

Abstract Submitted  
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**Ultracold Atom-Ion Schemes for Quantum Information** DIEGO VALENTE, ROBIN CÔTÉ, University of Connecticut — We present a hybrid platform for quantum information processing and quantum simulations that is based on ultracold atom-ion systems, and seeks to combine the advantages of other platforms that are already well established experimentally. By combining together the long coherence times of neutral atoms and the strong interactions of trapped ions we obtain unique properties that are not present in each of these subsystems when alone. We discuss the feasibility of these schemes for quantum information processing, as well as decoherence phenomena that will limit the effectiveness of this new platform for specific physical systems.

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