Supplementary Information for

Patterning Oxide Nanopillars at the Atomic Scale by Phase Transformation

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Figure S1

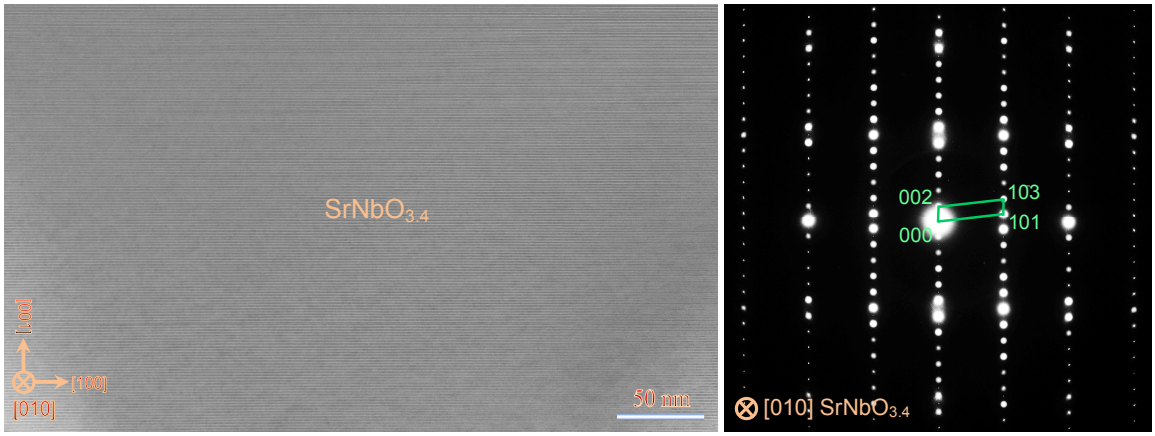

Figure S1. Bright-field TEM image and selected area electron diffraction pattern of $SrNbO_{3.4}$. The bright-field TEM image shows crystal structure and morphology of a $SrNbO_{3.4}$ single crystal. The electron beam is along [010] direction. The homogeneous image contrast indicates that there is no secondary phase in this single crystal.

Figure S2

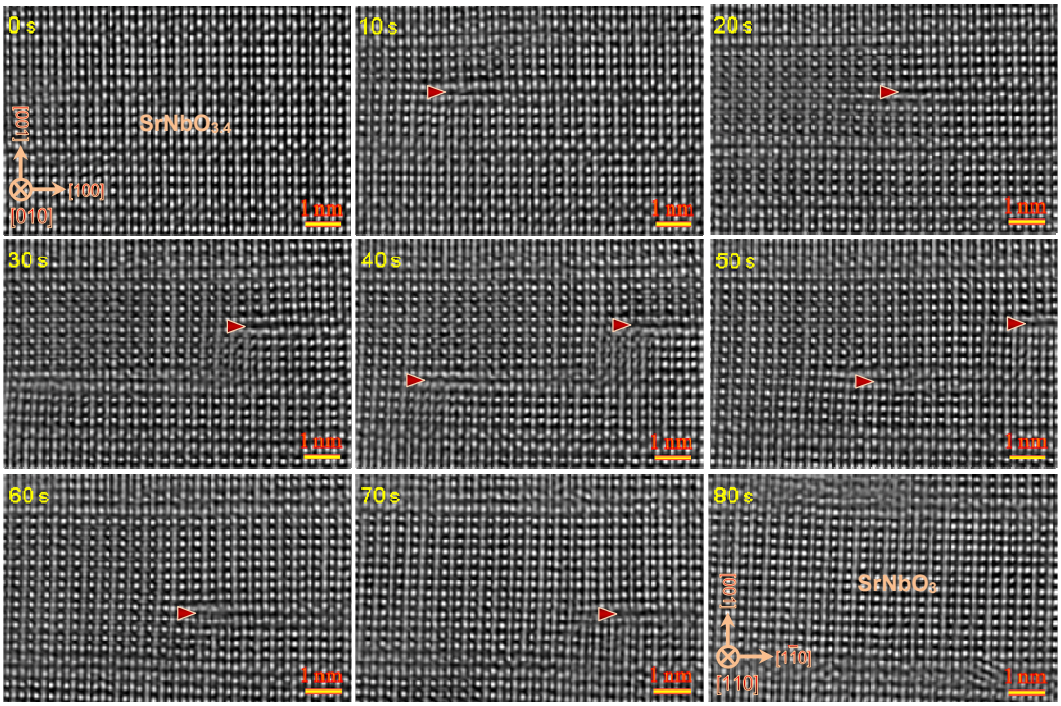

Figure S2. In-situ high-resolution TEM imaging of the phase transformation of $SrNbO_{3.4}$. A Series of HRTEM images as a function of the elapsed time during electron irradiation. The $SrNbO_{3.4}$ phase transforms partially into the $SrNbO_3$ phase induced by the electron irradiation. The layered structure of the $SrNbO_{3.4}$ is visible along the [010] zone axis at the initial stage (0 s). After irradiation for 80 s, the $SrNbO_{3.4}$ phase is completely transformed into the $SrNbO_3$ phase. The arrows indicate the region where the phase transformation initiates. The whole phase transformation process can also be viewed in the Supplementary Movie, which is created by a successive recording of the HRTEM images.