

# lumiblade

## insider

The OLED Lighting Magazine

Issue 03/2017

### On the bright side with Brite 2!

Meet the newest additions to  
the OLEDWorks Lumiblade  
portfolio

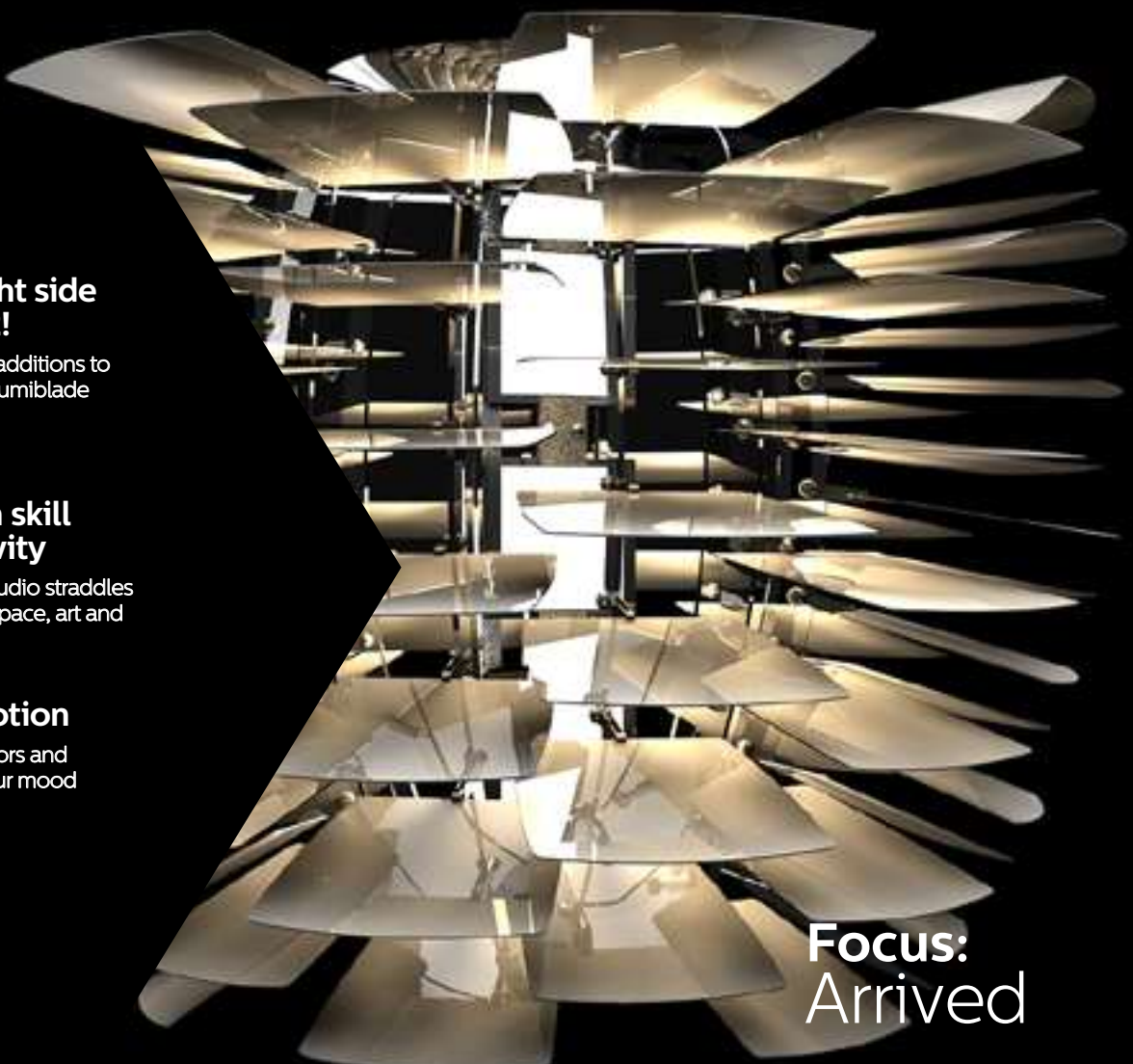
### Design with skill and sensitivity

Andreas Vogler Studio straddles  
the fields of aerospace, art and  
architecture

### Light is emotion

About lighting colors and  
how they affect our mood

**Focus:**  
Arrived



Each friend  
represents  
a world in us,  
a world not born  
until they arrive,  
and it is only  
by this meeting  
that a new  
world is born.

