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JUNE 10
VOL.24, NO.4

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AL architectural lighting (Vol. 24, No. 4 USPS 000-846, ISSN 0894-0436) is published seven times per year (bimonthly, except monthly in March and June) by Hanley Wood, LLC, One Thomas Circle, N.W., Suite 600, Washington, DC 20005. Periodicals postage paid at Washington, DC, and additional mailing offices. Printed in the USA. POSTMASTER: Send changes of address to Architectural Lighting, P.O. Box 3494, Northbrook, IL 60065-9831.

Canada Post Publications Mail Agreement No. 40612608. Return undeliverable Canadian addresses to: Bleuchip International, P.O. Box 25542, London, ON N6C 6B2.

Distributed free of charge to individuals or firms engaged in the specification of lighting products in the US. Per year, all other US subscriptions \$48; Canada, \$60; foreign, \$96. Payable in US dollars. For subscription inquiries, address changes, and single copy sales (\$10 in the US, \$16 in Canada, \$20 for other countries, payable in advance) write to Architectural Lighting, P.O. Box 3494, Northbrook, IL 60065-9831 or call 847.291.5221 or toll-free 888.269.8410.



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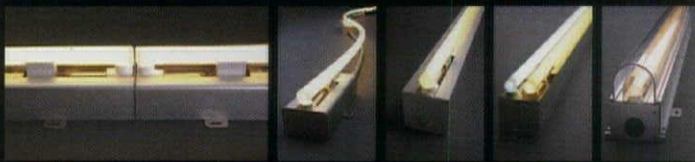
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VOL.24, NO.4

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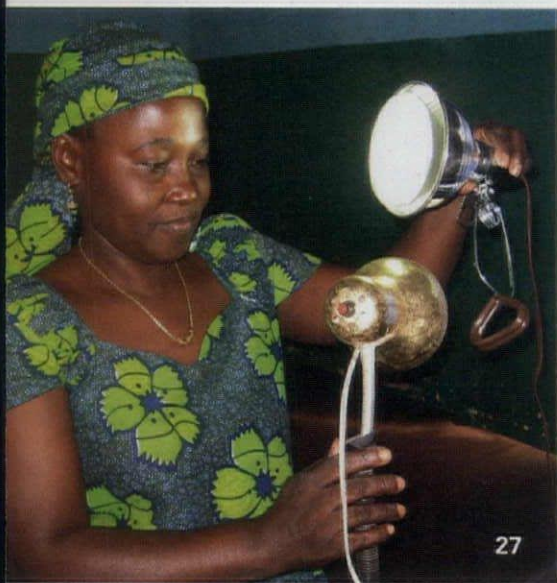
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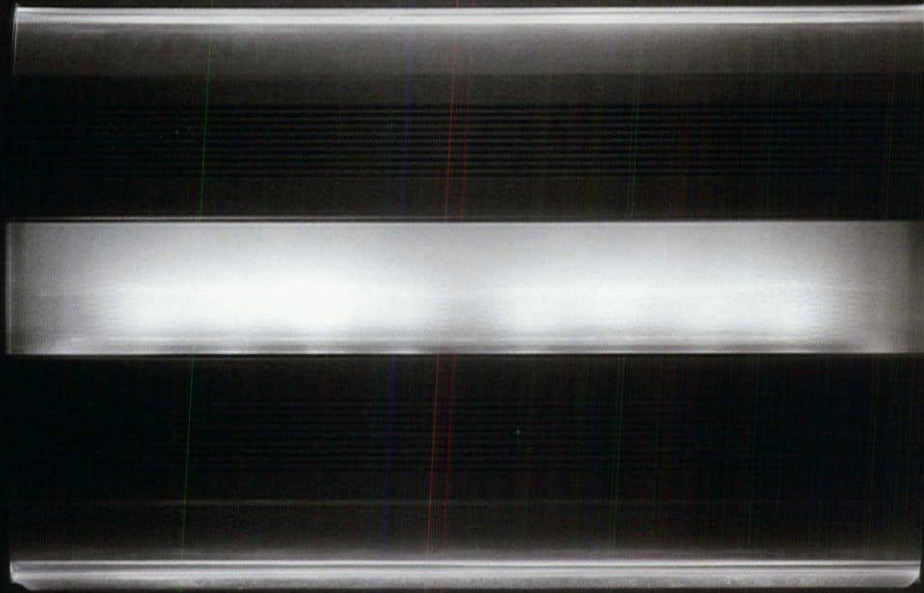
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Cover: The new MIT Media Lab Building.

ANDY RYAN

THIS PAGE: MESSE FRANKFURT EXHIBITION GMBH/JOCHEN GÜNTHER, SOLAR SUITCASE, ANDY RYAN



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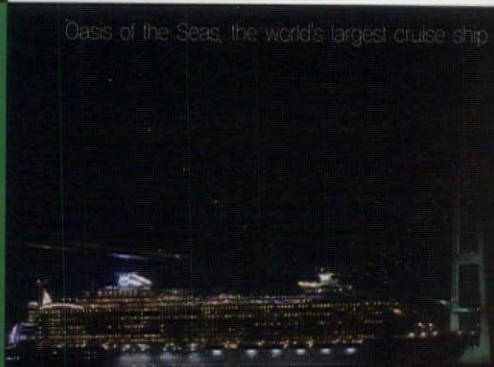
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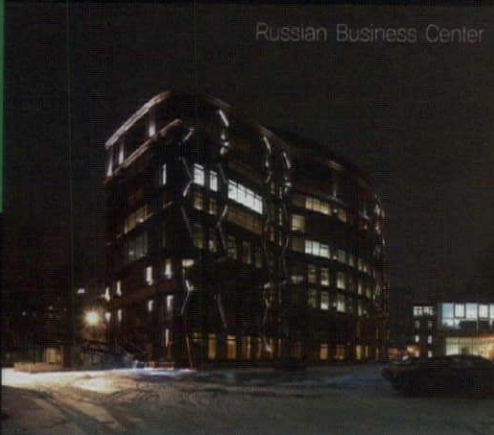
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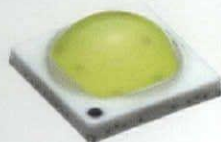
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The Three Cs of Design

I often speak with Howard Brandston, one of lighting's elder statesmen, to get his perspective on issues that impact the lighting design community. His 50-plus years in the field give him tremendous insight into the evolution of the profession. During our most recent conversation, we talked as usual about a pretty wide range of topics—everything from the incandescent phaseout to quality-of-light issues—but one of Howard's comments in particular stood out to me: Underlying all of his work, all of the issues he devotes his time to, he said, is a constant sense of curiosity. He's not content to accept things simply as they are, and curiosity is his fuel, his energy.

In our busy, overscheduled lives, can we still make time for curiosity? In my opinion, the answer is a resounding yes. We absolutely must. If you're going to choose a career in a design field—whether it is architecture, lighting, landscape, or any other area—curiosity is one of the traits that will be invaluable to your success. Add creativity and collaboration into the mix and you have a powerful recipe for innovation.

Curiosity, creativity, and collaboration are what all of the people, projects, and products included in this issue represent. I always look forward to putting together this annual issue of ARCHITECTURAL LIGHTING, which is organized around the theme of innovation. The challenge is to find a collection of work that represents a richness of ideas, from those individuals and companies who are not afraid to push beyond existing limits to solve problems. In other words, the challenge is to find those who are willing to take a risk in order to achieve excellence.

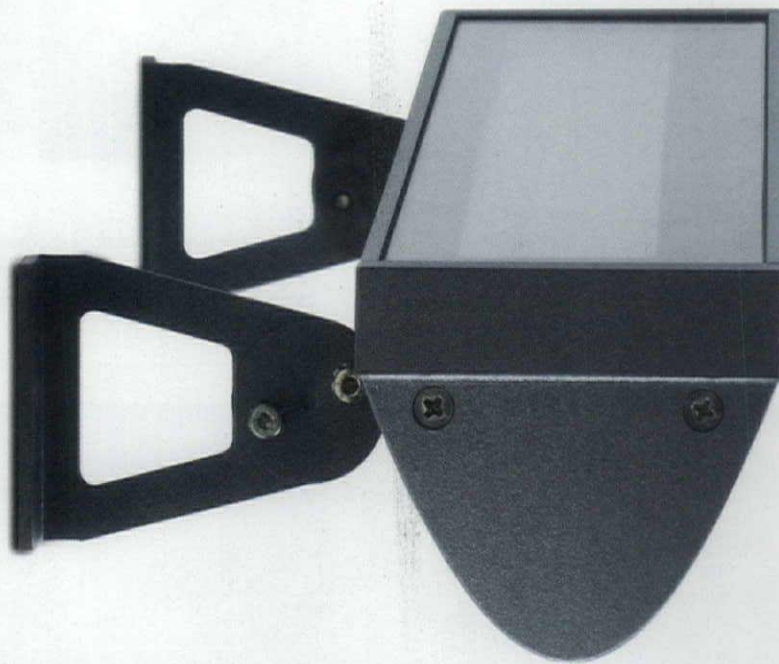
The pursuit of curiosity, creativity, and collaboration is not easy. At every turn there are obstacles: evaluating the pressure of economic realities; coordinating the work of large, complex project teams; studying and adhering to stringent building and energy codes; and keeping up with the growing awareness of environmental issues. These are merely a few of the problems that you, as a designer, encounter. Yes, at times the design process is a series of trade-offs, but we should never abandon creativity and the exploration of ideas because it is too difficult, too inconvenient, too expensive, or will take too long.

A designer would not be staying true to the essence of design without at least trying to find a solution, even under the most challenging of circumstances. Right now, lighting designers are hard at work, utilizing their unique set of quantitative and qualitative skills to marry the wide-ranging set of issues that confront a project in order to find a cohesive set of solutions.

It might not always be easy to have these three criteria of design (curiosity, creativity, and collaboration) converge—at least not as easy as, say, the criteria for selecting a diamond (carat, clarity, and cut). But when it is accomplished, the result can be truly brilliant.

ELIZABETH DONOFF
EDITOR

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THE STATE OF LIGHTING

In response to the Comment article, "Safeguarding Lighting Design," in the March 2010 issue:

I was greatly appreciative of your pointing out some of the issues confronting lighting and lighting design at this moment. From the lack of any evidence that this attack on this aspect of our built environment and habitation is abating, I wonder what the future will bring. I am sorry to say that it will lead to a need to redefine "good" in order to assess lighting projects in the future. It is clear to me that nobody thought of existing classical projects that will be impacted by some of the proposed legislation. Certainly every residence in the country will be compromised in some fashion. Does no one care?

**HOWARD BRANDSTON, LC, FIES, HON. FCIBSE, FIALD, PLDA, MSLI
HOLLOWVILLE, N.Y.
CONCERNINGLIGHT.COM**

CORRECTIONS

Apr/May 2010 issue:

In the product section "Lamps/Ballasts/Controls," the website address for IEPC and its virtual control panel product (page 54) should have been properly identified as iepc.cc.

In the product section "LEDs and Drivers," the wrong photo was included for Osram Opto Semiconductor's Oslon SSL product (page 61). The correct image, accompanied by the description, is shown below:



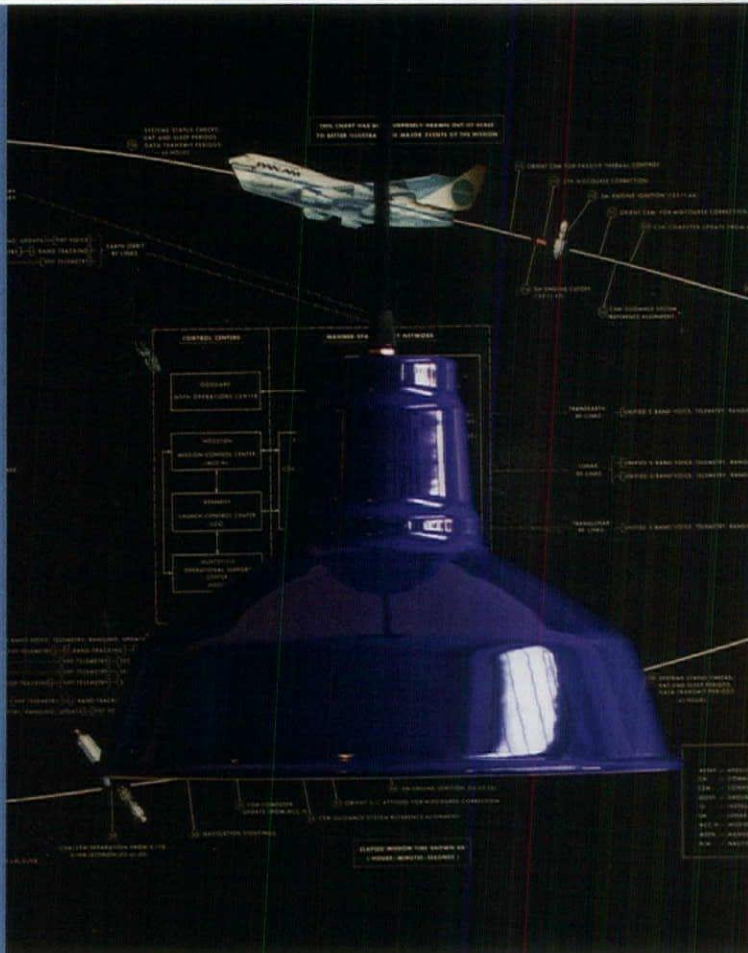
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Light+Building

Regardless of Eyjafjallajökull—the Icelandic volcano that erupted and impacted everyone's travel departure from Frankfurt—Light+Building did not disappoint. A visit to the fair this year proved particularly beneficial in seeing a full array of the latest architectural lighting offerings—both decorative and technical.

Although the Milan Furniture Fair was happening simultaneously, it did not deter decorative lighting manufacturers from making a strong showing. Nor did the economic downturn appear to keep visitors away. And while there did seem to be less of a “buzz” in the air this year, Messe Frankfurt, the fair's organizer, reported attendance of more than 180,000 people over the course of the six-day event.

What Light+Building is so good at doing is inspiring lighting designers and architects with the endless possibilities that come with discovering new lighting tools. As I scoured the aisles of the six principal lighting halls, I was impressed by a number of new product offerings. On the decorative

front, one couldn't help but be impressed with the sheer beauty and scale of Luceplan's Hope chandelier. At once modern and classic, the goal was to “reimagine the chandelier using as few sources as possible per fixture,” according to Paolo Rizzatto, one of the luminaire's co-creators.

Philips, a major presence at the fair, appears to be reinventing itself as it works hard to be known as more than just a lamp company. CEO Rudy Provoost made it clear during the company's press conference that they believe LEDs are the source of the future. To that end, their two lines of fixtures that integrate color-changing capabilities and personal control—LivingColors and LivingAmbience—are particularly interesting. Launched in Europe, they are available in limited release in the United States.

To be sure, LEDs were everywhere. However, an abundance of LED products does not mean it all represents quality. But some do. One new launch that separated itself from the pack was Erco's Quintessence. This line of recessed luminaires,

Manufacturer displays are on a grand scale at the Messe Frankfurt fairgrounds at Light+Building. Seen here is Hall 2.

with more than 1,200 different possible configurations, is designed with LED sources in mind, as it pays special attention to the reflectors and lenses incorporated into the luminaire assembly. Unfortunately, for a variety of reasons—everything from market share to the UL process—this line will not make its way across the Atlantic. Still, for designers working outside the United States, this is an interesting new product line to keep in mind.

