Majorana bound states in atomic structures

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Majorana bound states are zero-energy excitations localized at the edge of a one-dimensional (1D) topological superconductor. These excitations are predicted to exhibit non-Abelian statistics upon exchange and therefore viewed as a starting point for topological quantum information processing. So far, spectroscopy of Majorana states are reported in several 1D systems including semiconducting nanowires and atomic chains coupled to usual s-wave superconductors. In this talk, I will review current experiments on ferromagnetic iron atomic chains on the surface of superconducting lead and discuss efforts aiming at achieving control of Majorana bound states in atomic structures.