Anaïs Nin

# Dear reader,

2016 has been a Brite year indeed! In the twelve months since acquiring the Philips OLED assets and merging two of the world's leading teams for OLED lighting, we have rapidly focused on the market with concentration on product mix and affordability. OLEDs are ready now and are increasingly gaining traction in every day applications, in several regions of the world! We are pleased to share many of these solutions in this issue of the Lumiblade Insider.

Expanding the Lumiblade portfolio to feed the designer appetite has been a priority for 2016. This September, we launched the Brite 2, adding not only improved performance but also color temperature options. We are introducing a high efficiency amber light which is finding traction in healthcare, hospitality and residential, particularly in North America and Japan.

We have more coming next quarter – the Keuka module serves a new market with easy plug and play performance. Incorporating a small, low-cost driver on the panel, this module provides functionality with the option for the integrator to provide their own look and feel for the final finishing.

To get the creative juices flowing ahead of these respective product launches, OLEDWorks teamed with Corning® to sponsor a design competition. Designers, specifiers, furniture makers and others were inspired to submit product concepts, based on the Brite families, amber and Keuka module that not only showcased the OLED thinness and light quality but were also well conceived for

manufacturing and integration. The winners are featured in this issue; I am sure you will be inspired as well!

Experiencing the superb OLED light quality is an important factor in market adoption. We are working with a host of luminaire manufacturers to promote this experience in a real commercial setting which will have independent analysis as a U.S. Department of Energy Gateway installation. The fixtures, from the U.S., Mexico and Germany, were selected for the combination of functionality and design that was appropriate for the accounting firm. With installation just completed, the OLED lighting is already getting a positive response from the employees at the firm. We will share more on the Gateway in our next issue. Stay tuned.

Reflecting on the 2016, I naturally take pride in the product accomplishments, the market reaction and the foundation we have set for the future in our research and development including bendable substrates. However, it is the team that rises to the top of the accolades!

OLED is undeniably ready now! And rest assured, your everyday application has our superb team standing behind it.

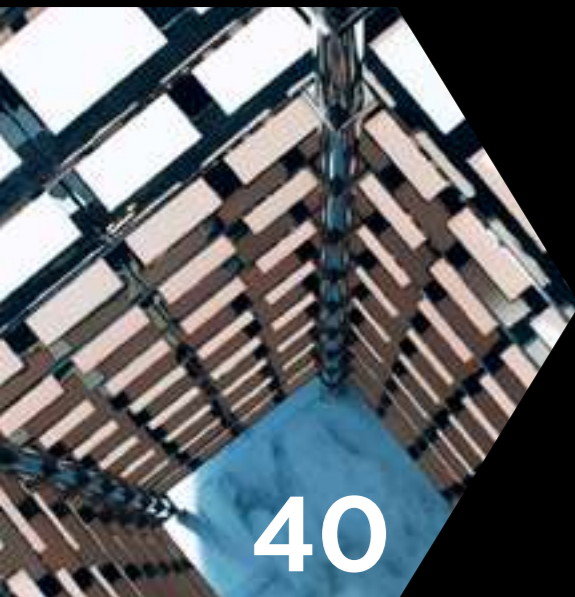
Keep it Brite!

