

E. Rico Ortega: *Atomic Quantum Simulation of  $U(N)$  and  $SU(N)$  Non-Abelian Lattice Gauge Theories*

Using ultracold alkaline-earth atoms in optical lattices, we construct a quantum simulator for  $U(N)$  and  $SU(N)$  lattice gauge theories with fermionic matter based on quantum link models. These systems share qualitative features with QCD, including chiral symmetry breaking and restoration at non-zero temperature or baryon density. Unlike classical simulations, a quantum simulator does not suffer from sign problems and can address the corresponding chiral dynamics in real time.