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Progress Towards a Quantum Degenerate Mixture with Extreme Mass Imbalance B. J. DESALVO, JACOB JOHANSEN, CHENG CHIN, The James Franck Institute, The Enrico Fermi Institute, and Department of Physics, The University of Chicago — We report experimental progress towards a quantum degenerate Bose-Fermi mixture of ^{133}Cs and ^6Li . Beyond providing the largest mass imbalance of any bi-alkali mixture, this system exhibits multiple interspecies Feshbach resonances allowing wide tuning of the interaction strength and Efimov resonances potentially inducing three-body interactions. The use of a dual-color optical dipole trap in our experiment overcomes the large differential gravitational sag due to the mass imbalance and facilitates mixing the species nano-Kelvin temperatures allowing precision studies of interspecies interactions. Turning from few-body physics to many-body, we will present our efforts to reach simultaneous quantum degeneracy as well as discuss prospects of high resolution imaging of both species.

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