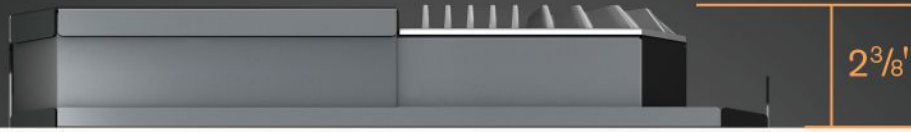


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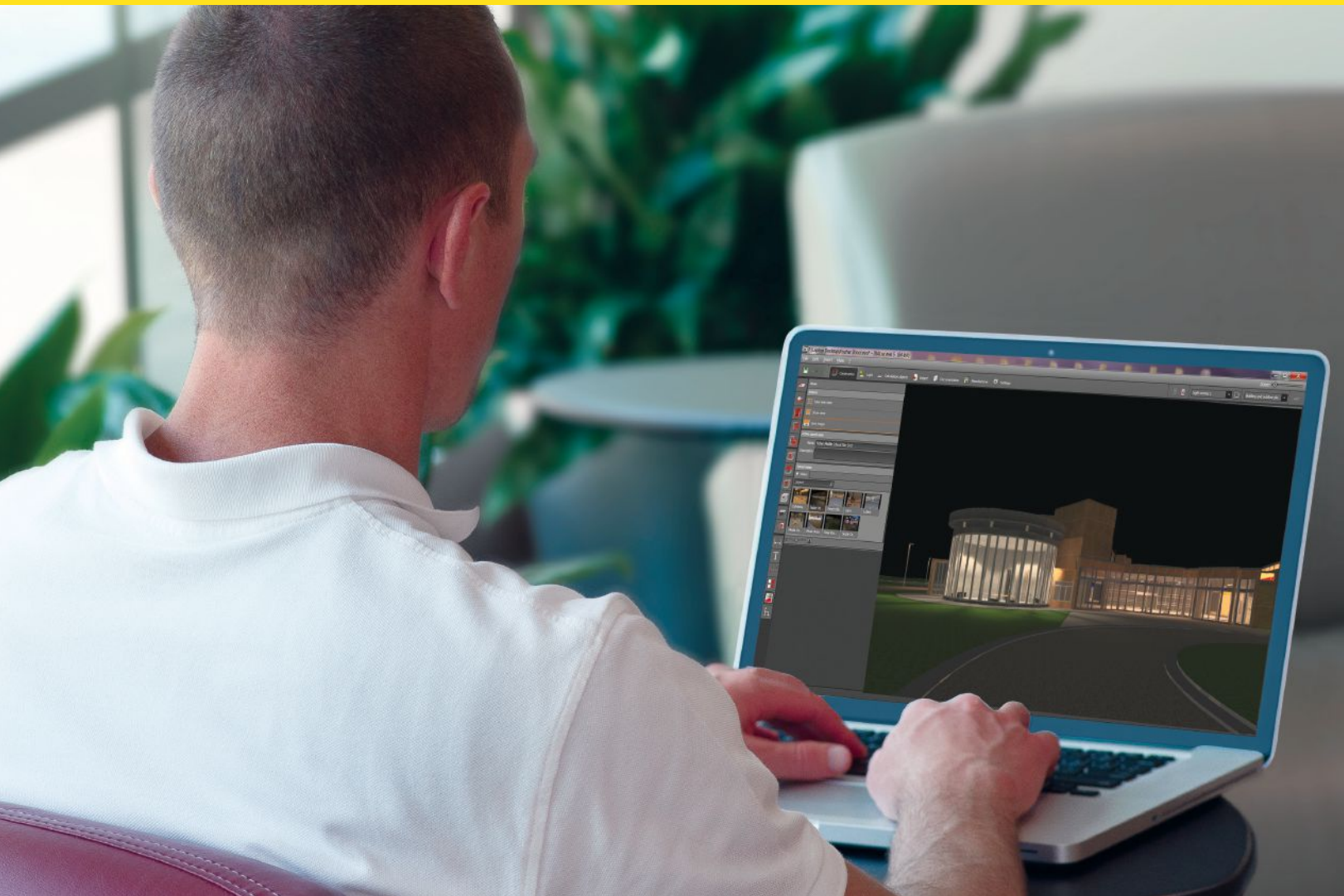
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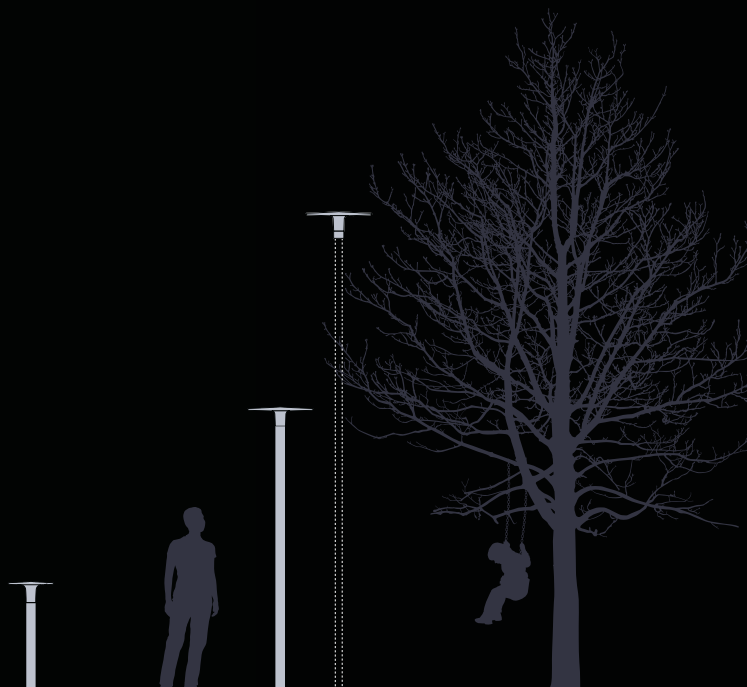
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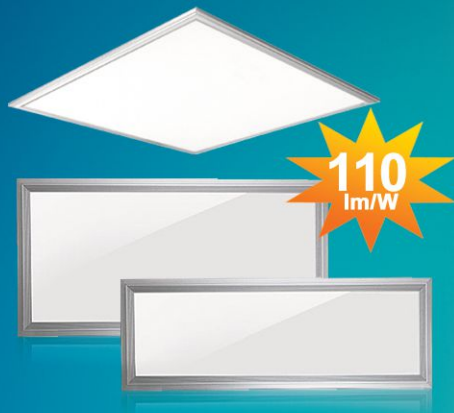
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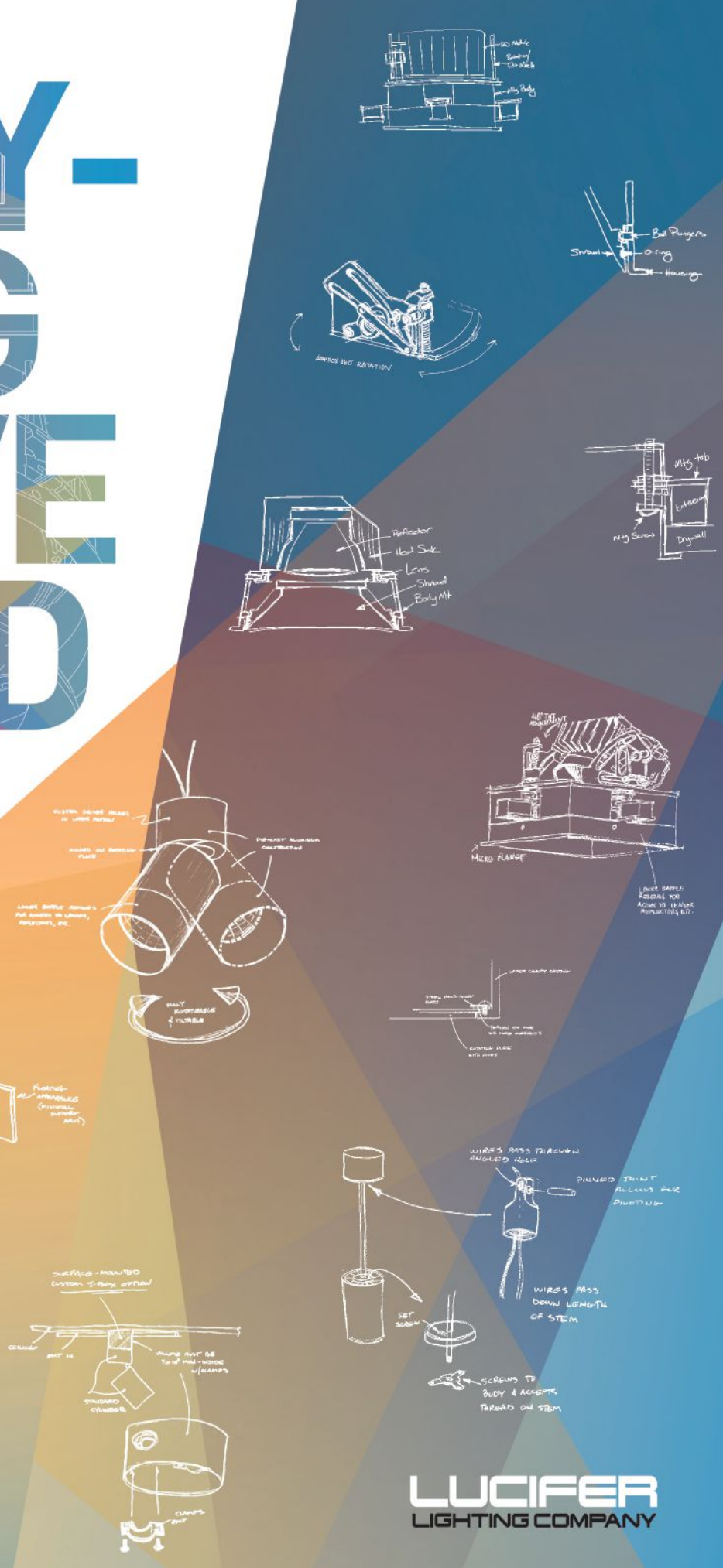


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Ketrá's lighting system is used in retailer Worth's New York showroom.

