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Quantum computing with micro-fabricated ion traps

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Over the last decade the field of quantum computing has evolved by placing increasing emphasis on engineering and device physics. For systems which use ion qubits, one of the main manifestations of this emphasis is the work on micro-fabricated ion traps. Using semiconductor processing techniques such as lithography, Sandia National Labs has fabricated many different trap designs in support of experimental quantum computing efforts. My talk will first describe what constitutes an ion qubit and how one is manipulated. Following that I will discuss how micro-fabricated ion traps work, how they are characterized and tested, and how they have supported novel experiments in the field of quantum computing.

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