

# Researchers develop flexible, transparent image sensor

By [Lexy Savvides](http://www.cnet.com.au/member/Lexy%20Savvides/) | February 22, 2013

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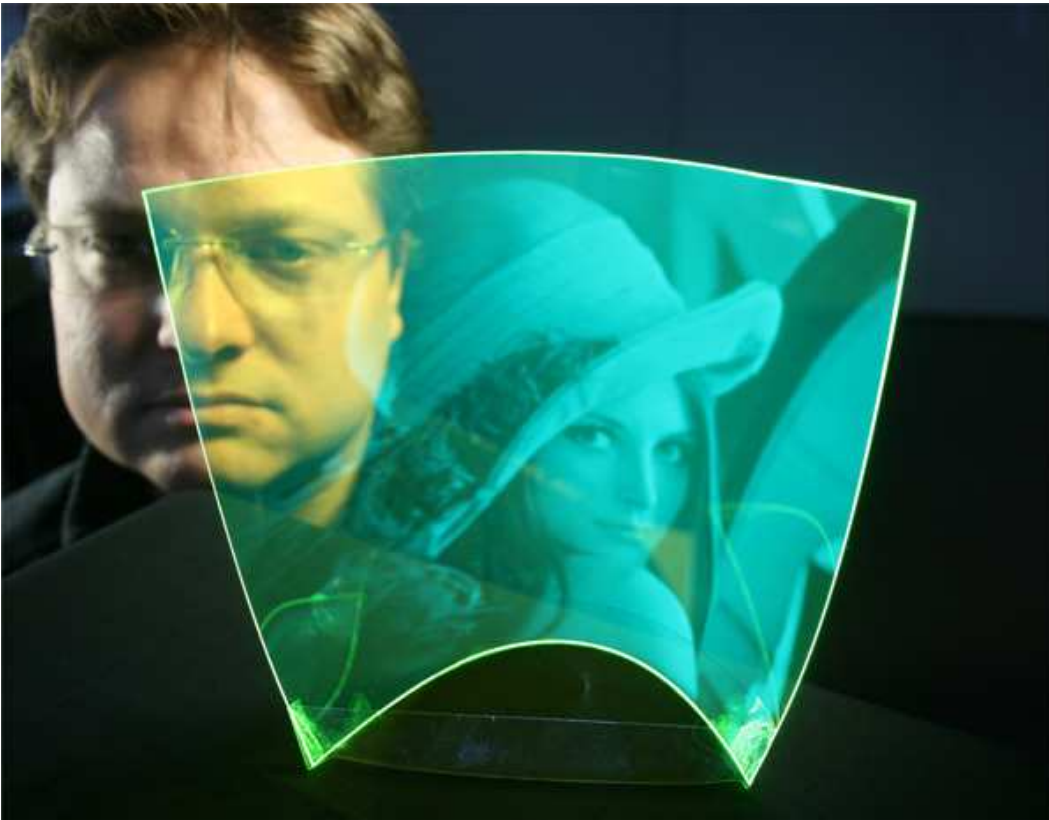
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Lexy spent her formative years taking a lot of photos and dreaming in technicolour. Nothing much has changed now she's covering all things photography related for CNET.

**A polymer sheet could hold the key to the image sensors of the future.**



I spy with my little eye ...  
(Credit: Optics Express)

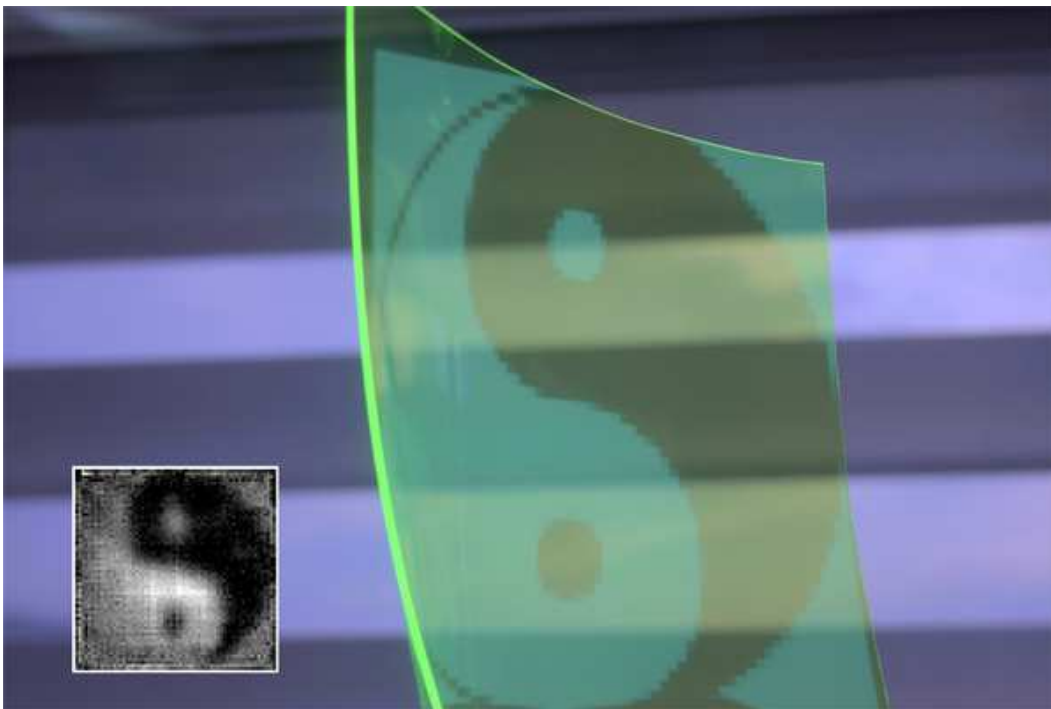
Researchers at the Johannes Kepler University Linz, Austria, have developed a way to capture images on a flexible sheet of plastic. Unlike traditional image sensors that use circuits and other internal structures to develop an image, this new solution is fully transparent.

This is no ordinary sheet of plastic though. The sensor is a polymer film (luminescent concentrator) containing a multitude of fluorescent particles that absorb a specific wavelength of light. It then transmits this light at a longer wavelength to optical sensors at the side of the sheet, which captures it all, reconstructing it as a greyscale image.

According to Oliver Bimber from the university, the reconstruction process uses a similar technique to CT scans:

In CT technology, it's impossible to reconstruct an image from a single measurement of X-ray attenuation along one scanning direction alone. With a multiple of these measurements taken at different positions and directions, however, this becomes possible. Our system works in the same way, but where CT uses X-rays, our technique uses visible light.

The breakthrough has potential uses far beyond standard camera systems. Flexible and touch-free displays that rely on being able to see through the screen, such as augmented reality glasses, would greatly benefit from this new image sensor. At the moment, the output photo size is low — just 32x32 pixels — but future prototypes will increase the resolution substantially.



The image focused on the flexible sensor, and output as the low-resolution photo.  
(Credit: Oliver Bimber, Johannes Kepler University Linz)

Other potential applications include applying the flexible sensor over an existing CCD sensor. This would let the researchers obtain two images of different exposures and combine them together, creating an image with increased dynamic range, or an HDR (high dynamic range) photo.

Because the polymer sheet is so inexpensive, Bimber said that the sensor could be disposable. "I think there are many applications for this sensor that we are not yet aware of," he said.

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