Another notable development in the field of LEDs was the emergence of what people have begun referring to as modules. Slowly, manufacturers are addressing the new form-factor possibilities that LED sources offer. The future of light sources is moving away from round bulbs to flatter, puck-like shapes. A number of companies—Cree, GE, Philips, Osram, Xicato, and Bridgelux and Molex (in collaboration)—launched new LED modules that enable OEMs to design luminaire housings



Occasionally even the most beautiful
objects have to bask in reflected glory.

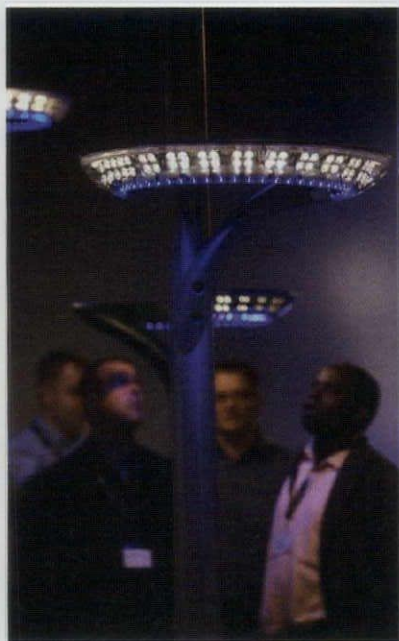
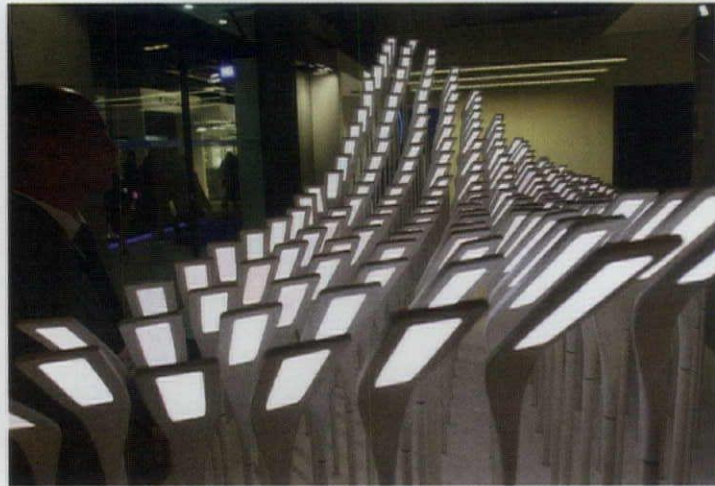


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Erco displayed its new Quintessence line of fixtures that are designed to address the specific attributes of LED sources (top left). Although OLEDs were on display, seen here at Modular's exhibit (top right), the design configurations are still more artistic than they are market-ready products. Schröder's Perla streetlight integrates LEDs in a new form factor (above left). Past meets present at the Osram Sylvania stand where a custom-designed chandelier provided a form of commentary on the state of the incandescent lamp (above center). LED technology was on display everywhere in multiple formats. Seen here are LED media-mesh screens (above right).

based around an LED source. All have slightly different approaches to their assemblies, but all address issues of color rendering and stability, which continues to be a key concern for lighting designers about using LEDs.

Most manufacturers are putting serious research and development behind the introduction of new LED products. One of the most promising prototypes I saw was Selux's presentation of a linear LED module that could function as a direct-indirect fixture as well as a wallwasher. Combining cool and warm LEDs, each separately dimmable, it was nice to see issues of optics and glare addressed in the design of the fixture. The wallwash version was particularly exceptional with a light distribution of 4:1, better than the standard 3:1 ratio.

Another product that caught my eye was a software program: Schröder's Owlet wireless control system for managing street lighting. The fully functional program allows for the tracking of a fixture's energy use so that municipalities can address energy savings in real time, in addition to monitoring where maintenance is needed. Information about operating status is stored in a database that includes a time stamp and geographical location. The program was impressive in both its functionality and user interface.

Finally, one of the things that still continues to surprise me is how indirectly, if at all, issues of sustainability enter the discussions about lighting overseas. While manufacturers do address green design topics, it is not something they launch into right away—unlike the product discussions at U.S. trade shows. Perhaps this is because building codes in Europe have addressed sustainability issues in a different way, often through more integrated curtain-wall design. Still, it is rather surprising that this discussion was really not part of the dialogue around lighting technology and products at Light+Building.

Although Light+Building does not take place in the U.S., it is recognized by the industry as the pinnacle in lighting trade shows, and we believe it is important to report on these findings. They offer inventive and stylish solutions that provide a source of inspiration—an important part of the lighting profession. We start our recap as seen through the eyes of several designers who attended the show. Look for additional coverage online at archlighting.com.

Attendance at Light+Building is not an inexpensive proposition, but the rewards are great. Luckily, one has two years to absorb all that was seen, heard, and discussed before it's time to head to Frankfurt again. **ELIZABETH DONOFF**

TOP ROW AND BOTTOM LEFT: MESSE FRANKFURT EXHIBITION GMBH/JOCHEN GÜNTHER; BOTTOM CENTER AND RIGHT: MESSE FRANKFURT EXHIBITION GMBH/PIETRO SUTERA

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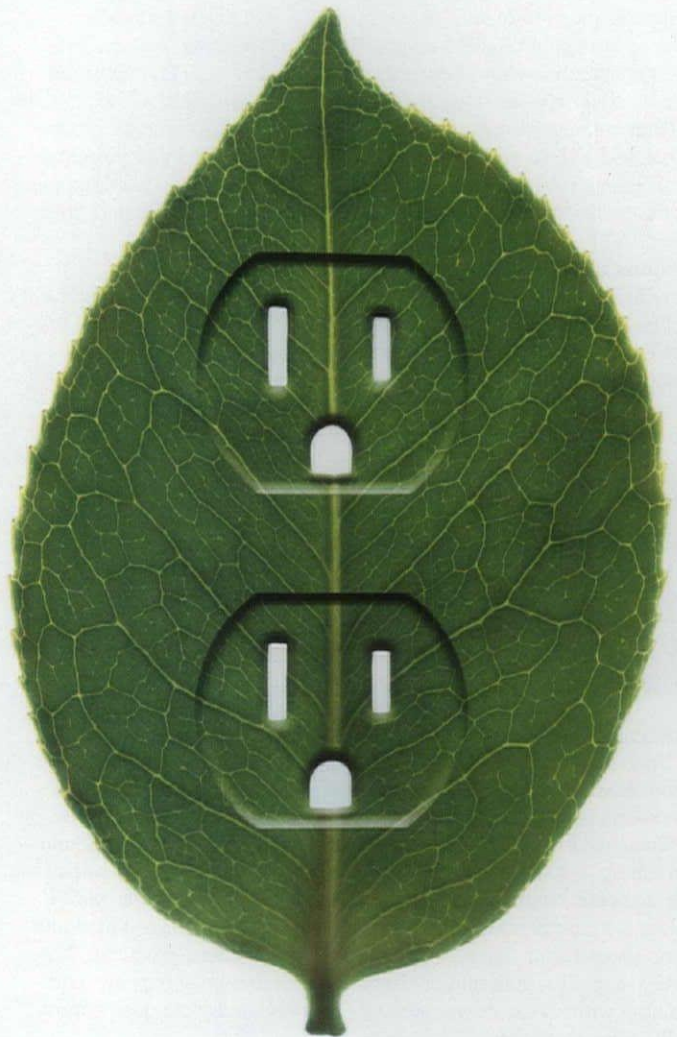
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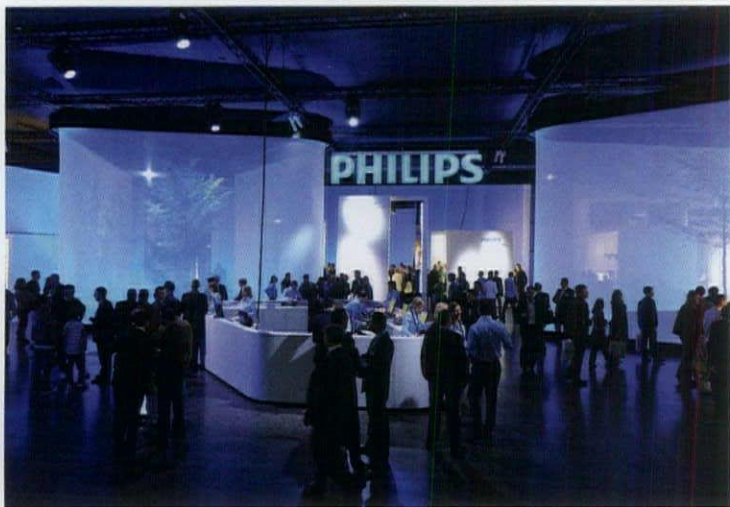
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Martin Lupton, lighting designer, Light Collective, London

Bio: Lupton is a former director of two major U.K. lighting practices and the current president of the Professional Lighting Designers' Association (PLDA). In conjunction with fellow lighting designer Sharon Stammers, he has co-founded a new practice: Light Collective. Light Collective's aspiration is to understand, interpret, and work with light in all of its contexts: artistic, social, architectural, commercial, cultural, physiological, and psychological, while providing a platform for like-minded and inspired people to collaborate in a multitude of ways and in different formats all with the medium of light.

Impressions of Light+Building:

I had very high hopes for this year's Light+Building. I thought it would be a year of new trends and high innovation. I really thought it was going to be special, but on the whole I was a little bit disappointed. There were some good elements and the overall standard of products had increased but, for me, there wasn't any one, unique, standout trendsetting product. Perhaps my expectations were too high?



One thing though was clear: White LEDs are definitely here and ready. White LEDs have really come of age. In fact, there were several stands lit in nothing but white LEDs and you could actually see what you were looking at! In addition to that luxury, the light quality was also good on a significant number of these fixtures. It was definitely a turning point.

Of the products that I would pick out for individual credit and attention, I am going to surprise myself and first say Philips. Their stand itself and some of the new products were very impressive. I had to eat a few of my words from the night before when I sat with their marketing team and praised their lamps but criticized their product design. They had a very innovative LED catenary system for street lighting that can run up to 30 meters long—really neat and minimal. They also had a fantastic domestic control system, called LivingAmbience that was based on wireless technology and worked with their specifically adapted products and, using special plug adapters, with other manufacturers' products. This would make a great retrofit into domestic systems to save energy and add scene control without extensive rewiring. They also had some good output white LED office solutions.

One company you can always rely on is Flos. They always manage to do something different and have a very special approach to light and product. Their stand at EuroLuce in Milan last year (2009) was streets ahead of all others. Despite only having a small presence at Light+Building this year, which was branded as Flos Germany (Light+Building occurred concurrently

with the Milan Furniture fair this year), they still managed to impress with the launch of their soft architecture range. This extensive range is made up of some really unique and entertaining plaster-in lighting details—very funky and really slick.

On the product front, one company that really did think out of the box and create something new was Modular Lighting from Belgium. Their Spock luminaire really does match aesthetics and function in a whole new way.

Probably the highlight of the show for me was XAL. Their slick, black, dim velvety stand showed not just cool product, but some cool lighting. It was a great place to be and not just another white box lined with product. Their LED curved track with chain curtain system was beautiful and they also showed some interesting downlights and soft-edged triangular LED office lighting ideas. Congratulations XAL for setting an example and thank you for the sunglasses you were giving away to protect me from the glare from most of the other stands.

Finally, I would like to pose a question to everyone who is going to be at Light+Building in 2012: Why does every stand have to look the same? I am a lighting designer. I want to be inspired. I am not buying a fridge. Please do not try to tempt me into your stand by lining up all your products in a nice row and pointing them at my face. If you want some ideas for a cool stand, give me a call!



The Philips stand at Light+Building was actually its own hall (top left). The company's new LivingColors and LivingAmbience system for home and office offers people personal control options (above) and sleek new luminaire designs with color-changing capabilities (below).



TOP LEFT: MESSE FRANKFURT EXHIBITION GMBH/PIETRO SUTERA; COURTESY PHILIPS

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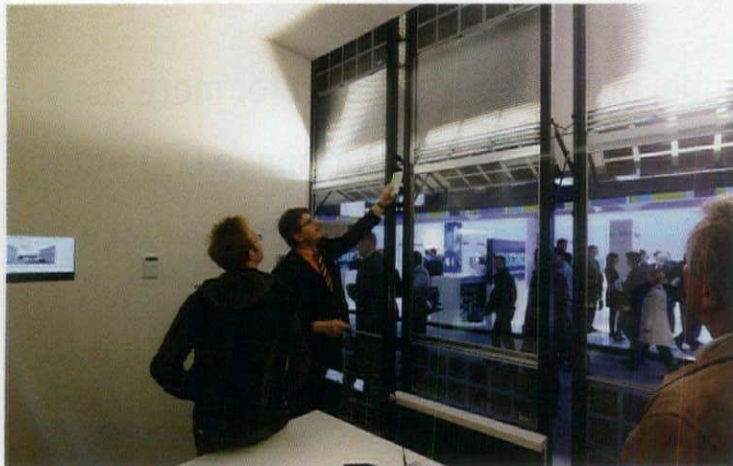


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Zumtobel, together with Behnisch Architekten, Transsolar Energietechnik, Bartenbach Lichtlabor, and Sunways, displayed a prototype for an intelligent façade system that incorporates lighting elements and photovoltaic panels into the building skin.

Eva Persson, lighting designer, Ljusarkitektur, Stockholm

Bio: Persson joined Ljusarkitektur in 2000 and has worked on a variety of projects including Nordic Walk, a light and sound installation at Stockholm's Arlanda Airport, and the House of Sweden, the new Swedish Embassy in Washington, D.C., completed in 2006. Persson studied interior design at the School of Design and Crafts in Gothenburg, Sweden, and received her lighting degree from Gothenburg University.

Impressions of Light+Building:

This year it was all about LEDs—from the most technical lighting manufacturers to decorative lighting companies such as Catellani & Smith. The development of LED light sources is starting to feel very promising, particularly with the introduction of remote phosphor solutions, which seem to offer better color rendering—as high as a CRI of 95. The question, though, is: Will the light quality and color temperature remain stable over time?

However, LEDs are not the solution for everything. At the moment it appears that manufacturers are adapting existing luminaires to the LED source rather than thinking about how to adapt the housing and fixture body to the form of the LED. I hope this will not be a long-term trend. For example, most LED downlights are very glaring. Manufacturers should give more consideration to better glare shields. LEDs are a promising light source, but we should use them to the best of their potential, maximizing a diode's inherent capabilities and characteristics.

Overall, my impression of this year's fair was not about a specific new product, per se, but rather more a feeling that we are at the beginning of a larger change in the types of light sources we use and the applications for them. In a few instances, manufacturers such as Zumtobel and Colt showed lighting solutions integrated into buildings using daylight as the light source and capitalizing on solar for producing the building's energy. With the Icelandic volcano and the suspension of air travel for a week, we all received a clear reminder that we have to better adapt to nature. And we should carry these ideas further in developing lighting design and the lighting industry as well.



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BRIEFS

Birgit Walter, lighting designer, BM Lighting Design, Barcelona

Bio: Walter studied in Barcelona, Frankfurt, and New York and worked in several lighting design offices in the United States, including the Brandston Partnership prior to founding BM Lighting Design (BMLD) in Barcelona in 2001. BMLD is a multidisciplinary team involving architects, lighting designers, and industrial and graphic designers. The office's current projects include the new W Hotel in Barcelona, the Harbour Bar and Wasabi Restaurant in Mumbai, and the new Le Méridien hotel in Oran. Walter is co-director of the newly created graduate lighting design program at the Universitat Politècnica de Catalunya in Barcelona.