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**On the Cover: Rich Brilliant Willing's Brooklyn, N.Y., workshop. Photo by Dustin Askland.**

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# IS THE FUTURE OF THE LIGHTING DESIGN PROFESSION IN JEOPARDY?



Yes. Talk with any lighting designer and they will tell you the profession is facing a monumental problem: a shortage of lighting designers in the workforce. And the problem is even more complicated than that—it's actually twofold. For one thing, there is a limited number of lighting programs across the country and around the globe, and they graduate a finite number of students each year. That number is not, and never has been, in sync with the number of employees that lighting design firms seek to hire. For another thing, the 2008 recession created a gap in the workforce when it comes to midcareer professionals, those individuals that have 10 to 15 years of experience. Design firms need these midcareer individuals to manage projects.

The seriousness of the issue has reached crisis proportions. It was practically all anyone talked about at the recent International Association of Lighting Designers Annual Enlighten Americas conference from Oct. 8 to 10 in Baltimore. A number of business-focused seminars addressed the issue, such as "Designing the Perfect Hire," "The 60 Minute Project Manager," and "Agents of Change for Lighting Education."

The challenges facing the future of the profession and how it educates and supports the next generation of lighting designers is not a new topic for this column. Nor is the discussion of how to maintain, grow, and support academic lighting programs and lighting educators. But what is really being done in the field?

Over the past decade, there have been a few meetings of lighting educators, held during trade shows such as Lightfair and Light+Building when the lighting community is already gathering, to discuss the establishment of a universal curriculum that could serve as a guide no matter the specific requirements of a particular school or country's education system. In the past, I've asked why there is no formal organization of lighting educators (which should be an easy way to make sure that education discussions are always on the table). This question is always met first with silence and then a rushed reply: "There

are too many organizations and committees in lighting. That's not what we need."

But clearly the lighting design community needs to take action if it is to increase the number of people who study lighting design and pursue it as a career. What I have yet to see is an assembly of all the constituents who are dedicated to discussing the state of lighting education and its roadmap for the future. If the current shortage of lighting designers proves anything, it is that such a meeting and conversation needs to take place now. Lighting educators and practitioners should be talking more directly and frequently with one another, so that the gap between the world of the academy and the world of practice does not become an obstacle. Meanwhile, lighting designers should not be shy about picking up the phone and calling educators to let them know that their firm is looking to hire. This is especially important for firms that are not located in the big cities where graduates typically look for employment.

The lighting community also needs to be talking with its colleagues in architecture, interior design, theater, landscape architecture, and industrial design to share information, experiences, and best practices for dealing with the challenges of educating future design practitioners. The lighting community has an opportunity to think beyond traditional design arenas and to potentially create new interdisciplinary models with business, urban planning, social work, and computer science programs. The current shortage of lighting designers doesn't have to remain an unsolvable problem. It's an opportunity for the lighting community and one that I am committed to discussing as ARCHITECTURAL LIGHTING celebrates its 30th anniversary in 2016.

Elizabeth Donoff  
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### STUDENT CREATIVITY ON DISPLAY IN ANNUAL LUMINAIRE COMPETITION

Celebrating its 14th year, the Robert Bruce Thompson Annual Student Light Fixture Design Competition provides a creative outlet for students to explore luminaire design in the context of a hypothetical project. This year, students were asked to design a pendant fixture for a theoretical wine bar and restaurant. The program required that the luminaire be decorative and functional, and employ an energy-efficient light source. A total of seven awards were given this year from a pool of more than 92 entries. First place and a cash prize of \$5,000 went to Chelsea Brukaradt, an interior design student at the Ringling College of Art + Design in Sarasota, Fla., for her sculptural LED luminaire “Surrealist” (shown here). Read the full story at [bit.ly/AL\\_RBT\\_2015](http://bit.ly/AL_RBT_2015).

Courtesy Chelsea Brukaradt





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### AETHER POPS UP IN NEW YORK CITY

For the design of its first East Coast retail location, activewear company Aether Apparel teamed with Paris designer Thierry Gaugain and New York City lighting firm Lumen Architecture to create a whimsical, industrial chic shopping experience in New York's Soho neighborhood. Playing off the company's introduction to the city two years prior, when it opened a pop-up shop in a converted Airstream trailer, the new brick-and-mortar store riffs on the mobile experience displaying merchandise in 36 wooden crates, each lit by an LED tapelight detail. Read the full story at [bit.ly/AL\\_Aether](http://bit.ly/AL_Aether).



Jacob Breinholt



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Despite its dominance of our senses and impact on our bodies, many seem indiscriminate about the light in which they live. **Complaisant, even.** Willing to settle for less than what they want. **But why?**

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# SONOMA RECORDING STUDIO

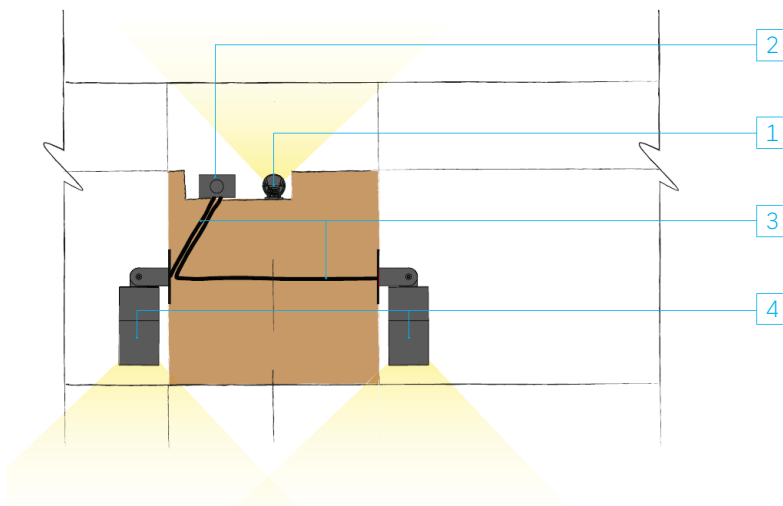
text by Elizabeth Donoff

“What does beautiful lighting sound like?” That was the primary design question Jody Pritchard, principal and co-founder of San Francisco-based PritchardPeck Lighting, asked herself as she set out to illuminate a professional-quality recording studio in the Redwoods of Northern California. Designed as a retreat where the client could invite Bay Area musician friends to write and record music, the studio, a freestanding structure separate from the main house, is built inside the structural bones of a 19th-century barn that the owners found in New York and had shipped back west. Working with old timbers required a high level of coordination and on-site customization.

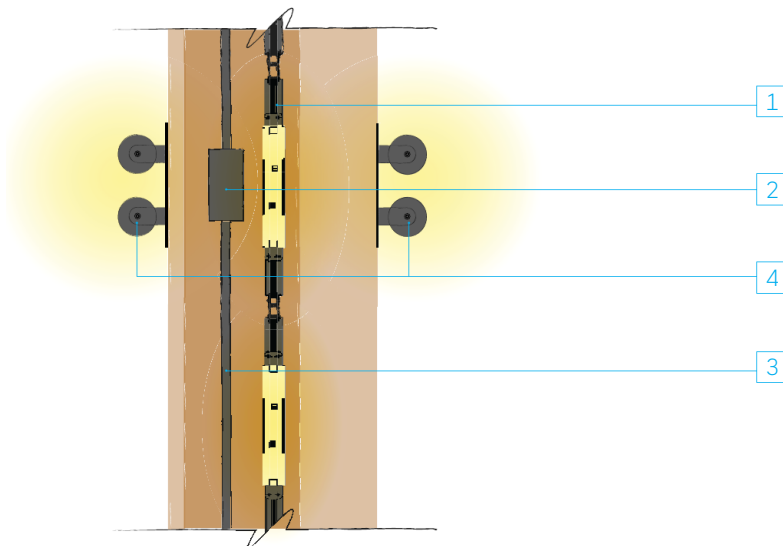
Adding to the challenge was the programmatic requirements of a recording studio. “The heart and soul of this project had to do with the function of the space, and they did not want the lighting to be the thing that disrupted the experience,” Pritchard says. Central to the experience are the natural surroundings, and the lighting is designed as if the studio was a spiritual gathering place. “That’s one of the reasons the ceiling is uplit,” she says. Extensive discussions with acousticians and numerous mock-ups helped to achieve a “sonically neutral” space: All of the fixture selections—a combination of halogen and LED sources—and wiring do not electromagnetically interfere with the recording equipment. The studio and control booth are wired independently from the main house, which is on a wireless system.

