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## Two New Picture-Perfect TV Technologies

At the 2008 Las Vegas CES tradeshow, two new television imaging technologies were introduced. The road from laboratory breakthroughs to these introductory products included many press releases along the way. As I viewed the new organic light-emitting diode (OLED) television at Sony's press conference, my mind flashed back to all the press releases that I had read since Kodak and Sanyo co-developed and patented the first organic electroluminescent display in 1999. The question becomes: Once manufacturing is ramped up, will the initial astronomical price drop enough for OLED TVs to significantly cut into the sales of LCD and plasma sets?

The technologies behind OLED television and laser television are radically different. However, since they were both introduced as new consumer electronics products at the same CES tradeshow, I decided to introduce them to you in a single column.

### OLED Television

The Sony OLED XEL-1 (Photo 1) is the first organic light-emitting diode television to hit the consumer market. Now on sale in Japan, it is expected to go on sale in the U.S. by the end of this year. The picture quality of the OLED XEL-1 was fantastic, but it wasn't the first thing that I noticed about the unit. I was instantly drawn to an edge view of its screen, which appears to be too thin to house any type of electronics. The Sony OLED XEL-1 screen is only 3 mm thick—only about as thick as three CDs sandwiched together!



Photo 1

Sony Electronics

OLED screens have an organic semiconductor layer sandwiched between a transparent positive electrode layer and a nontransparent negative electrode layer. The flow of electrons between the two outer layers causes the individual organic cells in the organic layer to glow. This glowing of the individual organic pixels forms the image that shines through the transparent layer. The transparent layer is the positive electrode and it is also your viewing screen.

So after nine years of research did the electronics industry hit a home run? The full-motion images on the different screens in Sony's booth made me feel like I was viewing live action through a very clean window. The OLED TV viewing angle didn't seem to degrade as I changed

my viewing angle to the screen. At all times, the image remained extremely bright with true-to-life color reproduction. Here, each organic image pixel is individually turned on or off by the flow of electricity, so image response time is almost instantaneous. The full promise of OLED will be met when all three layers are transparent so the picture win-

dow of your home can be turned into an HDTV at the flick of a switch.

### Laser Television

During CES 2008, Mitsubishi introduced its new line of laser TVs that are scheduled to go on sale for Christmas 2008, and Novalux showed how its Necsel™ optoelectronic chip will fundamentally change rear projec-

tion TVs, home theatre, and movie theatre digital video projectors. The laser TV images on all of these screens were as vibrantly startling as the images on the OLED units.

The technology inside all these products is basically the same. The thinness of the OLED TV screen is gone, since the Mitsubishi laser TV is a rear projection unit with images "painted" onto its screen by the new Necsel™ optoelectronic chipset that was developed by Novalux. (See Photo 2.)

Novalux's optoelectronic chipset

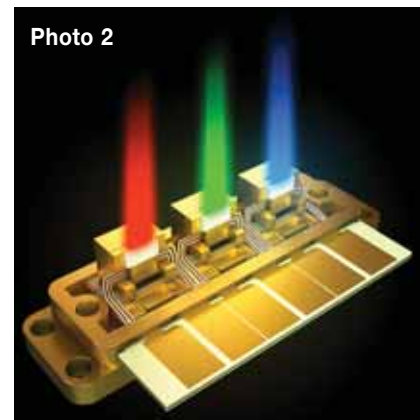


Photo 2

Novalux

uses a gallium arsenide laser combined with a lithium niobate crystal (LiNbO3) optic modulator to produce the critical wavelengths to output RGB (red, green, and blue) beams of light. Once you have red, green, and blue light you can create all the colors of the rainbow. The new laser TVs and projectors use the Novalux emitter to paint moving color images by reflecting their laser light off an array of thousands of micro-mirrors (DLP). (I covered Digital Light Processing™ in my April 2000 column, now available online at [www.techtodaynews.com/YearOneToFive/HTMLobj-407/E-CinemaApril2000.pdf](http://www.techtodaynews.com/YearOneToFive/HTMLobj-407/E-CinemaApril2000.pdf))

### Recalling the Facts

1. Describe the technology behind OLED TV.
2. Describe the technology behind laser TV. ©

Alan Pierce, Ed.D., CSIT, is a technology education consultant. Visit [www.technologytoday.us](http://www.technologytoday.us) for past columns and teacher resources.