Glossary

AMORPHOUS METALS – metals in which several different types of atoms are tightly packed in a random arrangement, making the metal both very hard and very elastic.

CARBON NANOTUBES – nanoscale tubes that resemble rolled-up sheets of hexagonally arranged carbon atoms. Carbon nanotubes have been found to have excellent tensile strength, electrical conductivity and thermal conductivity.

CAPILLARY FORCES – adhesive forces of a liquid to a solid substance.

CFCS/GREENHOUSE GASES – gases in the earth's atmosphere that trap infrared radiation (heat) emitted from the earth, raising its surface temperature.

FERROFLUIDS – magnetic nanoparticles suspended in a fluid. Ferrofluids have the fluid properties of a liquid and the magnetic properties of a solid.

FUEL CELL – an electrical cell that converts the chemical energy of a fuel directly into electricity, without burning the fuel.

HOLOGRAPHIC CUBE – a highly compact data storage system that can hold large amounts of data encoded as holograms. Holographic cubes may one day be able to contain a terabyte of information on something the size of a sugar cube.

INFRARED SPECTRUM – the portion of electromagnetic waves with wavelengths from 10^{-3} m to 7 x 10^{-7} m (longer than red light). Infrared (IR) waves are readily absorbed and perceived as heat.

LATTICE – a regular, repeating three-dimensional arrangement of atoms in a solid.

LIGHT-EMITTING DIODES (LEDS) – microscale semiconducting crystals that emit light when current passes through them. LEDs have much lower energy consumption than incandescent lightbulbs and can last up to 100,000 hours (more than 10 years).

LIQUID CRYSTALS – a state of matter with greater ordering than normal liquids, but less ordering than crystalline solids. Liquid crystals have unusual optical and electrical properties, which make them useful in electronic displays.

NANOMETER – one billionth (1/1,000,000,000) of a meter.

NANOCRYSTALS – nanoparticles with their atoms arranged in a repeating, three-dimensional pattern.

NANOFIBERS – fibers with a diameter of less than 100 nanometers.

NANOPARTICLES – particles measuring from one to a few hundred nanometers in size.

NANOSCALE – the size scale from one to a few hundred nanometers.

NANOTECHNOLOGY – the study and design of systems at the nanoscale. Nanotechnology capitalizes on the new and unique properties that a system may exhibit as a result of nanoscale manipuluation.

ORGANIC LIGHT-EMITTING DIODES (OLEDS) – semiconductor devices 200 to 500 nanometers thick that are composed of thin films of organic molecules which create light when electricity is applied to them.

POLYMER – A large molecule made up of long chains of atoms bonded in a repeating pattern.

SHAPE MEMORY ALLOYS – metal alloys that can "remember" and regain their original geometry. Shape memory alloys are currently used in vascular stents, dental arch wires, and eyeglass frames.

TENSILE STRENGTH – the ability of material to resist a force trying to pull it apart.

VAN DER WAALS FORCES – a weakly attractive force between neutral molecules.

VISIBLE LIGHT – the portion of electromagnetic waves that the human eye can detect. Visible light is perceived as color, and ranges in wavelength from 4×10^{-7} m (violet light) to 7×10^{-7} m (red light).

WAVELENGTH – The distance from one crest (or trough) of a wave to the next.

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