All of which creates a quality to the space that is special. “There’s this magical moment,” Pritchard says, “when the doors are open and the sound of all the things that come with being outside become part of the music.” •

Section



Plan



## Cross Beam Uplights and Monopoints Details

- 1 120V LED lightstrip in new channel on top of existing barn cross beam
- 2 2x4 handy box with through-wire conduit IN/OUT
- 3 12V power feeds for LED lightstrip
- 4 12V monopoints with custom canopy (backplate) mounted to existing barn cross beam



Layers of light bring out the architectural details of the studio and provide a creative setting. In-grade uplights highlight the texture of the axe-hewn timbers, while monopoints on the cross beams provide an accent of sparkle and tasklighting for the musicians.

#### DETAILS

**Project:** Sonoma Recording Studio, Sonoma County, Calif. • **Client:** Withheld • **Architect:** Schwartz and Architecture, San Francisco • **Lighting Designer:** PritchardPeck Lighting, San Francisco • **Project Size:** 2,100 square feet • **Project and Lighting Costs:** Withheld • **Code Compliance:** California Title 24 • **Watts per Square Foot:** 1.57

#### MANUFACTURERS

**B-K Lighting:** Delta Star monopoints at cross beams • **GE Lighting:** 37W IR MR16 lamps for downlights and monopoints • **Lucifer Lighting:** Zero Sightline downlights at drywall ceiling locations • **Lutron:** Grafik Eye QS control system with seeTouch keypads • **MP Lighting:** L05 Series in-grade uplights with 9W LEDs and custom 12-degree aiming angle at columns • **Philips Color Kinetics:** eW Cove QLX Powercore LED 30x60 degree uplights in wood beams

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# NEW PRACTICE PARADIGMS

A new generation of lighting designers is daring to reimagine the structure of lighting design practice for the next decade and beyond.

text by Elizabeth Donoff

The organizational structure and focus of design firms, no matter the discipline, has not changed significantly over time. Core work centers on projects that generate fees and those fees are used to meet the demands associated with running a business. But one of the greatest challenges for those who work in design fields that require time for creative exploration is how to integrate that pursuit into a business model built around billable hours. Research, critical debate, and design and product competitions are but a few examples of things that fall into



Marco Bevolo led the 2015 Think-in-a-Tank gathering that brought together design thought leaders to discuss the role of light in the built environment.



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a gray area: These things are all important for exploring new ideas and exercising one's design muscles but they don't necessarily generate revenue.

Architecture firms have already started to explore how they can incorporate design research as part of a viable business model. One example is Lateral Office in Toronto. Established in 2003, the firm was formed around the premise of using "design as a research vehicle." Another example is Gehry Technologies. The AEC technology company, established in 2002, grew out of Frank Gehry's architectural practice and that firm's use of advanced 3D modeling platforms in their design work.

The idea that the parameters of design practice can expand beyond traditional structures is also starting to take hold among the next generation of lighting designers. These younger designers are actively seeking ways to broaden the type of work that they do. Two firms that are pushing the boundaries of what it means to be a 21st-century lighting design practice are Madrid, Spain-based Lighting Design Collective and Cambridge, Mass.-based Lam Partners. Each has developed a platform that allows room for academic-oriented discussions and design research to exist within the office, while at the same time contributing to the firm's design thinking.

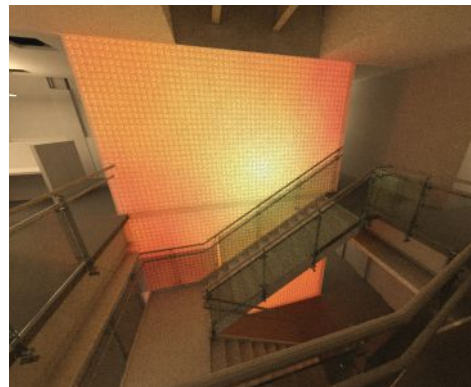
**THINK-IN-A-TANK**

Think-in-a-Tank is an initiative started in 2014 by Tapio Rosenius of Lighting Design Collective (LDC) and his partners Kristian Krogh and Jari Vuorinen. With offices in Madrid, Helsinki, and London, the firm's design process has always involved an interdisciplinary approach and incorporated built and conceptual projects into its workstream. To find a way to bring these two seemingly different types of work together, along with the need for a more critical dialogue in lighting design which Rosenius felt was desperately missing, the trio started thinking: What if they could stage an event about the future of light? As the group started to develop a possible format, they asked urban sociologist Marco Bevolo, whose expertise lies in design thinking, to join the team, and he has served as the event moderator ever since.

Rosenius and his colleagues were originally inspired by Brian Eno and Peter Schmidt's 1975 "Oblique Strategies," a set of printed index-size cards in a black box, each with a written phrase meant to help break an artist's creative block using lateral thinking—problem solving through a creative approach. For their

program, LDC and Bevolo have created a matrix of 16 discussion topics that are used as a tool to foster discussion among the invited participants as they analyze their own work and examine how light might aid their creative process.

"We consider this event a milestone because we aim at gathering the next generation of design leaders and facilitate them in an informal



Lam Labs' research into media displays has developed "a multi-application workflow" that uses Rhinoceros (with Grasshopper and the Firefly plug-in) for advanced modeling and programming and Autodesk 3ds Max for rendering. The new workflow allows stills and animated images to be incorporated into low- and medium-resolution displays.

setting to speak about the future in both professional and personal terms," Rosenius says. "The more critical thinking and conversation we can provoke, the better it is for the [lighting] industry as a whole, because we see that lighting design is radically changing, while the related industry seems slow or static."

The discussion sessions during the one-day event are held at Silo 468 in Helsinki, LDC's award-winning project that transformed an abandoned oil tank on the city's harbor into a public gathering space and permanent lighting installation. Participants are selected by Rosenius and his partners from individuals

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they think are influential in their fields. The first two meetings included mainly architects, but as the program continues, Rosenius is looking to the fields of digital design and start-up enterprises. These are the people who are “shaping the digital world, which is fast merging

with the built environment and influencing the discipline of lighting design,” he says. The goal of Think-in-a-Tank is nothing short of monumental: “We are looking for a paradigm shift in the role of light in the built environment,” Rosenius says.

**LAM LABS**

Lam Labs is an initiative started by Cambridge, Mass.-based lighting design firm Lam Partners in April 2014. Its goal is to marry education and research with project work, drawing on the firm’s areas of expertise like daylighting.

The lab is led by Dan Weissman, who serves as its director. Weissman was looking for an outlet to combine his architecture and lighting work, having returned to Lam Partners after completing his second masters degree, a Master of Design Studies in Sustainable Design from the Harvard Graduate School of Design (GSD), and then working at Safdie Architects in Boston.

Adding to the progressive nature of the Lam Labs model is that the initiative has the complete backing of the firm’s senior principals. “They’ve done a lot of these things over the years but have never had a way of coalescing it,” Weissman says. “Theoretically, it allows the firm to do a much broader set of things, in the world and in our practice, than we would otherwise.”

Those activities include teaching classes on lighting and daylighting, which members of the office have been doing for decades at the Boston Architectural College. This year, Lam Partners’ teaching reach extended to the GSD when Weissman taught a six-week daylighting seminar at his graduate school alma mater.

Under the structure of Lam Labs, firm members can propose a project for review. If accepted, the project then has to meet certain benchmarks in terms of time, resources, and budget to prove that it is viable.

A new research project that is underway focuses on media displays. Weissman and designer Jack Risser have developed “a new workflow for rendering low- and medium-resolution media displays in visualizations.” Next steps include validation of the prototype that the duo has built in Lam’s Cambridge offices.

