



Optical Short Course International

6679 N. Calle de Calipso, Tucson, AZ
797-9744

<http://www.oscintl.com>

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OSCI's Big Étendue Awards from InfoComm 2005

Optical Short Course International (OSCI) second annual best optical technology of show awards have been selected again. We thought our more technically oriented audience would appreciate an award named after one of the parameters we are all trying to increase: Étendue. Our second annual Big Étendue Awards for InfoComm 2005 in fabulous Las Vegas.

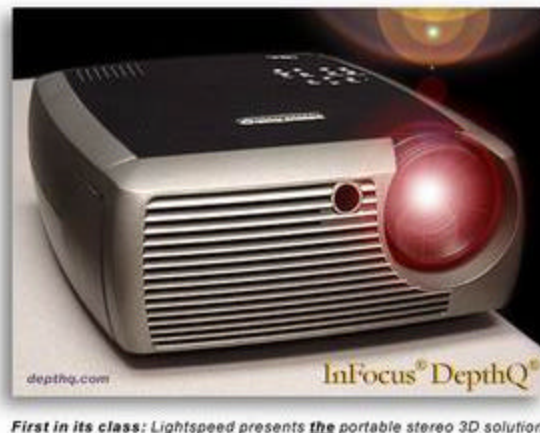
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1. LightSpeed Design Groups – Stereoscopic 3D digital projector technology

Lightspeed Design Group has developed a stereo 3D technology using an InFocus® DLP™ single chip platform. To view stereo images and video you need the InFocus DepthQ® 3D projector and some active stereo glasses. I must say that I have never been very impressed with the various 3D technologies that I have seen, but this InFocus DepthQ® 3D projector technology from Lightspeed was simply awesome. I think 3D has arrived for the mainstream scientists and engineers for everyday work and presentations. If a 2D picture is worth 1,000 words then this InFocus® DepthQ® 3D stereo image projected on a large screen is worth 1 million words.

In Lightspeed's booth at InfoComm I put on a pair of Stereographics Crystal Eye \$600 active glasses (no wires) and looked at the stereo 3D video examples on a rear-projected screen. The active glasses range in price from \$600 to \$50 with ergonomics and comfort being some of the main differences. I viewed some SolidWorks mechanical design assemblies. The stereo 3D viewing definitely enhanced my understanding of these complex assemblies. We also saw some 3D chemical modeling of molecules, some marketing videos, and an underwater dolphin scene from a 3D animated movie.



InFocus DepthQ Stereoscopic 3D projector
Photo Courtesy of Lightspeed Design Group
<http://www.lightspeeddesign.com>

According to Chris Ward, President of Lightspeed Design Group, they have been working on stereo 3D for more than 10 years as a company. “We went to InFocus® about 3 years ago with a 3D stereo concept for a single chip stereo 3D projector.” “We had two main critical goals in our development project: It had to be manufactured at a low price point; and it had to deliver high quality stereo images with comfortable viewing.” Chris says that there are several parameters that viewing comfort depends upon – a 120 Hz flickerless image and temporal extinction of the left and right image to the opposite eyes. CRT's have not been able to deliver on this later parameter because of the persistence of phosphors. DLP technology, because of the very fast micromirror switching times, is able to deliver on both of these parameters.

All of the stereo 3D is generated in software or played back from existing 3D movies, there are no optical modifications to the projector itself. On a basic level what has been done is to take the normal 60 hertz video signal and deliver it to the DLP modulator as a 120 hertz video signal. Each eye, because of the active LCD glasses, still only sees a 60 hertz signal, but the signal for each separate eye is time interlaced on the modulator at 120 hertz. The active LCD glasses receive a signal from the projector to switch between the left and right eye at 120 hertz. The DepthQ® projector is based upon the InFocus X2 projector platform which is an 800 x 600 SVGA native resolution, 2000:1 contrast ratio, with 1600 max ANSI lumen projector. You must have 3D content to view on the projector. SolidWorks now supports stereoscopic 3D viewing. Lightspeed Design Group is the exclusive distributor of the InFocus® DepthQ® 3D projector. The current price is US\$3,995 plus the glasses and shipping. Check it out for yourself. I think you will be impressed!

