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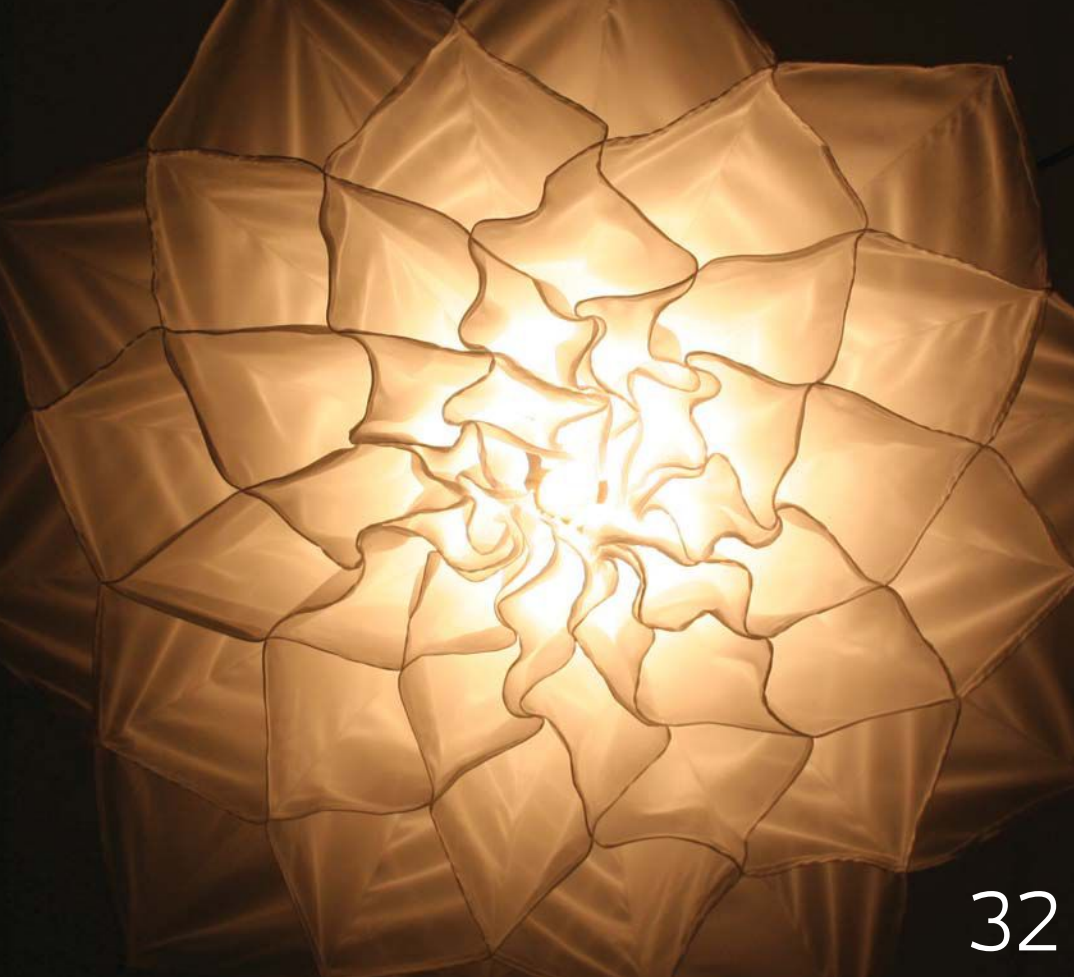
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# • CONTENTS

## • FEATURES

**Naturally Electric** Studio Drift uses light as a medium in works that meld technology and nature, p. 32

**The Building Speaks** Realities:United uses light and technology to make architecture communicate, p. 38

## • FRONT

**Comment** The Next Lighting Generation, p. 10

**Briefs** Noche Zero, "Creatures of Light," at the American Museum of Natural History, the Neon Museum, and the Robert Bruce Thompson Annual Student Light Fixture Competition, p. 12

**Professional Practice** Attorney Peter J. Lamont outlines best practices for choosing the right type of insurance policy for your design practice, p. 16

## • DEPARTMENTS

### DESIGN

**In Focus** L-Plan's lighting design for the Joe and Rika Mansueto Library at the University of Chicago, p. 23

### TECHNOLOGY

**Technology** Blaine Brownell looks at a new generation of materials and how they interact with light, p. 27

**Products** In Control: A selection of lighting products that integrate components and capabilities beyond illumination, p. 30

### BACK

**One-on-One** Interview with New York City-based lighting designer Amer Maleh, p. 48

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Cover: Jan and Tim Edler (left to right) in their Berlin studio. Photograph by Steffen Jänicke.

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**“As I enter 2013, my 10th year with this publication, I am reassured that the next generation of lighting professionals is here and that they are uniquely talented in design, research, and their desire to expand the boundaries of architectural lighting design.”**

## THE NEXT LIGHTING GENERATION

Every profession has a responsibility to nurture its young, to grow new talent, and to pass on knowledge. But, as editor of this publication, I have often expressed my concern that the next generation was nowhere to be found. I am happy to report, however—after attending both the IALD Annual Conference in Vancouver this past October, and more recently the IES Annual Conference in Minneapolis—that the next generation has arrived.

Young designers have started to make the transition from school to the workplace, and this has become evident with their appearance and participation in the lighting industry’s conferences and events. In particular, both the IALD and the IES should be applauded for their outreach efforts to students and emerging professionals (EPs) and for establishing programs, such as the IALD’s Emerging Lighting Design Professionals Initiative and the IES’s newly announced mentoring program, which make students and EPs not only feel welcome at these industry gatherings, but also feel as though they are part of a larger design community.

And it doesn’t stop there. At the IALD conference this year, EPs made up many of the seminar presenters, and it was extremely refreshing to hear a more diverse range of experiences represented in these sessions. This is a far cry from the first IALD conference I attended, more than 10 years ago, where students shied away, hiding in the corner of the conference venues, afraid to engage with professionals, who in turn were not sure how to engage with the students.

Before going any further, it also should be pointed out that much of this activity is supported by the generous financial contributions from lighting manufacturers whose donations make it possible for students and EPs from all over the globe to travel and attend annual conferences and industry events such as Lightfair.

But it’s not just students and EPs who get a lot out of these events, professionals do too. Many senior-level practitioners have commented on how rewarding it is to meet

students and young designers. The portfolio-review sessions at both conferences are yet another example of how this interaction between the generations is beneficial to both. Young designers get direct feedback from leading design professionals, and firm leaders find potential new hires.

The interstitial conversations are some of the most rewarding. I was particularly impressed by the questions I was asked at the speed-dating-style session at the recent IES conference. I’d been asked by the society to speak to students, EPs, and section leaders during the pre-conference workshops and the Leadership Forum about the role of social media, as well as to serve as a representative of an alternate career track in design. Professionals representing all facets of the lighting industry provided a brief overview of their backgrounds, and then the young designers had 10 minutes to ask questions. The questions were thought-provoking.

There are a host of industry mechanisms out there—grants and scholarships through the IALD, the IES, and the Nuckolls Fund; student design and fixture competitions; and workshops, such as the program in Alingsås, Sweden. But I’m not sure students and EPs avail themselves of these resources as much as they should. And this doesn’t consider the new opportunities that are appearing all the time, such as the recently announced Jonathan Speirs Scholarship Trust in the U.K. for architecture students who are interested in pursuing lighting.

As I enter 2013, my 10th year with this publication, I am reassured that the next generation of lighting professionals is here and that they are uniquely talented in design, research, and their desire to expand the boundaries of architectural lighting design. You should be too. The lighting community’s best return on investment is its next generation.

Elizabeth Donoff  
Editor



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# CREATURES OF LIGHT

An exhibit at the American Museum of Natural History explores bioluminescence.

text by Elizabeth Donoff



On view through Jan. 6, 2103, at the American Museum of Natural History in New York City, “Creatures of Light: Nature’s Bioluminescence” explores one of nature’s most fascinating topics: an organism’s ability to produce light. Although there are a few land-based organisms, such as fireflies, that possess the capability to glow, the ability to generate light through chemical reaction is most common among plants and animals that live deep in the ocean (below 700 meters).

The exhibit is a fantastic journey into another universe of species. Divided into eight areas—Introduction, a Summer’s Night, a Mysterious Cave, a Sparkling Sea, Night Dive, Altered Light, Borrowed Light, and the Deep Ocean—visitors are taken from land to the deep sea in pursuit of these amazing creatures. An accompanying soundtrack composed for the exhibit adds acoustical delight to match the images and interactive displays.

Whether you’re a child or an adult, a science novice or a lighting professional, this exhibit will educate, fascinate, and inspire. And while the scientific explanations are provided throughout, one still can’t help but ask: How does nature do that? Details at [amnh.org](http://amnh.org).



text by Martin Lupton, co-founder of U.K.-based Light Collective

Of late, the lighting community has been talking a lot about “darkness” and how we’ve lost our connection to the night sky. As much as 60 percent of the world’s population has never seen the Milky Way and almost two-thirds of the world lives in areas where urban lighting is brighter than the threshold for light-polluted status set by the International Astronomical Union. As the global population moves in ever larger numbers to cities, there is more of a need than ever to embrace darkness; by 2050, 70 percent of the world will live in cities where light pollution is at its worst. But it’s not simply about light pollution; we need to understand how to manage the balance between light and dark and get to a point where we have the right amount of light, in the right place, at the right time.