Given the firm’s history, it’s not surprising that Lam Partners has established something this progressive. “I’d actually trace the evolution of Lam Labs back to 1949 when Bill [Lam] set up Lam Workshop,” says associate principal Jamie Perry. As the firm’s website says: “Lam saw a critical need in the market for commercial-grade lighting products that would address the challenges of modern architectural design” and the workshop allowed him to explore those ideas. Building on that legacy, Perry says, is allowing Lam Partners “to redefine the role of a lighting design firm in the design community.” •

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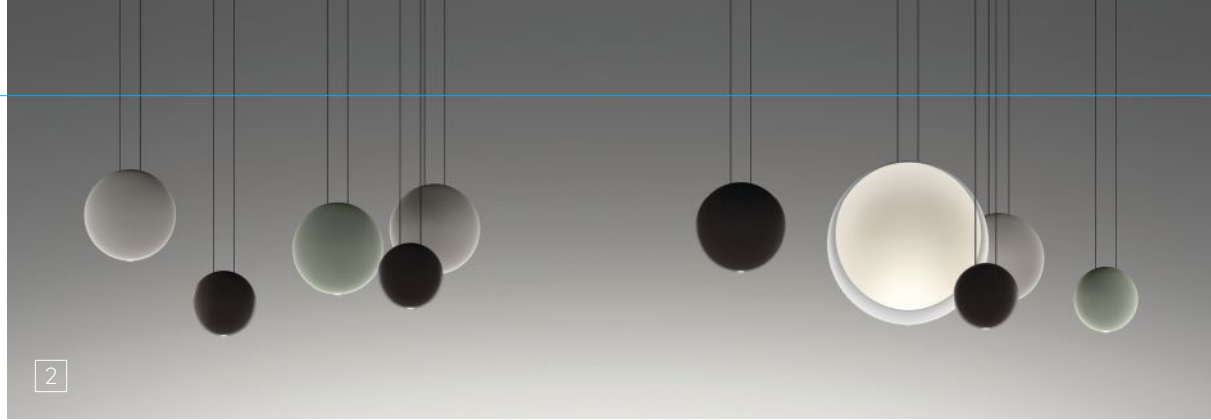




## EUROLUCE 2015

text by Elizabeth Donoff

This bi-annual celebration of decorative lighting did not disappoint. Held April 14 to 19 in Milan as part of the International Furniture Exhibition known as Salone, this showcase for furniture, lighting, and textiles continues to prove that design matters regardless of technology shifts or economic swings. Salone and Euroluce are a gathering of the who's who of the design world, and lighting plays a key role in the designers' arsenals. Trends on display in the four lighting halls included slim silhouettes, fixtures grouped in multiples, metal finishes, and the full adoption of LEDs. Euroluce serves as an outlet for creative inspiration. •

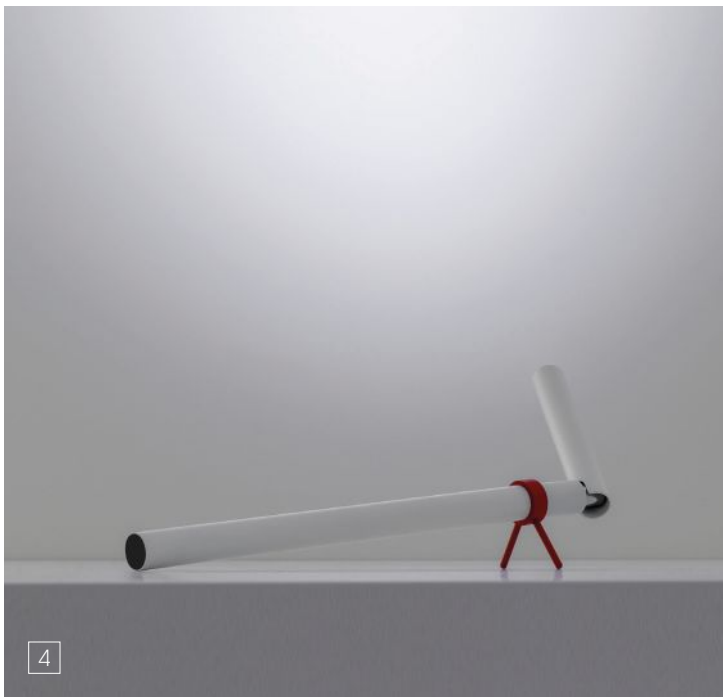


**1 Mesh, Luceplån** • “I set out to create a lamp by starting with this capacity for spatial separation of LEDs, scattering them to optimize the spread of light, but above all with the aim of giving each of these points of light its own independence,” says designer Francisco Gomez Paz of his latest design for Luceplån. Measuring 110cm in diameter by 90cm tall (43.3” by 35.4”), the LEDs appear to “float” in a net of fine steel cables finished in black. Dimmable, with light output to 8,000 lumens. • [luceplan.com](http://luceplan.com)

**2 Cosmos, Vibia** • Designed by Lievore Altherr Molina, this new series of pendants creates an illuminated constellation. The largest disk measures 48cm in diameter by 7cm thick and when lit reveals the look of the moon. The smaller disks, which are 19cm in diameter by 4cm thick, are available in dark brown, green, and light gray matte lacquer. The fixtures use either a single 1w LED or three 3.7W LEDs. • [vibialight.com](http://vibialight.com)

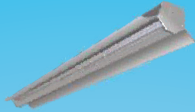
**3 16, Bocci** • “I have imagined what 16 would look like for almost a decade,” says Bocci’s creative director Omer Arbel. The fixture is created using a complex process of pouring three separate layers of colored, molten glass on a horizontal surface, with each layer allowed to form its own shape and level of opacity. Two of the layers are then attached and lit with an integral LED lamp. The glass fixture heads—8.5” in diameter by 2.5” thick—are supported by a modular armature that emulates the look of tree branches and houses the low-voltage power runs. • [bocci.ca](http://bocci.ca)

**4 Dragon, Davide Groppi** • “A little wireless dragon which ‘spits’ light out to [the] spot where it is required,” is how this 2.5W LED table lamp, designed by Omar Carraglia for Davide Groppi, is described in the company’s catalog. The fixture provides 250 lumens and the lamp head can be rotated 360 degrees. • [davidegroppi.com](http://davidegroppi.com)





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## PRODUCTS



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**5 Caigo, Foscarini** • The luminaire's name is a play on the word "caigo," which in the Venetian dialect means the mist that rises up from the lagoon waters. That was designer Marco Zito's inspiration as he developed the white and transparent shading technique for the Murano blown-glass diffuser that is the main design element of the piece. Measuring 9<sup>5/8</sup>" wide by 11<sup>3/8</sup>" tall, the luminaire uses one 8W GU10 LED lamp. • [foscarini.com](http://foscarini.com)

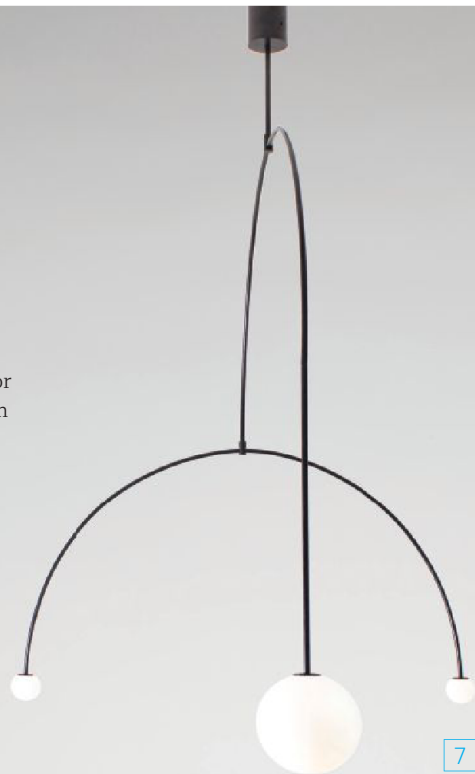


6

**6 Crystalon, Swarovski** • Crystalon's asymmetric form is a play on the DNA structure of a crystal. Available in seven pendant sizes ranging from 18" long to 75" long with either neutral- or warm-white LED options, or as a table lamp for use with an incandescent source, the dimmable fixture is available in two crystal colors: Crystal and Aurora Borealis. • [architecture.swarovski.com](http://architecture.swarovski.com)

### 7 Mobile Chandelier 9, Michael Anastassiades

"Nobody can replicate light in the way that it exists in nature. I would be happy if I was to capture a small part of that complexity when designing a fixture," says designer Michael Anastassiades. For Euroluce, he launched 15 new designs under his own name. (He also designs for Flos, among others.) The collection explores the shape of a sphere through different geometries. The latest evolution of the Mobile Chandeliers (No. 9 shown), introduces curved elements into the existing linear vocabulary. Made of black patented brass and opaline spheres that use 2700K frosted halogen lamps, the luminaire measures 57.28" wide by 39.49" tall. • [michaelanastassiades.com](http://michaelanastassiades.com)