[3D ROARS BACK ARTICLE \(PDF 2.5M\)](#) 

2. dnp SuperNova Screen®



dnp Denmark is the worldwide large screen centre of Dai Nippon Printing Co. Ltd - one of the world's largest printing and media companies. dnp Denmark is a manufacturer of optical rear projection screens and now front projection screens. We saw the new SuperNova Screen™ in their brightly lit booth with no roof and spot lights on the top shining on this screen. It did not appear like most grey screens appear in bright light. They were showing a side by side comparison from the same projector with two different screens and it was a dramatic difference in contrast.

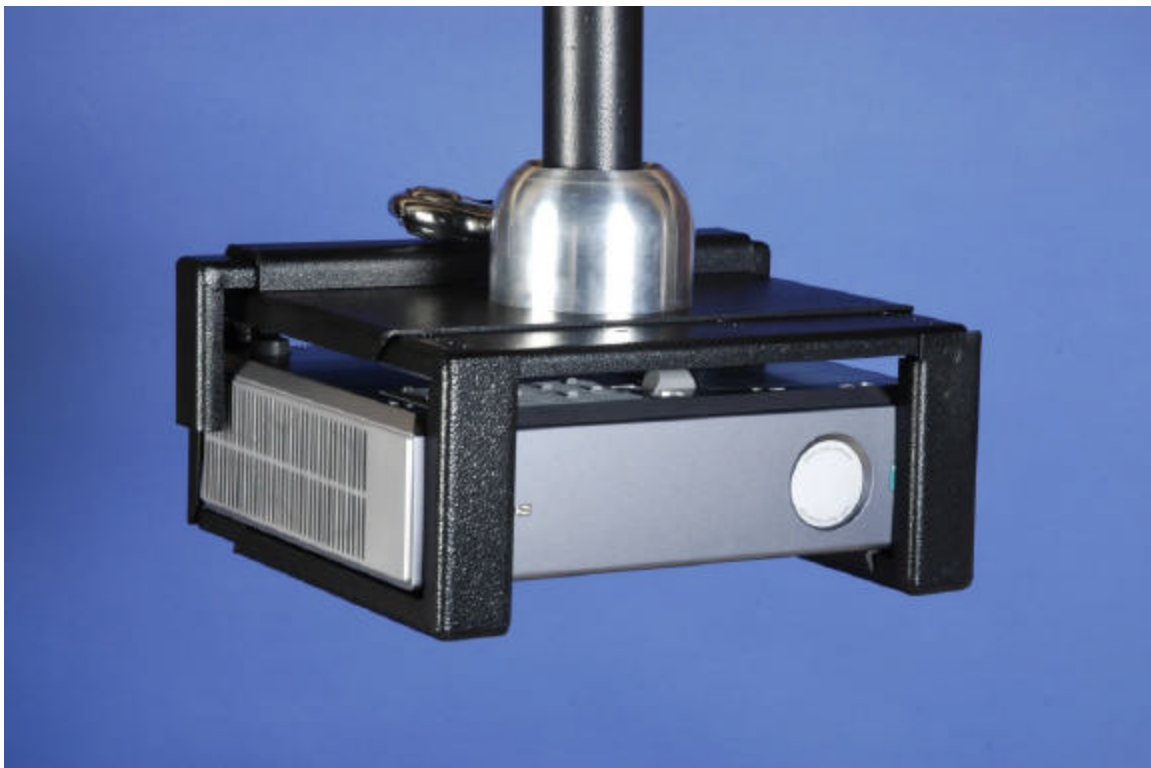


SuperNova website <http://www.supernovascreen.com>

According to R& D Manager, Søren Weis Lindegaard, “The SuperNova Screen™ is able to provide high contrast in bright rooms because of our advance screen technology.” He described the screen technology as having the ability to reflect or absorb light that has high angles of incidence, like room light from above or window light from the side, and to optically channel the wanted near normal light from a front projector to the middle or back of the SuperNova Screen™. The SuperNova Screen™ is a laminate of different layers like most of their screens. The front of the screen blocks high angle light and optically channels low angle light to the next layer. The second layer has a higher gain diffuse layer that scatters light back out in the near normal direction and provides the viewer with the high contrast image in bright light.