Two years ago, Paulina Villalobos of DIAV, a lighting consultancy based in Santiago, Chile, asked us at Light Collective to help create and host a darkness event in Chile. This past October, we were pleased to be part of the first Noche Zero ([nochezero.org](http://nochezero.org)). Created by DIAV and Light Collective in conjunction with the Universidad Católica del Norte, Noche Zero was designed to be an inspirational event—an educational summit and a darkness experience held in San Pedro in the Atacama Desert. With notable lighting experts such as Mark Major and Kaoru Mende speaking alongside *National Geographic* photographer Jim Richardson

and Massimo Tarengi, the head of the European Southern Observatories in Chile, this collaboration was targeted at an international group of influential people working in and linked to urban lighting design. The aim was to connect the groups interested in this topic, to celebrate darkness, and to create a methodology for light and urban design to help preserve the night sky in cities.

Essential to the event’s success was that it was held in the Atacama Desert in the north of Chile, the driest place on Earth with the clearest sky on the planet, and thus one of the world’s epicenters for astronomical observation. The stunning starry skies were the backdrop for the expert’s presentations, and for participants contributions to a new way of treating and understanding the role of darkness in urban lighting design.

Major and Mende discussed how to create spaces and simultaneously maintain a sense of darkness and control. Professor George Brainard of Thomas Jefferson University spoke about the effect of light on humans, and environmental expert Alvaro Boehmwald talked about nighttime biodiversity. Participants signed the Atacama Manifesto—a document that outlines how the work started at Noche Zero can be used as an ongoing resource. “The most unexpected element of the whole event was to find how like-minded we all were in not only wishing to tackle the issues of light pollution,” Major said, “but also in sharing real passion for light itself.”

AMNH/D. Finnin (left); Courtesy Light Collective (right)



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A 1940s neon sign from the Chief Hotel Court is one of the oldest Vegas signs still displayed.

## LIGHTS ON

*Las Vegas finally gets its recognition as the neon capital of the world with a new museum dedicated to the 18th element and its connection with the rise of Sin City.*

text by Lindsey M. Roberts

The glow from Las Vegas got a little bit brighter when the Neon Museum ([neonmuseum.org](http://neonmuseum.org)) flipped its switch this fall. The new museum exhibits the largest collection of neon signs in the world, with more than 150 examples dating from the 1930s, when the rise in popularity of neon advertising met the legalization of gambling. Included are icons from the Desert Inn, Flamingo, and Stardust (with its whopping 11,000 lamps and 1.2 miles of neon tubing).

After collecting and restoring the signs over the past 15 years, the museum has now made them accessible to the public in a two-acre area called the Neon Boneyard, housed in the former lobby of the midcentury modern La Concha Motel. The lobby of the hotel—designed by architect Paul Revere Williams in 1961—was saved from demolition and moved downtown in 2006 for this purpose, as a house for neon.

For buildings that weren't as fortunate as La Concha Motel—what with Las Vegas's fascination with the shiny and new—their neon signs may be the only proof of their onetime existence. "Often, a neon sign is the only remaining piece of a place that holds significance for the history of Las Vegas," says executive director Danielle Kelly. They are "visual treasures that serve as placeholders for the many stories of one of America's most luminous cities." Restored signs from the museum's collection are also now installed back on the Strip and as public art downtown. •

## TAKING FLIGHT

*Luminaire design takes center stage in the Robert Bruce Thompson Annual Student Light Fixture Design Competition.*

text by Elizabeth Donoff

Entering its 11th year, the Robert Bruce Thompson Annual Student Light Fixture Design Competition serves as valuable outlet for students in the area of luminaire design. The competition was established by Bruce Thompson, a 25-year veteran of the lighting industry "to encourage creativity and education in light fixture design and manufacturing."

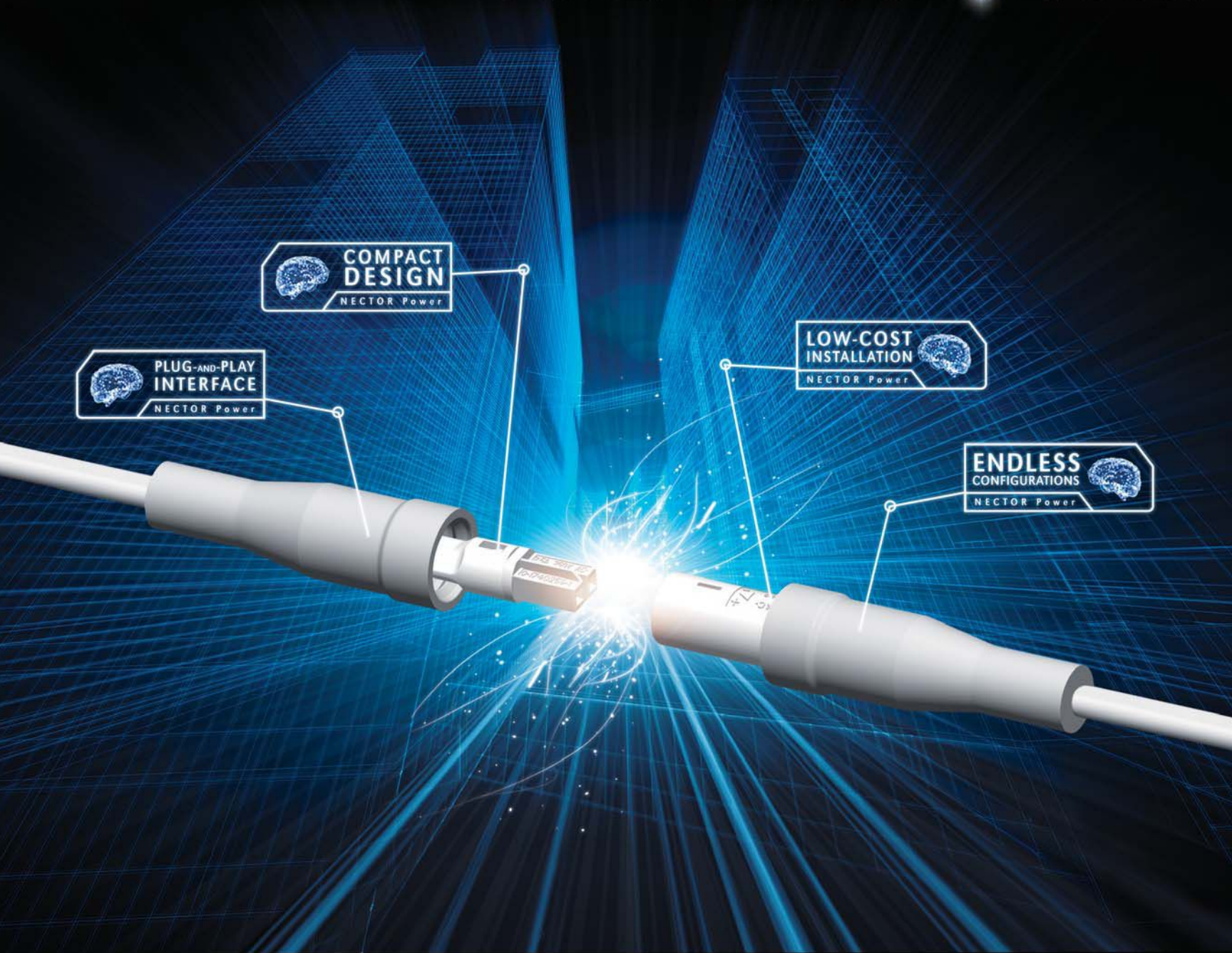
Each year, the competition puts forth a new design problem, such as this year's program that asked students to design a countertop-mounted light fixture to illuminate the task area of an airline ticket counter. The design of the ticketing area was left up to the students. The program also required the use of an energy-efficient light source.

First place and a cash prize of \$5,000 went to Kathryn Czub from Rensselaer Polytechnic Institute (RPI) for her circular-shaped luminaire called Aereo. Second place and a cash prize of \$2,500 went to Wendy Cruz-Gonzalez of the New York School of Interior Design for her canopy-styled luminaire called Shelter Light. Bailey Kelliher, an interior design student at Virginia Commonwealth University, received third place and a cash prize of \$1,000 for her design titled Aileron. And Daniel Marcus, also of RPI, received a special citation and a cash award of \$500 for his design called Solo. The luminaire for the 2013 competition will be a lobby pendant. The deadline is April 5, 2013, and all details are available at [rbtcompetition.org](http://rbtcompetition.org). •

Courtesy the Neon Museum



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PROFESSIONAL PRACTICE

## SAFETY NET

*Choosing the right type of insurance policy for your design firm can make all the difference in establishing a successful practice.*

text by Peter J. Lamont

illustration by Headcase Design

*Peter J. Lamont is a business and commercial litigation attorney nationally recognized in a wide variety of highly specialized areas within the kitchen, bath, lighting, construction, and design industries. He routinely represents various national and international companies within the design sector, and has achieved the highest rating in both legal ability and ethical standards as awarded by AVVO (avvo.com).*

There are many areas of a successful design practice that require a designer's attention. Aside from client-oriented work, a variety of business topics—such as advertising, marketing, developing new leads, employee issues, and business accounting—consume much of a designer's time. Unfortunately, one of the general topics that often does not receive adequate attention is insurance coverage.

