POSITION DESCRIPTION

Senior Device Processing Scientist

Position Level | B/C
Faculty/Division | Science
Position Number | 00095085
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Position Summary

The Senior Device Processing Scientist works with world-leading atomic electronics and quantum computing teams at Silicon Quantum Computing Pty Limited (SQC) and the Australian Centre of Excellence for Quantum Computation and Communication Technology (CQC^2T or Centre) based at UNSW Sydney.

The Senior Device Processing Scientist optimises the fabrication of nano to atomic scale devices in silicon. This includes the ongoing development of unique semiconductor fabrication techniques and processes utilising precision electron beam lithography, a mixture of dry and wet etching, evaporation and AFM techniques.

The Senior Device Processing Scientist works alongside the clean-room managers, device processing engineers, and atomic-scale device fabrication scientist to help develop efficient device manufacturing processes of high yield and quality and support the overall fabrication of globally unique quantum computer processors.

This position reports to Professor Michelle Simmons and works alongside other staff and students funded by SQC as well as CQC^2T. While this role does not have any direct reports, it is expected that they will assist where necessary with the supervision of other team members.

Accountabilities

Level B:

Specific accountabilities for this role include:

- Responsible for the reproducible execution of a globally unique atomic-scale device fabrication process of excellent quality.
- Drive the reproducible execution of device fabrication processes on a day-to-day basis.
- Responsible for the ongoing development of the atomic-scale device fabrication process for improved device metrics and high yield.
• Undertake detailed analysis of individual process steps for optimisation and improvement and provide thorough reports.
• Work closely with clean-room managers and device processing engineers to maintain the clean-room processing equipment in optimal working condition.
• Provide technical assistance and training to the research staff and students working on the current process.
• Liaise with Prof. M.Y. Simmons and her leadership team to ensure efficient delivery of atomic-scale devices.
• Implement safety systems including OH&S, hazardous substances, risk assessments and conformance with AS’s codes.
• Align with and actively demonstrate the UNSW Values in Action: Our Behaviours and the UNSW Code of Conduct.
• Cooperate with all health and safety policies and procedures of the university and take all reasonable care to ensure that your actions or omissions do not impact on the health and safety of yourself or others.

Level C:
In addition to the above:
• Assume a significant role in research projects including, where appropriate, leadership of a research team.
• Contribute to the long-term strategic planning and development of SQC projects.
• Design and implement experiments/projects for troubleshooting processing issues and improving the yield and efficiency of atomic-scale device fabrication process.
• Responsible for the training and guidance of cleanroom engineers and scientists.
• Supervise a program of study of postgraduate students.

Skills and Experience

Level B:
• PhD in Physics, Materials Science, Engineering, or relevant field desired, with at significant work experience in a research environment.
• Significant hands-on experience of clean room processing on a day-to-day basis
• Extensive semiconductor clean room processing expertise, including specifically the use of electron beam lithography, optical lithography and atomic force microscopy.
• Experience of acid etching (including HF etching), dry etching, metal evaporation, annealing, resist spinning, silicon cleaving, bonding and characterisation by optical and scanning electron and capacitive microscopy.
• Experience of working in close knit teams to optimise complex semiconductor device processes.
• Experience of developing semiconductor device fabrication recipes.
• Experience in troubleshooting and solving complex fabrication issues.
• Well-organised, attention to detail and ability to meet deadlines.
• Demonstrated ability to work effectively in a multidisciplinary team.
• An understanding of and commitment to UNSW’s aims, objectives and values in action, together with relevant policies and guidelines.
• Knowledge of health and safety responsibilities and commitment to attending relevant health and safety training.

Level C:
In addition to the above

• Substantial experience in a research environment, including hands-on experience of cleanroom processing.
• Extensive experience in fabrication and research of nanostructured and mesoscopic devices on semiconductor materials, such as silicon, III-V semiconductors, etc.
• Demonstrated ability to conduct independent research.
• An excellent research track record in the discipline area.
• Significant experience in HDR student supervision.