

POSTGRADUATE SCHOLARSHIPS/PROJECTS

PROJECT/SCHOLARSHIP TITLE	
Hot Electron Transport Through Nanowires	
FUNDING PROVIDER(S)	
Self-funding students only	
SUBJECT AREA(S)	
Electronics, physics, engineering, surface science	
PROJECT START DATE(S)	
October 2019 or January 2020	
KEY INFORMATION:	
<p>In electronic devices, electrons with significantly more energy than the background are termed 'hot'. They are critical in photovoltaic solar cells, contribute to leakage inside transistors and may damage devices. With very short lifetimes of typically hundreds of femtoseconds, they are experimentally difficult to study.</p> <p>To solve this, we have developed a technique where indicator molecules deposited on surfaces can be used to chart the path of the hot electrons. By measuring the modified indicator molecules using the scanning tunnelling microscope (STM) we can determine the transport properties of the hot electrons through the surface of the material. Our work using this technique has included several papers in Nature and Nature Communications. [1-3] More recent work is in press.</p> <p>In this project we propose to extend our technique to study the flow of hot electrons along various types of nanowires and look at coupling of, and transport between, nanowires and surfaces. A collaboration between Prof Richard Palmer and Dr Richard Cobley, the project will include sample preparation within our device cleanroom, experiment design and development work, and measurement using our ultra-high vacuum scanning probe systems, including a 4-probe cryo Nanoprobe STM.</p> <p>Interested students are invited to contact richard.j.cobley@swansea.ac.uk for more information.</p> <p>[1] http://doi.org/10.1038/nature03385</p> <p>[2] http://doi.org/10.1038/ncomms9365</p> <p>[3] http://doi.org/10.1038/ncomms12839</p> <p>Project supervisors: Professor Richard Palmer and Dr Richard Cobley.</p>	
WHO IS ELIGIBLE TO APPLY?	
Are UK/EU/International students eligible to apply?	UK/EU/International – self-funded students only
Qualifications required	At least a 2:1 undergraduate degree, in physical sciences, engineering or nanotechnology. A Masters degree in the same subjects is preferable.
Subject backgrounds considered	Physics, Engineering, Electronics, Materials, Nanotechnology
FUNDING DETAILS	
Tuition fees: Does the funding cover tuition fees?	<p><u>UK/EU students:</u> Not covered (delete as applicable)</p> <p>If partially covered, to what value: £</p> <p>-----</p> <p><u>International students:</u> Not covered (delete as applicable)</p> <p>If partially covered, to what value: £</p>

Stipend: Does the funding provide a stipend?	No
Funds for other expenses: (e.g. conferences, fieldwork)?	No This position is open to self-funded PhD students only. There will be tuition and bench fees for the project.
APPLICATION CLOSING DATE	
On-going	
METHOD OF APPLICATION	
What do applicants need to complete in order to apply e.g. College scholarship application form/CV and covering letter/Research proposal?	CV and covering letter
Who should applications be sent to? <i>Please note: research scholarship applicants should be directed to a relevant member of academic staff or departmental administrator within the College, NOT the online applications portal.</i>	Name: Dr Richard Cobley Email address: richard.j.cobley@swansea.ac.uk
CONTACT DETAILS FOR ENQUIRIES	
Name	Dr Richard Cobley
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