

Abstract Submitted
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Towards ultracold RbCa molecules¹ MICHAELA KLEINERT, HAYLEY WHITSON, ALEXANDRIA PARSAGIAN, Willamette University — Ultracold heteronuclear molecules have seen increasing interest in the scientific community over the last few years. By controlling their ro-vibrational energy levels, ultracold molecules can be used for high precision spectroscopy, to study cold collisions with rich internal dynamics, as model systems for condensed matter physics, and as qubits in quantum information processing. We study the novel combination RbCa. In addition to a permanent electric dipole moment, it also possesses a permanent magnetic dipole moment. This makes it an ideal candidate to study strong long-range dipole-dipole interactions. We are currently in the process of adding a Ca MOT to our existing Rb MOT and will discuss our current and future efforts toward our goal of creating, for the first time, ultracold RbCa molecules. Molecules, once created, will be detected through resonantly enhanced multi-photon ionization (REMPI). We have also performed *ab initio* calculations to determine the electronic energy levels of RbCa, and calculated Franck-Condon factors between the ground and several excited states

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