

Optimising silicon/silicon-germanium quantum dot qubits  
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Silicon/silicon-germanium (Si/SiGe) quantum well heterostructures comprise a leading materials system for hosting semiconducting quantum dot qubits. This talk will present our recent theoretical work that demonstrates that qubits in Si/SiGe heterostructures are affected strongly by compositional disorder in the SiGe and discusses how this understanding can be exploited to optimise quantum dot qubits in Si/SiGe.

References:

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MP Losert, et al., Practical strategies for enhancing the valley splitting in Si/SiGe quantum wells. *Physical Review B*, 108(12), 125405 (2023).

MP Losert et al., Strategies for enhancing spin-shuttling fidelities in Si/SiGe quantum wells with random-alloy disorder, preprint arXiv:2405.01832