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Cheap nanotubes for tough light materials

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A simpler, safer, and less costly way to produce bundles of single-wall carbon nanotubes without a metal catalyst promises to spur development in medical, materials, manufacturing, and imaging. A carbon nanotube is a graphite sheet one atomic layer thick wrapped on itself to create a strong thin structure. Single-wall tubes range from 0.7 to 7-nm diameters. Lengths can be as short as 50 nm (or smaller) but extend up to 35 microns and longer. This gives an aspect ratio of $1:10^4$. Because of the aspect ratio, single wall tubes are considered one-dimensional fillers for composites. "The real plus is that single-wall nanotubes have preferred mechanical, electrical, and thermal properties over multi-wall tubes," says chairman and CEO Brian Scott at **Nanotailor**, Austin, Texas (nanotailor.com). "Single-wall tubes are likely to improve sensors, so biomedical devices will benefit," he adds.

Former NASA Goddard researcher Jeannette Benavides developed the process which has been licensed to Nanotailor. The company says it will make high-quality, low-cost single-wall tubes commercially available.

Although discovered more than 15 years ago, use of the multi-walled tubes has been stymied due to their complex, dangerous, and expensive production. Scott says single-walled nanotubes are sought after because of their lower cost and properties. He adds that the tubes from his company are thermally stable up to 650C, about 150 degrees higher than other commercially available tubes.

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