The SuperNova Screen™ has a gain of 2.0, with the 50% gain at 20 degrees and 15 degrees horizontal and vertical respectively, and a contrast level exceeding 20:1 while typical front screens have a 2.5:1 contrast. This screen features an ultra-fine pitch of 65 microns and is available in sizes up to 100” in 4:3 and 120” in 16:9 formats. It is compatible with all LCD, DLP and LCoS projectors.

3. HardSteal.Com AV Projector Cage (Projector Theft Prevention)



HardSteal.Com AV Projector Cage http://www.hardsteal.com/av_cage.htm

An accessory in the Big Étendue Awards you ask, of course because it actively protects optical technology from being stolen. According to President, Roger Challis, HardSteal.Com was started in 1996 to prevent theft of computer electronics in schools and universities. Last year HardSteal.Com received a call from one of their customers

who was desperate for a projector security solution. This customer had ten projectors stolen over one weekend. They asked HardSteal.Com to develop a system for Projector Theft Prevention. Roger got his product design crew to develop a solution to their customers' theft problem. His patent pending AV Cage was sold out before the first production run was completed. The rest as they say is history, with a dose of continuous improvement thrown in for good measure.

The AV Projector Cage comes complete with everything you need to mount a projector to a drop pipe including a standard disk lock. It is offered in three sizes a Mini, Standard and Large to fit different sized projectors. Each size is fully adjustable on 1/2" settings in height, width and length, and comes with a Ball & Collar that mounts onto a standard 1.5 inch NPT drop pipe (not included). The Ball & Collar offers 15 degrees of tilt in any direction, with NO EXPOSED FASTENERS! The AV Cage is manufactured from 12 gauge cold rolled steel for high strength. All sides are open for proper ventilation.

For an added measure of security they offer a tri-groove security nut which requires a special socket to install and remove if you can get to them. The wings that hang over the sides of the projector have hard steel wing reinforcements to resist cutting and bending of the wings in attempts to pry the wings up and slide the projector out the side.

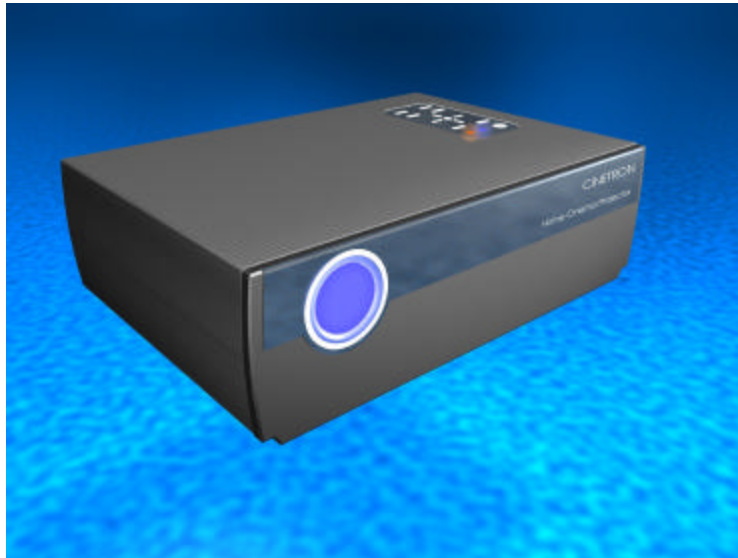


Figure X. AV Projector Cage wing reinforcements <http://www.hardsteal.com>

The AV cage lists for US\$400 MSRP. According to Roger Challis, HardSteal.Com is accepting dealer applications to represent the product in the US, Asia, and Europe. This product requires installation by AV Professionals who know how to handle, install, align, and calibrate digital projectors, so we feel that this will fit with many AV Pro existing product lines. They are also interested in working with OEM's who want to carry this product as one of their accessories for their customers.