Most designers understand that they need to have some insurance, but the question is what kind and how to procure it. To obtain coverage, designers can either contact an insurance company directly or hire an insurance broker. Regardless of how you secure coverage, it is critical that designers understand what types of coverage are necessary and what limitations may exist with the different types.

### Why Be Insured?

Before we address the specific types of insurance that are pertinent to design practices, it is important to discuss the purpose of insurance and insurance companies' reasons for wanting to retain you as a client.

For most designers, insurance is a safety net. Designers pay their monthly premiums for the sense of security that it brings them. It protects you when a client sustains injuries inside your studio or when a designer makes a mistake. Instead of having to shoulder the financial burden of defending a claim, you turn it over to an insurance carrier who, after you pay your deductible, handles the rest of the claim, including monetary payments to the client.

But insurance companies have something different in mind. They are in the business of making money, not paying out claims, and they have a full array of adjusters and attorneys whose goal is to deny claims. These individuals are adept at finding hidden exclusions of coverage in your policy. So, essentially, insurance companies play the odds and insure designers based upon a calculated risk. They use mathematical formulas to determine how much money they will bring in from a particular insured client versus how much money they are estimating to pay out. When they believe that the risk of insuring an individual is too high (based on whether or not the individual has made previous claims in the past) they either refuse to provide coverage or they ask for extremely high premiums.

That being said, having insurance is a necessity; when chosen correctly, it can protect you. The key to not letting an insurance company get the better of you is to fully understand what it is that you need to insure and what type of policy will provide you with the desired coverage. For this, most designers rely on the expertise of a broker. But many

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## For designers, there are two types of insurance which you should carry: commercial general liability (CGL) and professional liability, or errors and omissions (E&O) insurance.

brokers do not understand what lighting designers do and therefore fail to secure the proper type of insurance. So you need to have a basic understanding of what types of insurance to ask for and how to communicate what you do professionally to a broker.

### General Liability

For designers, there are two types of insurance which you should carry: commercial general liability (CGL) and professional liability, or errors and omissions (E&O), insurance. The most common of these two is the CGL policy, a standard insurance policy issued to businesses to protect them against liability claims for bodily injury and property damage arising out of premises, operations, products, completed operations, and advertising and personal injury liability. This is also referred to as comprehensive general liability insurance and

general business insurance.

It is noteworthy, in light of the damage caused by Hurricane Sandy, that most CGL insurance policies disclaim coverage for flood damage. If your business is located close to a significant body of water or in a known floodplain, you should also obtain separate flood insurance. Assuming that businesses which were lost along the coast had both a CGL policy and flood policy, they are able to seek reimbursement from their carriers. Those businesses that only had a CGL policy will most likely have no coverage for the hurricane damage.

A CGL policy is particularly important for any designer who has an office, studio, or warehouse. Scenarios that would be covered under a typical CGL policy include damage to office equipment as a result of fire, theft, or lightning strikes. So if your design studio was burgled and your office equipment was

destroyed, you would be able to submit a claim.

Recently, a design firm that rents the first floor of a building in New York City was forced to submit a claim under its CGL policy for damage to its office caused by a ruptured water pipe located in an adjoining building. The firm's office had equipment that included computers and copy machines, but also displayed various light fixtures and samples. The water that leaked into the firm's space destroyed everything in the office. It took the insurance company more than three months to investigate the claim, salvage certain equipment and fixtures, and make the payout to the design firm.

In another example, a potential client tripped and fell over a raised floor tile in a designer's office. Unfortunately, the client fractured her ankle and required two surgeries and extensive physical therapy. Although not hired by this client, the designer was able to submit the claim

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under her CGL policy and thus avoided having to pay the injured client. This designer had a \$1,000 deductible. The claim ultimately settled for \$150,000, which, minus the deductible, was paid out by the insurance company.

While a CGL policy does provide protection against property damage and personal injury, it does not cover mistakes or misrepresentations made by the designer. For example, if a designer is hired by a residential client to develop and install a lighting scheme in five rooms by a particular date, but only orders enough materials for four rooms, she will not be covered by her CGL policy. If the client sues, the designer would be required to hire her own attorney and would be responsible for any payments or settlement awarded to the client.

CGL policies also carry a number of exclusions—an exclusion being a statement contained within the policy that lists various issues, incidents, and claims that will not be covered. Often, these exclusions are confusing. A typical exclusion in a CGL policy is for “damage to your work.” In this circumstance, the exclusion will not afford coverage to instances when your product or design is damaged. For example, assume that you install luminaires in a ceiling that, unbeknownst to you, is structurally unsound. After the project

is completed, the fixtures fall and are damaged. Should the client sue you, the exclusion in the CGL policy would prevent you from being covered.

#### Professional Liability

As designers, the primary product that you are selling is your knowledge, opinion, and expertise. If a CGL policy won't cover you for claims arising out of those “products,” what will? The answer is professional liability, or errors and omissions (E&O), insurance. E&O covers you and your company in the event that one of your clients sues you or otherwise holds you liable for a service that you provided or failed to provide that did not meet the expected or promised results. Most doctors, accountants, architects, and engineers have some form of E&O coverage. It covers you in situations where mistakes, unintentional misrepresentations, or omissions have occurred, whether in the work performed or in advice provided.

Whether by commission or omission, there are many situations where a lighting designer would require professional liability insurance. An example of an error covered under an E&O policy would be when a designer provides incorrect layouts on design documents, which in turn delays a project. An example of an

omission would be a designer failing to make sure that a particular type of lighting is specified correctly, for instance if recess-mounted light fixtures are properly shielded from ceiling insulation.

The bottom line is that all designers should carry an E&O policy. Recently, I was asked by a young lighting design professional which policy, CGL or E&O, I would recommend he obtain given he could only afford one. The answer, without question, is an E&O policy.

#### Ask For Help

While you can obtain CGL and E&O coverage directly through an insurance carrier, it's recommended that you use a broker. Typically, a broker will be able to negotiate a fair premium and should be able to explain the limitations of your coverage. Separately, in the event that the policy secured by your broker is inadequate or fails to protect you against a particular claim, you may be able to sue the broker for professional negligence.

Regardless of the size of your practice, having proper insurance is critical to your success. Many design firms, especially startup companies, put off getting insurance to save money on initial costs. Remember though, just one claim could put your practice out of business. •



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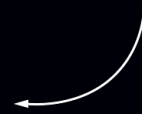
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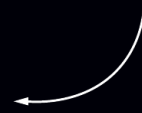
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• DESIGN

IN FOCUS

# THE JOE AND RIKA MANSUETO LIBRARY

*Integrated custom fixtures keep this reading room at the University of Chicago glowing at all hours.*

text by Deane Madsen

photos by Rainer Viertlböck

**Designed by Chicago-based** architecture firm Jahn (formerly Murphy/Jahn), the Joe and Rika Mansueto Library floats at the center of the University of Chicago's campus like a glass bubble. It is a dramatic counterpoint to the solidity of its neighbor, the Joseph Regenstein Library, a Brutalist-styled structure designed by architect Walter Netsch in the late 1960s. The new facility serves as an addition to the main campus library, and houses over 3.5 million volumes, providing the optimal conditions both for storing the collection and for reading it. Those "optimal conditions" meant keeping the two programmatic functions distinct from each other in their physical spaces: the reading room is above ground and almost completely transparent, while the books reside in an underground, climate- and light-controlled automated storage and retrieval system to meet the preservation needs of the books.

The robotic stacks, which retrieve volumes in about seven minutes, do not require light to function. However, trying to incorporate a nonintrusive lighting scheme into the reading room with its transparent glass dome proved a compelling challenge for lighting designer Michael Rohde and his team at L-Plan in Berlin, who have worked on a number of Helmut Jahn

projects over the years.

It was late in the design process when Rohde learned that there would be no fabric shades to protect the reading room from sunlight. "We were about to start with the specification of products, then found out that the interiors were completely changed," Rohde says. "It would have been a disaster in terms of lux level—we had to start all over."

L-Plan embraced the design change—the architect's choice of integrating custom fixtures into the furnishings and built elements—a minimal way of ensuring the right luminescence for a comfortable working environment.

"One of our design targets was to create an ambience quality similar to sitting under a tree with no glare," Rohde says. And while the lack of shading, save for a daylighting control membrane on the upper portion of the dome and a ceramic frit pattern on the glazing, may have added an unexpected twist to the design process, it helps on an energy-saving front: "If we have daylight, we don't need artificial light, which is the best way of saving energy," Rohde explains.

Working with a limited luminaire palette helped reduce the overall presence of light fixtures. Adjustable high-intensity 150W and 70W downlights reinforce the rhythm

of the glass roof's structural elements while delivering even vertical light distribution beneath the curved dome. Ventilation towers with indirect 26W T4 uplights increase the ambient light levels. At the circulation desk, 50W fixtures illuminate bibliophiles' robotically retrieved selections; readers can then peruse their favorite tomes at desks also lit by individually controllable, custom LED tasklights. The fixtures were designed by a former Jahn employee, with a sensibility that blends seamlessly into the architecture and furnishings.