**David DeJoy**  
President and CEO of OLEDWorks

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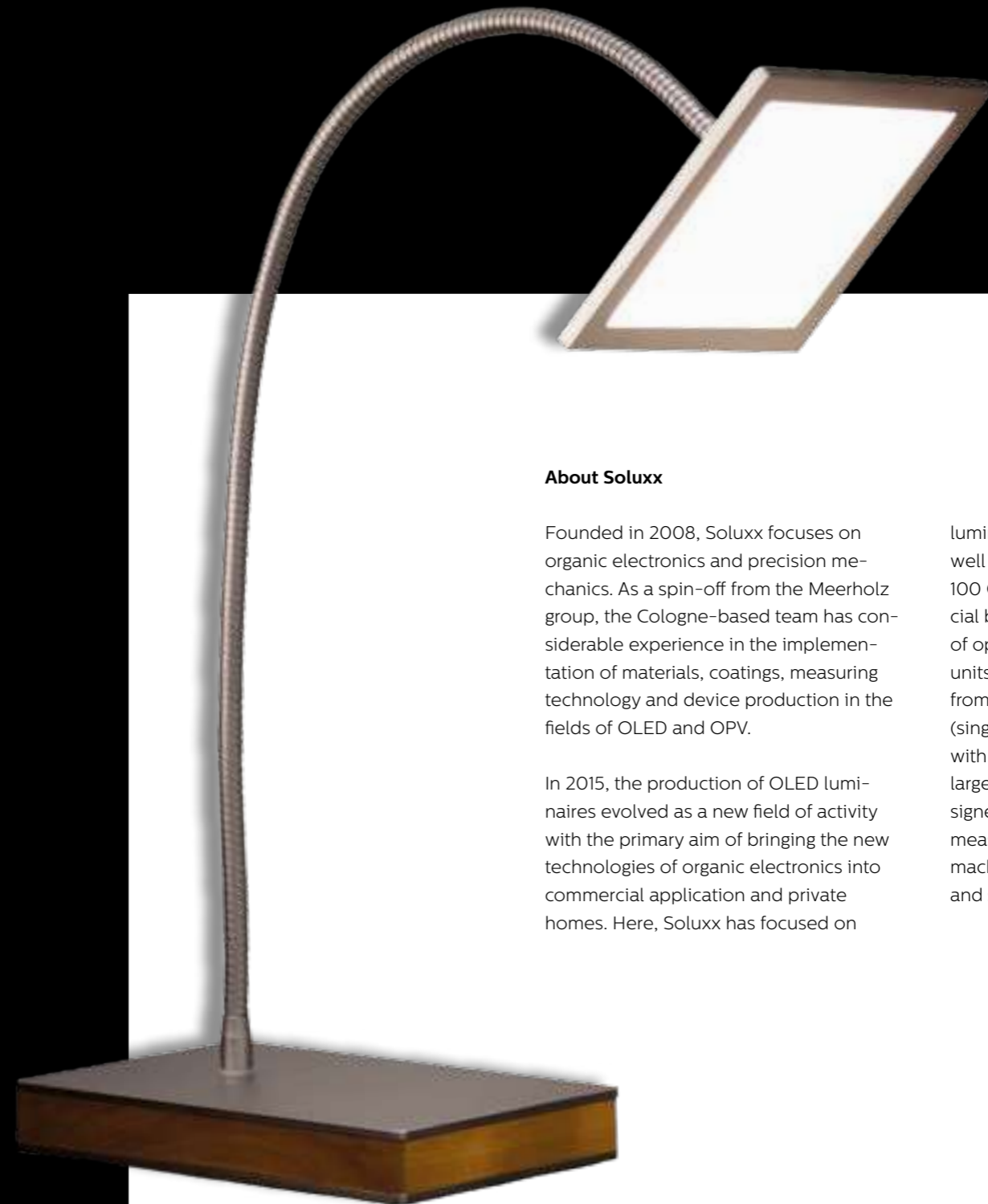
# Wanted: A desk lamp!

...and perhaps  
something for the  
entrance hall.

Over the years virtually all the staff at Soluxx has been closely involved with OLED or OPV research. Likewise, all of them have been looking forward to having their very own OLED lamp on their desk. However, until recently there have been few commercially available OLED products for the consumer market, apart from OLED displays. Fortunately, this situation is changing – not least because the company decided to take matters into their own hands.