4. Cinetron MHT10 1080p LCoS Front Projector with Xe Lamp

I walked into the Cinetron Technology, Inc. booth at InfoComm that was darkened to show off their prototype 130" diagonal LCoS front projector model MHT10. The preliminary specifications on this unit are: 1920 x 1080 native resolution with 1000 lumens (the darkened booth), 16:9 aspect ratio and a 4000:1 contrast ratio with 30 bits of color (10 bits for each color). Besides the 1080 vertical resolution the dynamic and stunning image was enabled by a Xenon lamp which is known to have much truer color than mercury lamps.



Technical Illustration of Cinetron's 1080p LCoS Front Projector

The high contrast and high image quality delivered to the screen also helped enable the visually stunning image and high definition video. The 3 LCoS panels are from eLCOS, a company (<http://www.elcos.com>) with an impressive history in LCoS technology and fabrication. They use 8.1 micron sized pixels (over 6.2 millions of them) and the VAN or Vertically Aligned Nematic liquid crystal mode for fast switching and high contrast with an inorganic alignment layer. I know what new toy I want from Santa Clause under my Christmas Tree.

According to George Wu, Senior Manager, Sales and Marketing, "We have leveraged our technical designs from our LCoS RPTV and made some significant progress in these high resolution front projectors." The street price of these LCoS front projectors will be about US\$15 to 20K at the beginning stage which they are expect to release later this year. These LCoS front projectors by Cinetron will be available for the North American market under the brand name of Dynovue, currently developing a website at <http://www.dynovue.com>, according to Bruce Sun, President of Dynovue.

5. Optoma Movie Time Digital DVD Projector

Optoma has created a new category of digital projector called the all-in-one segment with their Movie Time Digital DVD Projector. This home entertainment device was designed to be a simple solution with a power cord as the only required plug-in. The DVD player is built right into the top of the unit as are two 5 Watt stereo speakers. No more wires and all spouse factors are accounted for in this unit, a true plug it in and play the DVD movie or watch the ball game. The signal path from the DVD player to the DLP chip is all digital, and Optoma exclusive, and thus the name Digital DVD Projector.



Optoma Movie Time Digital DVD Projector

This all-in-one projector has a 1000 lumen brightness from their 200 watt lamp and a native 854 x 480 pixels to match the DVD resolution with a 16:9 format. This projector light engine achieves a 4000:1 contrast level by using TI's DarkChip2 Technology and their Image AI. The Image Auto Intensifier technology does a look ahead and dynamically changes the current driving the lamp to increase it for bright scenes and decrease the lamp current for dark scenes. This unit all the normal video inputs and an optical audio output which can be connect to a dolby home theater surround sound system. This unit has a \$1499 street price and will ship in July 2005.

We saw the unit operating at InfoComm in Optoma's booth and it looked good in their dark viewing room. We like the all-in-one setup to conquer all of the spouse factors of wires and boxes everywhere that usually accompanies a front projection setup in the home. Just put it on the coffee table and plug the power in and press play on the DVD player. It should also be an easy setup for the kids to watch a movie or play video games

in a darkened room. One possible irritant is the light leakage out of the air vents on the left side of the unit. If someone was sitting on this side of the unit the light leakage may bother them. A common problem with many front projectors than can be easily addressed with a system design solution.

