



## Lightweight, flexible electronic networks of carbon nanotubes



by [Stanislav P. Abadjiev](#) | 23 July 2008 17:00 GMT — Votes (3)

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The ability to form integrated circuits on flexible sheets of plastic enables attributes in electronic devices that are difficult or impossible to achieve with technologies that use semiconductor wafers or glass plates as substrates. Organic small-molecule and polymer-based materials represent the most widely explored types of semiconductors for such flexible circuitry. Although these materials and those that use films or nanostructures of inorganics have promise for certain applications, existing demonstrations of them in circuits on plastic indicate modest performance characteristics that might restrict the application possibilities.

A paper in the current issue of Nature reports improvements in the electrical performance of integrated circuits through the engineering of webs of carbon nanotubes onto bendable plastics.

A team of scientists report implementations of a comparatively high-performance carbon-based semiconductor consisting of sub-monolayer, random networks of single-walled carbon nanotubes to yield small- to medium-scale integrated digital circuits, composed of up to nearly 100 transistors on plastic substrates. Their devices show excellent electronic properties, with superior subthreshold characteristics, operating voltages, power consumption and switching speeds.

The authors expect that their approach will expand the range of potential applications as well as reducing their cost. Possibilities unattainable with conventional wafer-based electronics could include paper-like displays, wearable personal health-monitoring devices and intelligent food packages.

Source: [Nature](#)

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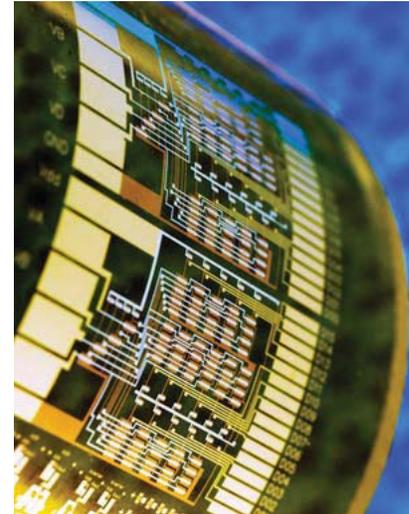
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Webs of carbon nanotubes provide high performance semiconductor material for flexible electronics. Integrated circuits as shown here could be used in personal health monitors, flexible displays, and other areas. (c) Beckman Institute, University of Illinois

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