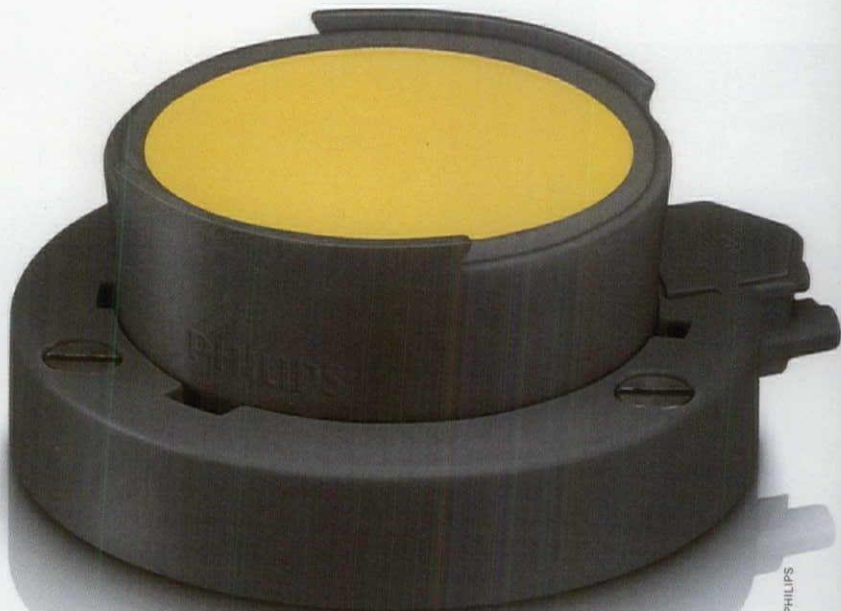
She is a professional member of the Professional Lighting Designers' Association (PLDA) as well as the Comité Español de Iluminación (CEI).

Impressions of Light+Building:

As expected, LEDs have been the "winner" of this event. LED technology has moved beyond the color and lighting effects stage. Now it is entering into higher wattages and the modulation of interchangeable LEDs, such as the Fortimo LED module by Philips, for a wide variety of fixtures and applications. There is also the introduction of the RGB, dimmable LED downlight to give designers the desired color temperature through a pulsing switch, as seen in Regent Lighting's prototype called Poco Pac.

As to the development of the energy efficient market, the introduction of Luxim's Light Emitting Plasma and the incorporation of OLED technology into prefabricated modules by Panasonic give designers something to

think about in terms of possible developments and directions for the lighting market. It's all about less and less energy ... though who is thinking about the quality of the light?



Philips' Fortimo is one of several new LED modules designed to deliver LED illumination options more directly to OEMs interested in developing LED luminaire packages.

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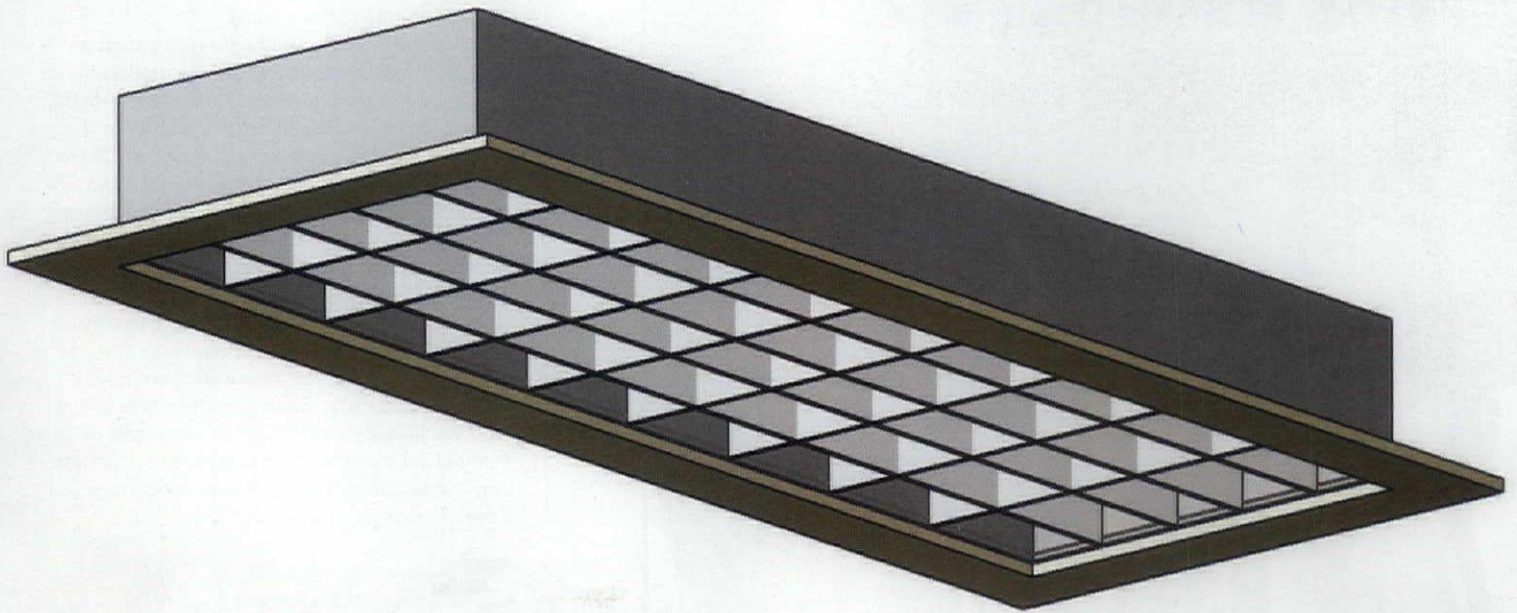
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BRIEFS

David Singer, principal, Arc Light Design, New York

Bio: Singer is an architectural lighting design consultant and a registered architect who also serves as a senior associate and principal in lighting of the interior design firm of Tonychi and Associates. He has worked on projects around the world and

specializes in the design of decorative lighting fixtures. He has taught the Luminaire Design course for the graduate lighting program at Parsons the New School for Design for the past 15 years.

Impressions of Light+Building:

I believe the economic slowdown has had one good outcome: Some manufacturers have taken

the time to reconsider their products relative to the new generation of LED light sources and advances in control systems.

Two years ago, the products at this fair were mainly about retrofitting existing fixtures with unimpressive LEDs and had a general lack of direction. This year, Light+Building was exciting and rejuvenating, as it provided a glimpse to the lighting advances of the next three to five years.

Much of this new product development on the LED front has been focused on getting a handle on the management of heat and how the form of the heat sink becomes a priority in the form factor of the luminaires themselves. There were notable fixture designs where the heat sink was integral to the fixture housing or enclosure. This achievement was not only done with decorative fixtures but also linear strip and downlight concepts. These fixtures, more often than not, took on new and fresh fixture forms. Though they provide a downlight performance, they do not look like the typical recessed downlight or troffer. Additionally, these new forms are in line with the aesthetic of the design proposals of many interior spaces authored by a new generation of designers. Notable fixture companies were Nimbus and Kreon.



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LED lighting technology meets nature at manufacturer Nimbus' display at Light+Building.

The advances in controlling light sources and the ability to manipulate light level and color were also impressive. This may be the first of the new generation of control systems designed to control solid-state control gear. There were many advances in the control and keypad technology for controlling LEDs. The most impressive control system was the seamless dimmable ceramic metal halide in downlights, which could dim from 100 percent to 50 percent smoothly and without color shift. Notable fixture companies were Philips and Philips/Ansorg.

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*Cost Analysis of Inadequate Interoperability in the U.S. Capital Facilities Industry; National Institute of Standards and Technology, August 2004.

BRIEFS

Joern Siebke, associate, Arc Light Design, New York

Bio: Siebke joined Arc Light Design in 2003 and has focused his time on the firm's notable hospitality projects around the globe. Siebke's distinctive background in film lighting design and landscape architecture have contributed to the firm's approach and philosophy to lighting design. Siebke has taught lighting design for interior design and display design students at the Fashion Institute of Technology in New York for past three years.



leaps forward. There are now several products available that can seamlessly be integrated into architecture, and make the light source and/or fixture disappear. What comes to mind is a product by Flos called 'soft architecture' as well as minimal extrusions by others.

The quality of white light LEDs has also made great advances, and these LEDs are now becoming more comparable in their ability to mimic the characteristics of incandescent sources. This is achieved through new phosphors and technologies that "apply" the phosphors to the diodes, as well

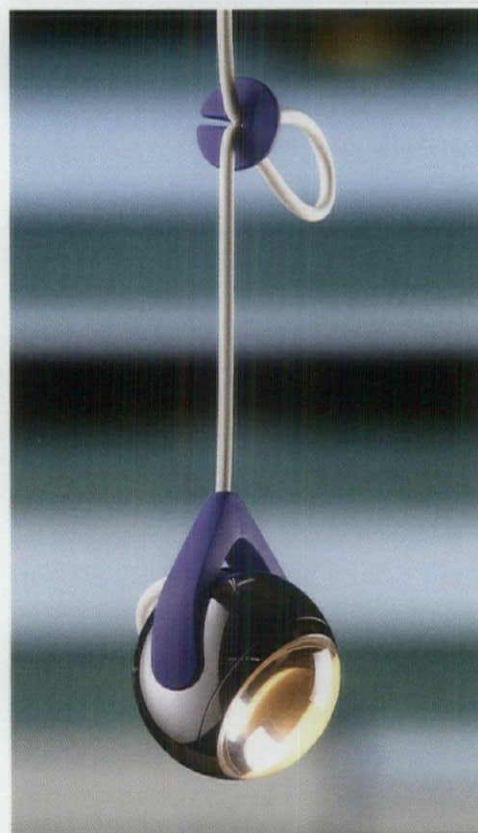
as through control systems for LED sources, where the light output is directly related to a shift in color temperature. What comes to mind here is a system shown by LG that allowed controlling the two properties—output and color temperature—digitally.

In terms of the quality of white light LED sources, one development that was specifically interesting was the effort of a company called Xicato, who for the first time tried to set an independent calibration-standard for color temperature consistency by employing McAdams ellipses. These are essentially areas in the color spectrum that are defined

as not representing a perceivable color-shift. This standard would address one of the most prevalent problems facing the fast-developing arena of LED products: the backward compatibility of new products. Being able to engineer all future products to stay within the same range (ellipse) as the original product that it supersedes would be a significant step.

The other singular, most noticeable element of the show, from a design perspective, was the use of a rotation joint—the ball-joint. This makes for a great mechanical connection with minimal moving parts and great industrial looks. This type of joint was omnipresent in designs from recessed fixtures with hidden mechanics as shown by Viabizzuno, to decorative fixtures where the joint is the design feature as seen at Tobias Grau.

Tobias Grau's pendant fixture Falling Star explores the mechanics of a luminaire with its ball-joint design.



COURTESY TOBIAS GRAU

Impressions of Light+Building:

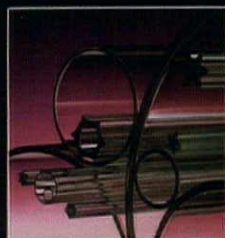
In general this year's show was the most exciting and inventive in years. It was evident that the majority of companies have used the economic downturn to invest in R&D and to develop new products. Most of these efforts seem to have gone toward LEDs and designs that for the first time took advantage of the specific characteristics of LEDs and the new shapes and concepts that this source allows.

