



A hole new spin on quantum information

Postdoctoral Fellowship
University of New South Wales, Sydney



A 3 year postdoctoral fellowship in experimental quantum physics is available at the Department of Physics at the University of New South Wales in Sydney, Australia.

Prospective applicants should contact Alex.Hamilton@unsw.edu.au by 24 May 2021.

The Fellowship and is open internationally. The University of New South Wales is Australia's leading university for semiconductor quantum technologies, and is located in the heart of Sydney.

The research project will investigate hole spins in quantum dots. In the past decade intense research has been devoted in trapping electrons trapped in semiconductor quantum dots, initially to study the fundamental properties of artificial atoms, and subsequently to use the spin of the electrons as the basis for quantum information technologies. To date almost all research has focussed on the properties of electrons in semiconductor quantum dots. Our group has developed single *hole* quantum dots in Si, Ge, and GaAs. These positively charged semiconductor holes bring significant advantages for high speed qubits, and also reveal unexplored new physics. This is because of the much stronger spin-orbit interaction that exists in holes than electrons, allowing the hole spins to be manipulated simply by applying an electric field.

The research fellow will study holes trapped in semiconductor quantum dots, to perform all electrical control of hole spins, and to study hole quantum bits. Experiments will be conducted at ultra-low temperatures, using ultra-low noise electrical measurement and control techniques. The UNSW research group is well equipped, with multiple dilution refrigerators, cryostats and access to extensive clean-room facilities. For further details of the research group and project see <http://www.phys.unsw.edu.au/qed>

Applicants should be highly motivated, enjoy working in a team, and have a PhD in experimental condensed matter physics. Experience with one or more of: dilution refrigerators, RF reflectometry, circuit QED, and/or spin resonance techniques is an advantage. Further details of the position, and how to apply are here:

<https://external-careers.jobs.unsw.edu.au/cw/en/job/501827/postdoctoral-fellow>