Back in 2015, Soluxx began work on a large and prestigious OLED installation for the entrance hall of the new COPT building at the University of Cologne. The ceiling-mounted wave<sup>3</sup> luminaire is based on three separate elements of around 1.8 x 1.8 m. One wave<sup>3</sup> element consists of 64 OLED panels. The complete installation consists of 192 single OLEDs resulting in a total lighting area of almost 2m<sup>2</sup>. Each OLED can be adjusted individually using DALI, which makes different static and dynamic light configurations possible. The system can be

easily controlled using WIFI, any internet browser and, for example, a smartphone or a tablet. The design goal of the wave<sup>3</sup> luminaire sought to emphasize the thinness and lightness of OLEDs while fitting in with the architecture and size of the COPT building. The rectangular shape of the building was thus reflected in the quadratic 8 x 8 arrangement of the panels. In order to introduce movement to this underlying static design, the panels were mounted on posts of different lengths thus creating 3-dimensional wave effect. Each OLED panel was attached with a specially designed connector system to allow easy exchange while providing security against theft. The base plate of the luminaire matched the color of the ceiling adding to the effect that the panels are simply floating. Although each OLED panel has a housing, the green light, coupled out from the edges of the panel, is deliberately visible and used as a design element. Anodized, sanded aluminum was used for all parts of the luminaire. No screws or other connecting elements are visible.



*Getting things done: The CYGNUS is one of two OLED desk lamp designs by Soluxx.*

## About Soluxx

Founded in 2008, Soluxx focuses on organic electronics and precision mechanics. As a spin-off from the Meerholz group, the Cologne-based team has considerable experience in the implementation of materials, coatings, measuring technology and device production in the fields of OLED and OPV.

In 2015, the production of OLED luminaires evolved as a new field of activity with the primary aim of bringing the new technologies of organic electronics into commercial application and private homes. Here, Soluxx has focused on

luminaires for the consumer market as well as large installations with more than 100 OLED panels for public or commercial buildings. The company's other fields of operation are electrospray deposition units for OLED and OPV materials ranging from R&D-units with single sprayheads (single ESD) to larger, scalable layouts with multiple sprayheads (multi ESD) for large area deposition and custom-designed precision mechanical components, measuring equipment, small special machines, sample holders, demonstrators and similar devices.



As well as large installations, Soluxx has produced a series of commercially available smaller luminaires for private homes.

The OLED luminaires in the COPT entrance hall are an eye-catcher for visitors, students and cooperation partners from science and industry. They highlight the activities inside the building which focus on organic electronics. With its different static and dynamic light settings, the OLED luminaires are both appropriate as an effect light at events as well as for general lighting of the entrance hall with their homogeneous, non-dazzling light.

But back to smaller things: next to this large installation, Soluxx also produces commercially available luminaires for private homes and offices. True to their design guideline, that a high-quality, modern light source like the OLED needs a premium chassis, the design is plain and straight. The housing is manufactured of high-quality materials and components. In terms of material, all lamps are made of chrome-plated matt-finished brass by default. All hinges and connecting parts are also made of metal to add stability and sustainability. The lamp stand contains a frame of solid oak wood, which can be glazed to give it the desired appearance. In addition, the design allows the exchange of the OLED, it is customizable to some extent in terms of color and surface, and offers the choice of knob or touch control. Thus, if desired, the customer can obtain an exclusive individual item.

Presently there are four different luminaires available, and two of them – the desk lamps Angulus and Cygnus – also help the Soluxx staff to get things done: in a pleasant and dazzle-free light. Finally.



*A pleasant appearance delivering a pleasant light: The Angulus luminaire lights up livingspaces with a warm, dazzle-free light*

*The wave<sup>3</sup> installation in Cologne creates a sense of motion in a building with mostly rectangular shapes.*



# On the bright side with Brite 2!

## Truly functional OLED light – again!

When it comes to lighting, OLEDs inspire on a whole different level. There is the unique quality of the light itself. In combination with other characteristics, for example, the razor-thin shape and the instant glare-free light, OLEDs can be used to realize innovative applications and designs. With its 2nd generation of the OLED Panel Brite FL300, OLEDWorks once again brings OLED lighting further into functional lighting applications, featuring an even more efficient and more beautiful OLED lighting experience. With a luminous flux of up to 300 lumens the FL300 is still the brightest warm white OLED panel commercially available worldwide.

The Brite 2 FL300 is available at two integration levels, making it the ideal building block for every OLED lighting application in the area of functional lighting. The new FL300 OLED panels are the second family of bright OLEDs in two different shapes for each of the two different color temperatures. This makes it even more easy to bring functional OLED lighting to places or products that require beautiful and functional lighting at the same time.

