
MA 29: Invited Talk Ardavan

Time: Thursday 9:30–10:00

Location: HSZ 04

Invited Talk MA 29.1 Thu 9:30 HSZ 04
Quantum information processing with electron spin resonance — ●ARZHANG ARDAVAN — The Clarendon Laboratory, Department of Physics, University of Oxford

Electron spin systems were among the earliest proposed physical embodiments of quantum information processors. We have addressed a range of basic questions surrounding the practicalities of exploiting electron spins as qubits. We have shown that electron spin resonance

can be used to perform quantum gates with a very high fidelity. We have studied the prospects for application of various candidate spin systems including N@C60 (a nitrogen atom encapsulated in a fullerene cage), molecular nanomagnets and phosphorus donors in silicon (P:Si). While in molecular nanomagnets magnetic nuclei in the vicinity of the electron qubit provides the dominant decoherence path, we have found that in N@C60 and P:Si nuclear moments can provide a valuable subsidiary resource in a quantum information processor.