If the aim of the lighting design was to create a comfortable space where people can read and work as day transitions to night, then L-Plan has accomplished its goal. During a recent visit, Rohde found the library crowded well after 9 p.m., proving this celebration of the book a success. •

#### Details

Project: Joe and Rika Mansueto Library, Chicago •  
 Architect: Jahn (formerly Murphy/Jahn), Chicago •  
 Lighting Designer: L-Plan Lighting Design, Berlin •  
 Project Size: 58,700 square feet • Project Cost: \$68 million • Lighting Cost: \$323,000 • Watts Per Square Foot: 0.91 • Manufacturer: Targetti

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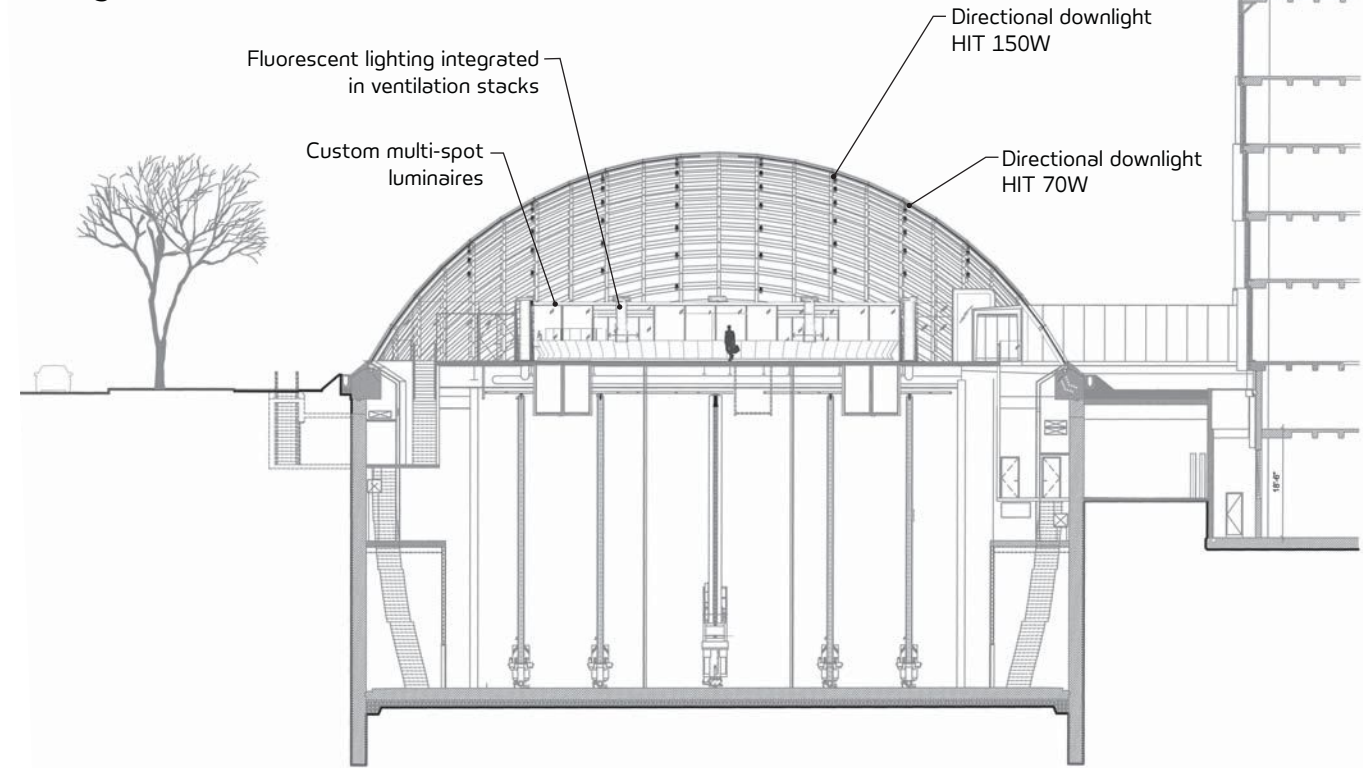
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The elliptical glass dome of the Mansueto Library addition sits beside the existing Regenstein Library (above). A section through the building (below) shows the reading room above grade and the Automated Storage and Retrieval System (ASRS) in the subterranean stacks.

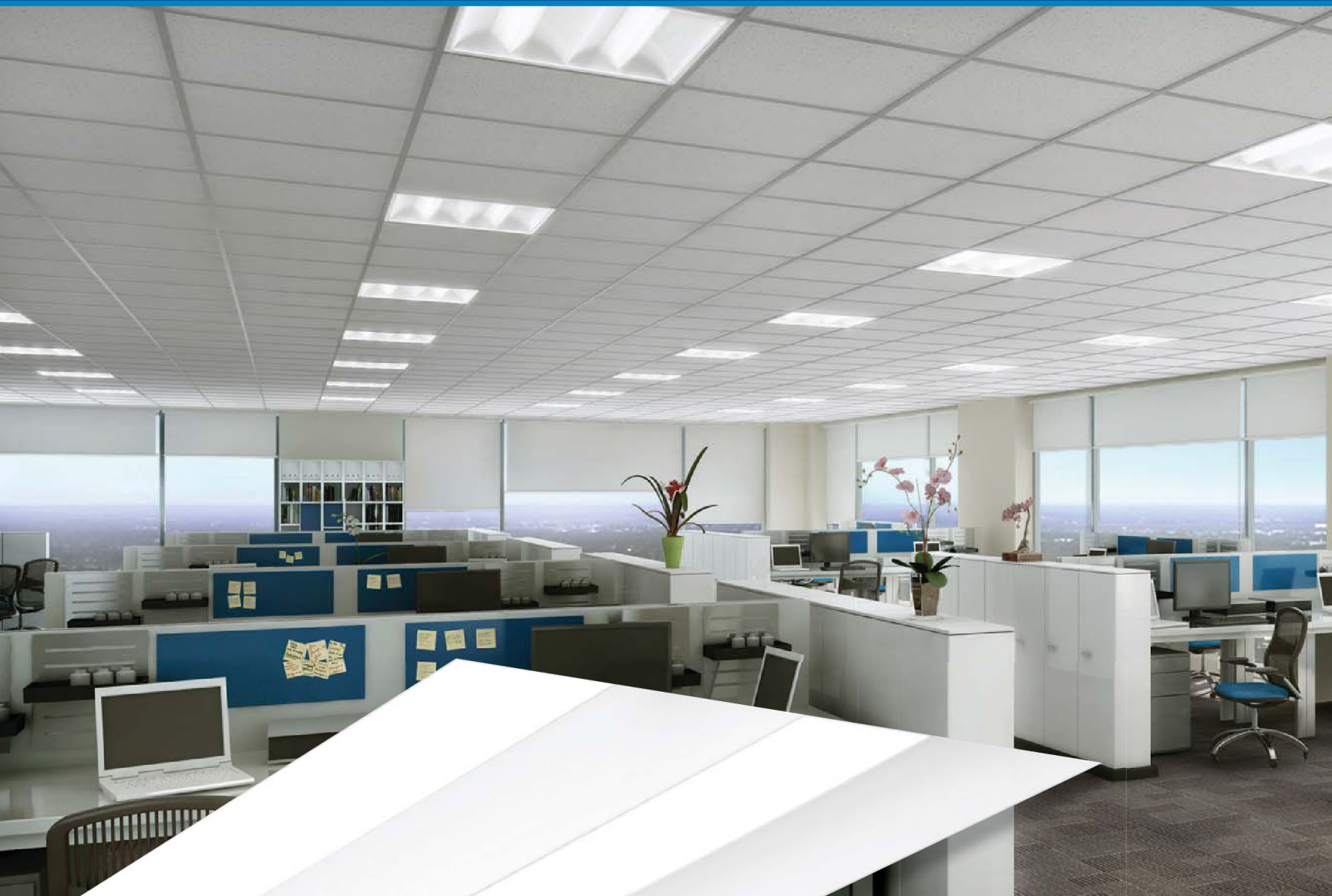
**Building Section**



Building section drawing courtesy Jahn and L-Plan

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# • TECHNOLOGY

Dynamic Performance of Nature

## LIGHT IN AN EXPANDING FIELD

*New technologies dissolve disciplinary boundaries.*

text by Blaine Brownell

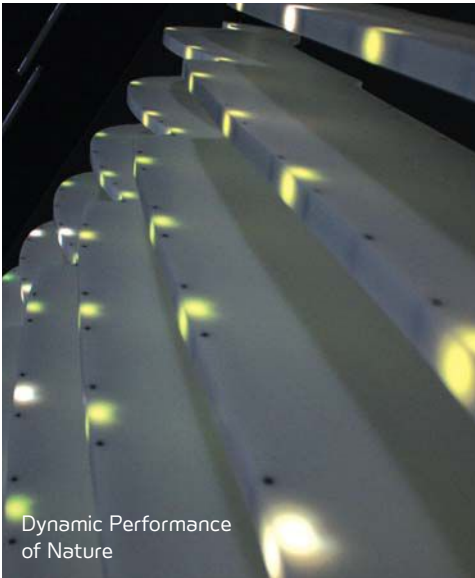
*Blaine Brownell is an architect and former Fulbright Scholar with a research focus on emergent materials. He is a principal of the design and research practice Transstudio and teaches at the University of Minnesota School of Architecture. Brownell authored the Transmaterial series and Matter in the Floating World, both for Princeton Architectural Press.*

One of the most compelling developments in lighting design is the way that new lighting technologies have encouraged the blurring of disciplinary boundaries. As new forms of illumination expand the capabilities of building systems and surfaces, lighting no longer operates as a discrete domain. Rather, the field has been making stronger connections to materials science, architecture, experience design, and engineering.

