**JOB DESCRIPTION**

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| **Job Title:** Senior Research Associate in Ultralow Temperature Physics | **Present Grade:** 7 |
| **Department/College:** Department of Physics |
| **Directly responsible to:** Dr Samuli Autti |
| **Supervisory responsibility for:** N/A |
| **Other contacts****Internal:** Department and faculty academic colleagues and PhD students, departmental and faculty administration, technical staff.**External:** National and international collaboration partners on STFC QUEST-DMC project and H2020 European Microkelvin Platform. |
| **Major Duties:** The role holder will work with the members of the Ultralow Temperature Physics group, driving research in relevant ongoing superfluid research projects including SuperVac and the Lancaster work packages for the STFC-sponsored research programme QUEST-DMC. SuperVac is investigating the thermal and mechanical microstructure of superfluid 3He. QUEST-DMC is a collaboration between four research universities in the UK, using 3He as a dark matter detector and a simulator of cosmological phase transitions in the early Universe. The position is in support of the experimental programme of the permanent staff currently working in this field at Lancaster: Dr S Autti, Prof R P Haley, Dr S Kafanov, Dr J Prance, Dr M J Thompson, Prof V Tsepelin and Dr D Zmeev.Experience with experiments taking place in the millikelvin or ideally the microkelvin temperature region and familiarity with cryogenic technology such as superconducting magnets are essential. Knowledge of the theory of superfluid helium-3 or practical understanding of unconventional superfluidity (-conductivity) are desirable. The role holder will lead independent work on the design and construction of experiments aimed at achieving microkelvin temperatures in helium-3, and design new techniques for probing the properties of the superfluid condensate at these temperatures. Possible applied techniques will be custom superconducting magnets, low-noise NMR measurement techniques, and using nanomechanical resonators for bolometry and studying the microscopic structure of the superfluid. The role will involve the design, construction, testing and troubleshooting of specialist experimental cells mounted on a custom dilution refrigerator including an adiabatic demagnetistation cooling stage. The role holder will be able to plan, execute and analyse novel ultralow temperature experiments, taking a leading role in the research project. They will liaise with other members of the research group and collaborators; work with and direct technical staff; and instruct PhD students involved in the project. The role holder will write research papers, including those published in high impact peer-reviewed academic journals, and will disseminate results at national and international conferences. They will initiate and foster links and networks with researchers in similar and related fields at other institutions. |