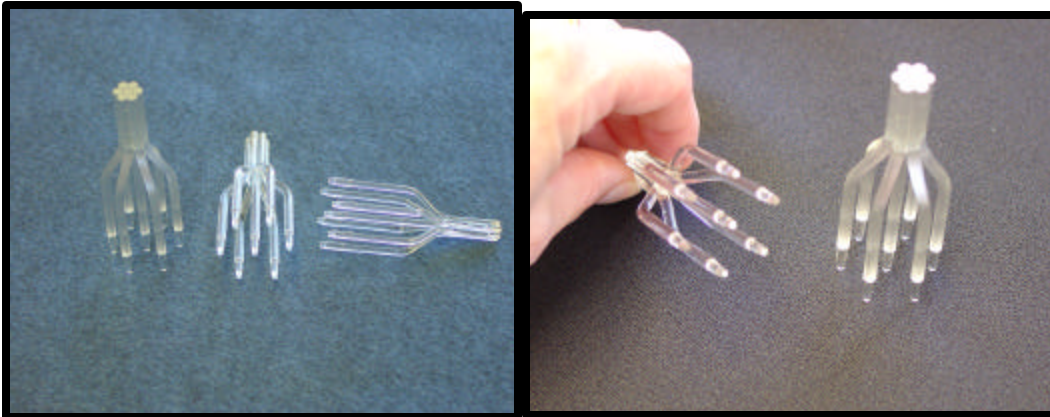
6. Texas Instruments DDP3020 DLP data processor with BrilliantColor[®]

Rainbow Warriors Rejoice as Texas Instruments has developed a color gamut busting six color DLP Data Processor with BrilliantColor[™] technology algorithm. The DLP[™] Data Processor is one of the key chips on the projector system circuit board along with the DMD[™] modulator chip. The data processor chip has often worked in conjunction with other front end chips from other companies on the same board or another custom board. TI has combined many of the functions from the front end chips into the new DDP3020 chip, such as system image processing, system control, DMD[™] data formatting, and DLP[™] image processing improvements. In the mini theater at TI's booth they had a "generic lab projector" projecting a 120" video of Animusic's animated music videos (<http://www.animusic.com>), very cool video and of course brilliant colors as advertised in the trademarked name. People who care about getting true colors from their projected media (see our Rainbow Warriors enewsletter <http://www.oscintl.com/enewsletter>) will be looking for and demanding the DDP3020 Data Processor with BrilliantColor[™] in their projectors. Another easy way to tell if a high end projector has the DDP3020 on board is if the image has an overabundance of saturated colors dripping off the screen, it will be visually obvious.

As a proponent of the Rainbow Warrior ilk, I am thrilled to see multicolor primary algorithms and technology embedded into the high end DDP3020 chip. In addition to the multi-primary colors TI claims to be able to boost the brightness in the mid tones of video images by over 50%. The new chip also provides two dimensional keystone correction, video picture-in-picture (PIP), video picture-out-of-picture (POP), frame rate conversion, electronic zoom lens emulation, zoom in capability and an enhanced menu or operator system design. Most of these features resided previously in other companies front end chips which are no longer required.

It has an enhanced 2nd generation deinterlacer which supports 10 bit processing with improved edge adaptive interpolation and improved film mode video processing. The pixel clock operates up to 173 MHz and also has an enhanced auto lock, motion adaptive deinterlacing, adaptive 3D noise reduction filters, and edge preserving scaling technology. According to Brian Dodge, Program Manager and former DDP 2000 Product Manager, "The DDP3020 Data Processor is targeted for the higher end projector systems and will coexist with the DDP2000 Data Processor." The DDP3020 supports TI's 0.55" SVGA, 0.7" XGA, and 0.65" WXGA with integrated front end processing functions. It will also process NTSC/PAL/SECAM formats as well as 480i, 480p, 576i, 720p and 1080i inputs.