The process of miniaturization also made great



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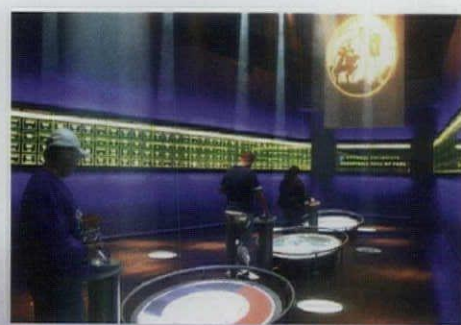
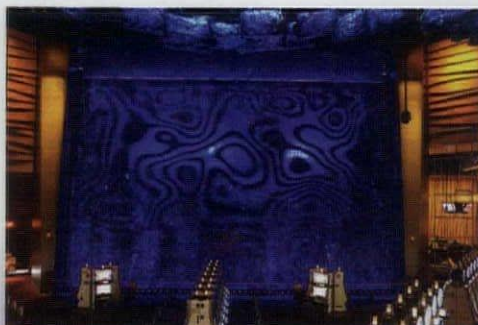
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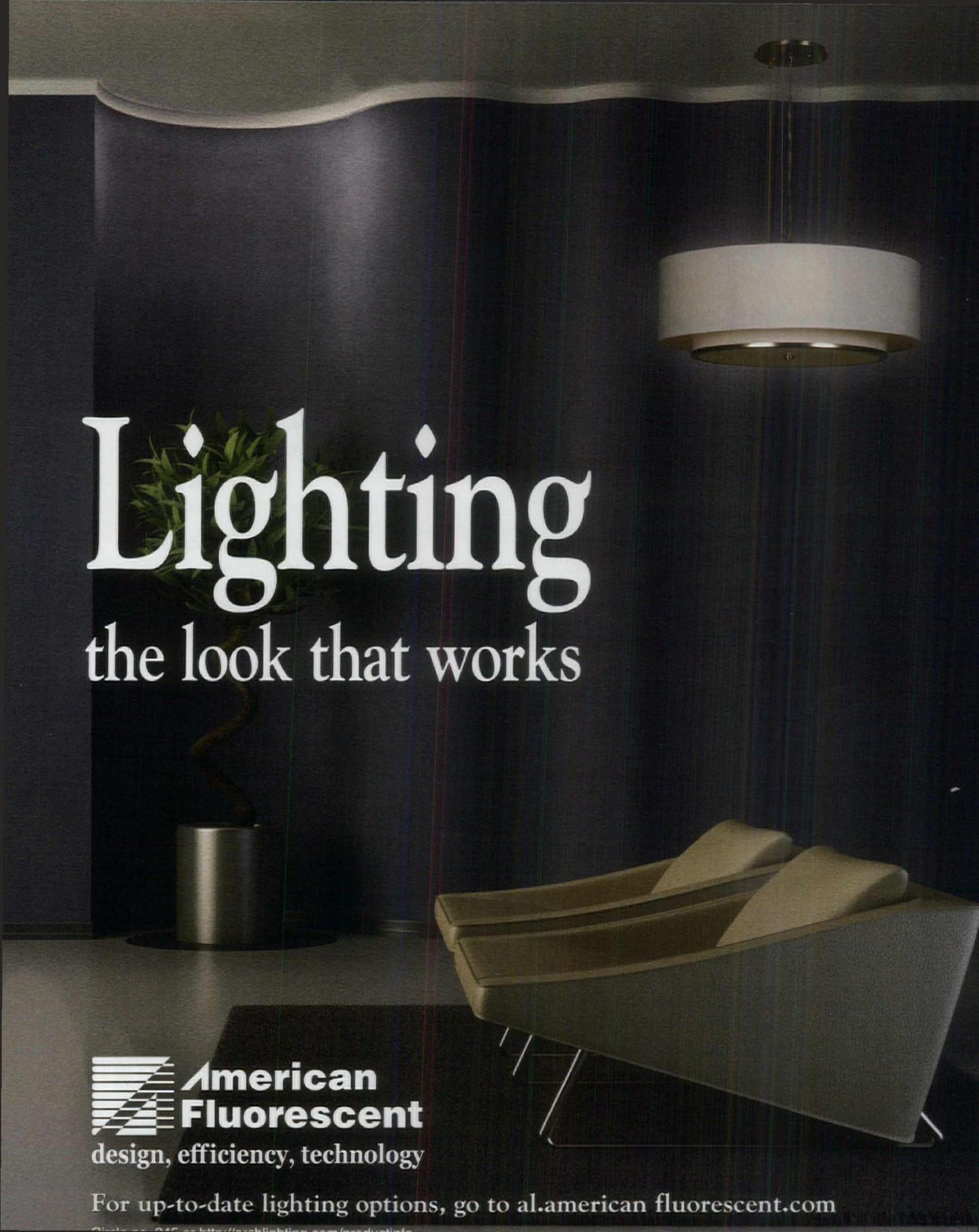
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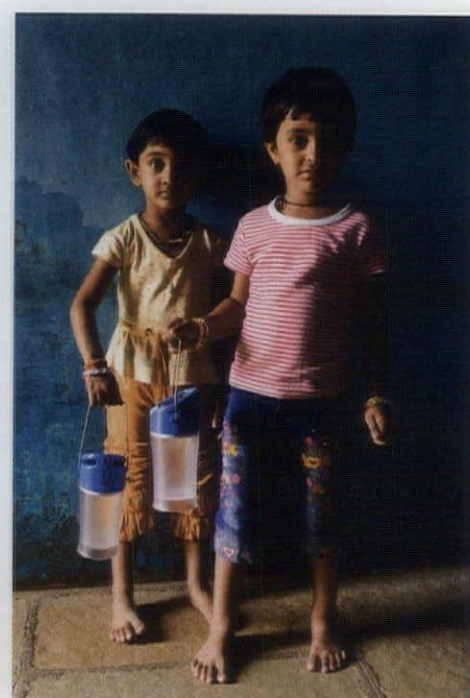
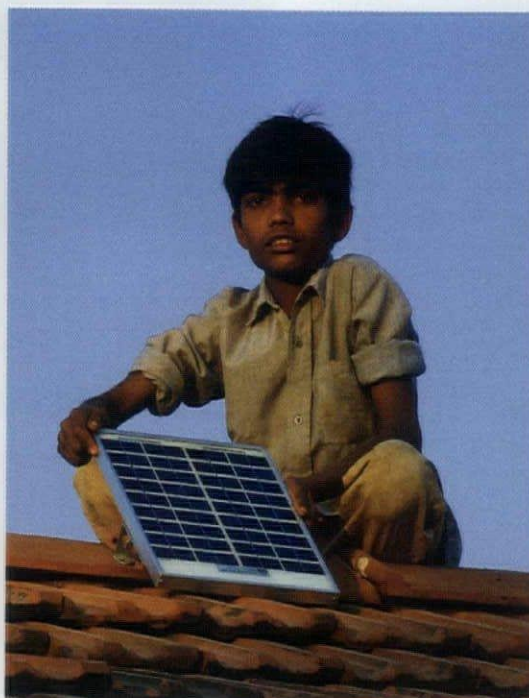
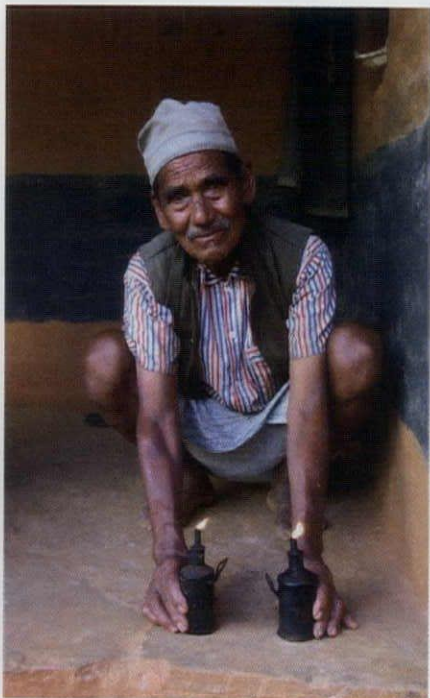
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Sam Goldman knows what it means to live in the dark. For four years, the young Peace Corps volunteer inhabited a remote rural community in the West African country of Benin. Kerosene lamps were the primary light source in this off-grid village. One night in 2003, a snake came out of the shadows and bit him. He rode 7 kilometers on the back of a motorcycle through the murky darkness to locate anti-venom. Luckily, another village had one dose left in a kerosene-fueled refrigerator. Not long after this harrowing evening, his neighbor—a 12-year-old boy—endured serious injury from a kerosene lamp accident.

"I had a series of things happen in a relatively short amount of time, which got me thinking," Goldman says of the perils of off-grid living. "It seemed like a huge market failure. You have millions of people who want something better and are willing to pay for it, but nobody [is] serving them."

In fact, it's a market of 1.6 billion individuals. That's how many people live without electricity, according to the World Bank, meaning nearly a quarter of the world's population effectively shuts down with the sun. Studying and socializing are limited to the paltry light cast by candles or kerosene lamps. In addition to the constraints on activities and work, the danger of fuel-based lighting is well documented. According to the World Bank, kerosene lamps guzzle 77 billion liters of fuel, emit noxious smoke and CO₂, and cause dangerous fires and personal injury. Then there is the cost. In sub-Saharan Africa, where 560 million live without electricity, families spend as much as a third of their income on kerosene.

Today, Goldman is the CEO and director of South Korea-based D.light, a three-year-old for-profit company on a mission to bring safe, affordable solar lighting to off-grid families. Last year the company released the Kiran, billed as the world's most affordable solar lantern (it retails for \$10 to \$15 depending on the country). The lamp is composed of a 0.3W integrated solar panel and high-powered LEDs. It is marketed as a replacement for kerosene. There are two task settings: high for studying and reading, and low for walking. Its tempered plastic body is transparent, creating 360-degree illumination when hung and

According to the World Bank, 1.6 billion individuals live without electricity and rely on candles or kerosene lamps (above left). But new solar (above center) and LED lighting solutions, such as the Kiran lantern (above right) are providing safer and cleaner illumination alternatives, so that nearly a quarter of the world's population does not have to shut down with the sun.

eliminating the shadow cast by traditional lantern designs. With eight hours in the sun, the Kiran collects enough power to provide eight hours of low light or four hours of bright light. The lantern can withstand the high winds and temperatures of climates like those in Africa and India and it can endure extensive daily use for five to 10 years, according to Goldman. "The environment is pretty intense compared to the way someone would use something if they were going camping," Goldman says. "People need these products. They use them daily."

"It's all about the consumer," says Robin Chilton, head of product design with D.light. "In designing the Kiran, we spent a lot of research time living with consumers, understanding their needs, and trialing prototypes with them."

REACHING AN OFF-GRID POPULATION

Understanding and cultivating this global consumer has become a priority for many nonprofits, nongovernmental organizations, and social entrepreneurs as they begin to realize the potent impact that off-grid lighting systems could have. In addition to the significant ecological benefits of moving from fossil fuel to renewable energy, there is also a market base hungry for affordable and reliable alternatives.

Itotia Njagi is the program manager with Lighting Africa, a World Bank initiative aimed at helping the lighting industry connect with consumers in developing nations. He says a cadre of new social entrepreneurs, like D.light, are looking to pioneer the field of off-grid lighting and develop the distribution infrastructure to get these fixtures and the equipment to underserved users. "This is an interesting market where social entrepreneurs are seeing an opportunity and spending the time to understand the needs of the market."

Laura Stachel, co-founder and director of San Francisco's We Care Solar, is

one of those social entrepreneurs. She is not a lighting designer by profession and—as with Goldman—it was a challenging problem in the field that led her to develop an off-grid lighting solution. “I am an ob-gyn and I was trying to do research about maternal mortality in Africa,” Stachel says. She discovered that sporadic electricity was a major issue. Most hospitals and clinics have anemic energy sources and are limited to just a few hours of electric light. One evening, the lights went out while Stachel was watching another doctor perform a cesarean section in a Nigerian hospital. The doctor was forced to finish the procedure by flashlight. “I felt there was nothing we could offer that hospital if they couldn’t get access to light,” she says.

Back home in San Francisco, Stachel partnered with her husband, Hal Aronson, a solar energy educator and designer, to develop a solar lighting system for the hospital. Stachel asked her husband to create a demo of the lighting that she could pack in her suitcase and easily bring through customs. The hospital staff in Nigeria was so taken with the demonstration, they begged Stachel to let them keep it. From this, the Solar Suitcase was born. Weighing about 35 pounds, the suitcase contains all of the components necessary to power two overhead LEDs as well as charge walkie-talkies and cell phones. It also includes LED headlamps that come with rechargeable batteries. Since its introduction in June 2009, the Solar Suitcase has been sent

to nine countries from Tanzania to Rwanda, to Tibet, Mexico, and Nicaragua. In Haiti, medical relief teams and maternity clinics now use them. The cost of the system is about \$1,000 and Stachel works with nonprofits and others to raise funds to offset the cost to the user.

Recent years have seen a rise in the development of these off-grid lighting systems that capitalize on compact fluorescent and LED technologies. They get their fuel from alternative energy sources such as wind, water, and human power, such as hand-cranking and bicycle pedaling. But it is solar that is encour-

aging the most research and development. “We use solar energy because it is the most versatile,” explains Michael Fark, executive director of the nonprofit foundation Light Up the World (LUTW). LUTW is an international humanitarian organization that has worked in over 50 countries to provide efficient lighting systems to disenfranchised communities.

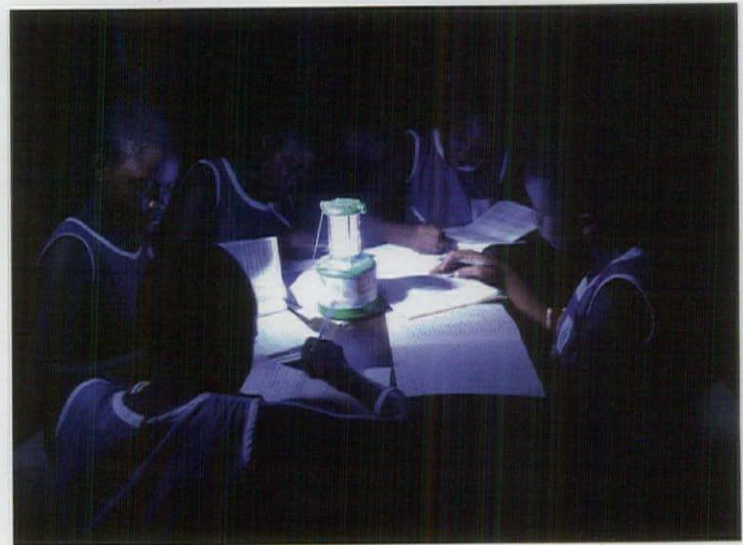
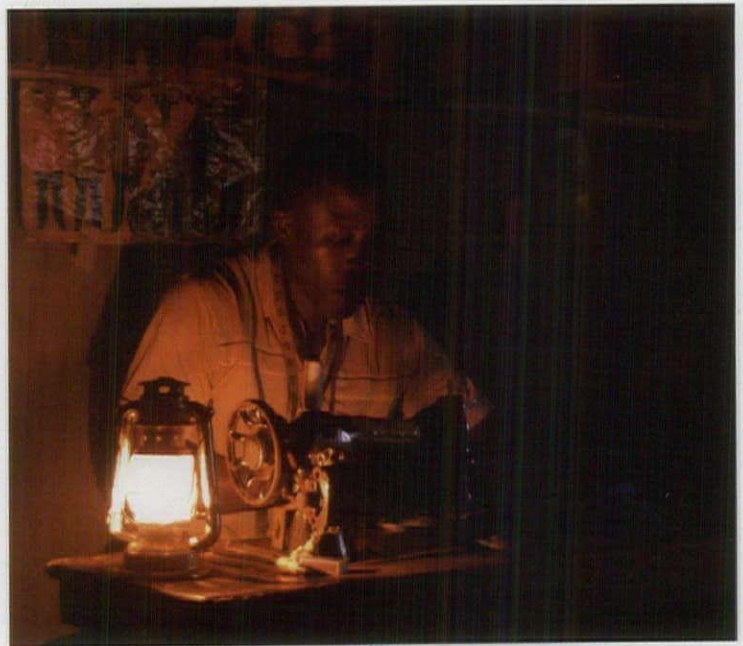
For the past three years, Fark and his team have partnered with Philips to test several solar lighting prototypes, including a portable lantern—composed of a 5W polycrystalline silicon solar panel and a 5W four-pin lamp—that is now available for retail. “They are the first of the big players in the lighting industry that have recognized the potential in the off-grid lighting market and are trying to design products for that market,” Fark says.

LUTW developed a pilot program in Costa Rica that places Philips’ basic solar light systems, reading lamps, and portable lanterns in homes for consumer feedback. Luis Dumani is the director of a Costa Rican nonprofit called the Association for Science and Moral Education and he partners with LUTW to deliver solar lighting to native tribes living on a reserve in Talamanca. Dumani says the lights not only improve the social and economic lives of these families, they also increase educational opportunities. “We want to strengthen the knowledge of the people with these systems,” Dumani says, by offering training in the basics of solar energy and maintenance.

Philips is now getting ready to release a complete low-cost plug-and-play home system through LUTW, a development that excites Fark. “The package will include the PV panels, batteries, switches for the light, everything, all in a well-contained, inexpensive, and easy-to-install parcel.”

BEYOND ILLUMINATION

Nick Kelso, senior communications manager for Philips Africa, says the company hopes to reach 10 million people by 2015 with their off-grid LED lights. Kelso is spending the summer traveling across Africa to introduce their latest



In Africa, where 560 million people live without electricity, solar and LED off-grid lighting solutions are providing a dynamic change for communities. Workers no longer have to rely on dangerous kerosene lamps positioned close to equipment (top), and students have more time to study, increasing their success rate at school (above).

design, a solar-powered floodlight system meant for outdoor purposes such as soccer fields. “The system can illuminate areas up to 40 meters by 20 meters (approximately 131 feet by 65 feet) with bright white light,” he says. Battery cells provide up to eight hours of floodlighting per solar charge. The system he is showcasing is portable, so it can be installed for a game, taken down after, and stored or moved to another site. And while soccer fields might not seem like a priority area in a part of the world where electricity is scarce, it is in fact a valuable community asset. The games allow for new social interaction while introducing people to the possibilities of solar through the sport that is so culturally significant in their everyday lives.