At a material level, scientific research has transformed the capacity of electric lighting, introducing novel substances like white light quantum dots, which can deliver more desirable light coloration, or projection surfaces made of micro-membranes. At a product level, luminaire design exhibits a trend that establishes more integral connections with architectural space. The result is a collection of multidimensional, sculptural objects that break

away from the ceiling or wall surfaces to which they are typically adhered—allowing greater drama and flexibility, especially in the case of adaptive reuse settings.

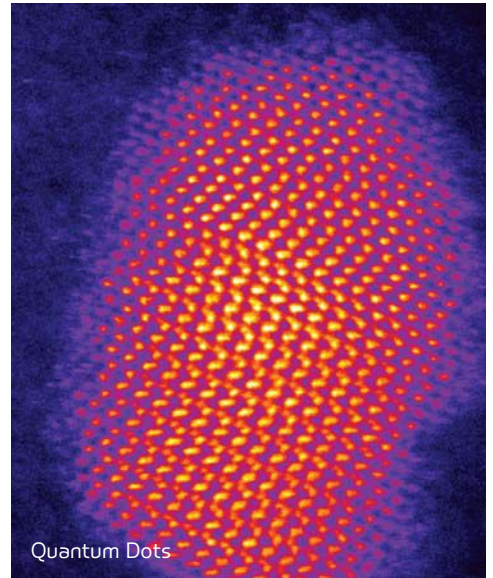
The proliferation of LED and sensor technologies has encouraged an explosion of interactive illuminated surfaces and projection systems. These systems may be designed to respond directly to the presence and location of building occupants, or they may convey changing circumstances in spaces or times that are purposefully disassociated from their own physical sites. One type of “interaction” takes place in the form of energy-harvesting, an area of building research that continues to gain importance. As renewable power technologies become more diversified and integral to building construction, their connections to lighting design and user control interfaces will similarly increase.



Dynamic Performance of Nature



Flex



Quantum Dots



Mis Estrellas



Colloidal Display



Portal



Power Felt



Hardcoded Memory



B.Torics

From top left: Courtesy Blaine Brownell; 3M; James McBride, Vanderbilt University; Courtesy Blaine Brownell; Yoichi Ochiai, Alexis Oyama, Keisuke Toyoshima; Princeton Architectural Press; Ken Bennett, Wake Forest University; Courtesy of Troika; Courtesy Rawlemon.

## DYNAMIC PERFORMANCE OF NATURE

### E/B Office (formerly SoftRigid)

This responsive installation by New York- and Portland-based E/B Office captures live environmental data such as wind speed, temperature, relative humidity, and seismic activity from around the world and translates it through full-color LED lighting embedded within a semi-translucent HDPE (high-density polyethylene) curtain. The installation communicates this information to museum visitors via custom processing scripts that display the information in illuminated flows of varying color, intensity, and direction, which respond to the unique geometry of the wall's overall form. • [softrigid.com](http://softrigid.com)

## MIS ESTRELLAS

### Barragan Studio + Aitken Studio

Mis Estrellas is a responsive wall system designed by Barragan Studio and Aitken Studio that displays visual feedback about a user's physical proximity in the form of light. Translated into English as "my stars," the system is equipped with sensors that detect local physical movements. These movements trigger constellations of hundreds of white lights that illuminate the system's semi-transparent acrylic surface. According to the Bogotá- and New York-based designers, "this work gives an impression as though one is drawing pictures with lights. People use their bodies as tools to shape the wall, enjoy the experience, and communicate." • [barraganstudio.com/projects/mes-etoiles/](http://barraganstudio.com/projects/mes-etoiles/)

## POWER FELT

### Wake Forest University

Scientists at the Center for Nanotechnology and Molecular Materials at Wake Forest University have developed a thermoelectric fabric that converts body heat into electricity. The material is made of layers of interlocking carbon nanotubes and plastic fibers, and feels similar to felt. The thermoelectric technology develops electric current from temperature differences, such as the difference between body temperature and room temperature. The first prototypes of Power Felt yielded 140 nanowatts of power from 72 layers of nanofabric, and the researchers are currently attempting to increase the output of the technology. • [wfu.edu/~carrold/Thermoelectrics.html](http://wfu.edu/~carrold/Thermoelectrics.html)

## FLEX

### 3M

Minnesota-based 3M, a company well-known for the development of sophisticated material technologies, has recently ventured into the rapidly transforming realm of lighting design. 3M's Flex is a linear lighting system that incorporates both straight and curved modules, allowing the flexible integration of lighting into idiosyncratic or high-bay spaces. Designed by 3M, Flex takes advantage of the company's technical prowess in the arenas of LED and OLED lighting. The system boasts a slim profile of less than 2 inches, and may be used to illuminate both horizontal and vertical surfaces. • [solutions.3m.com/wps/portal/3M/en\\_US/DesignLighting/Home/Products/Flex-Gallery/](http://solutions.3m.com/wps/portal/3M/en_US/DesignLighting/Home/Products/Flex-Gallery/)

## COLLOIDAL DISPLAY

### University of Tokyo/Carnegie Mellon

### University/University of Tsukuba

The surface of a soap bubble is commonly understood as a micro-membrane. This membrane allows light to pass through it, displaying the color of the light on its surface. Scientists at the University of Tokyo, Carnegie Mellon, and the University of Tsukuba have developed an ultrathin and flexible BRDF (bidirectional reflectance distribution function) screen using a mixture of two colloidal liquids. The membrane screen may be controlled using ultrasonic vibrations, and its transparency and surface states may also be altered depending on the scales of ultrasonic waves. The researchers have also developed several applications using their new membrane screen volumetrically. • [g6ochiai.ws/colloidaldisplay](http://g6ochiai.ws/colloidaldisplay)

## HARDCODED MEMORY

### Troika

Hardcoded Memory is a device that projects low-resolution photographs with LEDs through Swarovski crystal lenses. Designed by Troika, the motorized projector casts circular lights from each crystalline optic, creating intentionally blurred and pixelated images. Confronting the otherworldly quality of the projector's ambient glow, visitors parse the light of digital memories transmitted from an analog interface. The result is an abstract melding of analog and digital realms—too precisely controlled for analog, too serendipitous for digital. • [troika.uk.com](http://troika.uk.com)

## QUANTUM DOTS

### Vanderbilt University

With the demise of the incandescent lamp, scientists continue to seek alternative, efficient sources of illumination. Pure white light is especially important and can be difficult to produce efficiently. Discovered in a lab at Vanderbilt University, white light quantum dots are micro-scaled fluorescent beads of cadmium selenide that convert LED-emitted blue light into a warm-white similar to the color temperature of incandescent lamps. This white color is distinct from that produced by white light LEDs, which simulate white light from a combination of monochromatic colors. • [vanderbilt.edu/chemistry/faculty/rosenthal.php](http://vanderbilt.edu/chemistry/faculty/rosenthal.php)

## PORTAL

### James Clar

Light artist James Clar approaches light as an active participant in architectural space. Rather than treat light as an immaterial effect, Clar objectifies electric illumination as a material substance. One of his most compelling bodies of research concerns work with side-emitting fiber optics which, when combined with light filter diffuser screen material, enable the construction of structural lines of light. As seen in his installation "Portal," these glowing lines appear to levitate within space while crashing headlong into interior surfaces. • [jamesclar.com](http://jamesclar.com) and [viatrafic.org](http://viatrafic.org)

## β.TORICS

### Rawlemon

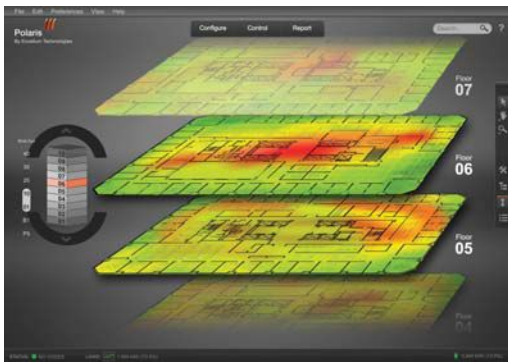
In the history of solar-harvesting technologies, flat panels have been the dominant format. However, scientists and manufacturers are exploring novel formats that exhibit certain benefits over flat panels. Barcelona-based Rawlemon has developed a technology called β.Torics that uses large, fluid-filled glass spheres to harness sunlight. The company claims that this technology can concentrate sunlight up to 10,000 times, increasing energy efficiency by 35 percent over conventional photovoltaic technologies. Although still in the prototype stage, β.Torics suggests new building-integration possibilities, such as bulbous curtainwalls or bubble-shaped rooftop collection systems. • [rawlemon.com](http://rawlemon.com)

PRODUCTS

# IN CONTROL

*A selection of lighting products that integrate components and capabilities beyond illumination.*

text by Wanda Lau



**Encelium Energy Management System, Osram Sylvania** • Designed for commercial use, this system can reduce lighting energy expenditures by as much as 75 percent, according to the manufacturer. Encelium EMS permits individual switching and dimming of each fixture or peripheral device in a facility through a central interface. Encelium's cloud-based software application Polaris 3D tracks the building's energy performance, including metrics such as lighting inefficiencies and energy consumption. • [sylvania.com](http://sylvania.com) • Circle 125

## Decora Universal Occupancy and Vacancy Sensors, Leviton

This residential line of sensors manages lighting and motor loads through automatic or manual switching and dimming. The sensors can control LED, CFL, fluorescent, incandescent, halogen, and motor loads. Using passive infrared detection technology, the sensors have a 180-degree field of view and can monitor up to 900 square feet. A time delay setting from 30 seconds to 30 minutes can be specified before lights or the motor loads switch off. • [leviton.com](http://leviton.com) • Circle 126



