



Coated nanotubes record light

Researchers from Nanomix, Inc. and the University of California at Los Angeles have combined minuscule carbon nanotube transistors and photosensitive polymer to make a fast optoelectronic memory device that promises to speed digital photography and provide high-density data storage.

Optoelectronic memory converts a light signal into an electrical signal, and stores the electrical signal. Carbon nanotubes are rolled-up sheets of carbon atoms that can be smaller than a nanometer in diameter. A nanometer is one millionth of a millimeter, or the span of 10 hydrogen atoms.

The device could bring high-resolution digital video to the average photographer, according to the researchers.

The researchers' device consists of networks of carbon nanotubes between metal electrodes on silicon wafers. The nanotubes are coated with light-sensitive polymers that absorb incoming photons and convert them to electric charge, which is transferred to the nanotubes. The charged nanotubes also serve as electrodes that read and erase the information stored as charge.

The optoelectronic memory could be used in place of the charge-coupled devices digital cameras use to capture a picture, according to the researchers. The process of reading charge-coupled devices involves transferring the charges to store the picture one row of pixels, or one line, at a time.

In contrast, the researchers' device allows each pixel to be addressed independently so that the pixels in an image could be read in parallel, speeding the process of storing a picture considerably.

The device could also be used in other memory applications. Because nanotubes are so small, devices consisting of one or a few nanotubes would be able to store a lot of information in a small footprint.

The device could be ready for practical use in five to ten years, according to the researchers. The work appeared in the June 16, 2004 issue of *Nano Letters*.

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