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| **University of St Andrews**  **School of Physics and Astronomy**  **Research Fellow – AR2626GB**  **Further Particulars for Applicants** |

**The Post: Photonic devices using polymers of intrinsic microporosity**

Organic semiconductors have been successfully used to make a wide range of optoelectronic devices, including organic light-emitting diodes (OLEDs), lasers, solar cells, sensors and transistors. This has led to applications in lighting, chemical sensing, communications, medicine and displays.

Organic semiconductor materials combine simple processing with optoelectronic function, but in doing so require some trade-offs in the performance of each. For example, side groups used to confer solubility generally reduce desirable properties such as absorption and charge transport. In this project we will develop a new generation of functional photonic polymers which will overcome these existing processing/electronic compromises. These will be based on polymers of intrinsic microporosity (PIMs), whose mechanical and chemical properties will be harnessed to control photonic and electronic function. To demonstrate their utility, we will investigate applications of these materials as chemical sensors, optically-pumped lasers and solar cells.

This position will be part of a Scotland-wide multi-disciplinary project to develop these new optoelectronic materials including the groups of Prof Graeme Cooke (University of Glasgow), Prof Neil McKeown (University of Edinburgh) and Profs Ifor Samuel and Dr Graham Turnbull (University of St Andrews). The aim of the position will be both to make photophysical measurements of the materials and to develop their application in chemical sensors, visible lasers and solar cells.

A PhD in physical science is required, together with experience of photophysical characterisation of organic semiconductors and/or fabrication and testing of at least one of organic lasers, chemical sensors, or organic photovoltaics. The successful candidate will be expected to work closely with collaborators who will synthesise the new materials. The position will be for a period of 30 months.

**The Organic Semiconductor Centre**

The Organic Semiconductor Centre (<https://polyopto.wp.st-andrews.ac.uk/>) is a facility, unique in Scotland, dedicated to the understanding, characterisation and development of organic semiconductors and devices made from them. It is led by Professor Samuel, and was founded by a major grant from the Scottish Funding Council, providing outstanding facilities for organic semiconductor research. These facilities include a cleanroom, femtosecond spectroscopy laboratory, time-resolved luminescence instrumentation, spectroscopic ellipsometer, atomic force microscope, scanning near field optical microscopy, solar simulator and a wide range of other equipment for optical and electrical measurements.

Within the centre, the group of Professors Samuel and Turnbull currently consists of eight research fellows and eleven research students, providing a range of skills and considerable scope for the development of ideas. The group has a world-leading reputation in organic photonics, in particular the development of photonic crystal organic semiconductor lasers and polymer optical amplifiers. The main other areas of research are understanding the optical and electrical properties of organic semiconductors (including structure-property relations); solar cell photo- and device physics, new organic semiconductors; and organic light-emitting diodes. The group has an excellent publication record and regularly presents work at international conferences. It has a strong record of innovation leading to regular filing of patents, and strong links with industry.

**School of Physics and Astronomy**

The School of Physics and Astronomy has a world-leading research profile that covers a broad spectrum from fundamental to applied physics. The research is broadly grouped into three areas: photonics, condensed matter physics, and astronomy. Condensed matter physics and photonics are internationally recognised as two of the strengths of Scottish universities, and the research groups in St Andrews as among the leading groups in their fields. The School has around 40 academic staff, 50 contract research staff, 100 postgraduate students, and 25 technical and administrative staff. Most of the work is carried out in the purpose-built accommodation on the North Haugh site of the University.

**The job description for this role is attached below.**

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| **Job Description** |

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| Job Title: Research Fellow  School:School of Physics and Astronomy  Reporting to: Professors Ifor Samuel and Graham Turnbull  Job Family: Academic Research  Duration of Post: 30 months | Working Hours: Full time/ 36.25 hours per week  Grade/Salary Range: 6/£34,304 - £38,587 per annum  Reference No: AR2662GB  Start Date: 1 June 2022 or as soon as possible thereafter  Interview date: 20 April 2022 |

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| **Main Purpose of Role** |

Plan and conduct research activities within the project to meet deadlines and deliverables in collaboration with the PI/line manager.

This post is offered on a fixed term basis as it is specific to a project/piece of work. As such the need for the post will cease to exist when the work/project is completed.

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| **Key Duties and Responsibilities** |

1. Plan and conduct own research activities within the project to meet deadlines and deliverables.
2. Understand and convey material of a specialist or highly technical nature to the team and, where

applicable, the funding body/sponsor through presentations, discussions and progress reports.

1. Write up research work for publication in peer-reviewed journals (as principal or co-author).
2. Write and present research papers (and, where applicable, posters) at conferences, seminars and workshops.
3. Engage in networking activities to make internal and external contacts, to develop knowledge and to form relationships for future research collaboration.
4. Participation in outreach via press releases, social media, blogs and talks at public events.
5. Develop specialist knowledge in the research area to deal with problems affecting the achievement of research objectives and deadlines, devising solutions to unexpected challenges in collaboration with the PI.
6. Plan and manage own administrative activities.
7. Proactively engage with other members of the research group and engage with the research environment within the School.
8. Supervise and provide support and guidance to research team members and assigned project student(s) as appropriate.
9. Undertake a modest amount of teaching or demonstrating as allowable by the funder.
10. Use initiative and creativity to identify areas for research, develop new research methods and extend the research portfolio.
11. Ensure compliance with all legal and regulatory requirements including equality and diversity, data protection, copyright and licensing, security, financial, health and safety and other University policies, procedures and codes as appropriate.