7





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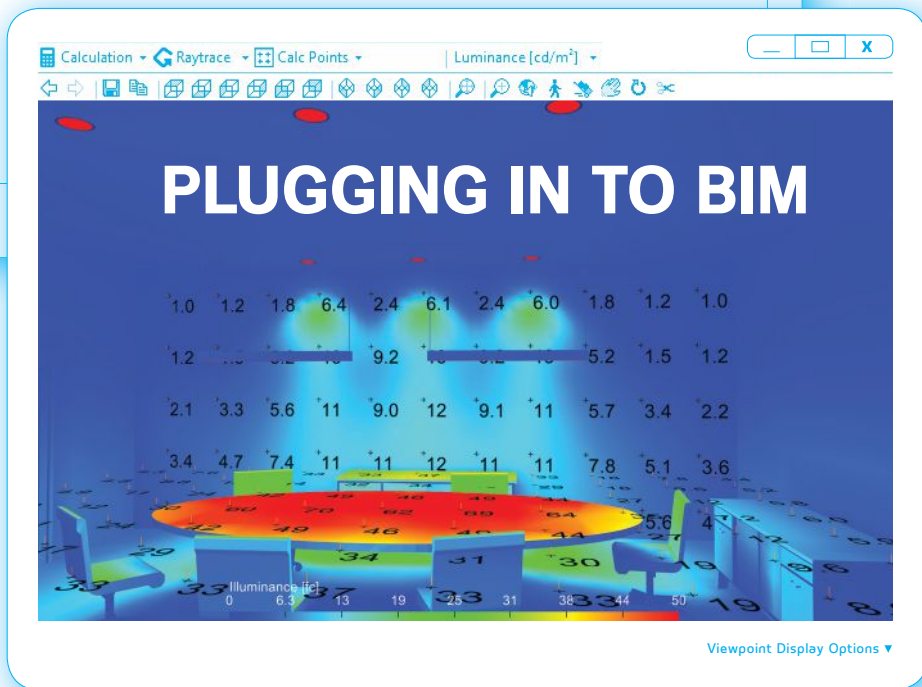
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Designers and software developers sound off on where today's lighting software stands to improve.

"The whole world of 3D exchange is still a very imperfect world—from taking a 3D model from one tool and bringing it into another tool," says David Speer, director of sales and marketing at Littleton, Colo.-based developer Lighting Analysts. In 2011, the firm, which makes the widely used AGI32 photometric calculation software, sought to contend with the difficulties of exporting the complexity of a BIM model into another package, like AGI32, and found that existing shortcuts didn't maintain the detail of the Revit model. They couldn't make BIM better, so Speer and his firm had to make a tool that worked within the existing constraints.

"How do we do lighting in BIM?" he says. "It didn't take anyone very long to say that the best way to do it would be right inside of [Autodesk's] Revit, because you have the 3D model right there, you don't have to re-create anything." Lighting Analysts worked with Autodesk and its application programming interface to build ElumTools, a Revit plug-in for calculations. Though the tool focused initially on interior applications, the team is now exploring its use for exterior illumination.

Having to work around the lighting-related limitations of BIM, and Revit's M/E/P package in particular, is common practice among both software developers and lighting designers, especially given the program's ubiquity among architects and engineers for structural and interior design. "On the Revit side of things, the growing prevalence of LED lighting is missing," says Bob Bell, a Seattle-based design technology manager for engineering firm Stantec. One shortcoming is that the Revit engine does not currently accept or utilize the IES photometric data files for LED luminaires. "The IES files are in a slightly different format and Revit doesn't understand that format," he says. Bell's workaround, right now, is to export the file to AGI32, which can read the IES files, in order to generate a point-to-point calculation that then allows the project team to change fixture position and quantity within Revit—though they'll still need to send any changes back out to AGI32 to ensure that the design remains compliant.

text by Hallie Busta

There has never been one definitive program for lighting design, calculation, and rendering, and there isn't likely to be. There is, however, the opportunity for better integration and compatibility among software programs, specifically with regards to computing and design modeling. Developers large and small are attempting to improve integration among the various platforms, but some industry watchers think these upgrades aren't coming fast enough, particularly when it concerns building information modeling (BIM). ARCHITECTURAL LIGHTING spoke with lighting designers and software developers to determine where today's lighting design, calculation, and analysis programs stand on interoperability, and what's left to improve.

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Matt Franks, an associate at the New York office of Arup, agrees. On his wish list is better integration between third-party software programs and BIM. “Just being able to do [lighting calculations] within the BIM software would be one of the bigger things we’re hoping gets developed in the near future,” he says. “To do the calculations in Revit works for very simple spaces but as you get into more complex spaces it doesn’t work particularly well.”

Other industry watchers fault Revit M/E/P for automatically generating schedules based on the fixtures included in the drawings, rather than allowing the project team to create a multiline specification within the program that automatically updates as the specs change. On the other side of the business, third-party developers have found issue with the modeling of material properties in BIM—while aspects such as color and transparency are compatible, texture maps that determine material reflectance have historically been missing. This is key for performing accurate lighting calculations and, ultimately, fostering compatibility between the tools used by the architects and those used by the lighting designers.

It’s easy to chalk up the incompatibility to megadevelopers not understanding—or, not caring to understand—how lighting designers work. In the lighting industry, the programs that do the bulk of the work are made by developers with small teams. That makes for slower update timelines. “It’s difficult to keep up with the sort of technology that users are expecting nowadays and deal with programs like SketchUp and Revit,” says Speer, one of roughly 12 employees at Lighting Analysts. “We have all sorts of projects on the drawing board, as usual, and inevitably only 15 or 20 percent of what we ever conceive hits the market.”

One way the industry is seeking to improve compatibility is through the Illuminating Engineering Society Computer Committee’s BIM subcommittee. (Learn more about the group at [bit.ly/1MAMBHM](http://bit.ly/1MAMBHM).) It has been tasked with developing vendor-neutral recommendations for BIM and CAD software developers to help them better understand the parameters important to lighting designers.

Autodesk has developed its own tool, a Revit plug-in that doesn’t aim to replace existing rendering engines but rather supplement them by opening up basic lighting calculations to the rest of the project team. Lighting Analysis for Revit, or LAR, is based on Autodesk’s 360 Rendering engine and uses a bi-directional ray-tracing algorithm that shows electric and daylighting results directly in the Revit model. “What we’re trying to do with LAR is put a wrapper around the analysis process ... use a very high-quality industry standard to make the front end much simpler so that during the design process, architects, interior designers—people that may not necessarily have specialized analysis or lighting design skill—can start to include that kind of analysis to inform their design process.”

Ultimately, the future of BIM compatibility with lighting design software should seek to incorporate and improve the existing technologies that lighting designers use daily. •

— “It’s difficult to keep up with the sort of technology that users are expecting nowadays and deal with programs like SketchUp and Revit. We have all sorts of projects on the drawing board, as usual, and inevitably only 15 or 20 percent of what we ever conceive hits the market.”

—David Speer, director of sales and marketing,  
Lighting Analysts

## RESOURCES

A list of references that discuss lighting-design software and BIM:

“Lighting Analysis in BIM,”  
Autodesk Sustainability Workshop.  
Available at: [bit.ly/1GX2w32](http://bit.ly/1GX2w32).

“Setting a Standard,” by Gideon  
Fink Shapiro, *Architect*, April 2014.  
Available at: [bit.ly/1lkkySU](http://bit.ly/1lkkySU).

“IES Position Statement: Integrated  
Building Design (PS-01-09),” by the  
Illuminating Engineering Society,  
2009. Available at: [bit.ly/1R0rKkl](http://bit.ly/1R0rKkl).

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RICH BRILLIANT  
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The up-and-coming fixture maker is breaking out of Brooklyn to formalize its place in the New York lighting design community and beyond.

text by Hallie Busta

photos by Dustin Askland

In the fall of 2008, when the market crash had many firms reeling, things were falling into place for three young designers in New York. Recent graduates of the Rhode Island School of Design with BFAs in furniture design, Theo Richardson, Charles Brill, and Alex Williams were sharing studio space in an East Village basement. That setup, says Williams, who now heads the firm's sales, "quickly jelled into a more cohesive, collaborative effort to develop product ideas." It wasn't long before one of those ideas stuck.

During a small show at Kiosk in Soho for New York Design Week in the spring of 2008, the three, who now work under a cheeky riff on their last names—Rich Brilliant Willing (RBW)—launched their first product, Excel. Named for the Microsoft spreadsheet software, with a large drum shade extending from a minimalist metallic arm, the floor lamp was a hit. Among those interested in the luminaire was clothing retailer Urban Outfitters, which specified a small number of the fixture for its stores. "We got this big check to do this project and we didn't even have a business banking account to deposit it in," says Brill, the studio's operations director. By 2009, RBW was officially in business.

Fast forward to today. The trio is fresh off opening a cozy-yet-chic showroom in Manhattan's Flatiron district and is balancing time between it and a bustling workshop in Brooklyn, N.Y. Meanwhile, their products illuminate top-tier hotels across the country and the offices of startups like Fitbit, Uber, and Yelp, whose recent high-profile commissions have pushed RBW into the spotlight.

What's made RBW so successful so quickly isn't just that it makes a good product. It's that it can mass-produce a high-end industrial aesthetic

to meet client demands for a product that looks like a one-off—even though it's not.

RBW didn't get to this point overnight. Rather, the company's growth is driven by hard work and a level of business acumen that seems counter to its relative youth. You might not expect such business savvy from a few new-to-the-scene 30-somethings who dare to suggest that they are, indeed, rich, brilliant, and willing. But you'd be mistaken. Being new means they're small, being small has helped them stay nimble, and being nimble is allowing them to get ahead.