Another company, Florida-based Sol, has been developing solar-powered exterior lighting since 1990. Today, they have products in 61 countries around the world. “A lot of those locations are what we would consider Third World where there is no electrical infrastructure,” says company CEO Rick Schuett. Their off-grid technology is perhaps most poignantly displayed when used in relief efforts, such as those in Haiti. Within 24 hours of the earthquake, Sol mobilized staff and volunteers to deliver exterior lights to airports,

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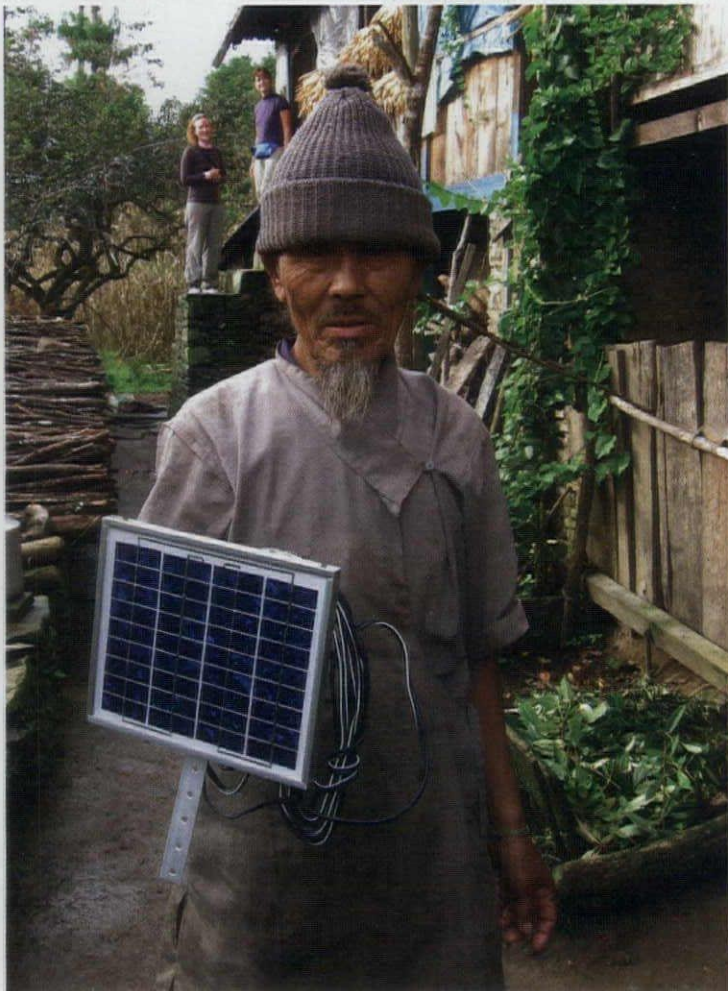


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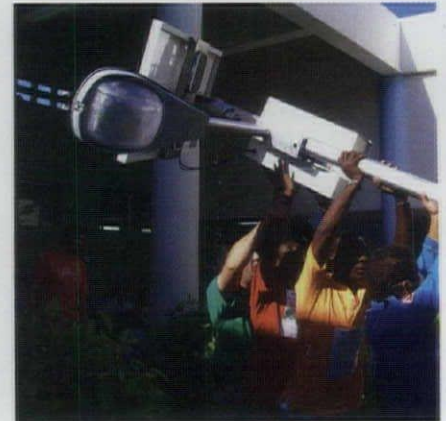
In remote areas where there is no electrical infrastructure, such as the mountains of Tibet (above) and Nepal (left), solar illumination systems offer a relatively inexpensive way to bring light to rural communities. These off-grid solutions and their technology serve as a critical resource, particularly in the aftermath of natural disasters, such as the earthquake in Haiti (below), where lighting needs to be installed quickly to carry out relief efforts.

medical clinics, roadways, and food distribution sites. Fixtures were also installed at refugee camps to provide security after dark. To date, over 100 of Sol's solar light systems have been donated and installed quickly and without wiring.

While strides have been made in recent years, renewable and safe solar lighting is still a mystery for most consumers living without reliable electricity. One of the biggest challenges, according to Lighting Africa's Njagi, is convincing consumers to switch from a known entity (kerosene) to an unknown entity (solar). With the glut of new solar products entering the marketplace, those of poor design quality threaten to arrest progress. "There is still very low awareness of these products among consumers," Njagi says. "They do not have a lot of disposable income, and there is no brand identity yet with these lights. If they buy a product that does not meet their expectations, then we run the risk that they say all solar products do not work."

Which is why companies like D.light go to great lengths to invest both capital and creativity in a human-centered design process that yields low-cost, high-quality lights. Robin Chilton says it's worth the extra effort. "Kids are no longer studying by looking into a flame of a kerosene wick, their faces covered with smoke and soot," he says. "These lights change lives."

ELIZABETH EVITTS DICKINSON



TOP AND LEFT: COURTESY LUTW; ABOVE: COURTESY SOL



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The Fragonard Room, The Frick Collection

A CELEBRATED ARTWORK BENEFITS FROM A LIGHTING RENOVATION

Project The Fragonard Room, The Frick Collection, New York **Client/Owner** The Frick Collection, New York **Lighting Designer** Renfro Design Group, New York **Project Size** 800 square feet **Manufacturers** Drama Lighting, Luxam, Lutron, Nulux, Visual Lighting Technologies



A carefully thought out solution is the cornerstone of the lighting renovation of the Fragonard Room, where modern technology is discretely introduced into the existing ceiling slots to illuminate Jean-Honoré Fragonard's paintings titled "The Progress of Love" (above and facing page, right). The room in 1947, when an electric lighting system was first installed (facing page, left).

The Fragonard Room, located at The Frick Collection, is a Fifth Avenue mansion and European art collection on East 70th Street in New York that was once the home of American industrialist Henry Clay Frick, and is now home to 11 masterworks by 18th century French painter Jean-Honoré Fragonard. The four largest paintings, a series of panels named "The Progress of Love," were commissioned by Louis XV in 1771 for his mistress Madame du Barry. Fragonard completed an additional four paintings in the series in about 1790. The paintings, which depict scenes of love with a Rococo-style exuberance, were acquired by Frick from the collection of fellow industrialist J.P. Morgan in 1915 and were then installed as a complete set. Only a chandelier and natural light provided illumination for the room and the paintings until a renovation in 1947 introduced a recessed electric lighting system. That lighting stayed in place until 2007 when lighting designer Richard Renfro was called upon to breathe new life into the outdated lighting scheme.

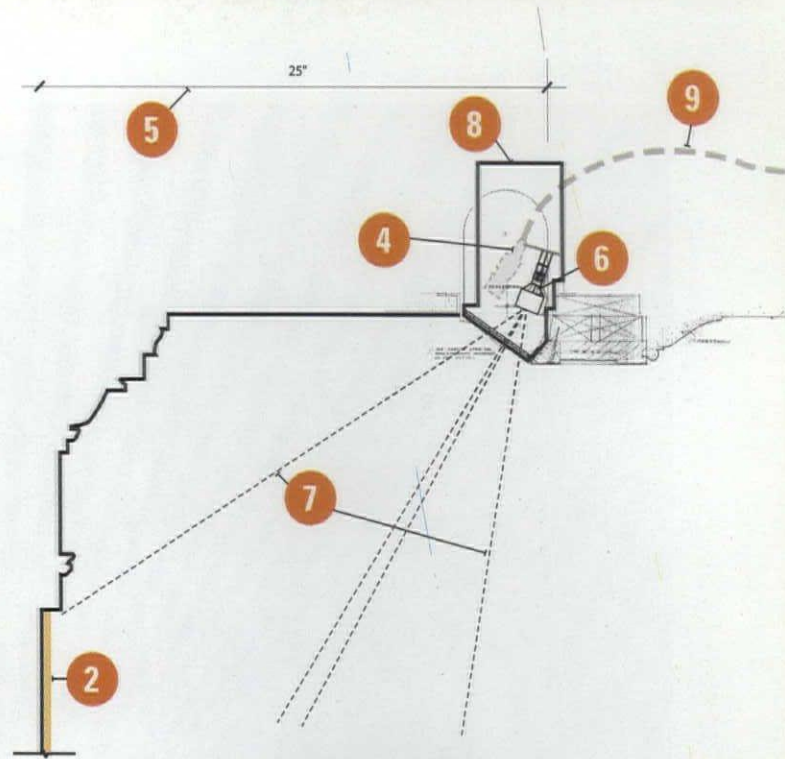
The 1947 electric lighting system consisted of frosted T-lamps recessed in lensed slots above each painting. While sophisticated for its time, this approach only lit the upper portion of the paintings and spilled light onto the gilded molding at the ceiling. The goal of the 2007 renovation (which focused solely on this one room) was to update and improve the outdated lighting system and to uniformly illuminate the full 10 feet 5 inches of each painting according to accepted conservation levels of 20 footcandles. The Frick wanted to respect the historic setting without "losing the residential feel" of the room, explains the museum's chief conservator, Joseph Godla. Since the room's two French door-style windows on the west wall provide some natural light for the space, the intent of the new lighting design was to supplement the daylight, not overpower it.

So as not to disturb the look of the ceiling, Renfro set out to develop a solution that utilized the existing lighting slots above each painting. Two

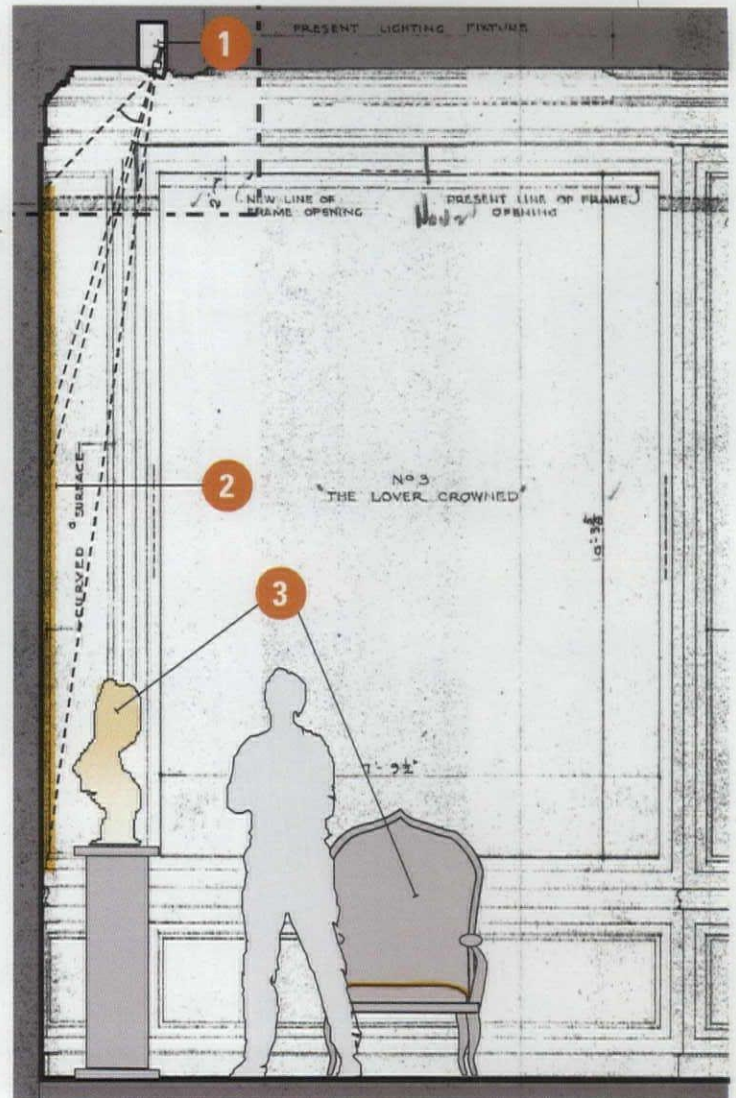
mock-ups were conducted on-site with the lighting team and the conservators. The first was to determine the feasibility of using the ceiling slots. Only 25 inches away from the wall, there was concern that the slots might be too close to the wall to allow enough distance for the light source to project sufficiently. The second mock-up examined using two aiming angles—one for the upper portion of the painting and a second one for the lower portion of the painting—each on its own circuit. The studies led Renfro to design a custom light fitting that would work within the existing ceiling slot dimensions. The final version of the custom lensed fixture contains a row of closely spaced low-voltage 20W halogen fixed reflector lamps with two aiming angles, to uniformly light the entire artwork, and with two circuits to ensure balanced light levels.

The lighting renovation also made it possible to accent the decorative arts objects—porcelain vases and gilded mantle piece sculptures—displayed around the room. To accomplish this, fiber-optic fixtures were integrated in separate compartments at each end of the custom housings. Each fiber-optic head is adjustable with a 180-degree rotation and tilt allowing for maximum flexibility in aiming. The sculptures and vases are only lit from the side opposite the windows to provide shaping “with a small amount of light, very precise,” explains Renfro. “Just enough to add sparkle to the glaze [of the porcelain objects].”

Completed in Oct. 2007, the Fragonard Room lighting renovation has enhanced the historic works of Jean-Honoré Fragonard, revealing details and colors in the paintings not previously visible. The careful consideration of how to incorporate contemporary lighting technologies while preserving the domestic setting of the Frick Collection has proved so successful, the museum has again called upon Renfro and his firm's expertise to adapt a similar lighting strategy (sans fiber-optics) in a second gallery—the Boucher Room. With a deft hand and design restraint, Renfro's lighting serves as the perfect foil to Fragonard's lively paintings. **JENNIFER BICKFORD**



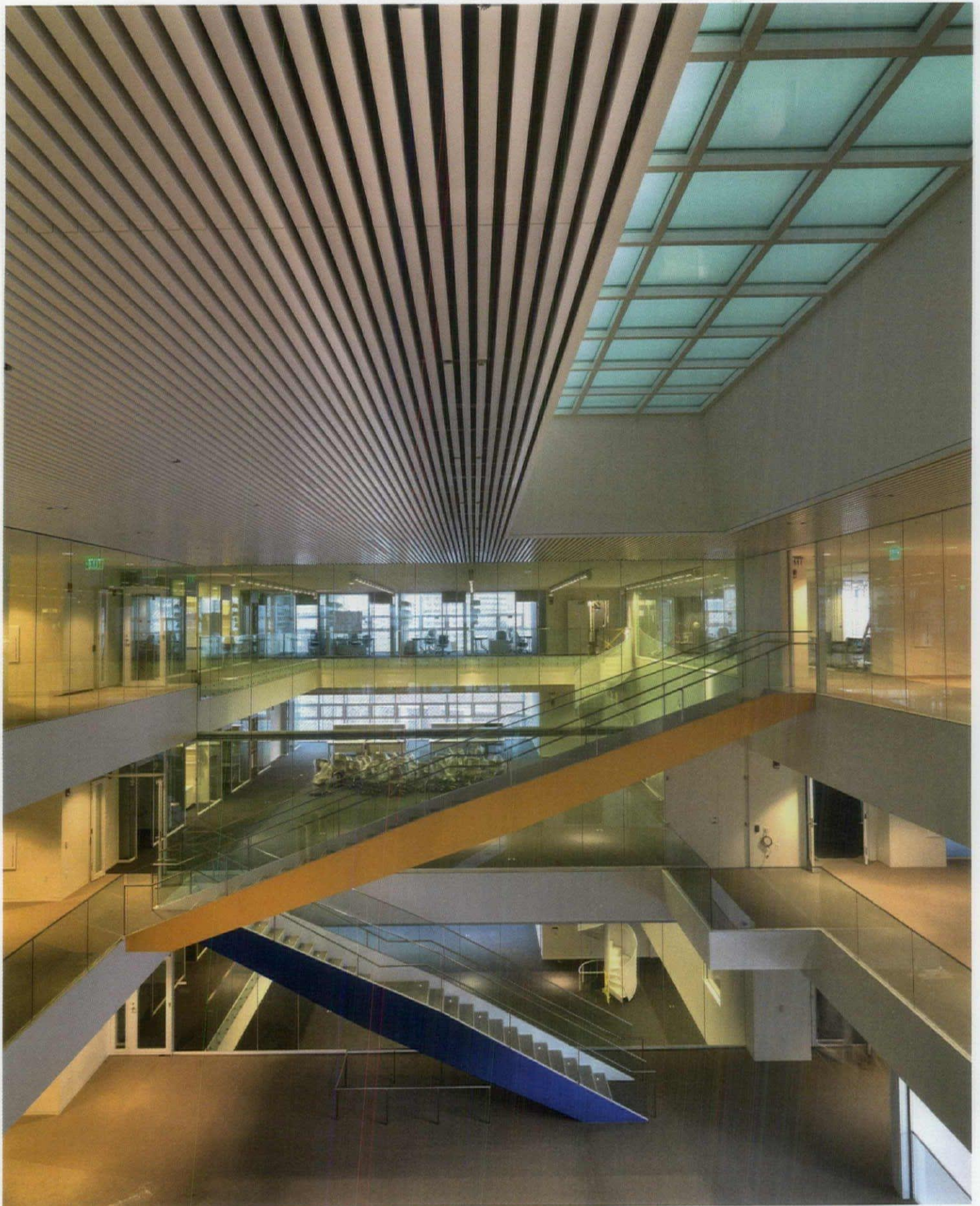
CEILING SLOT DETAIL



SECTION

- 1 NEW FIXTURE IN EXISTING RECESSED SLOT TO LIGHT PAINTINGS
- 2 FRAGONARD PAINTING SET IN WALL PANEL
- 3 DECORATIVE ART OBJECTS
- 4 NEW FIBER-OPTIC DECORATIVE OBJECT ACCENT LIGHT
- 5 ALR12 LAMP POSITIONED 25 INCHES AWAY FROM THE PAINTING
- 6 ALR12 LAMP FOR ILLUMINATING THE PAINTINGS WITH HIGH AND LOW AIMING ANGLE FOR ART LIGHTING
- 7 LIGHTING DISTRIBUTION
- 8 NEW FIXTURE HOUSING
- 9 FIBER-OPTIC HARNESS TO ILLUMINATOR

COURTESY THE FRICK COLLECTION; DRAWING DETAILS; COURTESY RENFRO DESIGN GROUP



The new MIT Media Lab is all about connectivity. The double-height labs are staggered on either side of the upper atrium so that no matter where one is standing, researchers can see what colleagues are working on. Diffuse natural light, from a glass skylight above, provides an ambient wash of illumination, and connecting stairs are highlighted with a splash of color.