This position may involve some national travel to work with collaborators and international travel to attend conferences. Some evening or weekend work may be required in order to run/monitor time sensitive experiments.

*Please note that this job description is not exhaustive, and the role holder may be required to undertake other relevant duties commensurate with the grading of the post. Activities may be subject to amendment over time as the role develops and/or priorities and requirements evolve*.

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| **Person Specification** |

This section details the attributes e.g. skills, knowledge/qualifications and competencies which are required in order to undertake the full remit of this post.

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| **Attributes** | **Essential** | **Desirable** | **Means of Assessment**  (i.e. application form, interview, test, presentation etc) |
| Education & Qualifications  (*technical, professional, academic qualifications and training required)* | PhD in a relevant physical science |  | Application/certificates |
| Experience & Knowledge  (*examples of specific experience and knowledge sought*) | Experience of applying relevant laboratory skills, fabrication techniques and methods including:  Photophysics of organic semiconductors  fabrication and testing of at least one of organic lasers, chemical sensors or solar cells  Published refereed journal papers | Nanofabrication including nanoimprint lithography  Optoelectronic device fabrication and testing  Time-resolved spectroscopy | Application/ Interview/ Presentation  Application |
| Competencies & Skills  (*e.g. effective communication skills, initiative, flexibility, leadership etc*) | Strong communication and collaboration skills to ensure effective working with collaborators and other members of the research group  Willing to help with the running of the research group and Organic Semiconductor Centre  Ability to work autonomously and to be proactive in identifying and resolving issues  Organising time and projects  Ability to write papers |  | Application/Interview  Interview/References  Interview/References  Interview/References  Application |
| Other Attributes/Abilities | Evidence of keeping up to date with new developments in relevant knowledge and techniques. |  | Application/Interview |

**Essential Criteria** – requirements without which a candidate would not be able to undertake the full remit of the role. Applicants who have not clearly demonstrated in their application that they possess the essential requirements will normally be rejected at the short listing stage.

**Desirable Criteria** – requirements which would be useful for the candidate to hold. When short listing, these criteria will be considered when more than one applicant meets the essential requirements.

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| **Other Information** |

Interviews will be held on20 April 2022

We encourage applicants to apply online at [www.vacancies.st-andrews.ac.uk/welcome.aspx](http://www.vacancies.st-andrews.ac.uk/welcome.aspx), however if you are unable to do this, please call +44 (0)1334 462571 for a paper application form.

For all applications, please quote ref: AR2662GB

Equality, diversity and inclusion are at the heart of the St Andrews experience. We strive to create a fair and inclusive culture demonstrated through our commitment to diversity awards (Athena Swan, Carer Positive, LGBT Charter, Race Charters and Stonewall). We celebrate diversity by promoting profiles of BAME, LGBTIQ+ staff and supporting networks including the Staff BAME Network; Staff with Disabilities Network; Staff LGBTIQ+ Network; and the Staff Parents & Carers Network. Full details available online: <https://www.st-andrews.ac.uk/hr/edi/>

The University of St Andrews is a charity registered in Scotland (No SC013532).

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| **Obligations as an Employee** |

You have a duty to carry out your work in a safe manner in order not to endanger yourself or anyone else by your acts or omissions.

You are required to comply with the University health and safety policy as it relates to your work activities, and to take appropriate action in case of an emergency.

You are required to undertake the Information Security Essentials computer-based training course and adhere to its principles alongside related University Policy and Regulations.

You are responsible for applying the University’s equality and diversity policies and principles in your own area of responsibility and in your general conduct.

You have a responsibility to promote high levels of customer care within your own area of work/activities.

You should be adaptable to change and be willing to acquire new skills and knowledge as applicable to the needs of the role.

You may, with reasonable notice, be required to work within other Schools/Units within the University of St Andrews.

You have the responsibility to engage with the University’s environmental sustainability strategy, committing the University to reach net-zero by 2035.

You are required to engage with the technology, systems and communication channels necessary for you to undertake your work and must update your personal details via HR Self Service whenever there is a change.

Employees with staff management responsibilities must familiarize themselves with appropriate policies.

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| **Who Are We? St Andrews At a Glance** |

The third oldest university in the English-speaking world

Ranked top UK university in the [Times and Sunday Times Good University Guide 2022](https://news.st-andrews.ac.uk/archive/top-of-the-class/)

Twice named [University of the Year](https://news.st-andrews.ac.uk/archive/st-andrews-named-university-of-the-year/)

Consistently ranked [one of the UK’s top five universities](https://www.thecompleteuniversityguide.co.uk/league-tables/rankings) and top in Scotland in the Complete University Guide

Top in the UK for [student satisfaction](https://news.st-andrews.ac.uk/archive/st-andrews-top-for-student-experience-2/)

Research-intensive – ranked 14th in [UK Research Excellence Framework](https://www.ref.ac.uk/2014/)

Athena SWAN [Bronze Award holder](https://news.st-andrews.ac.uk/archive/athena-swan-awards/)

[Strategy](https://www.st-andrews.ac.uk/about/governance/university-strategy/) founded on ambition to be World-Leading, Diverse, Global, Entrepreneurial and Socially Responsible.

