

Abstract Submitted
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Exploring strongly correlated matter with exotic atoms MINGWU LU, SEO HO YOUN, RICHARD TURNER, MATTHEW NAIDES, NATHANIEL BURDICK, ALICIA KOLLAR, NOBIE REDMON, BENJAMIN LEV, University of Illinois at Urbana-Champaign — Advances in the quantum manipulation of ultracold atomic gases are opening a new frontier in the quest to better understand strongly correlated matter. By exploiting the long-range and anisotropic character of the dipole-dipole interaction, we hope to create novel forms of quantum mesophases, states of quantum soft matter intermediate between canonical states of order and disorder. This poster presents recent advances in the laser cooling and trapping of the most magnetic atom, dysprosium, which should allow investigations of quantum liquid crystals, mesophases thought to exist in, e.g., high T_c cuprate superconductors. In addition, Dy will form the key ingredient in hybrid quantum circuits as well as in novel scanning probes using atom chips.

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