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Super-Colossal Magnetoresistance in Magnetic / Superconducting Oxides[1] CARLOS SA DE MELO, Georgia Institute of Technology — I discuss the super-colossal magneto-resistive effect in complex magnetic/superconducting oxides. In nanometer scale manganite/cuprate heterostructures it is possible to change the magneto-resistance of the nano-heterostructure by several orders of magnitude through the application of a small parallel magnetic field. When consecutive manganite layers are coupled antiferromagneticaly, superexchange fields cancel out in the sandwiched cuprate atomic layer and the heterostructure is superconducting at low temperatures. When a small parallel field is applied to the heterostructure the magnetizations in the manganite layers align and the superexchange fields add up in the cuprate layers, thus destroying its superconductivity. This results in the "super-colossal magneto-resistive effect"[1]. In my talk I will describe the microscopic theory that produces such effect.
[1] C. A. R. Sa de Melo, submitted (2004).

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