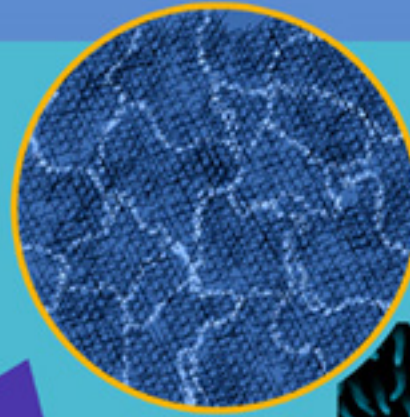
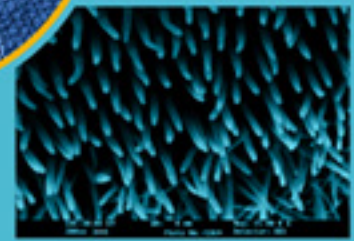


NANOTECHNOLOGY

Welcome to the tiny kingdom of nanotechnology, where researchers ponder such grand notions as elevators to outer space and a silicon chip the size of a sugar cube containing all the world's data—and, yes, they do mean all.



Nanostructured reinforced super material



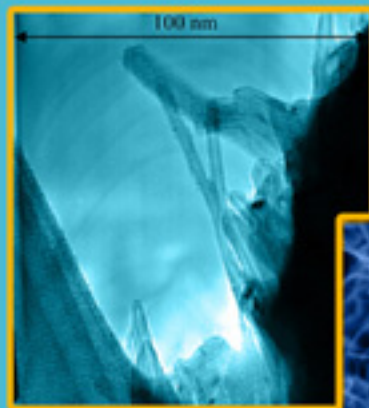
Nanostructured silicon



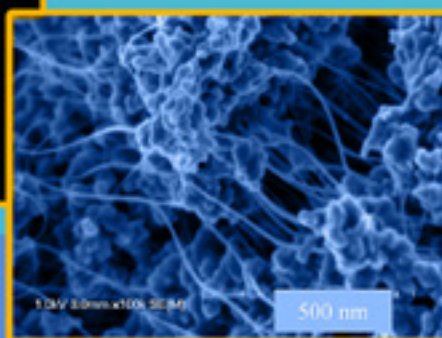
The world of nanotechnology is measured in nanometers, which run a few atoms wide. Think of a human hair divided by 50,000. Or divide a yardstick by a million; then divide each one-millionth by 1,000. Many nanostructured materials exist in nature—viruses, for instance. And some materials like carbon, boron, and silicon can be transformed into nanostructures.



Carbon nanotubes—aligned



Carbon nanotube composite



In the phenomenal field of nanotechnology, materials like carbon nanotubes are only one-sixth the weight of steel yet 100 times stronger. No wonder some researchers now dream of cables strong enough to support an elevator to outer space.

Y-12 researchers are investigating new advanced tools that can be used to precision machine ceramics and are developing super-strong materials.

Three different types of nanostructures exist: electronic nanostructures (like the carbon nanotube); superstructures (“super steel”); and silicon-based nanostructures (materials that offer fast interconnections and efficient optical communications). In other words, there’ll be plenty to read on that sugar cube while you’re taking the elevator to the moon.