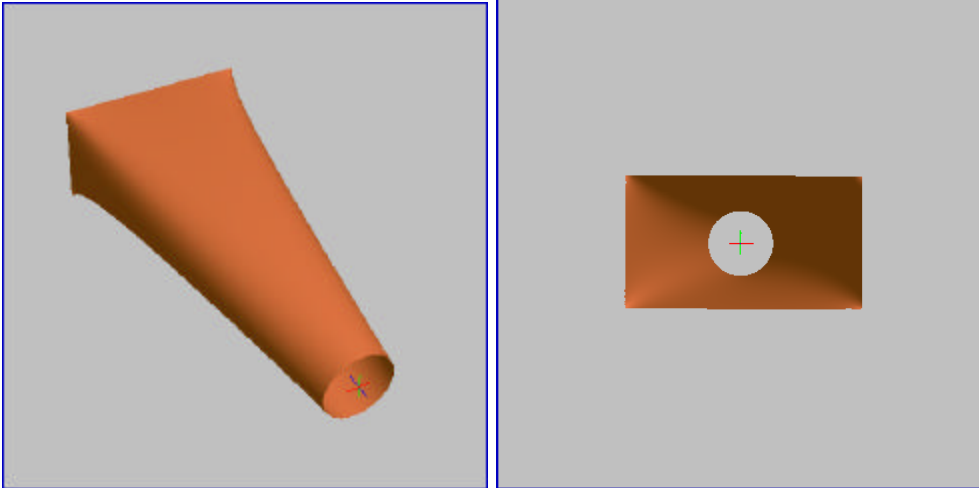
7. Schott LED Fiber Optics Illuminator



Photos Courtesy of Schott North America <http://www.schott.com/fiberoptics>

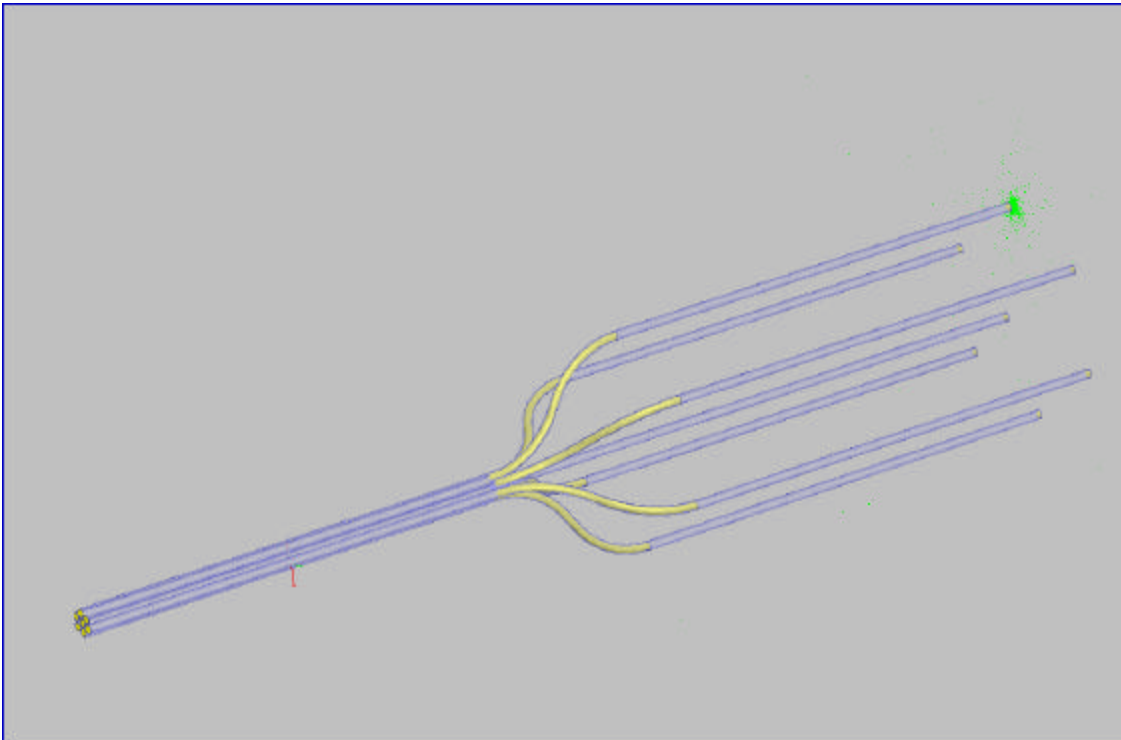
Schott North America has developed a new fiber optics application for LED illumination that will be of interest to light engine designers who are thinking of developing an LED light engine. Schott's fiber optics technology enables high collection efficiency from LED sources which is tough because of the large emittance angles of LED emitters. These fiber optics trees can be created in several different geometric configurations such as the 6-Around-1 or an NxM, or 1xM array. Each of the fibers is attached to the output face of an LED and the fibers have a collection numerical aperture or NA of 1, which means it will collect rays at up to 90 degrees or the whole hemisphere in front of an LED emitter. The particular fiber has a changing magnification ratio or a physical taper from the collection end to the output end. This physical taper enables the illumination designer to change the étendue of the fiber. If the area of the fiber increases then the angle decreases which is a good thing.