#### **GROWING UP**

Launching in a down market forced RBW to grow up lean. One way they've accomplished this is by manufacturing most fixtures in-house. Though the studio initially crafted both furniture and lighting products, it shifted to making only luminaires in 2011 and a year later went all LED. "Lighting has always been where our best ideas are," Richardson says. RBW wanted to find a specialty, and was intrigued by the potential impact of LEDs. "Engineers make it work, designers make it desirable," Richardson says. "We consider ourselves bridging the roles of design and engineering."

Today, about one-third of RBW's luminaires are at least part custom, and modifications to existing products often result in new fixtures altogether. One example is Queue, a linear LED pendant whose look rethinks conventional suspended workplace lighting. Previously, customers would specify the pendant version of RBW's Branch luminaire—whose minimalist, perforated metallic diffuser shields an LED strip—in extended lengths of up to 40 feet. "We felt Branch could be optimized to better serve

architectural linear systems," Williams says. The result is Queue (shown right), an indirect/direct fixture whose linear construction is designed for long runs. Palindrome, a modular suspension luminaire whose steel armature and diffusers can be arranged in nearly any form a client desires, is perhaps the best example of an RBW product that addresses mass-customization at scale. "We're trying to find products that transform—that are almost customized," Richardson says.

## WORKSHOP MENTALITY

This approach benefits from the co-locating of design and fabrication at RBW's 3,000-square-foot Brooklyn studio. When visited on a rainy October morning, a small cadre of team members were working at desktops clustered near the ground-level space's storefront windows. Throughout the rest of the studio, assembly stations and stacks of finished orders shape a labyrinthine path. Prototypes are suspended from the ceiling, tools are fixed to boards based on the products they'll be used to assemble, spare parts fill bins and hang from the walls, and space heaters ward off the chill. The cold outside can't damper the warm buzz of activity within.

The team meets twice per day, in the morning to run through production and again in the evening to go over what worked and what didn't. One fixture whose design has benefited from its proximity to the work bench, Branch, underwent more than 26 revisions "over things that no one would really notice but would make it easier to assemble," Williams says.

For all their streamlining, however, RBW is anxious to expand. That's causing the studio to look outward—new markets, more space, and even production partners to fabricate the simpler fixtures "Certain products involve so few parts that there isn't really much left to produce in-house," Richardson says.

The opening this past spring of the showroom in Manhattan has given them room to breathe. It's also afforded the partners a sleeker front for meeting clients and displaying products. "For the first time, we have a space that is dedicated to our customers and presents our brand in a strategic way," says Williams, who now runs the sales team out of the showroom. "It's changed the way we communicate with our clients."

## KEEPING CLIENTS

Many of RBW's most important clients have been with them from the beginning, but the opportunity to work with so many, particularly across the hospitality and commercial office sectors, has

forced the company to be discerning about the jobs it accepts. "It's been a long, complicated process of figuring out how to approach that and where the boundaries lie," Williams says. "Is [the fixture] something we're going to be proud calling an RBW product? Is it going to be profitable? Is it something we can repeat in the future? Saying 'Yes' or 'No' to opportunities like that has been challenging at times."

One sign that RBW has narrowed its focus to target professional lighting designers is its plan to attend the 2016 LEDucation trade show in New York this spring. Over the past few years, RBW has showed at the larger and more diverse trade shows such as the NeoCon commercial interiors fair in Chicago, Boutique Design New York, and Dwell on Design. And RBW's sales team calls on professional lighting designers directly. The company's long-term goals include becoming a go-to supplier for top hotel chains, as well as establishing a direct sales force and a physical presence in key markets beyond New York—San Francisco, Los Angeles, Atlanta, and London, in addition to new business abroad.

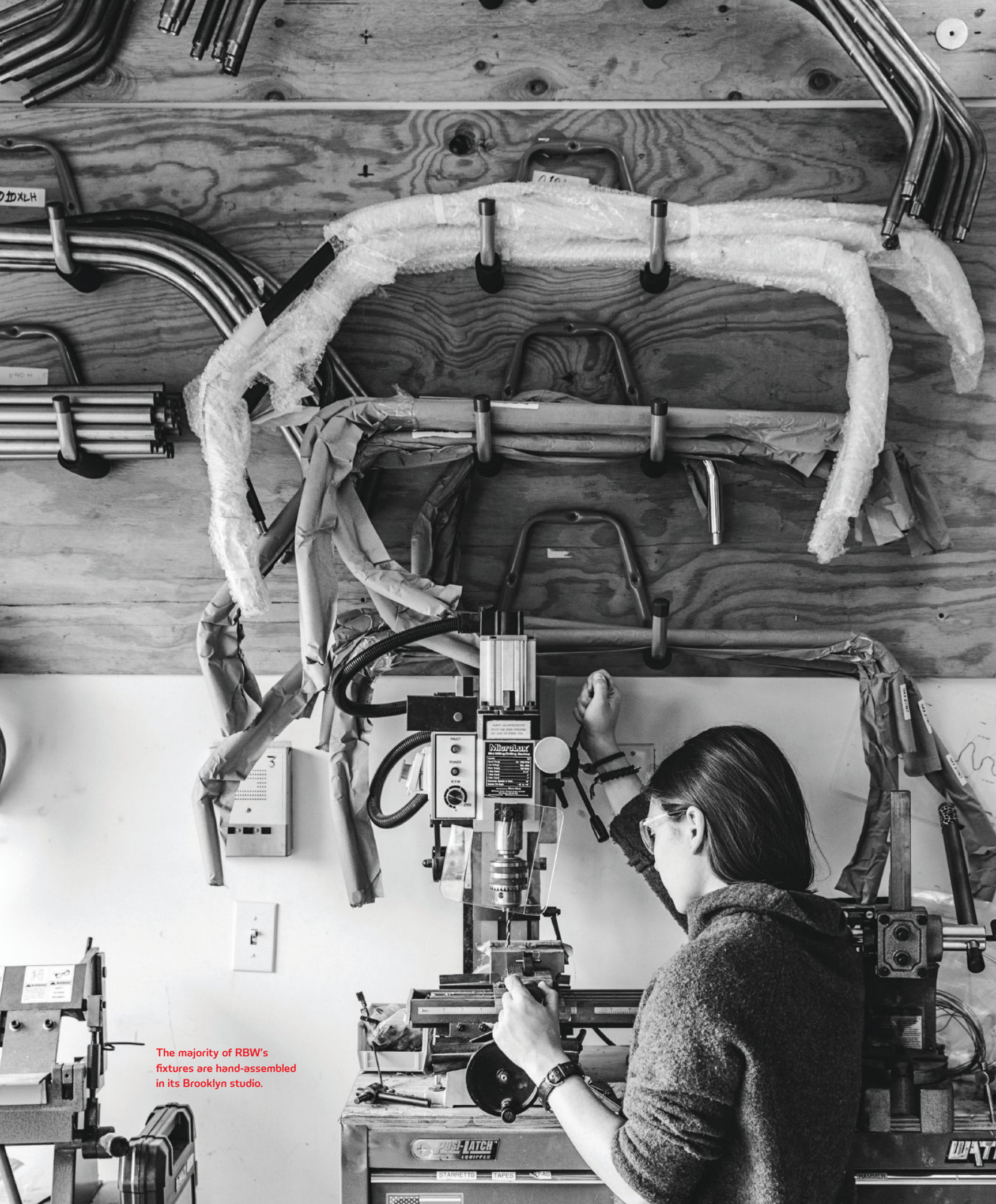
When asked what niche they aim to fill in the high-end lighting design market, the three give an answer that is perhaps intentionally abstract: to bring simplicity, technology, and creativity to interiors through their luminaires. "We hope to be considered as a well-rounded decorative lighting brand that offers a wide range of solutions that address the needs of specific applications ... something for everyone," Williams says before he catches himself. "Not everyone," he finishes. But with their subtle industrial touch, streamlined forms, and incorporation of LEDs, that their products will continue to gain broader appeal isn't such a stretch. •




Opening spread, from left: Rich Brilliant Willing's co-founders Alex Williams, director of sales; Charles Brill, director of operations; and Theo Richardson, director of development.

Queue (above) is among the latest additions to RBW's product line. The 44-inch, 2,300-lumen modular light bars are suspended from stainless steel wires and connect with sliding joints.





The majority of RBW's fixtures are hand-assembled in its Brooklyn studio.

A man with dark hair, wearing a green button-down shirt and dark jeans, stands in a brightly lit room. He is leaning against a white wall with a textured, geometric pattern. The lighting is soft and even, highlighting the texture of the wall and the man's clothing. The overall mood is clean and modern.

