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**Magnetoresistive  $\text{La}_{0.67}\text{Sr}_{0.33}\text{MnO}_3$  Nanowires** CHAO LI, Univ. of Southern California, BO LEI, CHONGWU ZHOU, USC TEAM — We report the synthesis of novel  $\text{La}_{0.67}\text{Sr}_{0.33}\text{MnO}_3$  (LSMO) nanowires and the observations of intriguing magnetoresistance phenomena. These nanowires were synthesized by depositing an epitaxial shell of LSMO onto MgO nanowires, thereby rendering single-crystalline MgO/LSMO core-shell structures. Transport studies on these nanowires have revealed a remarkable metal-insulator transition at 325 K, accompanied by room-temperature colossal magnetoresistance  $\sim 10\%$  under a one-Tesla magnetic field. In addition, anisotropic magnetoresistance was observed at room temperature with a 1.4% resistance variation between magnetic fields parallel and perpendicular to the nanowire. Furthermore, polycrystalline LSMO have been obtained by tuning the synthesis condition, leading to a low-field magnetoresistance up to 16 % at 0.06 T. This is attributed to the spin-dependent scattering of polarized electrons at the grain boundaries, with underlying physics similar to the giant magnetoresistance. Our study demonstrates the advantages of one-dimensional magnetic oxide nanowires and may lead to novel applications in the near future.

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