**POSITION DESCRIPTION**

**Job Title:** Postdoctoral Research Fellow – Theory of Organic Optoelectronic Materials

**Organisation Unit:** School of Mathematics and Physics/School of Chemistry and Molecular Biosciences

**Position Number:** 3023560

**Type of Employment:** Fixed term, full-time for 2 years

**Classification:** Research Academic Level A

**BACKGROUND**

**Organisational Environment**

The Federal Government’s 2010 Excellence in Research for Australia survey confirmed The University of Queensland as one of the nation’s top two universities, measured on a combination of research quality and breadth. ERA reported that research at UQ is above world standard in more broad fields than at any other Australian university: this reflects UQ’s leading global role in many areas of discovery. More researchers at UQ are working in research fields that ERA has assessed above world standard than at any other Australian university. UQ’s outstanding critical mass offers researchers significant interdisciplinary capability.

UQ integrates its research strengths with excellent teaching and learning and has won more national teaching awards than any other Australian university. The Times Higher Education-QS table ranks UQ in the top 100 universities globally, and the Shanghai Jiao Tong University World Rankings names UQ as a top 20 Asia-Pacific institution. UQ is one of Australia’s Group of Eight, and a founding member of Universitas 21, an international consortium of leading research-intensive universities.

UQ’s 44,000-strong student community includes 10,000 postgraduate scholars and almost 10,000 international students from 134 countries. The University has 6300 academic and professional staff and a $1.4 billion annual operating budget. Its major campuses are at St Lucia, Ipswich, Gatton and Herston, in addition to teaching and research sites around Queensland and Brisbane city. The University has six faculties and eight institutes. The institutes — funded by government and industry grants, philanthropy and commercialisation activities — have built scale and focus in research areas that UQ regards as strategically important.

The Centre for Organic Photonics & Electronics (COPE) draws together expertise from Chemistry and Physics in a combined facility ([www.physics.uq.edu.au/cope](http://www.physics.uq.edu.au/cope)).

COPE has more than 40 senior research staff, postdoctoral fellows and research students and is housed in newly refurbished laboratories on the 9th Floor of the Chemistry Building that include state-of-the-art synthesis and materials characterisation facilities; a Class 1000 clean room incorporating gloveboxes with integral evaporators for device fabrication; and prototype measurement capability. The laboratory is located on the St. Lucia campus, one of the most spacious and attractive university campuses in Australia.
The Centre has extensive experimental and theoretical research programs in optoelectronic organic materials for organic photovoltaics, organic light emitting diodes, organic field effect transistors and circuit elements, organic chemisensors and unconventional superconductors. The Centre’s research includes computational quantum chemistry and analytical theory research programs. These interact closely with the materials design, and device and applications work. This allows rapid testing of theoretical hypotheses and for the theory to help in the rational design of new materials and devices.

**Information for Prospective Staff**

Information can be found at [https://www.uq.edu.au/uqjobs](https://www.uq.edu.au/uqjobs).

Schedule 10 of The University of Queensland Enterprise Agreement 2010 – 2013 outlines the position classification standards for Levels A to E.

**DUTY STATEMENT**

**Primary Purpose of Position**

Develop and apply theories of organic optoelectronic materials and to interact closely with experimental/device physicists and synthetic chemists in designing and optimising new materials. The main area of study will be the understanding of the optical and electrical properties of new classes of organic optoelectronic materials with a particular focus on the active materials in organic light-emitting diodes (OLEDs) and organic photovoltaic (OPV) devices. Typical calculations will involve a mixture of computational quantum chemistry and analytical theory.

**Duties**

Duties and responsibilities include, but are not limited to:

- Conduct research in the area agreed with the supervisor;
- Publish scholarly papers;
- Work with colleagues and postgraduates in the development and carrying out of joint research projects (with a special emphasis on collaboration with the condensed matter experimentalists and synthetic chemistry groups in the Centre);
- Present research findings at seminars and conferences.

**Other**

- Comply with the University’s Code of Conduct (see the University’s web site at [http://www.uq.edu.au/hupp/?page=24987](http://www.uq.edu.au/hupp/?page=24987))
- Adopt sustainable practices in all work activities and comply with associated legislation and related sustainability responsibilities and procedures developed by the University (see the University’s web site at [http://www.uq.edu.au/sustainability/responsibilities](http://www.uq.edu.au/sustainability/responsibilities))

**Occupational Health and Safety**

- Comply with requirements of Queensland occupational health and safety (OH&S) legislation and related OH&S responsibilities and procedures developed by the University or School. (see the University’s web site at [http://www.uq.edu.au/ohs/index.html?page=133956](http://www.uq.edu.au/ohs/index.html?page=133956))

**Reporting Relationships**

The position reports to Associate Professor Ben Powell, Centre for Organic Photonics & Electronics.
SELECTION CRITERIA

Qualifications

**Essential**
- Hold a PhD or Postdoctoral experience in the theory of materials (e.g., theoretical condensed matter physics or theoretical chemistry).

Knowledge and Skills

**Essential**
- Have an advanced understanding of quantum mechanics as applied to solids and molecules.
- Be expected to be able to demonstrate competence/success in the theory of materials, e.g. as judged by publications (or papers in press) in peer reviewed journals.
- Have the ability to take accurate and reliable records of work carried out.
- Have the ability and desire to interact closely with experimentalists and synthetic chemists.
- Have a general broad working knowledge of condensed matter physics and/or theoretical chemistry and the ability to convey this understanding to others in both written and spoken English. Particular evidence will be sought of a deep understanding of the applicant’s previous fields of research.
- Applicants should be able to demonstrate independent intellectual and practical contributions to previous research projects as evidence that such attributes can be brought to bear on this present project.

**Desirable**
- Experience at working within multi-disciplinary environments and in particular working closely with experimental condensed matter physicists and/or synthetic organic chemists.
- Expert knowledge of relativistic effects in condensed matter or chemistry.
- Expert knowledge of the Marcus-Hush theory of charge transport.
- Expert knowledge of theories of organic electronic devices.
- Experience using quantum chemistry computer programs.

Personal Qualities

**Essential**
- Ability to work collaboratively with colleagues.
- High level communication, inter-personal and communication skills.
- The ability to present work to other scientists in the field in a clear and concise manner, e.g., in papers or in conference presentations.
- The ability and desire to interact and advise more junior colleagues, particularly students.

The University of Queensland is an equal opportunity employer.

Smoking is prohibited in all University buildings.