# THE NATURE OF CONTROL

Austin-based startup Ketra entered lighting with an innovative microchip capable of making the source mimic the dynamic range of natural light. Then it decided to design an entirely new lighting system.

text by Aaron Seward  
portrait by Ben Sklar

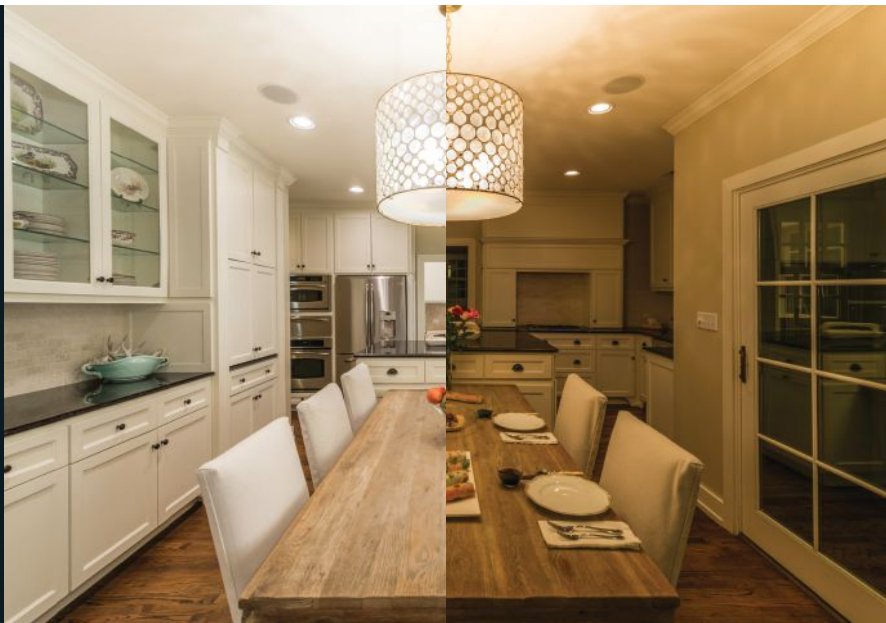


Ketra's headquarters are located in an unassuming office park nestled along the leafy fringe of the Barton Creek Greenbelt in southwest Austin, Texas. The modest, three-story, red-brick-and-mirrored-glass buildings surrounded by landscaped parking lots could easily pass for Palo Alto, Mountain View, or some other Silicon Valley town in California.

The comparison is apt because, while Ketra is a lighting company, its founders, Horace Ho and David Knapp, are semiconductor engineers and entrepreneurs. They started the company six years ago after noticing certain deficiencies in LED lighting: It was harsh, it flickered, it didn't dim warmly, it tended to produce a lot of blue light, and there was color variability from LED to LED. The color and quality of the light produced by a single module also changed as the diode decayed over time. Like fluorescent lighting, it was not very pleasant, and not at all like natural light. Ho and Knapp thought they could fix these issues, not by inventing the LED anew, but by developing a microchip that would regulate the flow of electricity to the light source, improving its performance and consistency, and giving it the same dynamic range of light as is found in the natural world.

"What humans have evolved under are two sources: the sun and fire," says Ketra CEO Nav Sooch (shown at left), who joined the company in 2011. "We find that during the middle of the day we love the bright cool light that sunlight provides. It makes you feel fresh and alive. At night, the soothing warm light that fire provides is also really comforting. At Ketra, we saw the opportunity with LEDs to create that naturally occurring cycle and have light that feels more natural indoors."

Like audio speakers, which can act as both loudspeakers and microphones, LEDs can both emit and receive light. Ketra designed a module in which most of the LEDs produce light and some receive it. These monitor LEDs send the information they've gathered back to the driver chip. If there is any change, the chip adjusts the frequency of the electrical current feeding the LED emitters. The effect of this closed



**Ketra CEO Nav Sooch at the company's Austin, Texas, headquarters next to a display that showcases the full spectrum of rich saturated colors and plush pastels that the company's lighting technology can produce (previous spread).**

**For a residence in Austin, Ketra's dynamic lighting system lets the clients customize their lighting, no matter the time of day (above).**

**For the Art Institute of Chicago, which is in the process of switching its gallery lighting to LEDs, Ketra's S38 lamp and N1 controller were used to illuminate Monet's *Haystacks* (opposite, top).**

**The color temperature range and color stability makes the lighting system appropriate no matter the setting. Ketra's products were used at Uchi restaurant in Dallas (opposite, bottom).**

feedback loop is that the chip can correct the LED module and maintain a consistent light level and color temperature. It can also dim the color temperature—from 10,000K down to 1,400K—to produce warm, flicker-free light. With a little programming, it can put on a “circadian show,” mimicking the dynamic qualities of natural light throughout the course of the day and night. Ketra also equipped the driver chip with radio frequency capabilities, allowing it to talk to other modules and to be controlled wirelessly.

The company's initial idea was to sell its technology to established lighting manufacturers, but under Sooch's leadership they put together a complete lighting system instead—from light source to fixture, user interface, and control module. “Making a great light is about more than just the chip: it's the emitter, the optics, the interface,” says Brett Paulson, Ketra's vice president of sales. “Other manufacturers don't have the capability we have with our chip. We said, ‘Why don't we bring on a team to do everything in-house, design a system that is easy to use and elegant, where you don't have to worry about compatibility?’” Now with about 62 employees, Ketra has semiconductor chip specialists, software and firmware programmers, mechanical engineers, industrial designers, and optics and lighting experts. “I think we have a technical team that is unmatched in the industry,” Sooch says.

In order to continue to hone each element of its stand-alone system, Ketra has also called upon the experience of the specifiers and lighting designers who use its products. Ketra

often brings groups to its headquarters for presentations by its engineering and design teams, and asks for their guests' feedback on prototypes that are in development. “Feedback is very important to us,” says Paulson. “We're only going to become great by listening to great people.”

Ketra's current product line includes an A-series, a PAR-style S38, and linear accent lamps; interfaces that include wall-mountable and tabletop touch pads, mobile device apps, and computer application software; and wireless and wired control modules. Its control system is capable of interfacing with fans and electronic shading systems, and is compatible with other companies' products, so a project can be specified top-to-bottom with only Ketra products, or using a mix of luminaires from other manufacturers. “The goal is to make it easy,” says Paulson. “We don't want them [designers] to get calls on commissioning. It has to be easy from spec, to installation, to when the end user uses it in their space.”

To date, the company's systems have mostly been deployed in the corporate and commercial realms, and it is making headway in high-end residential and museums as well. Ketra has chosen a “direct-to-designer” route for its marketing strategy, which has allowed the company to focus on perfecting its systems and expanding its product range. “We're going to keep releasing new form factors,” says Paulson. “We want to have all the elements you need for any space.”

But Ketra has bigger goals than just expanding its luminaire and lamp offerings, it's planning to stay at the forefront of a revolution in the lighting industry. “We're trying to create a new category for electric lighting options—a category called natural electric light,” Sooch says. The company has even released a manifesto that casts it as an upstart, barging its way into a static world in desperate need of change. “Ketra is an innovation that follows an age-old axiom: Lighting should be dynamic,” the manifesto reads. “A fluid presence in our lives—like sunshine, firelight and the soft shine of the moon—lighting should shift in accordance with the time, your mood, or the task at hand. It should be yours to control, yours to design, yours to enjoy. Lighting, finally, after all this time, should be a comfort.”

“We hope to lead a transition where everyone will demand natural light in a few years,” Sooch says. “If we can make indoor experiences more enjoyable, people are going to appreciate lighting like they've never done before.” •



Top: George Lambros; Bottom: Ashlee Rose Scott

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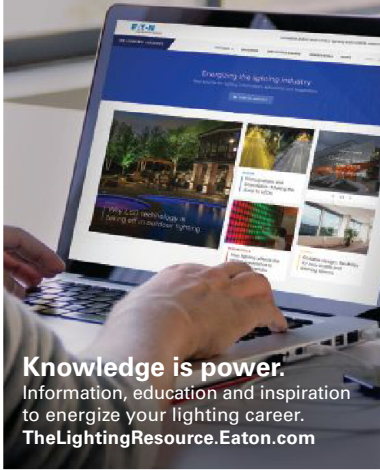
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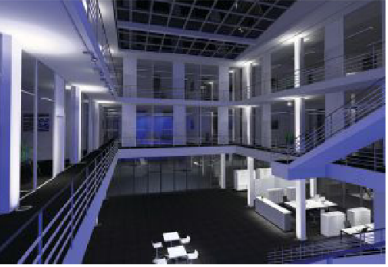
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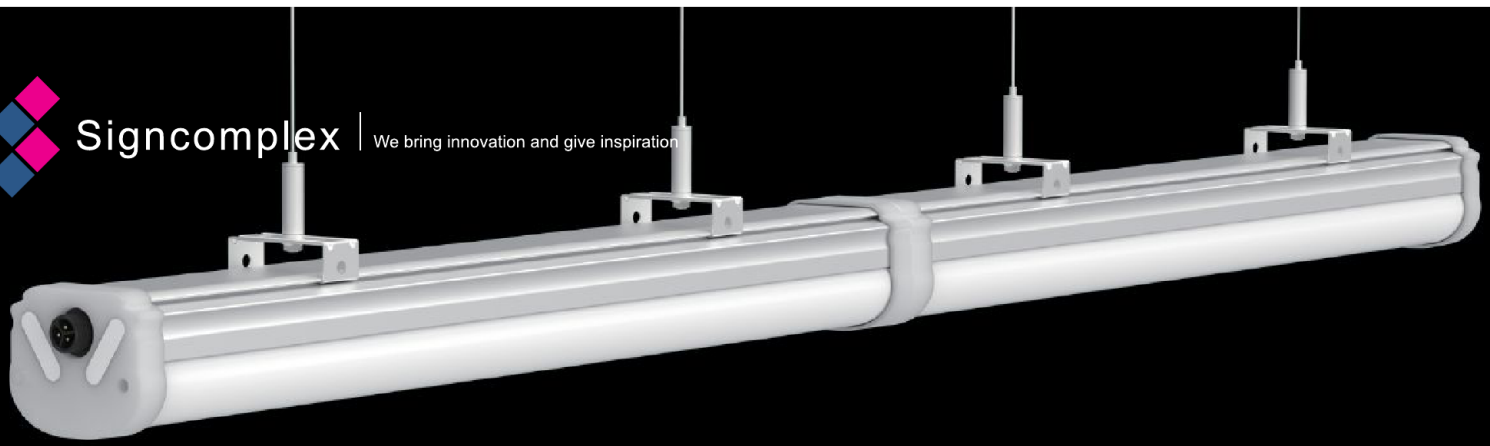
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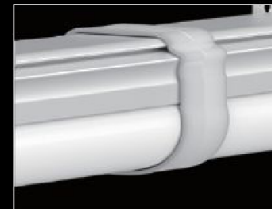