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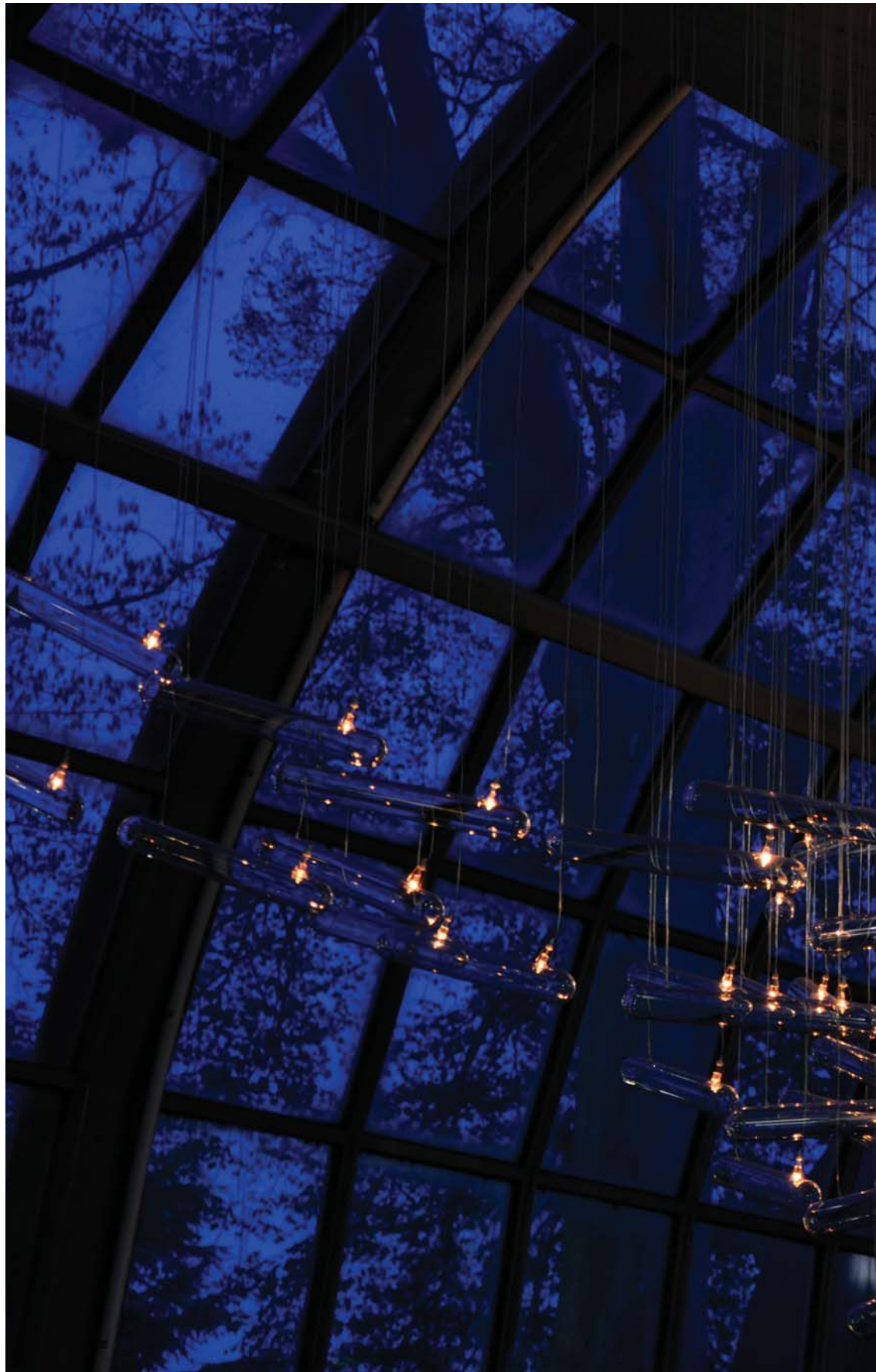
STUDIO DRIFT USES LIGHT AS A MEDIUM IN  
WORKS THAT MELD TECHNOLOGY AND NATURE.

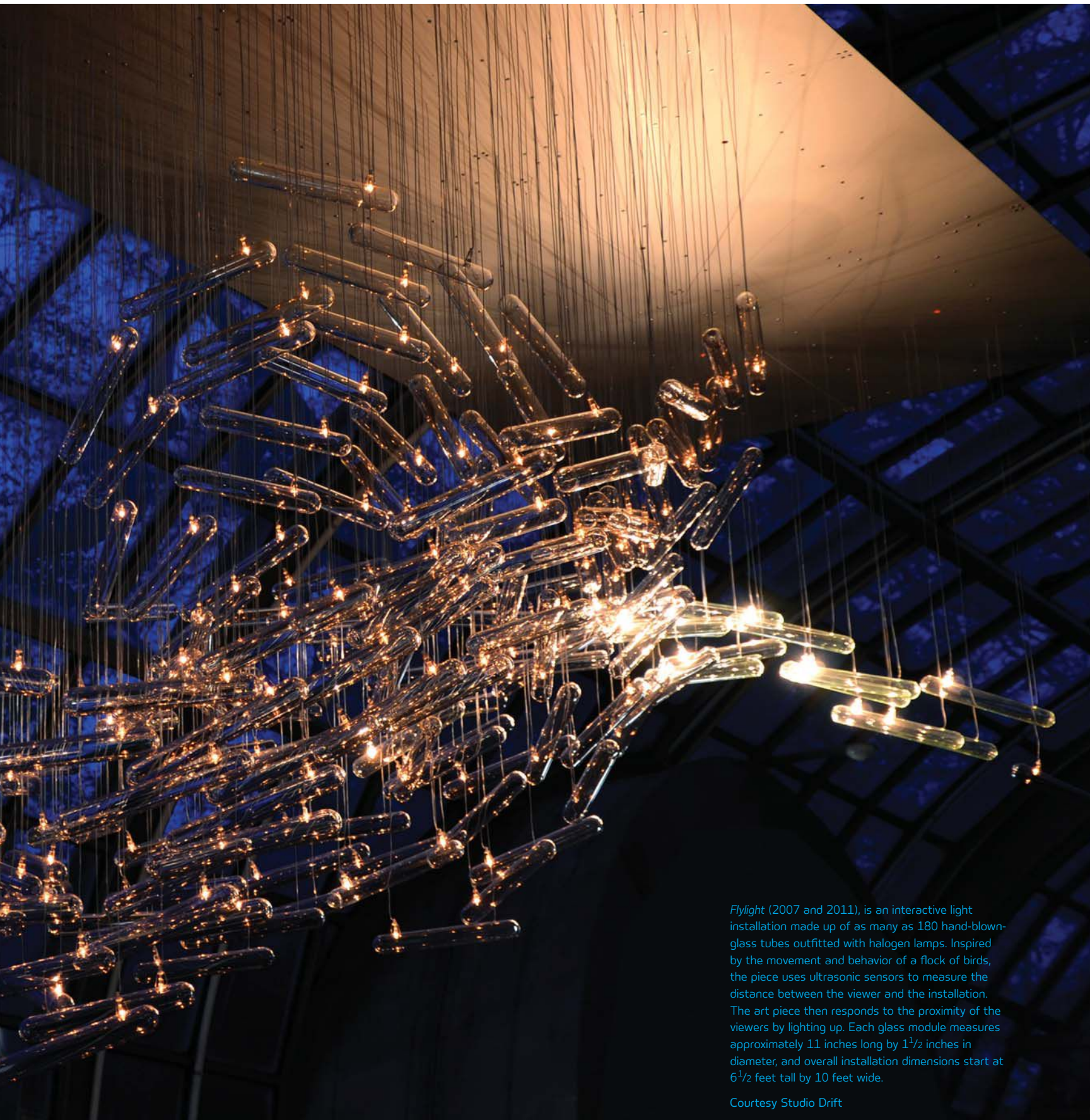
text by Aaron Seward  
portrait by Manon van der Zwaal

**The founding of** Amsterdam-based art and design workshop Studio Drift is as storybook a tale as any that you could hope to find in the design world. Partners Lonneke Gordijn and Ralph Nauta met while they were enrolled at Design Academy Eindhoven in 1999, became friends, began to collaborate, fell in love, and established their company in 2005. Since then, the couple has experienced something of a meteoric rise to prominence. Their art installations, which always incorporate light, have garnered praise around the world in exhibitions at such cultural institutions and events as London's Victoria & Albert Museum, the Museum of Art and Design in New York, the Salone del Mobile during Milan Design Week, and Luminale during Light+Building in Frankfurt this past April. These shows have led to a number of commissions for private residences, offices, and hotels, where the duo has had the opportunity to customize its concepts to interact best with the spaces.

Studio Drift now numbers seven full-time employees, augmented by a body of 30-odd freelancers, but the strength of the company's output lies solidly in the combination of its founding partners' interests. "Lonneke has always been into nature on a micro scale: looking at how plants function, looking in between the grass in the garden to see what's happening, what kind of life is evolving," Nauta says. "As a boy, I was always interested in science fiction, not so much in the sense of laser fights, but in the technology behind it. It's a predecessor of technological revolutions. These [differing interests] work well together. We decided to keep both the stuff we are fascinated the most about and go from there, and see where it leads. As a result, our work has always been about nature and technology morphing together."