DETAILS

Project MIT Media Lab, Cambridge, Mass.
Client Massachusetts Institute of Technology, Cambridge, Mass.
Design Architect Maki and Associates, Tokyo
Executive Architect Leers Weinzapfel Associates, Boston
Lighting Designer Lam Partners, Cambridge, Mass.
Structural Engineer Weidinger Associates, Cambridge, Mass.
General Contractor Bond Brothers, Everett, Mass.
Project Size 163,000 square feet
Project Cost \$90 million
Photographer Andy Ryan, New York and Boston

LIGHT COLLECTIVE

FUMIHIKO MAKI'S ELEGANT DESIGN FOR THE NEW MIT MEDIA LAB CREATES A **NURTURING ENVIRONMENT FOR RESEARCH AND CREATIVITY**

You know good architecture when you see it; it doesn't make a fuss, but rather artfully steps forward and says: "Here I am." And that is exactly what you experience in the sophisticated design for the Massachusetts Institute of Technology's (MIT) new Media Lab Building in Cambridge, Mass., designed by Pritzker Prize-winning architect Fumihiko Maki. One might expect a lot of complicated architectural gestures to be included in a world-renowned facility such as the Media Lab, where some of the most advanced thinking about design and technology is occurring today. But that would have been contrary to Maki's architectural approach, which is grounded in the traditions of Modernism. Like the man himself, the building is unpretentious and meticulous in every detail.

Maki and his design team at Maki and Associates, led by Gary Kamekoto, have created a space that is wholly conceived around the theme of communication and collaboration. Everything is meant to foster a physical and visual dialogue—from the sectional configuration of the building itself to the design of the individual labs.

A lot was at stake for MIT in seeing this project through. Recent outings with high-profile architects such as Frank Gehry, and his design for the university's Stata Center, had met with mixed reception and problematic construction issues. And the fate of the Media Lab was not without its own bit of drama. Design for the building began in 1999, at the height of the dot-com frenzy. When that bubble burst, technology companies, many of whom

were supporting partners in the lab's research initiatives, were unsure of their own futures. So the university put the project on hold in 2003.

Three years later, with the technology world having regained its footing, MIT decided to move ahead with the building. Design was completed in April 2007 and construction began in May of that year. It was finally completed in Dec. 2009, which was no small feat given the recent economic downturn. That the integrity of the architectural design conceived by Maki and Associates was maintained throughout these starts and stops is a testament to the respect and collaboration between the design team members—including Boston-based executive architects Leers Weinzapfel Associates and Cambridge, Mass.-based lighting designers Lam Partners.

The layout of the new six-story Media Lab Building focuses on transparency and the physical manifestation of light. Divided into three zones—the upper and lower atriums, the labs, and the service areas—there is "a great clarity to the building," explains Joe Pryse, principal at Leers Weinzapfel Associates and Maki and Associates' local point person for the project. Even on an overcast, rain-drenched day (the circumstances under which ARCHITECTURAL LIGHTING visited the project) the quality of light throughout the building is beautifully sublime.

Architecture and light are perfectly balanced. There is a fundamental awareness of natural light in Maki's thinking about architecture that permeates the entire building, and which contributes to the ease of movement



from space to space. In fact, that sense of openness is one of the most surprising—and refreshing—things about the MIT Media Lab. The fact that during regular business hours one can walk right into the lobby galleries and even up into the labs without having to check in at a security desk stays true to the Media Lab's mission to maintain a sense of transparency about the work and research that is conducted there.

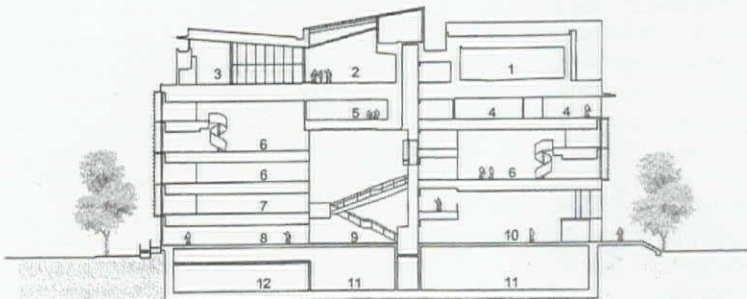
The Media Lab is home to seven different laboratories, each of which investigates something different—from digital technologies to the future of the automobile. Each lab is its own community—or neighborhood, if you will—within the city that is the MIT Media Lab. The design of the new labs, which range in size from 5,000 to 8,500 square feet, were modeled after the layout of lab E15 in the existing media lab building. The existing lab building, adjacent to the new facility, was designed by architect

The façade is a glass-and-aluminum curtain wall with an aluminum pipe screen that helps cut transmittable light into the building interior by 50 percent. At night, illuminated from within, the building reveals itself to the surrounding campus (above). A longitudinal section (below left) shows the organization of the building. The work of faculty and students is displayed in the lobby galleries, awash in a balance of natural and electric light (facing page top). Elevators are used as a sculptural element, their mechanical components highlighted with metal halide narrow beam spotlights (facing page bottom).

and MIT alum, I.M. Pei, and follows a more typical layout of cubicle-type spaces. But what is unique about lab E15, and what the researchers commented on after being polled about the types of spaces in which they preferred to work, was the openness of that lab's layout: It is a double-height work area ringed by offices on an upper and lower level. Maki replicated the E15 lab layout and took it one step further by staggering the overall sectional arrangement of the labs. This creates myriad views no matter where you are in the building. Horizontally, vertically, and even diagonally across the atriums, colleagues can take a peak at their compatriots work, fostering both formal and informal discussion.

Everything about the building's design is maximized for flexibility, allowing researchers the room to work in order to respond to the latest technological advancements. Telephone and data lines are laid out in a grid in the floor and the ceiling is outfitted with structural points from which to hang things. This gives the researchers the option of using every available surface.

This flexibility also is found in the lighting. For the galleries, labs, and workshops, Lam Partners employed a tracklighting strategy. "The goal was





to provide a framework," says lighting designer and Lam co-principal Keith Yancey. "But we also designed the space with the idea in mind that folks could turn lights on and off, change the spacing of fixtures, or even remove fixtures completely, if need be."

A further testament to the clarity of the original architectural concept and the architectural lighting design and layout is that, once the project design resumed in 2006, Lam Partners was not allowed to go back and update its fixture or technology selections. Rather, they had to keep what they had chosen back in 2000–03; MIT was concerned that the project would not stay on track or budget if design selections were revisited.

As a result, the building does not use as many LED fixtures as one might expect, given the proliferation of that light source and the forward-thinking nature of the work being done at the Media Lab. At the beginning of the project, LED technology was still in its infancy, so Lam Partners had only introduced LED features as accent details. For example, there are recessed LED up-lights in the entry gallery as well as in the treads of the stairways that connects the lower and upper atriums. Linear fluorescent, compact fluorescent, and PAR lamps make up the majority of sources used for the project.

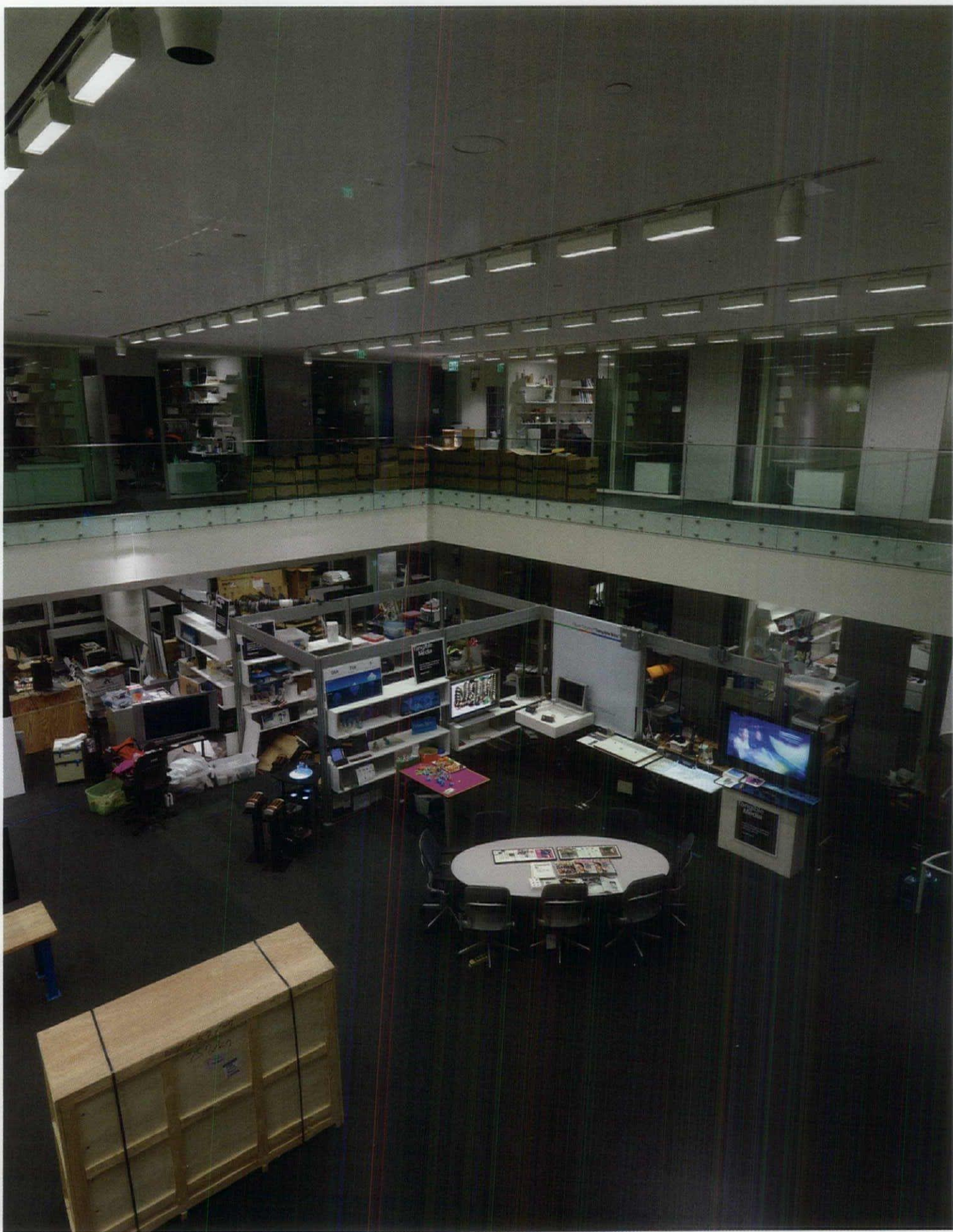
"Yes, it was a bit frustrating that we couldn't revisit any new technologies," Yancey says. "But now that the building is complete, they might

revisit some technologies as needed. Still, they have a sound and reliable base with which to work." This point is echoed by Lam colleague and co-principal Robert Osten: "The goal was to provide a workable base layer of light, which would be as flexible as the space."

And regardless of the particular generation of lighting technology used, energy code compliance was never compromised. In order to meet the light levels as warranted by the Massachusetts state energy code, all fixtures are on a sensor. The design of the buildings' exterior façade—an aluminum pipe screen—also came about as a result of the Massachusetts state energy code regulations, which mandates that, in terms of transmissible light, up to 50 percent of a building's exterior can be glass. To articulate the building's aluminium and glass façade, Maki and Associates devised a layout where panel sections of the pipe screen aid in cutting out 50 percent of the transmissible light into the building interior. There is also a very fine ceramic frit pattern on the center section of the curtain-wall glass.

In keeping with the lab's mission to stay connected to the university and to research communities, the building's sixth floor is designed as an event space for conferences and symposia. There are a variety of spaces that can satisfy the needs of different types of meetings—including a 100-seat auditorium, a 3,500-square-foot multifunction space, and an outdoor terrace. Common







Tracklighting was used to maximize spatial flexibility in the labs, which are organized into a double-height working area, ringed with offices on the upper and lower levels (facing page). The building's primarily white color palette lends an air of calm to even the most public of spaces, such as the lower atrium (left). Diffuse natural light permeates the sixth floor multifunction space from the curtain wall and skylight, while providing a stunning view of the Boston skyline across the Charles River (above).

to all of the spaces, however, are the extraordinary views of the Boston skyline (something Maki had in his mind since his attendance at the 1953 opening of nearby 100 Memorial Drive), as well as an amazing amount of natural light from the curtain-wall windows and diffuse ambient light from the skylight system in the partially sloping roof structure.