## A significant expansion to the product portfolio.

“The addition of the new Lumiblade Brite 2 OLED panels is a result of OLEDWorks commitment to continuous improvements and investments in our product offerings,” said Daniel Hoffmann, Lumiblade Brite Product Manager. “With expanded options in color temperatures, our new OLED panels offer designers the freedom to design with few restrictions in functionality and performance.” OLEDWorks showcased the functionality of these panels for the first time at Light + Building 2016 in Frankfurt, Germany. The customer feedback was amazing. A more efficient, commercially available beautiful light with competitive prices and short lead times. OLED lighting will be available for more applications in more diverse environments, be it residential, office or retail.

We've enhanced the performance so you can enhance your designs. Meet the latest additions to the OLEDWorks Lumiblade portfolio. The Brite 2 product line delivers the same industry – best brightness and outstanding reliability that is the hallmark of the Lumiblade Brite technologies.

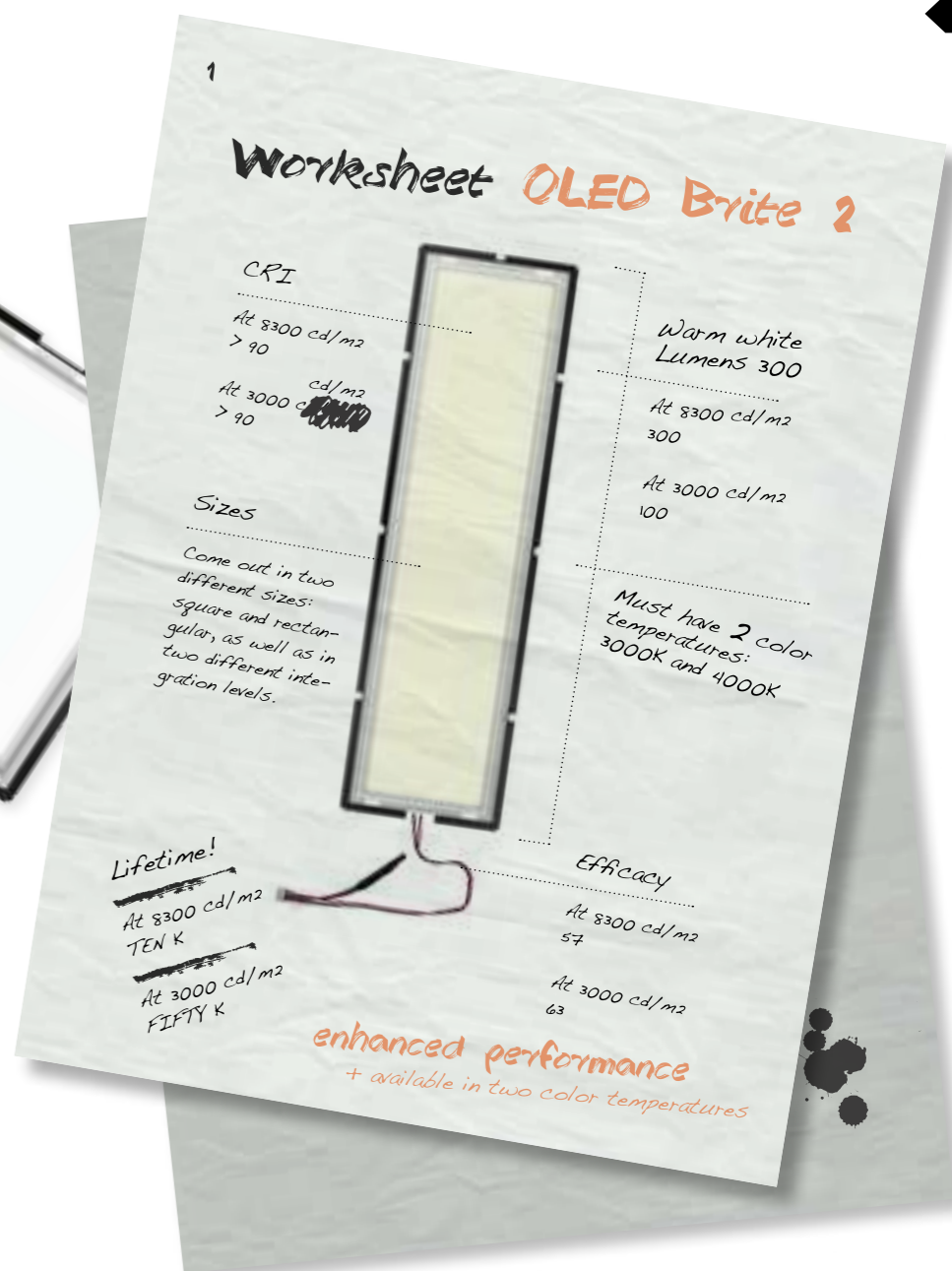


## Myth Busters

Too expensive. Just a glow. Not available in volume. These are just a few of the tags that cling to the reputation of OLED lighting. It is time to shake off these dusty labels and start seeing OLED lighting as the exciting innovative light engine it truly is.

Let's consider performance. OLEDs now provide beautiful light quality at truly functional light levels. One 120mm Lumiblade panel can provide 300 lumens, and that is no glow! Want a glow? Sure, it can dim down to 1%. The Brite 1 panels were already competitive at 45 lumens per watt, and the newly announced Brite 2 continues the OLED evolution (or is that revolution?) to over 60 lumens per watt.

The performance is enticing. But aren't they too expensive? Light designers are increasingly concluding that the total



cost is in fact a compelling argument for the use of OLEDs. With scale and manufacturing innovation, the OLED costs are tracking the Department of Energy SSL OLED cost curve very closely. Without a need for thermal management or optical wave guiding and diffusion, designers also realize the savings in product development time, supply chain management and total system cost.

With performance and price opening up larger market opportunities, are products really available in volume? Absolutely!

OLEDWorks can ship Lumiblade panels at manufacturing quantities very quickly, usually within a few weeks. What about drivers? A family of Philips OLED drivers, dimmable to 1%, are available and the driver options continue to expand as the industry seizes this growth opportunity.