Another attractive feature of the light tree is that the individual LED's can be physically separated on a circuit board for good heat dissipation and then optically brought together which is one method of decreasing the étendue of an array of LED's. This has been one of the limiting issues for illumination designers in the development of LED based digital projectors. At the exit end of these fibers bundles one can put a solid glass integrating rod with cladding that is straight rectangular or morphs from a circular to a rectangular cross section. According to Product Manager, Kevin Tabor, "We are just starting to learn about all of the potential applications in the LED illumination applications and it is very encouraging to us." These fused fiber optic components have a transmission in the bent 2 inch rods with no antireflection coatings of over 80% while a conventional light guide would have a 68% transmission. So these light trees not only collect more light but get it delivered to the output end with more efficiency.



Circle to Rectangle Integrating Rods Courtesy of OSCI Illumination Design
<http://www.oscintl.com/consulting.htm>

You will no doubt see these Schott fiber optic illumination components or their derivatives in LED illumination systems in a large way in the coming months and years. There are not many optical methods to conquer étendue but I think Schott has some great tools here to help us in the illumination design community. Great Job!



Illumination Design Model of Fiber Light Tree from OSCI Illumination Design Consulting
<http://www.oscintl.com/consulting.htm>

Look for OSCI's up coming educational materials titled *The Étendue Handbook*.

8. Mitsubishi LED PocketProjector



http://www.mitsubishi-presentations.com/proj_pocket.asp
Photo Courtesy of Mitsubishi Digital Electronics America

Mitsubishi has three of these LED projector operating in a darkened section of their booth at InfoComm. The small size of the LED projector class is appealing. The PocketProjector as Mitsubishi calls it's projector is based upon a light source composed of three 1 watt Lumileds™ LED's a red, green, and blue which are sequentially operated to achieve a color image. The LED's are rated to last more than 10,000 hours compared to the 2,000 to 4,000 hours of typically rated UHP and Xenon lamps used in standard projectors, these lamps of course have much higher lumens output. These LED based units were very quiet with only a small fan blowing for cooling the unit.

The PocketProjector uses a Texas Instruments 0.55" 12 degree DMD™, DDP 2000 SVGA 800 x 600 native resolution and puts out approximately 250 lux on a high-gain screen sized around 20 to 60 inches diagonal. In the darkened booth we saw still images that were crisp and had good images on a screen with about 1.0 gain. This projector currently comes in a just about 1 pound or 450 grams. One of the three PocketProjectors was sitting on a battery pack module which was attached to the bottom of the unit, which serves as an elevated base with the same length and width dimension of the projector box with about a 2 cm thickness. The battery power will enable this LED projector to be used in non-typical situations where wall power is not available, the battery will last up to about 2.5 hours on a full charge.

"We are excited about the different uses that people will figure out for their PocketProjector," said James Chan, Director, Projector Product Marketing for Mitsubishi Digital Electronics America. "Some of the uses we anticipate are projection of PDA's, DVD's, Laptop Screens, Digital Cameras, and of course Gaming, it will be fun to learn of all the new uses our customers will develop." The LED PocketProjector will have an estimated street price of \$799 and is expected to be available in September-October 2005 timeframe.

