Single Molecule Magnetism for Quantum Information Storage

Selected Reference(s): 1) "***What is not required to make a single molecule magnet***", *Faraday Discuss*., **2011**, *148*,, 229–238; 2) "***Electronic read-out of a single nuclear spin using a molecular spin transistor***", *Nature*, **2012 (August 16th)**, *488*,, 357-360; doi:10.1038/nature11341

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Worldwide information demands increase yearly and are currently on the order of Zettabytes (trillions of Gigabytes). Because of this, the study of more compact means of information storage and more powerful computational implementations are indispensable for the modern age. Sessoli and coworkers' discovery of magnetically bistable molecules at liquid helium temperatures has led to a new field of molecular spintronics associated with high spin molecules of high magnetic anisotropy. The search for, and synthesis of, these molecules are possible and have been achieved many times; however, not without difficulty. It is through the coordination (forgive the pun) of synthetic inorganic chemists, spectroscopists, and computational chemists that the single nuclear spins of these compounds may be measured, improved, compared to each other. Work in this field continues today to generate bistability above liquid nitrogen temperatures and warmer. This talk is a summary of some important moments in creation and growth of this extremely interesting field of quantum chemistry.