Proposed Universal Deutsch Gate Circuitry Using GaAs/InAs Quantum Dots PAUL BAILEY, JEAN-FRANCOIS VAN HUELE, Brigham Young University — The Deutsch gate is a universal quantum logic gate, meaning that any quantum computing task can be completed using only a series of Deutsch gates. Although a proposal exists to build a Deutsch gate using Rydberg atoms [X-F Shi, Phys. Rev. Applied **9**, 051001], to our knowledge no Deutsch gate has been experimentally realized. We propose to combine two GaAs/InAs quantum dots described by [Bouwmeester et al., Phys. Rev. Lett. **104**, 160503] with photon polarization in a larger circuit comprised of linear optical elements to create a spin-spin-photon polarization three qubit Deutsch Gate. In this talk we display the circuit and discuss the intricacies of designing a universal gate.

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