

Abstract Submitted
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Integrated Multilayer Nanogenerator Fabricated Using Paired Nanotip-to-Nanowire Brushes¹ YAGUANG WEI, SHENG XU, RUSEN YANG, ZHONGLIN WANG, SCHOOL OF MATERIALS SCIENCE AND ENGINEERING, GEORGIA INSTITUTE OF TECHNOLOGY TEAM — We present a new approach to a nanogenerator (NG) that is composed of integrated, paired nanobrushes made of pyramid-shaped metal coated on nanotip (NTP) arrays and hexagonal-prism-shaped ZnO nanowire (NW) arrays, which were synthesized using a chemical approach at <100 °C on the two surfaces of a common substrate, respectively. With one piece of such a structure stacked in close proximity over another to form a layer-by-layer matched brush architecture, direct current is generated by exciting the architecture using ultrasonic waves. A four-layer integrated NG is demonstrated to generate an output power density of $0.11 \mu\text{W}/\text{cm}^2$ at 62 mV. The layer-by-layer assembly provides a feasible technology for building three dimensional NGs for applications where force or pressure variations are available.

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