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Progress towards a rapid production of a two-species mixture of quantum degenerate Bose and Fermi gases HAOXIANG YANG, LIYUAN QIU, TIAN TIAN, XIANGHAO MU, Tsinghua Univ, YINGMEI LIU, Oklahoma State Univ, LUMING DUAN, Univ of Michigan Tsinghua Univ — We present the design and construction of a novel apparatus to rapidly generate a mixture of quantum degenerate ^{6}Li Fermi and ^{23}Na Bose gases. Sodium and lithium atoms are collected in a two-species magnetic-optical trap and cooled to around 40 microKelvin through a three-step polarization gradient cooling process. The cold dense atomic clouds are then transferred to a tightly-focused crossed optical trap. Sodium Bose-Einstein condensates are generated from evaporation and rethermalization via a simple all-optical approach, while a quantum degenerate ^{6}Li Fermi gas is produced through interspecies sympathetic cooling. We also discuss how to optimize the efficiency of sympathetic cooling in the ^{23}Na-^{6}Li system.

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