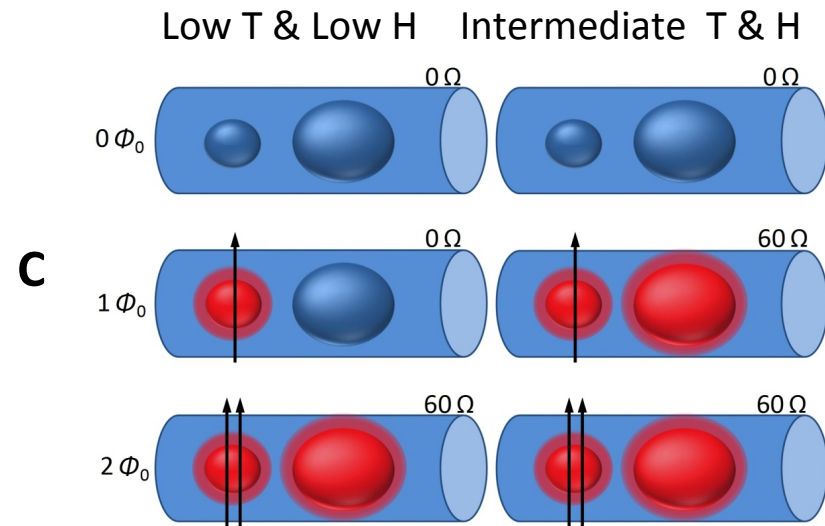
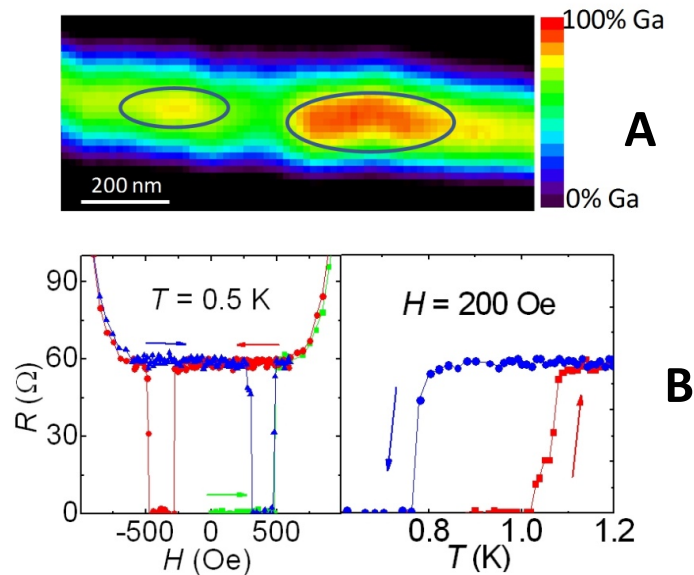


Single-Fluxon Controlled Resistance Switching in Centimeter Long Nanowires

Weiwei Zhao, Jesse L. Bischof, Jimmy Hutasoit, Xin Liu, Thomas C. Fitzgibbons, John R. Hayes, Pier J.A. Sazio, Chaoxing Liu, Jainendra K. Jain, John V. Badding and M. H. W. Chan



Resistance measurements were made as a function of temperature and magnetic field on a 6 mm long Ga-In eutectic nanowire confined in a hollow glass fiber of 150nm inner diameter. Novel hysteretic switching between stable superconducting and resistive states are seen. The nonzero resistance occurs when a Ga nanodroplet spontaneously formed along the length of the nanowire traps one or more superconducting fluxons, thereby driving a Josephson weak-link created by a second nearby Ga nanodroplet normal. This experiment opens the possibility of developing single-fluxon logic and memory devices.