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Cold atom quantum emulation with ultracold lithium and strontium[1] SHANKARI RAJAGOPAL, RUWAN SENARATNE, ZACHARY GEIGER, KURT FUJIWARA, KEVIN SINGH, DAVID WELD, Physics Department, University of California, Santa Barbara, and California Institute for Quantum Emulation — We discuss progress towards cold atom quantum emulation of nonequilibrium dynamics in optical lattices, focusing on quasiperiodic and strongly-driven systems using lithium and strontium. Tunable interactions in lithium grant access to an added dimension of parameter space to explore in such systems, which could uncover rich physics. The high nuclear spin of fermionic strontium presents opportunities to study interactions in spin-dependent lattices and develop novel cooling techniques. We also describe construction of a single-site resolution imaging chamber for strontium, including a novel bio-inspired imaging scheme that makes use of a dark metastable state.

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