

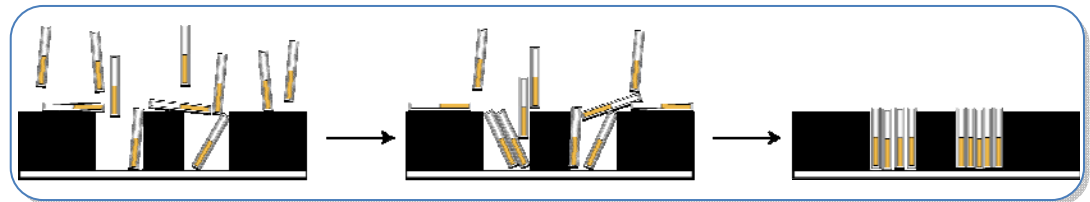
Versatile bottom-up approach to nanostructured solar cells **PENNSTATE**



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Columnar arrays are of interest to harvest solar energy. We developed a self-assembly technique to position and vertically orient anisotropic nanoparticles with offset centers of mass. We discovered that microwells both directed and enhanced these assemblies. In fact, solid nanowires (with no offset in their center of mass) assembled, thereby expanding our available materials. Wells also allowed drying, thus surface anchoring was explored on both flexible and inflexible substrates.



Electrodeposited Metal

MacroScale

SEM

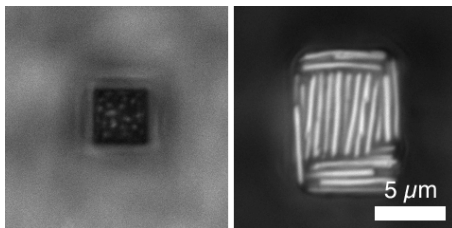
Side

Top

PDMS

PDMS

An illustration of particle anchoring techniques. Macro-scale images of the resulting material and electron micrographs are to the right.



Reflectance micrographs (taken from below) of Au nanowires, 5 μm , assembled in different sized microwells. In the small well, nanowires take vertical orientations, well in larger wells, nanowires take horizontal ones.