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Kondo Metal and Ferrimagnetic Insulator on the Triangular Kagome Lattice YAO-HUA CHEN, Texas Center for Superconductivity and Department of Physics, University of Houston, Houston, Texas 77204, USA, HONG-SHUAI TAO, Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, China, DAO-XIN YAO, State Key Laboratory of Optoelectronic Materials and Technologies, Sun Yat-sen University, Guangzhou 510275, China, WU-MING LIU, Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, China — We obtain the rich phase diagrams in the Hubbard model on the triangular kagome lattice as a function of interaction, temperature and asymmetry, by combining the cellular dynamical mean-field theory with the continuous time quantum Monte Carlo method. The phase diagrams show the asymmetry separates the critical points in Mott transition of two sublattices on the triangular kagome lattice and produces two novel phases called plaquette insulator with a clearly visible gap and a gapless Kondo metal. When the Coulomb interaction is stronger than the critical value U_c, a short range paramagnetic insulating state emerges before the ferrimagnetic order is formed independent of asymmetry. Furthermore, we discuss how to measure these phases in future experiments.

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