A perfect example of this melding of the natural world with cutting-edge technology is the piece that first garnered Studio Drift recognition: *Fragile Future*. Winner of the "Light of the Future" prize from the German Design Council in 2008, the Moët Hennessy-Pavilion of Art and Design London Prize 2010, and now in the permanent collection of the Victoria & Albert Museum in London, *Fragile Future* is composed of a three-dimensional orthogonal framework of delicate phosphor bronze tubes supporting a constellation of LEDs that are covered in dandelion seeds. Studio Drift harvests dandelions by hand and painstakingly glues their seeds to the LEDs. "We use real dandelion seeds because they have a beautiful quality of diffusing the hard bright LED light," Nauta says. This precise handiwork is combined with industrial processes, such as laser cutting and bending the metal. Each 8-inch-by-8-inch-





*Flylight* (2007 and 2011), is an interactive light installation made up of as many as 180 hand-blown-glass tubes outfitted with halogen lamps. Inspired by the movement and behavior of a flock of birds, the piece uses ultrasonic sensors to measure the distance between the viewer and the installation. The art piece then responds to the proximity of the viewers by lighting up. Each glass module measures approximately 11 inches long by 1<sup>1</sup>/<sub>2</sub> inches in diameter, and overall installation dimensions start at 6<sup>1</sup>/<sub>2</sub> feet tall by 10 feet wide.

Courtesy Studio Drift

by-4-inch module consists of three LEDs, and each installation contains between three and 100 modules.

Another Studio Drift work that is currently gaining momentum is *Flylight*. Originally commissioned in 2007, the piece was shown outside of the Netherlands for the first time in 2011 at the Salone del Mobile in Milan. It is currently being customized for private houses and public spaces in Europe and the Middle East. *Flylight* was inspired by flocks of birds and the patterns they make as they twist through the sky, interacting with one another. The installation is composed of as many as 180 hand-blown glass tubes suspended from cables and outfitted with halogen lamps. The tubes also house ultrasonic sensors that measure the distance between themselves and viewers, transmitting this information to a computer program that drives the electronics controlling the lights. Each tube responds individually to the movement of people in the room, and the overall installation is programmed not to repeat selected patterns, making it truly interactive.

“For us, the interesting part is the free will of the flock,” Nauta says. “Does the group attack the viewers one by one, or will it split up and flee?” Studio Drift produced *Flylight* in collaboration with the mechanical engineers, industrial designers, and nanotechnology specialists Klaas van der Molen and Luuk van Laake—a fact that reiterates the firm’s commitment to working at the forefront of technology.

With the sheer range of media available to artists today, it is remarkable that Studio Drift works so consistently with light. Yet to Nauta, this physical phenomenon, so essential to life itself, is what makes the work endlessly fascinating. “Light works so different in different space,” he says. “We just did a show in Eindhoven with our piece *Shylight*. Even though I worked on it for a long time, seeing it again in a new way made me so happy.” Inspired by the movement of flowers as they open and close to attract and repel pollen-gathering insects, *Shylight* consists of an LED lamp enclosed in a cocoon of silk fabric with an aluminum and polished stainless steel structure. Exposed mechanics at the top of the hanging lantern control its movement, ratcheting the translucent veil open until the point when the system pops out of gear and the “petals” drift slowly closed under the influence of gravity.

Studio Drift is currently working on another project that will involve moving parts. Though Nauta could say little about it at press time, he did confirm that it will also employ light. “When the sun shines, everybody is happy. It’s pure energy,” he says. “There is endless possibility of what you can do with light.” •





*Fragile Future III* (2011–2012), is an exploration of time and the dichotomy between nature and the man-made (above). For these modular works, Studio Drift builds a three-dimensional framework of bronze tubes and then inserts a series of LEDs, each of which has a hand-harvested dandelion seed glued to it. Each module uses three dandelions and measures 8 inches by 8 inches by 4 inches. Installations are composed of anywhere from three to 100 modules or more. Studio Drift uses the dandelion seeds because of the way in which they sensitively diffuse the LED light. The *Fragile Future* series grew out of a work called *Dandelight* (2007) (far left). The luminous dandelion sculpture is powered by a 9V battery. *Shylight* (2007–2012) is a group of individually suspended light sculptures (left and bottom center), each made out of stainless steel, aluminum, silk, and high-powered LEDs, and operated on a series of springs. The light source is hidden in the cocoon of silk, folded origami-style. As the light descends, the springs push out the silk shade, “blooming” like a flower opening its petals. Then, as the light retracts and the springs pull in, the silk folds back up.

Courtesy Studio Drift





# *THE BUILDING SPEAKS*

REALITIES:UNITED USES LIGHT AND TECHNOLOGY TO MAKE ARCHITECTURE COMMUNICATE.

text by Aaron Seward  
portrait by Steffen Jänicke



Jan and Tim Edler on the rooftop of their Berlin studio (left and right, previous spread). Realities:United's first use of light as a medium was BIX, a communicative display system designed for the Kunsthaus in Graz in 2003. A custom-designed software program controls the intensity of light from each of the 930 circular fluorescent tubes arranged in a grid on the east façade.



**Before founding Realities:United (RealU)** in Berlin in 2000, brothers and trained architects Tim and Jan Edler had made a name for themselves in the art world with a series of installations that explored the intersection between physical space and digital technology. “E-Picknick” (1996), for example, sought to introduce people to the Internet with a collection of computer stations placed on circles of AstroTurf on the floor of the Ludwig Forum Cologne in Aachen, Germany; and “Multimind” (1999) gave each visitor a computer-enabled backpack that filmed the tour through the exhibition and broadcast it on a bank of monitors. The siblings were also interested in more radical ideas, including the creation of buildings that are capable of altering their form.

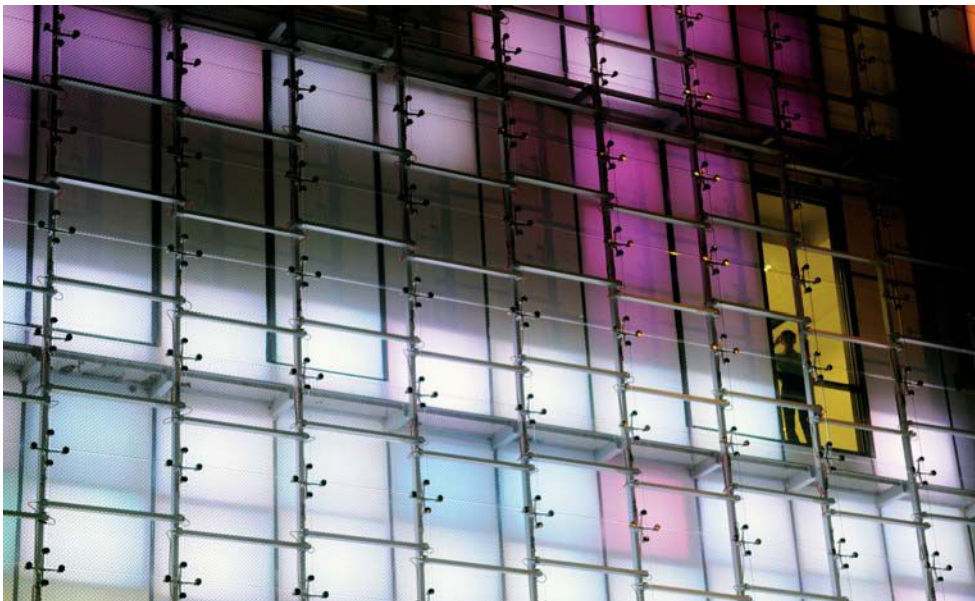
“In the beginning, we were looking forward to technologies that would lead to augmented realities, like those proposed by Archigram in the ‘60s,” Jan Edler says. “We thought it would be a fascinating future because it would be able to make people perceive space in a different way.” Such technology has yet to arrive, but the Edler brothers struck upon something else, something that has become their niche: media façades. “If you look at media, that is also a way of augmenting realities,” Edler continues. “For us it’s an experiment in trying to see how architecture will look when it does become dynamic.”

RealU’s first media façade, and its first use of light as a medium, was BIX (2003) at the Peter Cook/Colin Fournier–designed Kunsthhaus in Graz, Austria, which features a biomorphic form clad with 1,300 unique Plexiglas panels. The building’s skin was originally meant to embody varying levels of transparency, creating a line of communication between interior and exterior. Considerations such as excessive sunloading, however, led to the exhibition spaces being encased in black boxes, leaving the glass exterior with nothing to reveal but opaque surfaces.

The design team invited RealU to do something about this. The Edlers created BIX, a grid of 930 conventional circular fluorescent light tubes integrated into the Kunsthhaus’ east face. The grid can be animated by way of a custom-designed software program; custom-built hardware allows the fluorescent tubes’ brightness to be adjusted between zero and 100 percent in  $\frac{1}{18}$  second.

