	E
Willingness to undertake any necessary training for the role	E
Willingness to travel both within the United Kingdom and abroad to conduct research and attend conferences	E
Commitment to meeting deadlines	E
Commitment to maintaining and enhancing facilities and training others in their use	E

Further Information

Please note that job descriptions cannot be exhaustive, and the post-holder may be required to undertake other duties, which are broadly in line with the above key responsibilities.

Imperial College is committed to equality of opportunity and to eliminating discrimination. All employees are expected to follow the [Imperial Values & Behaviours framework](#). Our values are:

- Respect
- Collaboration
- Excellence
- Integrity
- Innovation

Employees are also required to comply with all College policies and regulations paying special attention to: Confidentiality, Conflict of Interest, Data Protection, Equal Opportunities, Financial Regulations, Health and Safety, Information Technology, Smoking, Private Engagements and Register of Interests. They must also undertake specific training and assume responsibility for safety relevant to specific roles, as set out on the [College Website Health and Safety Structure and Responsibilities](#) page.

The College is a proud signatory to the San-Francisco Declaration on Research Assessment (DORA), which means that in hiring and promotion decisions, we evaluate applicants on the quality of their work, not the journal impact factor where it is published. For more information, see <https://www.imperial.ac.uk/research-and-innovation/about-imperial-research/research-evaluation/>

The College believes that the use of animals in research is vital to improve human and animal health and welfare. Animals may only be used in research programmes which are ultimately aimed towards finding new treatments and making scientific and medical advances, and where there are no satisfactory or reasonably

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practical alternatives to their use. Imperial is committed to ensuring that, in cases where this research is deemed essential, all animals in the College's care are treated with full respect, and that all staff involved with this work show due consideration at every level. [Find out more about animal research at Imperial.](#)

We are committed to equality of opportunity, to eliminating discrimination and to creating an inclusive working environment for all. We therefore encourage candidates to apply irrespective of age, disability, marriage or civil partnership status, pregnancy or maternity, race, religion and belief, gender reassignment, sex, or sexual orientation. We are an [Athena SWAN Silver Award](#) winner, a [Disability Confident Leader](#) and a [Stonewall Diversity Champion](#).

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