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Electronic Supplementary Information

Facet-dependent optical and electrical properties of SrTiO₃ wafers

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Probe preparation

The tungsten probes were fabricated from 99.95% tungsten wires with a diameter of 0.5 mm (Strem Chemical Inc.). The tungsten wires were straightened and cut into pieces of 3 cm. Next, the wires were dipped into a 2.0 M NaOH electrolyte solution and applied a current of 1 A at a voltage of 15 V to sharpen the tips. The tips should be sequentially immersed in a 10 M KOH solution and deionized water for 3 sec each to remove the surface tungsten oxide layer and any ions from the tip surface.



Fig. S1 Crystal structure of SrTiO₃.



Fig. S2 (a) Drawing showing a 45° cut over the $\{100\}$ SrTiO₃ wafer produces $\{110\}$ side faces. (b) For a $\{111\}$ wafer, cuts creating 120° angle produces $\{110\}$ side faces. The triangular and cubic shapes are drawn to assist understanding why $\{110\}$ side faces are formed.



Fig. S3 (a) Schematic diagram and (b) the recorded photoluminescence spectra of SrTiO₃ wafers.



Fig. S4 (a–c) Multiple *I–V* curves recorded with tungsten probes contacting (a) {100}, (b) {110}, and (c) {111} faces of SrTiO₃ wafers. (d, f) Multiple *I–V* curve obtained for the (e) {100}/{110} and (f) {111}/{110} combinations of SrTiO₃ wafers.



Fig. S5 Photographs showing the nanomanipulator and SrTiO₃ wafers placed on the sample holder.