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A New Lithium (Li)–Cesium (Cs) Machine for The Study of Quasiparticle Localization in Bose-Einstein Condensates. YI-DONG CHEN, WEI-XUAN LI, CHIA-SHAN LI, AI-LIN CHEN, MIN-EN CHOU, CHUN-HSIEN KUO, CHEN-YU JHANG, SHIH-KUANG TUNG, Department of Physics, National Tsing-Hua University, Taiwan — Mixtures of quantum gases provide opportunities to explore new phenomenon and to verify theories that are beyond the extent of single component systems. Here we propose a new Li–Cs machine to study the fascinating physics lying behind the mixtures. The machine is designed to create both Bose-Bose ^{133}Cs–^{7}Li and Bose-Fermi ^{133}Cs–^{6}Li mixtures. Exploiting the huge disparity in Li and Cs, we plan to study quasiparticle localization in Bose-Einstein condensates, one species acting as disorder for quasiparticles of the second species, and also use the machine to study systems composed of two kinds of superfluid with large mass disparity and different statistics.

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