OLEDs are here, affordable, high performing, and opening up a whole new way to design and deliver a superb lighting experience. Those dusty labels are long gone.





“Trilia offers a modular and highly configurable general OLED lighting system.”



## Acuity with **acumen**

Acuity Brands' confident approach to OLED design

The recent advances in glare control, color rendering and improved lifetime have encouraged Acuity Brands to take an increasingly expansive view of OLED application possibilities. Task lighting in commercial and institutional spaces are two particular areas where discrete, ambient light has been recognized as having a positive psychological effect on professional performance and overall well-being. However, the Atlanta-based electronics company is keen to point out that plummeting production costs coupled with higher luminance also makes OLED the perfect vehicle for creating points of visual interest. Two luminaires introduced to the market for lighting in communal settings over the last few years illustrate Acuity's confidently broad approach to OLED implementation. The

geometric flower design of the Revel luminaire brings dead space to life in high-ceiling offices without compromising on functionality. The Trilia was one of the company's first luminaire families adapted to utilize Lumiblade Brite 2 OLED panels from OLEDWorks. The modular lighting system comprises straight and angled sections which can be configured to provide maximum spatial flexibility, making it ideal for galleries, libraries, convention halls and lobbies. Indeed, any large, open-plan space benefits from Trilia's adaptable design possibilities. And with one eye on customers' budget requirements, Acuity has proved that improved OLED quality and business acumen are one and the same goal.

# Yeah, but...

About choices, procrastination and confusion

“To be or not to be” – Shakespeare’s anti-hero Hamlet is the patron saint of procrastination. But whereas Hamlet grapples with questions of life and death, we are daunted daily by seemingly simple choices. Should I accept the job offer or not? Should I buy those shoes now or maybe sleep on it? What about the concert tickets? It would be nice to have someone to go with, but the tickets are sure to sell out quickly. Or maybe not. I just can’t decide.

While we still believe in weighing the alternatives, our brain is usually far ahead of us by this time and, as research at the Berlin Center for Advanced Neuroimaging seems to suggest, has already made its decision. The reason for this speed is connected to our evolutionary development. As hunters and gatherers, making split-second decisions was of vital importance – that hungry saber-toothed tiger was unlikely to wait until we had thought through all our options and discussed them with our friends.

