Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Experimental realization of a new quantum spin liquid. BELLA LAKE, CHRISTIAN BATZ, JOHANNES REUTHER, Helmholtz Zentrum Berlin, Germany, HUBERTUS LUETKENS, Paul Scherrer Institut, Switzerland, RICO SCHNEMANN, THOMAS HERRMANNSDRFER, Helmholtz Zentrum Dresden Rossendorf, Germany, YOGESH SINGH, Indian Institute of Science Education and Research Mohali, India, A. T. M. NAZMUL ISLAM, Helmholtz Zentrum Berlin, Germany, ELISA M. WHEELER, Institut Laue-Langevin, Grenoble, France, JOSE A. RODRIGUEZ-RIVERA, TATIANA GUIDI, National Institute of Standards and Technology, Gaithersburg, USA, GIOVANNA G. SIMEONI, Technische Universitat Mnchen, Germany, CHRIS BAINES, Paul Scherrer Institut, Switzerland, HANJO RYLL, Helmholtz Zentrum Berlin, Germany — Unlike conventional magnets where the magnetic moments are partially or completely static in the ground state, in a quantum spin liquid they remain in collective motion down to the lowest temperatures. Despite an extensive search among such compounds, experimental realizations remain very few. Here we investigate the new spin-1/2 magnet, $Ca_{10}Cr_7O_{28}$, which has a unexplored lattice with several isotropic interactions consisting of strong ferromagnetic and weaker antiferromagnetic couplings. Bulk properties measurements, neutron scattering and muon spin relaxation reveal coherent spin dynamics in the ground state, the complete absence of static magnetism and diffuse spinon-like excitations. Thus we show experimentally that it displays all the features expected of a quantum spin liquid.

Bella Lake
Helmholtz Zentrum Berlin, Germany

Date submitted: 13 Jan 2017 Electronic form version 1.4