Scientific Achievement
An instrument for spatially resolved Seebeck coefficient measurements has been developed and applied to test Zn-Co-O and Ni-Co-O combinatorial sample libraries.

Significance and Impact
The instrument can quickly determine the type and estimate the density of the majority carriers in new materials (holes/electrons) and can do high-throughput screening of optoelectronic and thermoelectric materials.

Research Details

Design Feature: Steady-state temperature gradient coupled to scanning probe voltage measurements (Fig. 1).

Benefit: Temperature-dependent Seebeck coefficient measurements up to 400 °C.

Materials Result: Co-M-O (M=Zn, Ni) are p-type electric conductors across a wide compositional range (Fig. 2).