From top to bottom, every inch of the new MIT Media Lab Building is given careful consideration. Nothing is forced and everything works together expertly. This is an architecture and a lighting design that knows what it is doing. It is a clear vision executed by a deft hand—the hand of a master architect. **ELIZABETH DONOFF**

Manufacturers / Applications

Altman T6 metal halide very narrow beam uplights in atrium elevator pits

Bega Compact fluorescent steplights at outside ramps and in event space on sixth floor

Belfer Compact fluorescent cove strip for Winter Garden architectural "holes in the wall"

Birchwood Linear fluorescent downlights for medium-sized conference rooms

Design Plan Custom-designed single 1W warm-white LED uplights recessed in lower atrium connecting stair, warm-white LED uplights recessed in lower atrium terrazzo floor and roof deck

Edison Price Compact fluorescent downlights in corridors

Engineered Lighting Products Upper atrium skylight well, Winter Garden conference room, and lounge space

Erco 70W ceramic metal halide light scoops on the catwalks and exterior courtyard

ETC Unison controls, PAR scoops and ellipsoidals in sixth floor event space

Ledalite T5HO fluorescent cove in Winter Garden

Lighting Services Inc. Two-circuit track and compact fluorescent track heads throughout building

Lightolier Monopoint track in Winter Garden architectural "holes in the wall"

Lutron Lighting controls for the all labs and galleries

Vode Lighting Wall-mounted wallwasher at pantry behind upper atrium

The Animator

WORKING WITH A PALETTE OF MIXED MEDIA,
JASON BRUGES CREATES INTERACTIVE
INSTALLATIONS THAT USE LIGHT AS A
MEANS OF COMMUNICATION

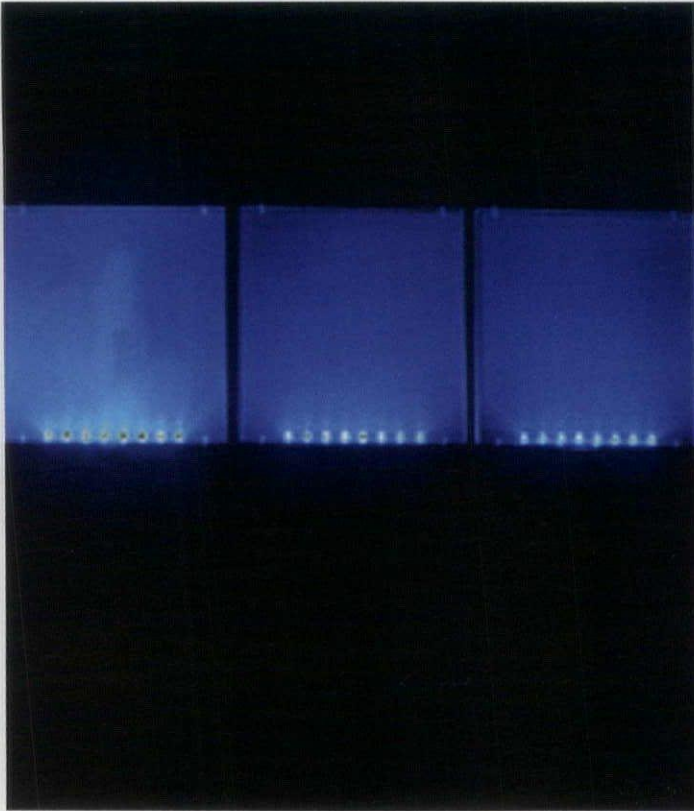
Though trained in architecture, first at Oxford Brookes University and then at University College London, Jason Bruges prefers not to commit himself to any one professional classification. His firm, Jason Bruges Studio, which he founded in 2001, works in the fertile ground that lies between the worlds of art, architecture, and media. Based in east London's hip Shoreditch neighborhood, the 16 members of his staff come from such diverse backgrounds as industrial and lighting design, film and television, information technology, and sculpture. For the past decade, Bruges and his team have made a name for themselves creating temporary and permanent site-specific installations with strong conceptual foundations and deft technical craftsmanship that respond to the world around them. Glowing, pulsing, changing color, the dynamism and life that these works bring to the built environment have been executed primarily with one brush: light.

An inventive and interactive use of light, coupled with an air of playfulness, captures the spirit of Jason Bruges' work, as seen here in *Pixel Cloud* (2007), an installation of color-changing globes in the atrium of law firm Allen & Overy's London headquarters.

COURTESY JASON BRUGES STUDIO





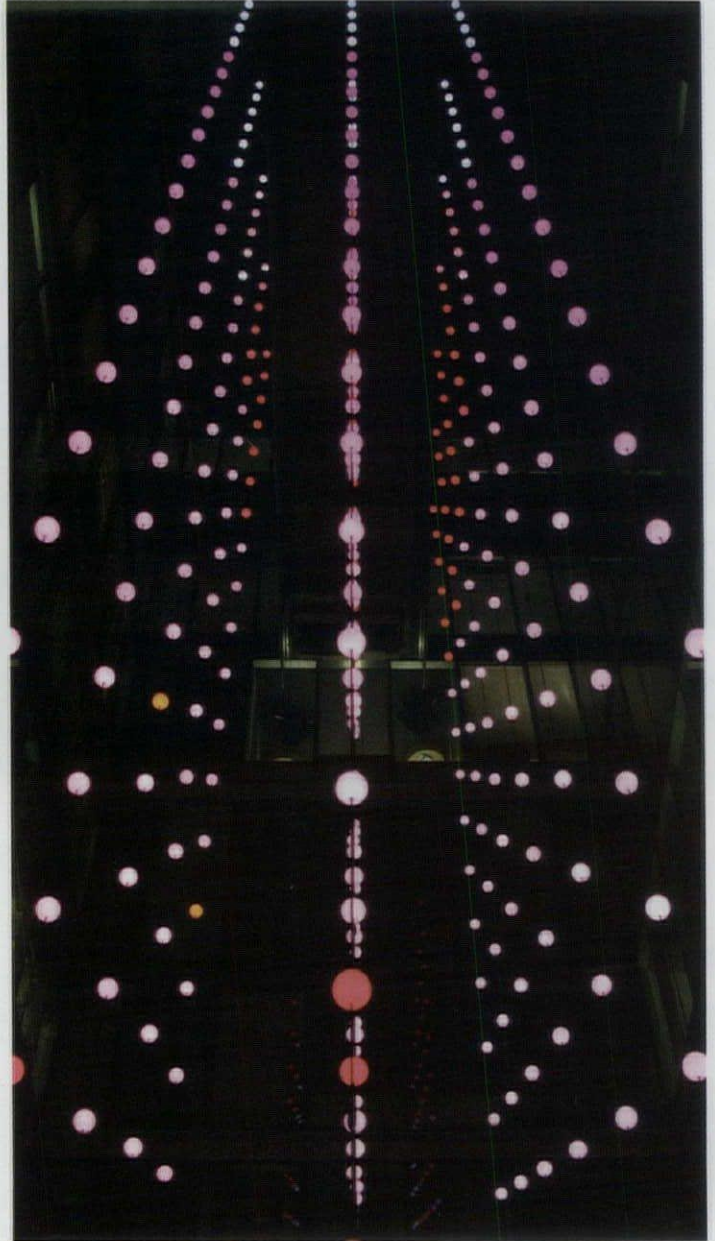


One of Bruges' first installations, *Four Seven Three* (2000), set up in a cyber café, used an infrared matrix to track the movement of customers (above). Light takes on the role of spatial markers in *Pixel Cloud* (2007) (right). In *Phosphor Field* (2008), wind powers the lighting feature—a sphere—at the top of each carbon-fiber mast (facing page).

"As part of my studies, I became interested in dynamic and changeable architecture," Bruges explains. After school he spent four years working for Norman Foster, both in London and in Hong Kong. But the world of bricks and mortar, or rather of glass and steel, did little to hold his attention, and Bruges soon moved to a position at the experiential design company Imagination. "I worked as an interaction designer on the Millennium Dome in London and on other projects, such as the Guinness Experience in Dublin," Bruges says. "Meanwhile, I started, in my free time, building time-based, site-specific installations that animated or changed space. The main palette I was using was light technology. I started to gain [a] reputation for making light art installations, and started getting lots of commissions ... so I set up a studio."

One of Bruges' very first installations, *Four Seven Three*, was commissioned by a cyber café in London. Completed in 2000, though since removed, this installation was composed of six floating LED light panels that used an infrared matrix to read the movement of customers. Controlled by a series of microprocessors, this data was then translated into lighting effects in the panels. The installation took its name from the light waves it emitted, 4-7-3 nanometers.

From these humble beginnings, Bruges and his team worked their way to larger public projects that showed the same innovative application of new technology and a growing mastery of metaphor. *Leicester Lights* (2006) is an intervention along a 1.5-kilometer carnival route between Leicester's cultural district and the Peepul Centre, a multipurpose event facility. Bruges and his team outfitted the street lamps with segmented light bands that read the passing traffic and record the color of the cars, forming a visual barcode on the light pole. *Pixel Cloud* (2007) is a chandelier of light globes suspended in the atrium of the Allen & Overy headquarters,



a Foster + Partners-designed building in London. The globes are spaced in accord with the grid of the building's floor plates and columns. The color of each globe can be individually controlled, and each changes color in response to environmental data broadcast on the international law firm's worldwide network. *Phosphor Field* (2008) is a grouping of carbon-fiber masts topped by blue glowing spheres in Poole, Dorset, England. Wind blowing across the site causes the lights to sway and dance. Integrated within each sphere are energy harvesters, such as those used in watches, that generate electricity when shaken.

One of Bruges' most successful works to date is *Mirror, Mirror* (2009), which was displayed in the courtyard of London's Victoria & Albert Museum during the exhibition "Decode: Digital Design Sensations," which ran from Dec. 8, 2009 to April 11. The exhibition was about digital culture and Bruges took this idea and wove it through his artistic mainstays—interactivity and site specificity. "The [museum] courtyard has this shallow elliptical pond that has amazing reflections," Bruges says. "My first thought was [to ask], 'How do people respond to their reflection?' I looked to the legend of Narcissus [as a reference], and asked, 'What is a



PHOTOS BOTH PAGES COURTESY JASON BRUGES STUDIO

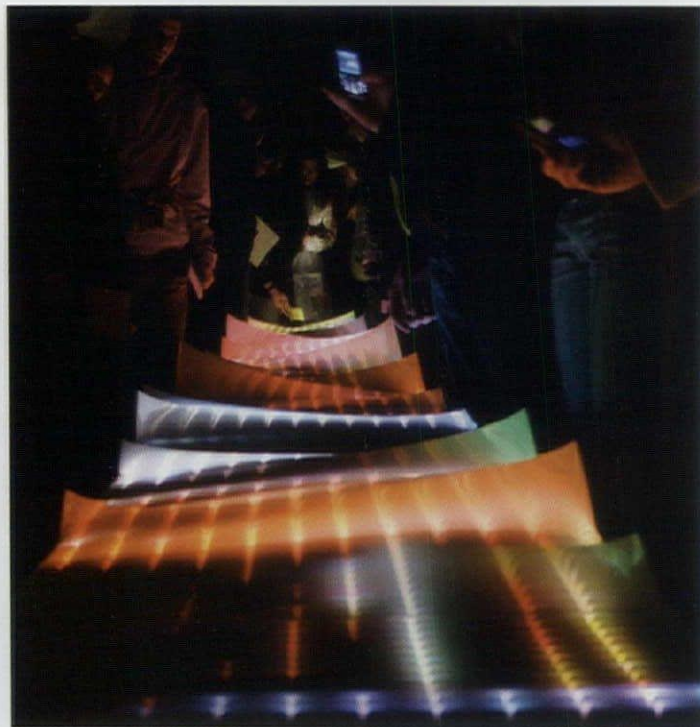
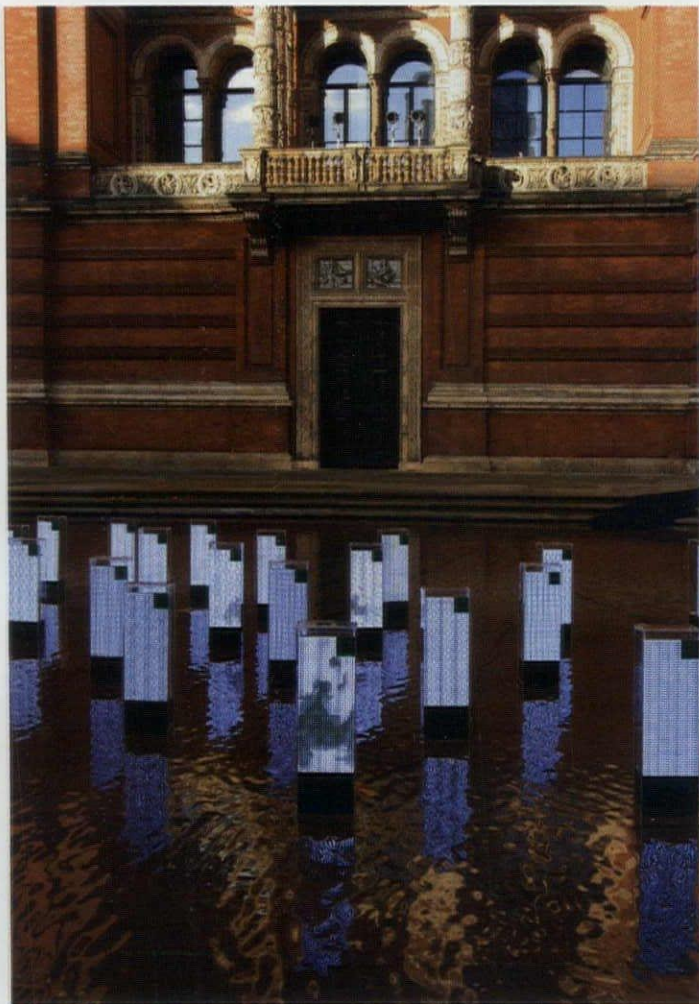


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- 9 TOOLLESS, INTERCHANGEABLE TRIM
- 10 TRIM-MOUNTING CLIPS



NOT SHOWN AT ACTUAL SIZE



Transforming data through light, *Leicester Lights* (2006) integrates a sculptural lighting element onto existing streetlights to track traffic patterns (facing page top and bottom left). Interactivity at an immediate scale can be seen in Bruges' 2007 installation *Visual Echoes* (above) and the Flatliner LED lamp (facing page bottom right). The lamp uses a touch-sensitive ring around its edge to turn it on and off. A more recent work, *Mirror, Mirror* (2009) (left top and bottom), created for the exhibit "Decode: Digital Design Sensations" at London's Victoria & Albert Museum, explored how people interact with technology. For this, 60 acrylic plinths, sited in the courtyard's reflecting pool and equipped with LEDs and cameras, broadcast visitors their images as they passed by.

