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Multiferroic $BiFeO_3/BiCrO_3$ superlattices MARK HUIJBEN, COLLEEN KANTNER, QIAN ZHAN, JOSEPH ORENSTEIN, RAMAMOORTHY RAMESH, Physics Department, University of California, Berkeley — There is currently an increasing interest into multiferroic materials. Although a large number of potential applications can be envisaged, there are currently no known single-phase materials that show large, robust magnetization and polarization at room temperature. Theoretical calculations of artificially constructed (111) layered double perovskite Bi_2FeCrO_6 predict them to be ferrimagnetic (with a magnetic moment of 2 μ_B per formula unit) and ferroelectric (with a polarization of $\sim$80 $\mu C/cm^2$). A high degree of control over the layer composition is required to accomplish this. In this work we fabricated such epitaxial $BiFeO_3/BiCrO_3$ superlattices by laser-MBE during which the growth was controlled on the atomic scale by reflection high energy electron diffraction. We will report results of structural, chemical, electrical and magnetic measurements of such superlattices.

Mark Huijben
Physics Department, University of California, Berkeley

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