

# UCLA engineers create fully stretchable OLED

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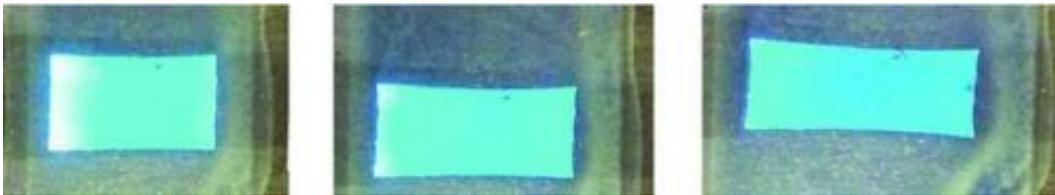


Image: Wiley

(PhysOrg.com) -- Engineers at the University of California, Los Angeles, have created the first fully stretchable organic light-emitting diode (OLED). The researchers devised a way of creating a carbon nanotube and polymer electrode and layering it onto a stretchable light-emitting plastic. Their device is a two-centimeter square with a one-centimeter square area that gives off a blue light. Details of their work were published in July in *Advanced Materials*. The paper is titled, "Intrinsically Stretchable Polymer Light-Emitting Devices Using Carbon Nanotube-Polymer Composite Electrodes."

The method they used for their proof-of-concept device has attracted interest because stretchable electronics is peppered with lots of design challenges, starting with carbon nanotubes themselves. These nanotubes are stretchable and are conductive, but to keep their shape, they need to be attached to some surface. Researchers have found that coating carbon nanotubes onto a plastic backing has not worked well, because the

nanotubes slide off or past each other instead of stretching with the elastic. Until the UCLA team's work, researchers were unable to come up with an entirely stretchable [OLED](#).

Another drawback encountered has been that the [carbon nanotube](#) film is rough and can cause shorting, says Zhenan Bao, a Stanford professor of chemical engineering who works on stretchable solar cells. "Using this method, they ended up with a relatively flat surface that can be used for an [electrode](#)."

Nonetheless, the need for further work in this area is far from over. She said that stretchable electronics demonstrated thus far lose conductivity after being stretched too far or too many times, so more research is needed. "We are still some ways off from having high-performance, really robust, intrinsically stretchable devices," says Bao, but "with this work and those from others, we are getting closer and closer to realizing this kind of sophisticated and multifunctional electronic skin."

According to [Technology Review](#), [stretchable electronics](#) could enter our worlds in the form of video displays that could be rolled up and tucked into a shirt pocket, or cell phones that could swell or shrink. In medical science, one might see electronic sheets draped like cloth.

**More information:** Intrinsically Stretchable Polymer Light-Emitting Devices Using Carbon Nanotube-Polymer Composite Electrodes, *Advanced Materials*, [DOI:10.1002/adma.201101986](https://doi.org/10.1002/adma.201101986)

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