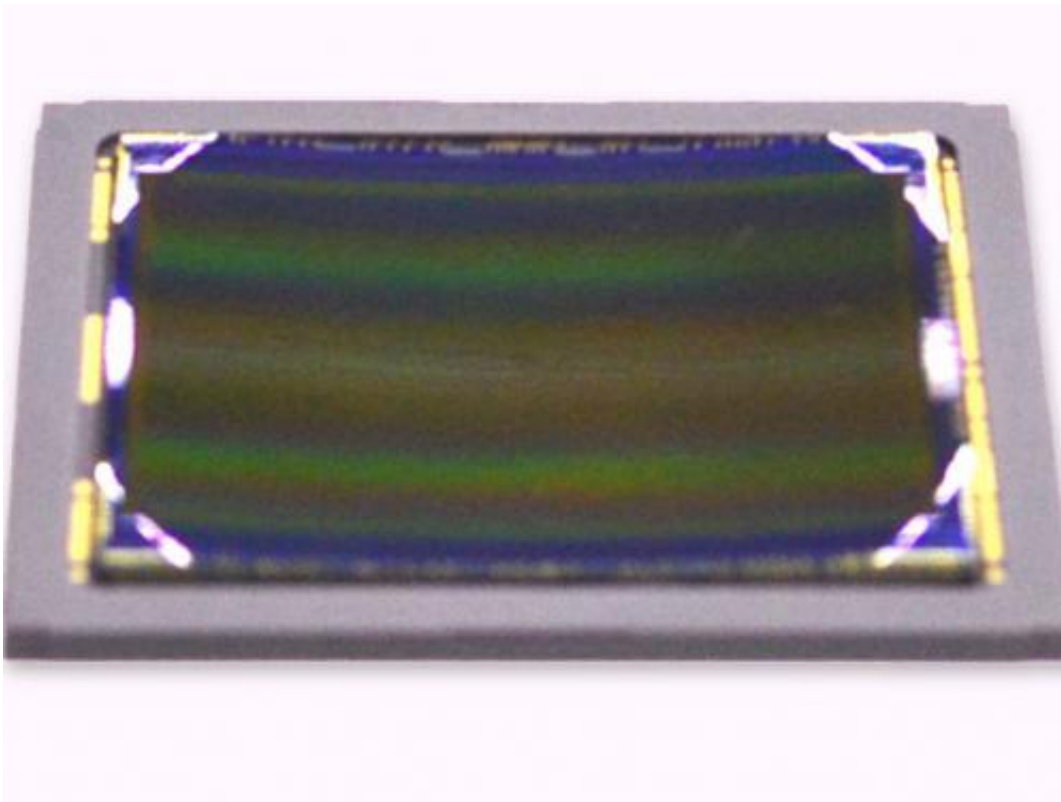


Sony inspired by biomimicry develops curved CMOS sensors

June 14 2014, by Nancy Owano



Credit: Sony

Sony's advance in image sensors appears quite natural: the company has developed a set of curved CMOS image sensors based on the curvature of the eye. A report on the sensors in IEEE Spectrum said that, "in a bit of biomimicry," Sony engineers were able to achieve a set of curved CMOS image sensors using a "bending machine" of their own

construction.

Sony's Kazuichiro Itonaga, a device manager, reported on the new development in Hawaii, at the 2014 Symposia on VLSI Technology and Circuits. This is a conference on semiconductor technology and circuits, which took place from June 9 to June 13.

It was unclear how much the chips were curved, said IEEE Spectrum, although Itonaga said they did achieve the same level of curvature found in the human eye. The curved systems were 1.4 times more sensitive at the [center](#) of the sensor and twice as sensitive at the edge, according to the Sony engineers.

According to IEEE Spectrum, "Photodiodes at the periphery of a [sensor array](#) will be bent toward the center, which means light rays will hit them straight on instead of obliquely. What's more, the strain induced on a CMOS sensor by bending it alters the band gap of the silicon devices in the sensor region, lowering the noise created by 'dark current'—the current that flows through a pixel even when it is receiving no external light." A curved CMOS sensor has an edge over a planar sensor, Itonaga noted. Considering its geometry, it can be paired with a flatter lens and larger aperture, which lets in more light.

Two chips were reported. First, there was a full-size chip that measured some 43 millimeters along the diagonal, suitable for a camera. A smaller chip with smaller pixels suitable for mobile phones was also reported. Gizmodo said the 43mm was possibly to suit a follow-up to the RX1 compact camera. There is no date yet on when the sensors will make their way into consumer products, but IEEE Spectrum said the team made about 100 full size sensors with their bending machine. No official word yet on when the sensors will show up in products for sale has not deterred speculations on how and where they might appear. SonyAlphaRumors said the full frame [curved](#) sensor is likely to come on

the new RX2. No matter when, PetaPixel a photography blog, said on Friday that the curved full-frame sensor promises to be "an impressive leap [forward](#) in [digital imaging technology](#):"

More information: www.vlsisymposium.org/

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