JOB DESCRIPTION

<table>
<thead>
<tr>
<th>Job Title:</th>
<th>PDRA in Quantum Manipulation in Semiconductors</th>
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<tbody>
<tr>
<td>Department /Faculty:</td>
<td>Physics</td>
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<tr>
<td>Grade:</td>
<td>RHUL 7</td>
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<tr>
<td>Hours:</td>
<td>Full Time</td>
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<td>Reporting to:</td>
<td>Dr James Nicholls</td>
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<td>Responsible for:</td>
<td>Low temperature experiments associated with work packages WP2 and WP3 of Programme grant.</td>
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**Job Purpose**

The post is funded by an EPSRC Programme Grant “Non-Ergodic Quantum Manipulation” (EP/R029075/1) which is led by Professor Sir Michael Pepper at University College London (UCL). The grant started in January 2019 and besides Royal Holloway there are collaborating research groups at the University of Cambridge (growth, processing, and measurements) and the University of Birmingham (theory). The project will explore ways of decoupling the charged carriers from energy-loss mechanisms, which has potential applications in quantum technologies.

Funds for this post are available for 3 years in the first instance. The role will be to investigate nanostructure devices using electron transport (resistance, conductance) and thermal transport measurements (thermopower and thermal conductance). A key signature of many-body localisation is the observation of “slow energy”, a key milestone in the work packages associated with electrical (WP2) and thermal (WP3) measurements. Interactions with researchers at all four institutions, about the design, growth, processing, measurement of the devices, including interpretation of the results is an important feature of the Programme grant. To speed up sample development some fabrication and processing may be carried out in the new clean rooms in the Physics Department at Royal Holloway.

**Key responsibilities and outcomes: (most frequent duties first)**

1. Participate in the design, fabrication, characterisation and measurement of semiconductor samples; these will be predominantly be supplied through collaboration with the University of Cambridge and UCL.
2. Perform high quality low temperature electrical and thermal transport measurements of semiconductor samples.
3. Work with MSci and PhD students, taking day-to-day responsibility for good practice in the lab, and running of their experiments.
4. Present ongoing work at weekly research meetings and quarterly Programme grant meetings.
5. Write up results for publication.
Other duties:

- Maintain safe workplace practice and procedures in accordance with the requirements of Health and Safety legislation;
- Maintain an up to date knowledge of relevant statutory Health and Safety legislation and recommendations and attend safety training as required.
- To observe and comply with all College policies and regulations.
- Public dissemination of research and project outcomes, through web site. Take part in outreach activities, both associated with the grant and within the Physics Department.
- Any other duties as required by the line manager or Head of Department that are commensurate with the grade.

Internal and external relationships:

The following lists are not exhaustive but the post holder will be required to liaise with:

Internal: Principal Investigator (Nicholls); mechanical workshop technicians to maintain apparatus and design and build new measurement set-ups; electronics technician to make new circuits and to maintain low-noise measurement environment; PDRAs and academic staff within Department with similar technical and research interests; cryogenics technician to ensure smooth running of low temperature apparatus; Technical Operation Manager – to maintain a safe working lab according to codes of practice; Department Outreach officer.

External: with academic staff, PDRAs, technicians and PhD students within research groups in the programme grant (UCL, Cambridge and Birmingham); technical suppliers.

The University is committed to equality and diversity, and encourages applications from all sections of the community.