The combination of advanced and pre-existing technologies as exemplified by this project—a pixelated screen made with circular fluorescent light tubes—speaks to the need for architecture to be timeless and affordable. “New technologies are always expensive, and aging becomes a problem,” Jan Edler says. “With the latest LED screens, the new generations come up very quickly, and one or two years later you need an upgrade or else it looks dated. Architecture cannot keep up [with] that pace of change,” so





Continuing its exploration of light as a communication device, in 2005, Realities:United realized a project called “Spots” (opposite). Designed for an uninhabited office building overlooking Potsdamer Platz in Berlin, “Spots” continued the studio’s thinking about media elements in an urban and architectural context. “Nix” (top), also completed in 2005, continued this line of thinking by asking: Why apply these technologies just to a building’s façade when you could use a building’s three-dimensional form as a multidimensional pixel landscape? The studio’s 2008 media art installation in Singapore, “Architectural Advertising Amplifier” (AAMP) (above), was its first use of colored light for a media screen, employing a low-resolution matrix of 546 full-color, computer-controlled LEDs. “2x5 (Brothers)” in 2012 (left), on the campus of Brown University in Providence, R.I., explores the role of time. Two backlit light boxes, each containing colored canvases, rotate on mechanical poster scrollers, which move according to a series of algorithms synchronized to the university’s calendar.

it is preferable to select a technology that has some staying power.

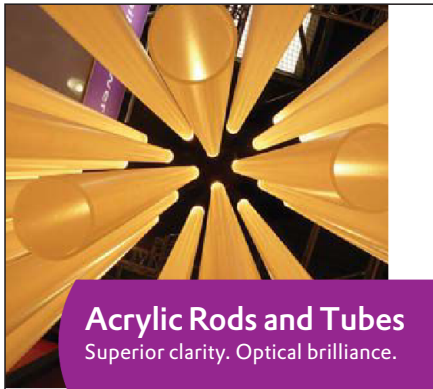
Two years later, RealU created “Spots,” a temporary installation in an uninhabited office building at 10 Potsdamer Platz in Berlin. “Spots” featured 1,014 circular and 760 linear fluorescent tubes that served as pixels in a giant, low-resolution, gray-scale matrix. A central computer controlled each light individually, allowing movies and graphics to animate the façade.

In the firm’s next media façade, the Edlers integrated 546 full-color, computer-controlled LEDs into the interstitial spaces of a double curtainwall on a mixed-use retail-office building in Singapore. Known as the “Architectural Advertising Amplifier” (AAMP) (2008), the façade is animated by signals from an LED billboard already attached to the building. A software program analyzes the signals from the billboard and translates them into a visual color echo of the advertisement, albeit in extreme low resolution, across the 800-square-meter (approximately 8,600-square-foot) elevation.

AAMP led the firm to another façade project in Singapore, “Crystal Mesh” (2009), for a black box entertainment complex known as Bugis+ (previously known as Iluma). The project consists of 3,000 cells of deep-drawn polycarbonate “crystals” covering an area of more than 5,000 square meters (approximately 53,800 square feet). Roughly 1,900 of the cells contain a matrix of compact fluorescent light tubes that form active patches. Unlike RealU’s previous façades, “Crystal Mesh” does not act as a monitor. The active patches are spread out enough that it would be difficult to screen films or animation, so the façade demands content to be written for it. The project is also active during the day. Folded aluminum reflectors in the crystals capture the sun’s rays, sending off glints and gleams of light.

Jan Edler is adamant that RealU is not a lighting design firm. But light has been their primary medium. “Light is one of [the] technologies where [dynamic qualities] are possible, technologically,” he says. “We have been working on other technologies to make architecture dynamic, but light is the easiest to control based on what is available on [the] market.”

And light is fertile ground for the firm’s work. “Nix,” a conceptual design, expands on the pixelated façade, taking over a building’s central lighting system and turning it into an aesthetic instrument. The ceilings of office buildings become three-dimensional canvases, animated by a pre-written program or controlled by signals from the building’s mechanical and electrical systems. As soon as a worker leaves his office at night, the space is turned over to the choreography. If he works late, however, his light could intervene with the overall display. “It would be a charming interaction,” Edler says. •



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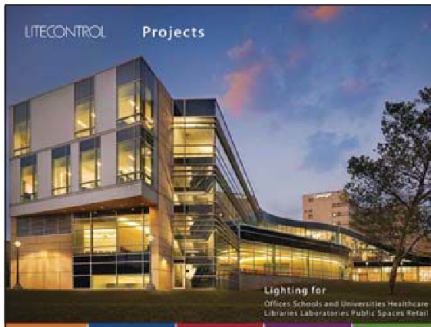
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# AD INDEX

PAGE	ADVERTISER	CIRCLE NUMBER
C3	Acuity Brands	32
C2	Alera Lighting	85
17	American Institute of Architects	-
19	Amerlux	99
20	Barron Lighting	162
26	Columbia Lighting	39
31	DuraGuard	178
31	Engineered Lighting Products	73
7	GE Lighting Solutions	94
5	Gotham	75
13	Juno Lighting Group	93
9	Lighting Science	169
22	Litecontrol	27
11	Lumenpulse	197
1	Luminis	38
C4	Lutron Electronics	37
47	Manning Lighting	98
21	MechoSystems	78
16a-h	RAB Lighting	-
18	ROSCO	86
2-3	SELUX	53
24	Shanxi Guangyu LED Lighting	249
24	Signcomplex	163
15	TE Connectivity	199
6	Universal Lighting	47
4	USHIO	179

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# Amer Maleh

interview by Elizabeth Donoff

photo by Sioux Nesi

“Global financial and energy issues are posing a real threat to the future of the lit environment, as there is a push toward the quantitative versus qualitative aspects of light. The lighting community has a much larger responsibility now to make sure we are creating a healthy lit environment and a well-lit environment.”

**Amer Maleh is part of** the new generation of young lighting designers who combine entrepreneurship with inventiveness. He first became aware of lighting more out of necessity than out of design interest. Growing up in war-torn Beirut in the 1980s, electricity was scarce and could go out at any time. From an early age his creativity revolved around electricity and light, learning how to make his own lamps out of found objects and wiring his family’s house with a battery backup system. In turn, light—and its absence—has influenced Maleh’s thinking in every way, first as an industrial design student at Pratt Institute in Brooklyn, N.Y., and then as a lighting design student at Parsons. This all combined to make him a new type of practitioner, one not limited to a single design discipline.

**What interests you about light?**

How we can use it to transform and manipulate our constructed environments.

**What text has influenced your work?**

*Vision and Art: The Biology of Seeing* by Margaret S. Livingstone. She talks about vision and how both our eyes and our brain “see.”

**How do you start your design process?**

Listening, observing, and getting inspired.

**What is the biggest misconception you had about lighting design as you transitioned from school to the workplace?**

In the beginning, I approached lighting as if it were a product: You would design it, deliver it, and wind up with a result. But lighting is so much more; it’s at the intersection of art and science.

**How do you balance moving between design, teaching, and sales?**

It’s a delicate equilibrium, and you have to be able to wear many different hats. When I started my own consultancy, I made it a point to get a deeper knowledge of all aspects of the industry—design, education, manufacturing, sales. This has provided me with a more complete perspective, which feeds back into everything that I do. It enables me to do my work better and more efficiently.

**What advice would you give a lighting student or a recent graduate?**

Find your own way to get inspired and stay inspired. The lighting industry is very convoluted; there are a lot of different layers. It’s easy to become frustrated. However, there are a lot of different creative avenues to explore in lighting; working as a lighting designer is only one of them.

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With architectural styling for every need, from Period, to Transitional, to Contemporary, Acuity Brands offers you the choices you need to make your vision of each project a reality.

Acuity Brands brings you over a century of experience in lighting streetscapes, parking areas, and walkways. From that experience, we lead confidently into the future.

Regardless of the Architectural Outdoor application, we have the brand and the style to fit your needs. And, you can be certain to find unmatched performance and value in every Acuity Brands solution!



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# Lutron systems help the Empire State Building achieve sustainability goals.

Lutron lighting controls and sensors **save up to 65% of lighting energy.\***

- **Wireless** – simplifies installation and minimizes disruption
- **Flexible** – for easy retrofits or new construction
- **Expandable** – add to a system or reconfigure at any time

“Lutron products are state-of-the-art, cost effective, and architecturally beautiful. We worked with Lutron to develop wireless solutions for the Empire State Building – now you can buy our choice for energy-saving light control.”

**Anthony Malkin**

Empire State Building Company

## Empire State Building sustainability goals

Building energy reduction	38%
Building carbon emission reduction (over the next 15 years)	105,000 metric tons
Annual building energy bill reduction	\$4.4 mil
<b>Lutron contributions toward overall goals</b>	
<b>Projected lighting energy reduction</b>	<b>65%</b>
<b>Projected lighting controls installed payback</b>	<b>2.75 years**</b>

For more information please visit [www.lutron.com/esb](http://www.lutron.com/esb) or call 1.800.523.9466 for 24/7 support.

\* Compared with manual (non-automated) controls, up to 65% lighting energy savings is possible on projects that utilize all of the lighting control strategies used by Lutron in the ESB project (occupancy sensing, high-end trim, and daylight harvesting). Actual energy savings may vary, depending on prior occupant usage, among other factors.

\*\* Estimates based on Lutron controls installed in ESB pre-built tenant space. Payback claims assume 65% reduction in energy costs and energy rates of 22 cents per kwh. Actual payback terms may vary.

The Empire State Building design is a registered trademark and used with permission by ESBC. Empire State Building sustainability goals are provided by ESBC and contain energy saving strategies in addition to lighting control.

Learn about our other energy-saving projects at [www.honestbuildings.com/lutron](http://www.honestbuildings.com/lutron)



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