Nowadays, this Stone Age super reflex is no longer as desirable as it was back then. Our circumstances have changed and the decision to fight or flee

has become – more likely than not – one about next year’s holiday destination. Sun or snow? Mountains or the sea? Car or plane? Holiday home or hotel? With friends or rather a contemplative retreat? And can I even afford to go on holiday? Would it not maybe be better to work the whole year through and go for that promotion on offer? Do I even want to be promoted? More responsibility? Less time? Although the money would be quite nice ... And so it goes on with increasing exhaustion until we finally decide to make no decision for fear of making the wrong one. Hardly an ideal situation.

Can anything help? Alleviating the strain between our brain and our erratic self by relaxing and limiting our options may be a good start. Less, slower, better and more beautiful rather than wanting ever more and as quickly as possible. And every now and then, listening to your brain’s best friend, gut instinct, can as often as not bring about the result you really wanted. After all, the two of them have an excellent rapport with each other.







“The core of our designs is the idea of creating light that will make people comfortable, so they can regain their mental calm in an environment that gives everyone peace of mind.”

# The exact color of blood

Synqroa applies lighting technology and market development from the medical sector to semiconductor light sources. An interview with Kaori Ayabe, President of Synqroa Co. Ltd.

The OLED luminaires developed by Synqroa are unique because they make the most of the characteristics of OLED for use in medical environments. With the concept of hybrid lighting, which integrates functional light sources (LED, halogen, etc.) as solutions, Synqroa developed the Luculia series of lamps for medical examination and treatment situations. These lamps direct environmental lighting from OLED into the area surrounding a strong functional light, to relieve the eye strain caused by differences in brightness.

**As a naturally diffuse, planar light source, OLED is different from any other light engine. What role do you see OLED playing and what synergies with traditional lighting technologies do you envision?**

We think it is very important to use planar light sources to light everything uniformly. We also see OLED as light that brings people closer together. We therefore maximized all the advantageous aspects of OLED panels. OLED does not produce glare. The

soft light from OLED is ideal for use close to people, such as in reading lights. OLED does not generate heat, so it doesn't cause turbulent air currents, and that reduces the dispersion of dust in the medical workplace. OLED is slim. This gives it the advantage of being easy to retrofit. It doesn't need heat sinks, so it can be installed without major work. The most important characteristic of OLED is that it has the same wavelengths as sunlight. That means it lights things up with their true colors. With excellent color rendering, at Ra90 or more, it reproduces the color of blood accurately. It also reproduces real skin coloration. This is why our organic EL task lights are used to assess the true colors of patients' faces. The synergy with conventional light sources is, as I mentioned, that functional light sources (LED, halogen) give a correct impression of objects. Integrating OLED into such lighting provides the effect of gentle warmth, with the synergistic effect of illuminating objects clearly and accurately.

“The soft light of the OLED is ideal for the use close to people.”

**Why did you as such a small company of 3 people working mainly in the healthcare market decide to go for OLED and what are your reflections on the design process? The product development process? Challenges and requirements? Perhaps you can explain the Japanese mentality regarding your approach.**

We have been working in the medical care industry for many years. Above all, Synqroa's product engineer, Mr. Koyama, has the advanced optical design skills necessary to design shadowless surgical lighting. When LEDs came into widespread use, he was concerned about their very poor color rendering, and about the effects of the blue wavelength range on eye (such light may trigger retinal damage). Now LEDs also have better color rendering, but their blue emission at 470 nm is still there. That light is emitted at the peak level, and we see that as a problem. Organic EL lights have the same black body as sunlight and do not produce blueness. We thought we should take OLED lighting into the healthcare field first of all to create gentle environments for weakened people. People weren't aware of the advantages of OLED, so we started by spreading that knowledge. We have been working on that for a few years, and now the number of people who have heard about the benefits of OLEDs is growing.

During the design process, we think about how to make friendly environments for people. The core of our designs is the idea of creating light that will keep people comfortable so they can regain their mental calm in an environment that gives everyone peace of mind.

