UNIVERSITY OF WARWICK

Job Description

Job Title	Research Fellow – Theory of Quantum Transport
Department	Engineering
Grade	6

Job Description	
Job purpose (a brief summary of the role)	Undertake research in order to support the work of the School and develop and enhance its reputation, both internally and externally. Assist the Principal Investigator and, where appropriate, project collaborators in the successful execution of the project.
Duties and responsibilities	**1.** Establish a sound research base within the department in order to develop research objectives, projects and proposals. **2.** Extend, transform and apply knowledge acquired from the position to research and appropriate external activities. **3.** Work on the dedicated task within the ATYPIQUAL project. **4.** Work on the theory of quantum transport in nanoscale molecular structures. **5.** Undertake collaborative project with external experimental collaborators **6.** Report regularly the obtained results to the Project PIs **7.** Write or contribute to publications or disseminate research findings using other appropriate media. **8.** Produce and present regular project reports ensuring that the project objectives and deadlines are met. **9.** Make presentations at conferences and/or exhibit work in other appropriate events. **10.** Routinely communicate complex and conceptual ideas to those with limited knowledge and understanding as well as to peers using high level skills and a range of media. **11.** Deal with management / administration matters that may arise from the project. **12.** Assist the PIs in the supervision of PhD and MSc students working on related research projects. **13.** May be expected to contribute to the teaching and learning programmes in the department along with supervise postgraduate research students. **14.** May be involved in the assessment of student knowledge and supervision of projects. **15.** Collaborate actively within and outside of the institution on individual and collaborative research projects and advance thinking. **16.** Undertake specific departmental roles as may be required. **17.** May be required to attend departmental meetings and to participate (where necessary) in other committees and working groups within the department, the faculty and the University. **18.** Participate in relevant professional activities. **19.** Ensure compliance with health and safety in all aspects of work and, when appropriate, undertake risk assessments. **20.** Participate in and develop external networks, for example to identify sources of funding, generate income, obtain projects, or build relationships for future activities. **21.** Mentor colleagues with less experience and conduct individual or collaborative research projects. **22.** Support the work of the department and develop and enhance its reputation, both internally and externally. **Administration and Other Activities**

	1. Contribute to School of Engineering committees and administrative duties and tasks. **2.** Work within budget constraints. **3.** Ensure compliance with Health and Safety, and other University regulations and good working practices in all aspects of work. Duties and responsibilities outlined above are not intended to be an exhaustive list but provide guidance on the main aspects of the post. The post holder will be required to be flexible in their duties and to carry out any other duties as directed by the line manager.

Person Specification

The Person Specification focuses on the essential and desirable knowledge, skills, experience and qualifications required to undertake the role effectively. This is measured by (a) Application Form, (b) Test/Exercise, (c) Interview, (d) Presentation.

Essential Criterion No.	Essential Criterion Description	Measured by
E1	Good honours degree or equivalent in a relevant subject.	A
E2	A PhD or equivalent in a relevant discipline (or nearing completion) such as Condensed Matter Theory, Atomistic Modelling of Materials, Computational Chemistry, Theoretical Nanoscience or a closely related field.	A
E3	A level (or equivalent) in Physics, Chemistry or Engineering.	A
E4	Proven ability in research and evidence of quality research output in relevant field.	A, C & D
E5	A developing research profile with the ability to publish and/or produce high quality research output in the theory of molecular electronics or modelling nanoelectronic device field.	A, C & D
E6	Practical experience with theory of quantum transport and modelling electronic and magnetic properties of molecular- or nano- materials.	A, C & D
E7	Sufficient breadth or depth of computational research and methods such as DFT codes, Green's function method, scientific programming, and machine learning.	A, C & D
E8	Demonstrable ability to work collaboratively and effectively with academic and administrative colleagues, including those external to the University, to promote and contribute towards a collegial environment.	A & C
E9	Able to demonstrate a capacity to contribute collegiately to the life and community of the School by undertaking a variety of duties, such as supporting offer holder days and outreach activities, which will occasionally require weekend work.	A & C
E10	Good IT skills and proven ability to use IT to write technical research papers and presentations, including the use of graphics software required for the preparation of manuscripts and publications.	A, C & D
E11	Able to evidence excellent interpersonal skills with relevant experience of working independently and as part of a team, contributing positively.	A & C
E12	Able to evidence strong time management and organisational skills.	A, C & D
E13	Strong communication skills including the ability to communicate effectively in English, both verbally and in writing.	A, C & D
E14	Understanding of equal opportunity, safeguarding and prevent issues as they may impact on areas of research content.	A, C & D

Desirable Criterion No.	Desirable Criterion Description	*Measured by*
D1	Experience using or developing the NEGF code Gollum.	A,C & D
D2	Experience with modelling vibrational properties (e.g. phonon transport) as well as electronic and magnetic properties (e.g. quantum/spin transport).	A,C & D
D3	Expertise in using machine learning algorithms for first principle calculations.	A,C & D