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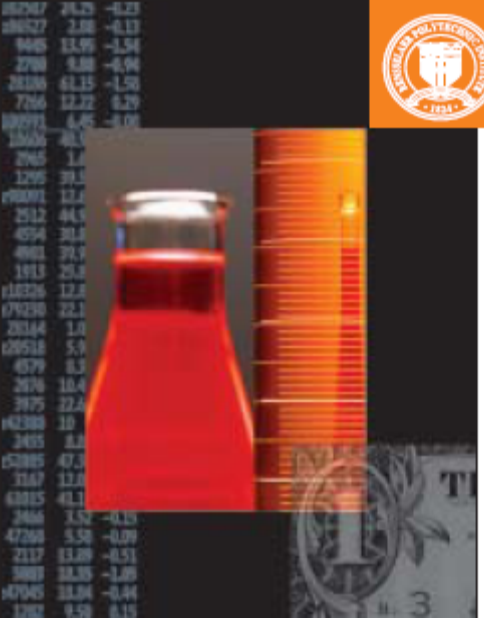
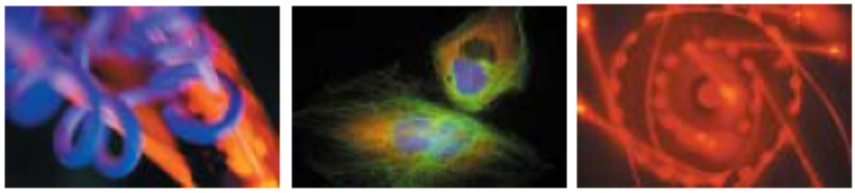




Seeking commercialization partners for

Super Dark Absorbers for Thermophotovoltaic, Radar and Infrared Applications

▶ Advantages

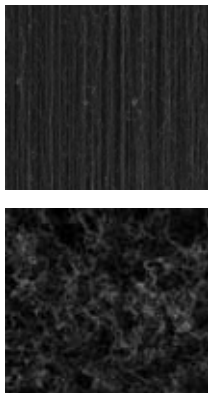
- Has total reflectance of R=0.10%
- 60-80% darker than darkest material (world record)
- Can sustain high-temperature operations

▶ Applications

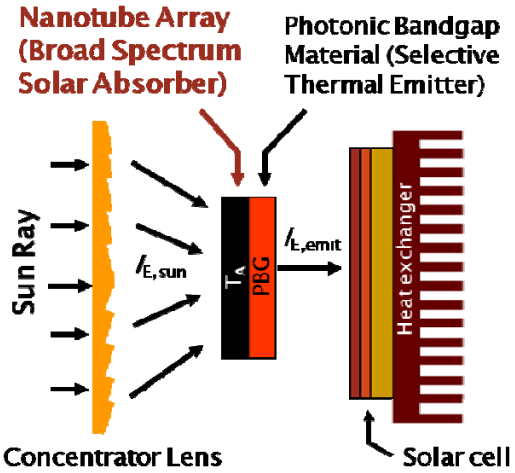
- Promising for high power, high efficiency and low cost solar conversion (power 5W/cm^2, efficiency>50%)
- Microwave, millimeter wave infrared absorber for stealth technology
- Hot water heating
- Infrared sensing

RPI's researchers have engineered vertically aligned carbon nanotube arrays to produce the darkest ever synthetic material, with promising applications for high-power, high-efficiency solar energy conversion. The long, low density arrays of nanotubes provide deep pores to absorb light throughout the entire visible wavelength, with reflectivity as low as R=0.045%.

Arrays of the nanotubes are prepared by chemical vapor deposition, and can be peeled off of their growth substrate to produce self standing films, to form a component of a broad spectrum energy conversion device.



Side and top images of nanotube arrays



▶ Publications

"Experimental Observation of an Extremely Dark Material Made By a Low-Density Nanotube Array", *Nano Letters* 8, (2), 446-451 (2008)

"A super dark material: randomness and porosity in a nanostructure", *Proc. SPIE*, Vol. 6713, 67130N (2007)

IP STATUS	U.S. Patent Pending
INVENTORS	S.Y. Lin, J. Bur, Z. Yang, L. Ci, P. Ajayan
OTC CASE	1115

FOR MORE INFORMATION

Beth Bornick
Licensing Associate
(518) 276-3297
bornie2@rpi.edu

Rensselaer Polytechnic Institute
110 8th Street J Building
Troy, NY 12180-3590

Mind to Marketplace