New Kagomé Metal Sc$_3$Mn$_3$Al$_7$Si$_5$— Quantum Spin-Liquid Candidate?\(^1\) HUA HE, WOJCIECH MIİLLER, Stony Brook University, MEIGAN ARONSON, Stony Brook University; Brookhaven National Laboratory — While most of the reported Kagomé systems are semiconductors or insulators, in which the magnetic moments have a highly localized character, here we present a new intermetallic compound, Sc$_3$Mn$_3$Al$_7$Si$_5$, as a rare example of a Kagomé metal. The structure of the compound was established by single-crystal X-ray diffraction, and it crystallizes with a hexagonal structure (Sc$_3$Ni$_{11}$Si$_4$ type) with Mn atoms forming the Kagomé lattice. The dc magnetic susceptibility measurements find a Curie-Weiss moment of $\sim 0.51 \mu_B$/Mn, however, no magnetic order is found for temperatures as low as 1.8 K. Electrical resistivity and heat capacity measurements show that this compound is definitively metallic, with an enhanced specific heat Sommerfeld coefficient below 10K, indicating strong electronic correlations. Intriguingly, these features have revealed Sc$_3$Mn$_3$Al$_7$Si$_5$ as a possible quantum spin liquid. The role of the geometrically frustrated structure and Mn-ligand hybridization in the magnetism of Sc$_3$Mn$_3$Al$_7$Si$_5$ is also discussed.

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Hua He
Stony Brook University

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