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**ZnO Nanowires for PV: Size Control and Scalability Studies** DAR-LENE GUNTHER, JENIFER LAWRIE, Fisk University, AKIRA UEDA, Professor, Fisk University, RICHARD MU, Advisor, Fisk University — Our research attempts to understand the carbothermal vapor- solid growth process for novel ZnO nanowires (NW's). In addition to being a relatively simple growth process, the ZnO NW's, most often n- type, have high electron mobility and a large bandgap (3.4 eV). This makes them an attractive electron conductor. Our team expects these ZnO NW's to provide a means of reducing the charge recombination problems currently hampering the efficiencies of photovoltaic (PV) cells. Current growth methods are limited to small sample sizes in a horizontal tube furnace. We propose an innovative vertical design that provides optimal control of the growth parameters, allowing us to study each of the factors to determine their role in growing the required ZnO structures, e.g. gas flow turbulence, oxygen supply, distance from source to substrate, temperature control and uniform density. We report the results of our initial experiments where we grew dense ZnO nw's on a large (11.3 x 44.8 mm) silicon substrate (100).

> Darlene Gunther Fisk University

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