

Abstract Submitted
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Degenerate Quantum Gases of Strontium SIMON STELLMER, 1, MENG KHOON TEY, 2, MARK PARIGGER, 1, RUDOLF GRIMM, 1,2, FLORIAN SCHRECK, 2, INSTITUT FUER EXPERIMENTALPHYSIK AND ZENTRUM FUER QUANTENPHYSIK, UNIVERSITAET INNSBRUCK TEAM, INSTITUT FUER QUANTENOPTIK UND QUANTENINFORMATION TEAM — The alkaline-earth elements differ significantly from the alkalis, namely by the presence of metastable triplet states, narrow optical transitions, and a decoupling of nuclear and electronic spin in the ground state. Notably, there exists a fermionic isotope of strontium with a large nuclear spin. Recent proposals use these features for novel schemes of quantum computation and for simulations of lattice spin models. These proposals require deeply degenerate and well-controlled samples of atoms in optical lattices. As a prerequisite of such studies, we have achieved Bose-Einstein condensation of bosonic isotopes of strontium, spin-polarized Fermi gases, and combinations of the two, and we will present new work on the bosonic isotopes towards the realization of quantum simulation schemes.

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