## IP65 Seamless connection Tri-proof lamp

IP65 Seamless connection Tri-proof lamp, the first one which realizes IP65 waterproof seamless butt joint, and assembling and disassembling is unnecessary; convenient and quick to install; adopt special end cover, no dark area after seamless butt joint, good vision effect.



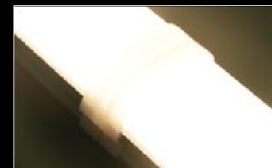
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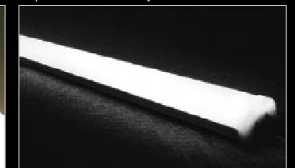
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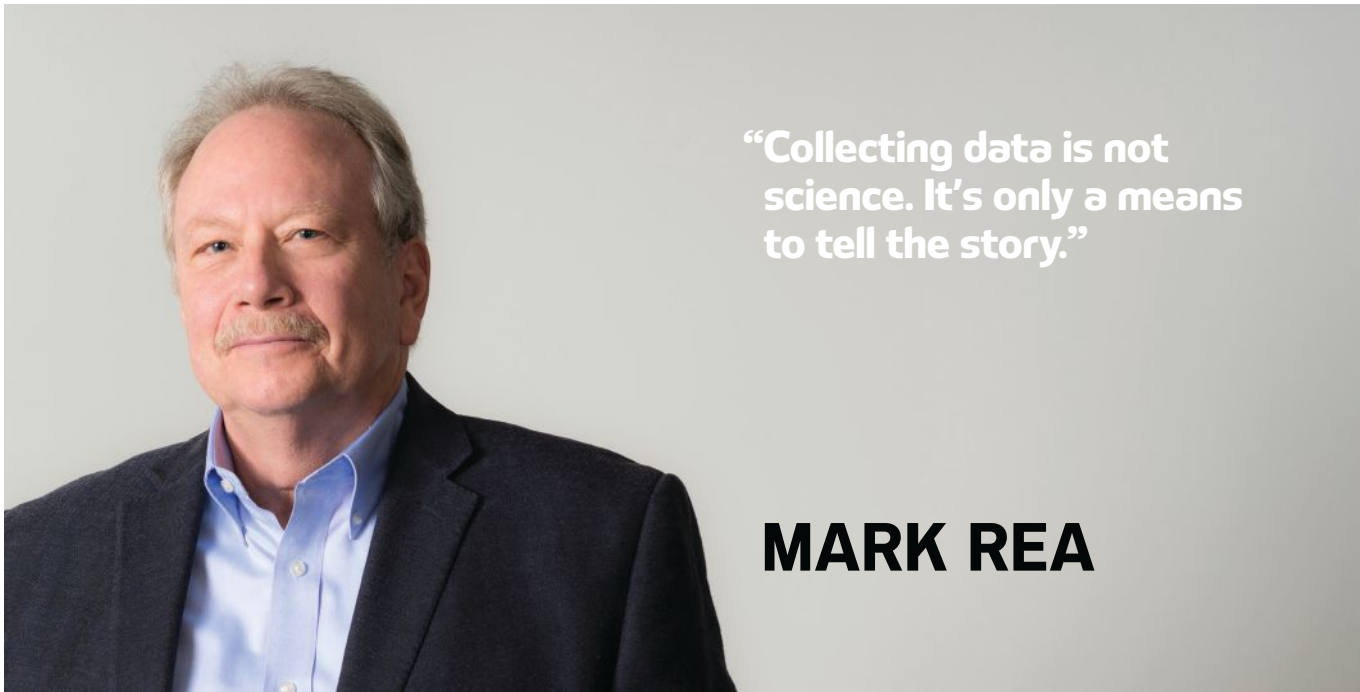


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## MARK REA

The process of scientific discovery and investigation has been central to Mark Rea’s work throughout his career. As a graduate student at Ohio State University in the 1970s, he studied visual performance and color vision and is now regarded as an expert in the area of circadian photobiology, mesopic vision, and psychological responses to light. He has served as the director of the Lighting Research Center at Rensselaer Polytechnic Institute in Troy, N.Y., since its founding in 1988.

### **Difference between training and education?**

Training is a mechanical process aimed at acquiring near-term skills. Education provides the context for what you do in life.

### **Is there a text that has had an impact on your thinking about light?**

*Color Science* by Günter Wyszecki and W.S. Stiles (Wiley-Interscience, 2nd Edition, 1982). It was first published in 1967. It brought together the subject of color measurement in a way so that people could understand the basics.

### **How has lighting research evolved?**

Research evolves from discoveries in both science and technology. New technology opens up avenues for inquiry but scientific discoveries are much rarer.

### **Most misunderstood aspect of research?**

Science is storytelling. You’re trying to understand and then explain how a phenomenon works. The math comes second. People think

it’s the other way around, somehow it’s all about equations, but those are just ways of formalizing the concepts in the story.

### **What led you to write *Value Metrics for Better Lighting* (SPIE, 2013)?**

I was at a conference, in one of those multipurpose ballrooms, seated next to a mechanical engineer. He commented, “Isn’t this energy-inefficient lighting (filament lamp chandelier) overhead deplorable?” When I responded that it was actually the most efficient lighting because it was delivering maximum sparkle per watt, he looked at me like I was crazy. It got me thinking: We measure the wrong stuff and keep coming back to metrics that don’t represent what we are trying to do.

### **What do you try and impart to your students about the research process?**

It’s the last frontier of discovery. It’s a privilege to have the opportunity to discover something that nobody’s done or thought about. •

interview by Elizabeth Donoff  
photo by Jennifer May

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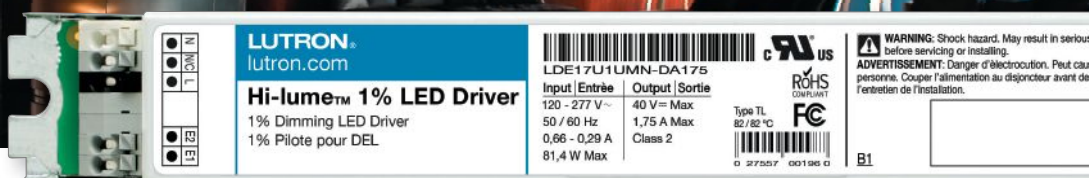
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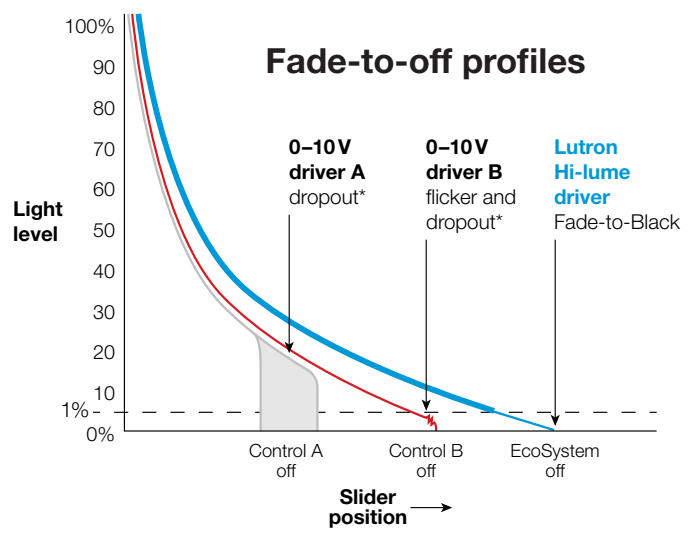


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