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**Andrew M Childs, David Gosset\*** (dngosset@gmail.com) and **Zak Webb**. *Universal computation by multi-particle quantum walk.*

Multi-particle quantum walk includes well-known physical systems of interacting particles on graphs, such as the Bose-Hubbard model and models with nearest-neighbor interactions. We show how multi-particle quantum walk can efficiently simulate a universal quantum computer. In principle, our construction provides an architecture for a quantum computer which does not require time-dependent control. (Received September 12, 2012)