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Controlling the Spin State of Individual Cobalt Adatoms and Molecules

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The spin of individual magnetic atoms and molecules at surfaces is of fundamental interest and may play an important role in future atomic-scale technologies, among them classical and quantum computation. In this talk we demonstrate the ability to manipulate the spin state and associated magnetic properties of individual cobalt adatoms by the controlled attachment of molecular ligands. The spin state of the cobalt adatoms and complexes is determined via the Kondo resonance by low-temperature scanning tunneling spectroscopy. Spatial Kondo resonance mapping is also introduced as novel imaging tool to localize spin centers in magnetic molecules with atomic precision.