Over 9000 students and 3000 staff

Highly international – over 45% of students and staff are from outwith the UK

A non-campus university, closely integrated with the ancient town of St Andrews

Top quality [sports](https://www.st-andrews.ac.uk/sport/), [music](https://www.st-andrews.ac.uk/music/) and [nursery](https://www.st-andrews.ac.uk/hr/edi/carers/childcare/nurseries/) facilities for staff and students

Committed to sustainability and [aiming for Net Zero by 2035](https://www.st-andrews.ac.uk/sustainability/)

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| **The University & Town** |

Founded in the early 15th century, St Andrews is Scotland’s first university and one of the oldest in the world.

Situated on the east coast of Scotland and framed by countryside, beaches and cliffs, [the town of St Andrews](https://en.wikipedia.org/wiki/St_Andrews) was once the centre of the nation’s political and religious life. Today, it’s a vibrant academic town with a distinctively cosmopolitan feel where students and university staff account for more than half of the local population.

The University of St Andrews is a diverse and international community of almost 12,000 students and staff, typically of more than 140 nationalities. It has over 9000 students, just over 7000 of them undergraduates, and employs approximately 3000 staff - made up of c1350 in the academic job families and c1650 in the non-academic job families.

Under the leadership of current [Principal Professor Sally Mapstone](https://www.st-andrews.ac.uk/about/governance/key-officials/principal/), the University’s [Strategy (2018-23)](https://www.st-andrews.ac.uk/about/governance/university-strategy/) is to broaden its global influence, become more diverse and consolidate its long-held position amongst the top five universities in the UK.

The plan sets out St Andrews’ ambitions to grow its international profile, champion diversity and inclusivity, expand its portfolio of world-leading research, develop stronger links with industry and embed a new culture of entrepreneurship among students and staff. It also places social responsibility at its heart, with a pledge to manage growth in student numbers, foster a growing culture of sustainability, and pursue a research and teaching agenda for the wider public good.

The University is one of Europe’s most research-intensive seats of learning. In the [Research Excellence Framework (REF) 2014](https://www.ref.ac.uk/2014/) it was ranked top in Scotland for quality of research output and one of the UK’s top 20 research universities.

St Andrews is consistently ranked one of the UK’s top five universities in league tables compiled by [The Times and The Sunday Times](https://www.thetimes.co.uk/article/good-university-guide-in-full-tp6dzs7wn), [The Guardian](https://www.theguardian.com/education/universityguide) and [The Complete University Guide](https://www.thecompleteuniversityguide.co.uk/league-tables/rankings). St Andrews was ranked the top university in the UK in [The Times and Sunday Times Good University Guide 2022](https://www.thetimes.co.uk/article/good-university-guide-in-full-tp6dzs7wn): the first time in the history of the Guide, and UK university league tables in general, that a university other than Oxford or Cambridge has topped the rankings.

It is the third year that St Andrews has challenged the Oxbridge rankings, coming [second to Cambridge in 2020](https://news.st-andrews.ac.uk/archive/staff-and-students-help-st-andrews-to-league-table-first/) and [second to Oxford in 2021](https://news.st-andrews.ac.uk/archive/university-challenged-st-andrews-breaks-oxbridge/). It has frequently been rated the leading university in Scotland for [teaching quality and academic experience](https://news.st-andrews.ac.uk/archive/st-andrews-scoops-top-teaching-award/), and in the National Student Survey 2021 was [the leading mainstream UK university for student satisfaction for the 15](https://news.st-andrews.ac.uk/archive/st-andrews-top-for-student-experience-2/)[th](https://news.st-andrews.ac.uk/archive/st-andrews-top-for-student-experience-2/) [year in a row.](https://news.st-andrews.ac.uk/archive/st-andrews-top-for-student-experience-2/)

In international and world rankings St Andrews scores highly for teaching quality, research, international outlook and citations. It is currently a World Top 100 institution in the [QS World University Rankings 2019.](https://www.topuniversities.com/university-rankings/world-university-rankings/2022)

St Andrews’ reputation for teaching, research and student satisfaction make it one of the most sought-after destinations for prospective students from the UK, Europe and overseas.

The University typically averages 12 applications per place and has not offered Clearing places for over a decade. St Andrews has highly challenging academic entry requirements to attract only the most academically potent students in the Arts, Sciences, Medicine and Divinity.

St Andrews holds an Institutional [Athena SWAN Bronze Award](https://news.st-andrews.ac.uk/archive/athena-swan-awards/), while the Schools of Biology, Physics & Astronomy, and Psychology & Neuroscience have achieved [Athena SWAN Silver Awards](https://www.st-andrews.ac.uk/hr/edi/sex_gender/athenaswansupport/).