Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

**Novel ferroelectrics in AA/BB/$O_6$ perovskites with double rock-salt order** GUUS RIJNDERS, JEROEN BLOK, DAVE H.A. BLANK, MESA+ Institute for Nanotechnology/University of Twente, INORGANIC MATERIALS SCIENCE TEAM — In recent years, the effect of strain and symmetry on the properties of epitaxial ferroelectric perovskites ($ABO_3$) has been studied by many groups. However in most cases the studied systems were grown on (001) oriented substrates. Growing ferroelectrics in the <111> direction allows us to apply strain in a different way and, furthermore, if [1:1] superlattices are grown of two different materials it would result in films where the neighboring atoms on both A-site and B-site are always different. The symmetry in such double perovskites will be altered and interesting and unique ferroelectric properties are expected. We fabricated such double perovskite superlattices in the <111> direction. Using strain matching (that is selecting materials with equal, but opposite strain), we managed to keep the surface of the superlattice atomically smooth even after the growth of 100 monolayers. We will show this for the growth of a $CaTiO_3$ - $SrMnO_3$ as well as $CaTiO_3$ - $BiFeO_3$ superlattices on a (111) $LaAlO_3$ and $SrTiO_3$ substrate. We have used X-ray diffraction to show that the superlattice is fully strained to the substrates. In this contribution we will focus on the growth and structural properties of the superlattices, as well as the resulting properties.

Guus Rijnders
MESA+ Institute for Nanotechnology/University of Twente

Date submitted: 23 Nov 2009 Electronic form version 1.4