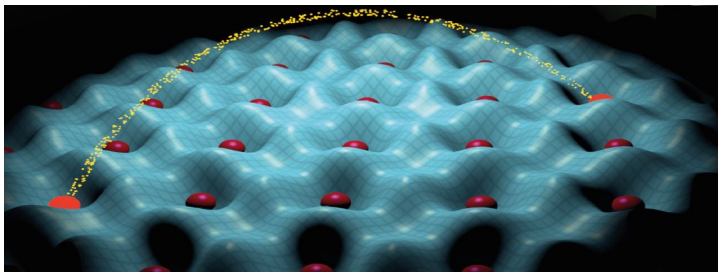

Contribution ID: **12** Type: **not specified**

”Replica symmetry breaking in a quantum-optical vector spin glass”

Tuesday 18 June 2024 10:00 (1 hour)

Spin glasses are canonical examples of complex matter. Although much about their structure remains uncertain, they inform the description of a wide array of complex phenomena, ranging from magnetic ordering in metals with impurities to aspects of evolution, protein folding, climate models, combinatorial optimization, and artificial intelligence. Advancing experimental insight into their structure requires repeatable control over microscopic degrees of freedom. I will present how we achieved this at the atomic level using a quantum optical system comprised of ultracold gases of atoms coupled via photons resonating within a confocal cavity. This realizes an unusual form of transverse-field vector spin glass with all-to-all connectivity. The controllability provided by this new spin-glass system may enable the study of spin glass physics in novel regimes, with application to quantum associative memory.

Presenter: LEV, Ben (Stanford University)