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Interaction of single atoms in optical tweezers[1] YICHAO YU, LEE LIU, KENNETH WANG, LEWIS PICARD, JONATHAN HOOD, TILL ROSENBAND, KANG-KUEN NI, Harvard University — Ultracold polar molecules have long-range, anisotropic, tunable interactions providing a versatile platform for studying quantum many-body physics, quantum information, and quantum simulation. The full quantum state control of atoms trapped in optical tweezers could be utilized to study the interaction between single atoms and to coherently create diatomic molecules with high fidelity and low entropy. Based on spectroscopy with single Na and Cs atoms trapped in optical tweezers, I will present results on the scattering lengths between Na and Cs atoms and the observation of NaCs molecular states. These measurements improved upon previous predictions of NaCs molecular properties and refined our scheme on creating ground state NaCs molecules.

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Yichao Yu
Harvard University

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