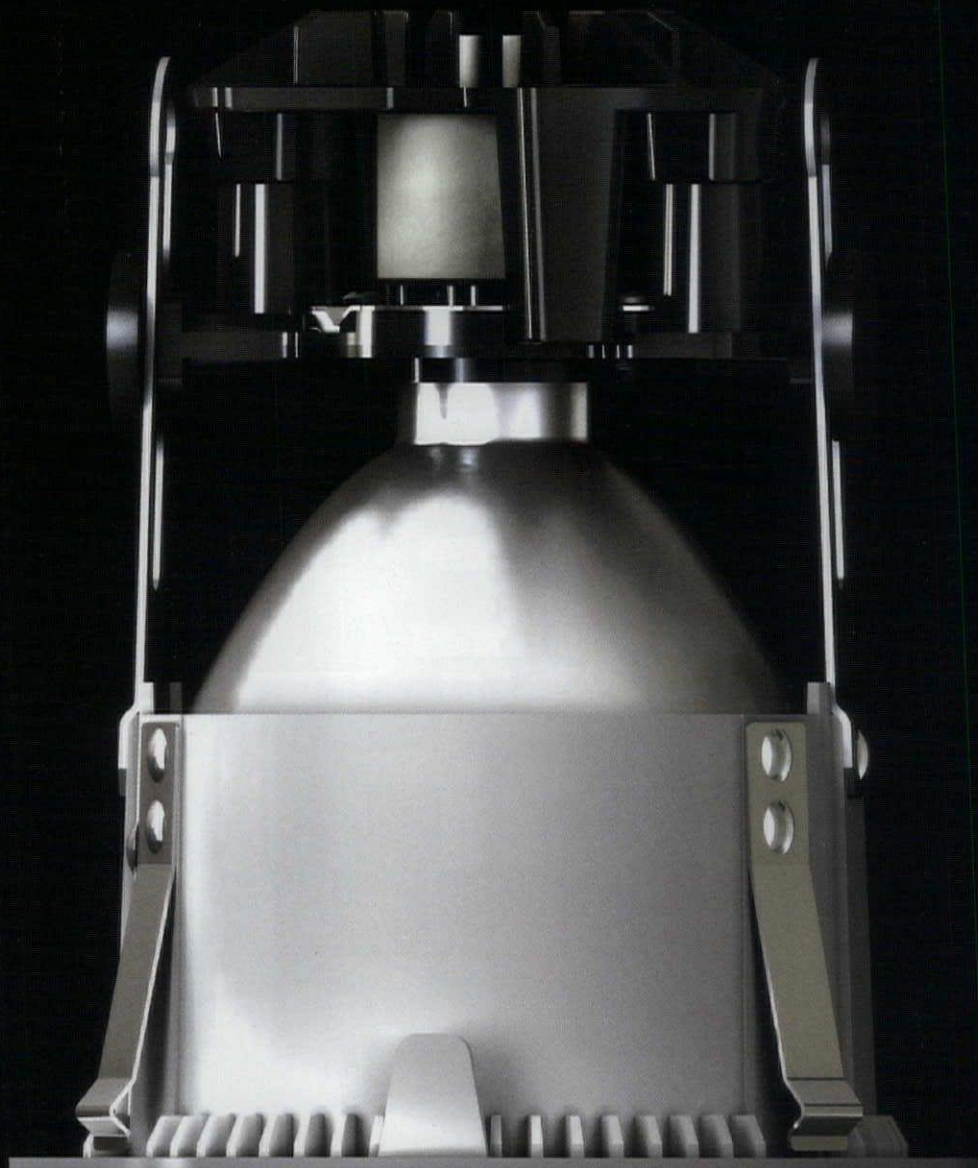
Mirror, Mirror fuels Bruges' work, the studio is also strongly involved in hands-on craft and can be credited with a few technological innovations. "We do a lot of prototyping ourselves," Bruges says. "We test and program everything before approaching the manufacturers. That's very much built into our philosophy." One such innovation has recently become a marketable product: the Flatliner Lamp. Released by London-based design outlet Established & Sons, the luminaire is built from the low-profile LED matrices that Bruges has been working into materials for years. Flat, black, and "stealth-like," the lamp has been imbued with the studio's trademark interactivity in the form of a touch-sensitive ring around its edge that turns it on and off, and provides a dimming function. The Flatliner comes in floor, table, and pendant varieties.

Though certainly well established, Bruges' star seems to be ascending. He has worked primarily in the United Kingdom and Europe, with a few stints in the United States, including the installation *Visual Echoes* (2007) at the Center for Architecture in New York City and *Focal Shift* (2009), a collaboration with Jake Dyson for the 2009 International Contemporary Furniture Fair, also in New York. And his popularity is growing on this side of the pond. Bruges is currently completing an installation for Toronto's York Spadina subway line extension, and, rumor tells, is involved in a project at a university in Oregon. He is also doing a project for the 2012 Olympic Park in London, a series of artwork that will emit sounds and vibrations based on the records set by athletes at the games. Wherever he applies his craft, however, it can be assumed that what was once mute will begin to communicate, and what was once dark will be awash with light. **AARON SEWARD**

reflective surface in [an] age of technology where we are able to capture our reflections in many ways?" Bruges outfitted the pond with 60 acrylic plinths, each equipped with white LED dot matrices and cameras. As museumgoers approached, their images were broadcast back to them and reflected on the pool water, just as one's image can be multiplied on the Internet through social networking sites, Bruges observes.

While thought-provoking social commentary such as that motivating

WALLWASH NANOLUMEN




Officially launched in January, the NanoLumen underwent intense testing. The company's research showed that architects and lighting designers wanted a fixture that was small, attractive, and used a T4 CMH lamp. The T4 is popular with the design community because of its small size and high efficiency, according to Al Near, senior vice president of sales and marketing for USAI. Feedback from the market also indicated there was a need for an attractive, miniature recessed fixture specifically designed for the T4. Easy maintenance was also a factor in the new luminaire's design. Research revealed concern about relamping from a ladder, particularly for less experienced store personnel.

USAI's engineering department developed the NanoLumen to have three different configurations—downlight, adjustable, and wallwash. The octagonal housing is universal to accommodate all three versions, as are the round and square trims. And while the NanoLumen was designed around the T4 lamp, it can also house a T4.5, CDM-Tm, MH MR16, or MR16 lamp to meet designers' requests for a residential version after seeing the prototype in person.

The real beauty of the NanoLumen's design lies in its behind-the-scenes details. For the adjustable configuration, it was important that, in addition to being less noticeable than a traditional 6-inch fixture, the luminaire not

The wallwash version of the NanoLumen comes with a diamond-faceted reflector and a low-iron, triple-textured lens to achieve maximum uniformity (above). The downlight configuration (facing page) adds a twist-and-lock interchangeable reflector, available in 10-, 20-, 35-, and 60-degree custom-designed facet options, to the basic die-cast model.

let any of its internal workings be visible. To this end, the design features an injection-molded, custom-designed, interchangeable baffle that hides most of the hardware on the inside of the trim, out of view from the average on-looker but still visible for maintenance purposes. There are four interchangeable reflectors with custom-designed facets for 10-, 20-, 35-, 60-degree beam spread coverage and one diamond-faceted wallwash reflector. When developing the reflectors, the company, along with input from outside product development research firms, examined three manufacturing methods and four different materials. "We were actually willing for each reflector to be made out of a different material and from a different manufacturing method if it made sense and maximized performance," Littman says. "It was all about achieving maximum performance." The winning reflector combination helps the wallwash version span a 10- to 60-degree distribution. When coupled with a 39W



SEEING THE LIGHT

USAI'S THOROUGH RESEARCH AND DEVELOPMENT PAYS OFF WITH THE DESIGN OF THE NANOLUMEN

It began with a seemingly impossible task: design a T4 ceramic metal halide (CMH) recessed luminaire that would include a wish list of features suggested by lighting specifiers in a 2½-inch aperture. Seemingly impossible because, to date, the smallest market-available CMH fixtures had only been able to accomplish this feat in a 3-inch aperture. And although the engineering department at USAI petitioned to make it ¼-inch larger, Bonnie Littman, president of this family-owned New Windsor, N.Y.-based lighting company, would not compromise. USAI's quest to design, fabricate, and produce the smallest CMH recessed downlight is based on three generations of lighting expertise coupled with extensive market research. The hard-earned result is the company's latest product offering: NanoLumen.

The family's history with the lighting industry dates back to the 1938 World's Fair, when Littman's grandfather—William—introduced fluorescent lighting at the General Electric exhibit. Nearly 25 years ago, Littman's father, Eugene, formed USA Illumination, which Littman and her brother David, who is CEO, rebranded under the name USAI in 2005.

DOWNLIGHT NANOLUMEN



lamp, it achieves 67.8 percent energy efficiency, which, according to USAI, is approximately 15 percent greater than the nearest competitor.

In terms of maintenance, USAI addressed the wide range of individuals who could be tasked with installing the fixture or changing the lamp—everyone from maintenance staff to a store employee. As a result, all of NanoLumen's trims are designed to detach without the need for separate tools or rewiring. Vertical aiming memory assures the light source in the adjustable configuration will settle into the housing exactly how the lighting designer or architect intended it to. Finger tabs align the fixture in a vertical position for removal or relamping when pulled down, then spring it back into place when released.

Another novelty of the design is the ballast location. The ballast fits through the 3½-inch ceiling opening and can be replaced via a patent-pending slide-and-replace tray that allows the installer easier access to the ballast. "[In a] typical light fixture, when you're looking through a hole, your ballast is probably going to be 3 to 4 inches away, so you have to reach through a hole, then reach back 3, 4, or 5 inches and try to manipulate removing the ballast from its fixed position," says Frank Cogliano, vice president of engineering. Plates

and thumbscrews are colored with a silver finish that makes them easy to see without a flashlight, which also helps when examining the wiring. The screws were engineered to a specific size and shape so they can be easily handled and removed by different-sized hands. Cogliano recalls one naysaying lighting designer: "He looked at me and said, 'There's no way you're going to be able to replace that ballast through that 3½-inch hole.' So I went through a couple of steps, pulled it right out of the aperture, and in a few minutes he looked at me and said, 'Wow. If I didn't see it, I wouldn't have believed it.'"

Over the course of 4 months, Cogliano traveled with a NanoLumen prototype to more than 50 lighting designers, architects, and specifiers' offices, allowing them to test and examine it. One designer even attempted to break it. One individual's suggestion led to the addition of a shallow housing option for the downlight configuration for use in low-plenum ceilings. In all, it took USAI two years to research, develop, tool, and test the NanoLumen. Littman admits, "[Eliminating] that extra ¼ inch probably added close to a year to the design cycle because we just were not willing to compromise on our target size." But the positive feedback USAI has received since releasing NanoLumen proves it was well worth the wait. **KIMBERLY R. GRIFFIN**

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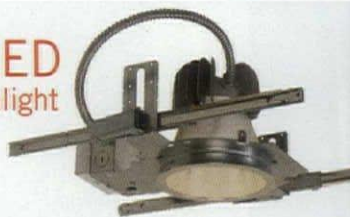


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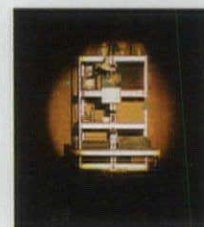
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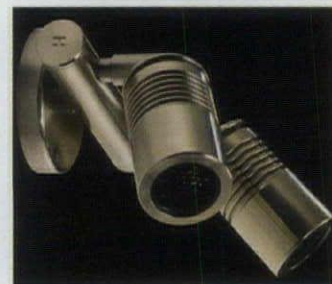
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Sean O'Connor

CREATING A BRIDGE ACROSS DESIGN DISCIPLINES—AND GENERATIONS

Having arrived at lighting via architecture, Sean O'Connor has established a lighting practice that works across design disciplines. Drawing inspiration from art, music, and fashion, as well as from architecture and lighting, his work rigorously explores the fundamentals of the visual world. But aesthetics alone do not fuel his work. Incorporating an interest in how things are crafted, coupled with an understanding of the mechanics of lighting, his firm's portfolio includes both project and product design. Although O'Connor is young (38), there is a credibility to his work; it respects tradition while staying in tune with contemporary cultural currents. **ELIZABETH DONOFF**

Who has influenced you in your design career?

My grandmother, Ruth O'Connor. She taught me to oil paint when I was five years old. There's also Eric Kahn, my first-year studio instructor at SCI-Arc, and, once I started working, Anthony Schmitt at Barneys New York, Bill Schwinghammer in New York, and Darrell Hawthorne in San Francisco.

You opened your own firm when you were just 25. Did that present any particular challenges?

Absolutely, I had no intention of starting a practice at the time. I was

fortunate, I had existing client relationships and they encouraged me to go out on my own. Unlike fashion, where a 25-year-old can run an entire house, in architecture, and even lighting design, it seems that age equals credibility, so there were challenges when initially meeting new clients.

What role does lighting play in architecture?

Lighting should help tell the architecture's story, to celebrate it. Lighting designers are curators of sorts, helping to navigate a person through a space and create a sense of emotion.

How does your architectural background inform your work?

It ensures that lighting is not a topical discussion but integrated, and in turn becomes part of the project's common vision.

How are changes in technology impacting practice today?

Our toolbox is both growing *and* shrinking. Knowing how to use both codes and equipment to your advantage is critical.

Where do you see lighting heading?

The lighting designer's role is becoming increasingly important; lighting is the one thing that can tie all the complexities of a project together.



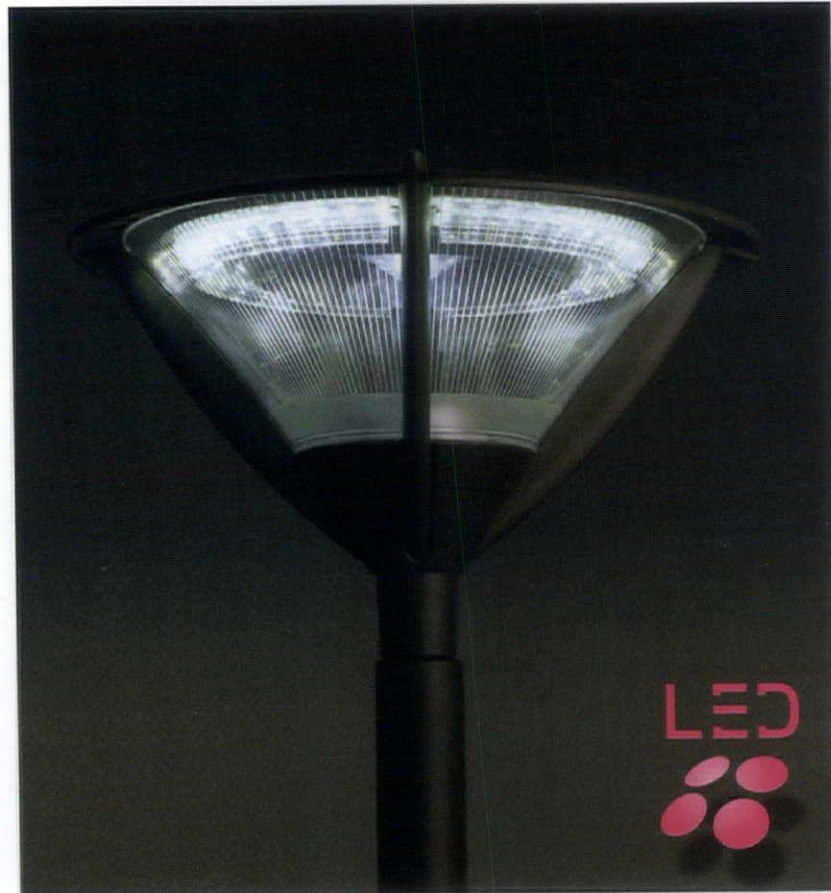
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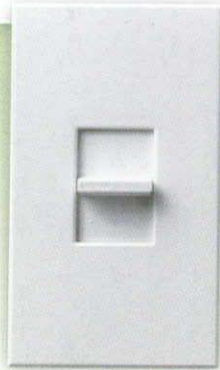
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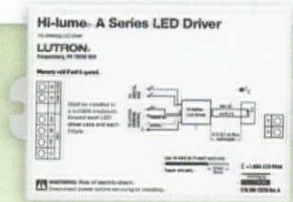
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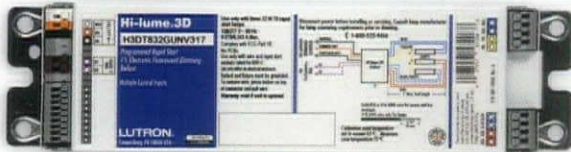
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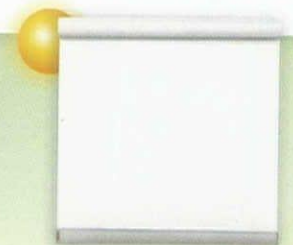
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