9. Canon Realis SX50 LCoS Front Projector

The product line name Realis is a contraction of Real and Realistic and after seeing an image from the fully Canon optics design I can tell you it is Realistic, Wow! This baby delivers 2500 ANSI lumens with a 1000:1 contrast and high image quality. At only 8.6 lbs., the Realis SX50 model Canon claims is the smallest, lightest 1400 x 1050 (SXGA+) LCoS projector in the world. They are using D-ILA modulators from JVC with the high quality Canon optics. We saw a cut away view that is shown below in the booth and this illumination system is unique. I am not sure what Canon's patented proprietary AISYS (Aspectual Illumination System) technology is yet, but I am eager to learn about it too after seeing the results of this light engine.



Canon Realis SX50 LCoS Front Projector

Photo Courtesy of Canon USA Inc.

<http://www.usa.canon.com>

The Realis SX50 light engine consists of a 200 watt parabolic reflector lamp and then a pair of cylinder lens arrays (not typical fly's eyes) with a polarization conversion system in the middle. Next they have a plano cylinder lens with power in the orthogonal direction of the cylinder arrays, a fold mirror, a plano cylinder cross to the first one,

another cylinder or anamorphic with the power cross to the last cylinder lens. Between these cylinder lenses was an aperture with the shape of a capital I. Next comes a dichroic mirror that let green pass through to the polarizing beam splitter and the single D-ILA panel. The red and blue progress to a cube polarizing beam splitter and then on the their respective red and blue panels. All the colors are combined with another polarizing beam splitter/dichroic cube and then onto the impressive 1:1.7 zoom lens assembly and out the screen for your viewing pleasure. The projector features a genuine Canon high-performance 1.7x optical zoom lens that can project a 100-inch image on a screen from 9.8 feet away, perfect for my living room or yours.

The Realis SX50 projector also features Multiple Image Modes that provide a wide range of options depending on user needs. These Image Modes include four Color-Preset Modes, which are designated as Standard, Presentation, sRGB, and Cinema.

- The *Standard* mode produces images closely resembling the original input source, with an emphasis on white areas.
- The *Presentation* mode increases contrast between bright and dark areas to make it easier to see detailed diagrams and text often used in presentations.
- The *sRGB* mode is the color space used in most digital cameras, which is an international standard to unify color reproduction and color spaces as defined by the International Electrotechnical Commission (IEC).
- The *Cinema* mode is the most suitable mode for projection of moving images; it emphasizes gradations to produce Realistic depth and dimension.

All these features with Canon optics for a suggested price of \$4,999, a great value in comparison to other competitive models. Santa Clause this one is also on my list and I am checking for this one twice.

Drawing Winner OSCI's DVD Course

Mr Sandeep Pillay, was the winner of OSCI's Optics of Digital Projectors Free DVD course drawing from InfoComm 05 in Faboulus Las Vegas

Mr. Pillay is a Fabrication Manager with SPL Integrated Solutions in the Las Vegas, NV branch. According to splis.com "SPL Integrated Solutions is the leading nationwide integrator of audio and video systems." They have 19 offices that work on projects "designing and installing large-display videoconferencing systems and fully integrated multimedia systems." Some of their customers include: The Dow Chemical Company, Texas Department of Public Safety, and Walter Reed Army Medical Hospital among others. Pillay and his team of technicians build and install audio visual equipment for different companies. He loves being out in the field installing, but his favorite part of the job is: "when we test the equipment and it works. Then you feel proud."

InfoComm 2005 Irritations

Las Vegas Convention Center gets the OSCI Sit Down Award, Oh wait, there are very few chairs or tables to sit down at in the center, but certainly more than last year in Georgia. This year we were able to find some chairs and tables over in the corner of the convention center, thank you for having some tables and chairs on the convention floor this year. Several vendors with booths did mention that there was an empty booth next to them so show management put in a table and some chairs for a meeting space – great job on this benefit to everyone InfoComm.

One day right next to the Pizza Pavilion on the floor there were no chairs and table to eat at, so people just sat on the floor to eat lunch one day, just like last year in Georgia. Get some benches or tables for people to eat at, let them sit down and rest their feet from walking and standing all day.



InfoComm Lunch Seating at Las Vegas Convention Center

Otherwise Thanks for a great show and to all the exhibitors, see you next year in Orlando.