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Triply degenerate quantum mixture of ^{41}K, ^{40}K and ^{6}Li PEYMAN AHMADI, CHENG-HSUN WU, IBON SANTIAGO, JEE WOO PARK, MARTIN ZWIERLEIN, Massachusetts Institute of Technology — We report the observation of a triply quantum degenerate mixture of ^{41}K, ^{40}K and ^{6}Li atoms. It is demonstrated that bosonic ^{41}K atom is an efficient coolant for sympathetic cooling of fermionic ^{40}K and ^{6}Li atoms. The ^{40}K and ^{6}Li mixture provides access to a strongly correlated Fermi-Fermi mixture allowing us to study superfluidity and Cooper pairing with imbalanced masses. We also present our investigation of ^{41}K and ^{40}K, a Bose-Fermi mixture where a 12 G p-wave resonance and a 40 G s-wave resonance are observed. Negligible differential gravitational sag between ^{41}K and ^{40}K makes these resonances excellent candidates for studying unexplored properties of Bose-Fermi mixtures such as Boson mediated Cooper pairing.

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