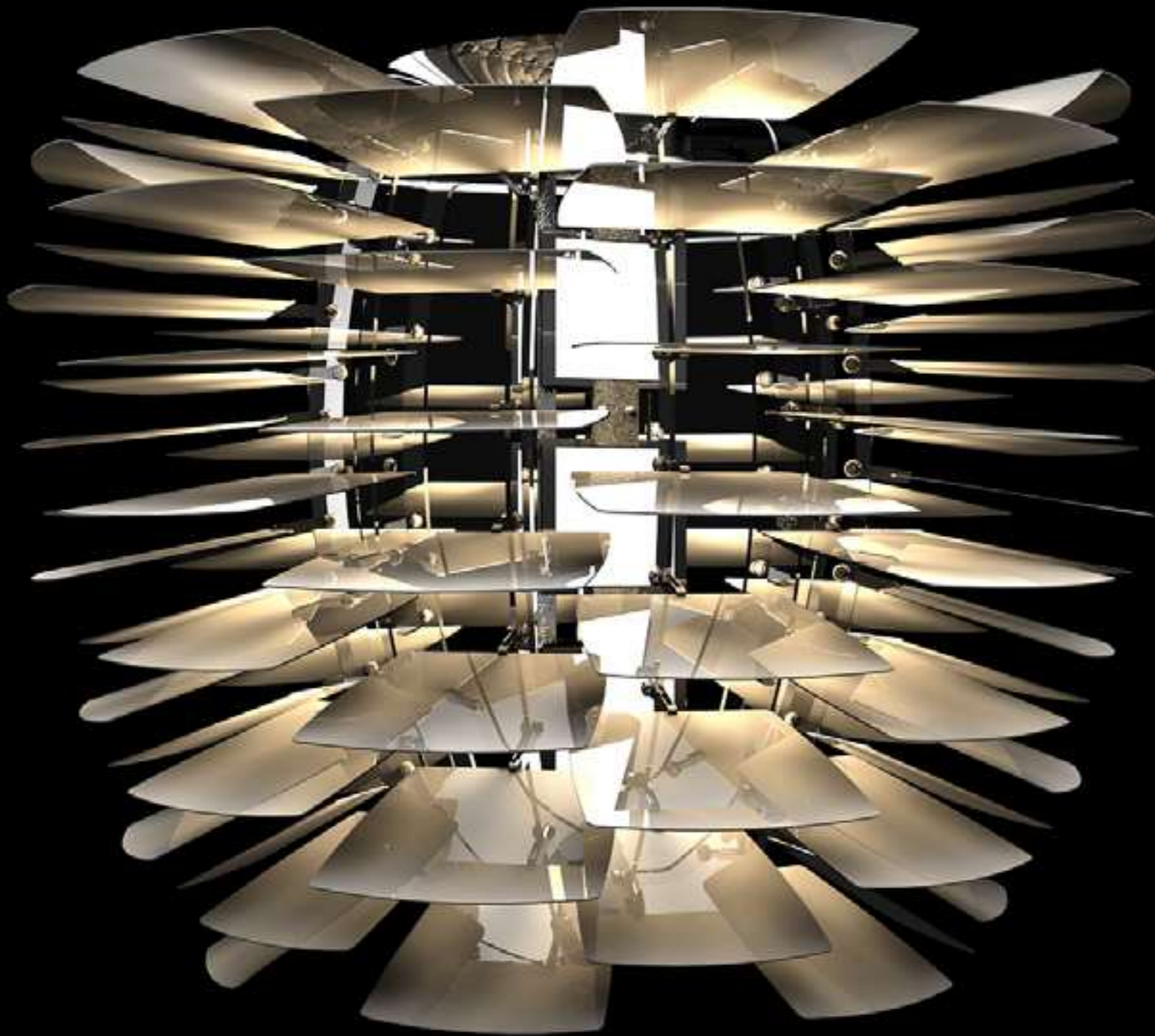
**Lumiblades are significantly brighter than other OLED engines. Is this an important feature or are other features more important for you? Do you use the entire range of brightness in your designs?**

Lumiblades are bright. That is important, but actually there are some applications which don't need to be bright. There are all kinds of applications installed on walls or ceilings, embedded in devices, and so on. For a wall installation that shines directly into the eyes, OLED is ideal, but it will still produce glare with high brightness, and make it hard to be in that space. A ceiling installation, with downward shining light needs bright OLED. So there are many diverse applications which have different requirements from OLED.

Ceiling lighting needs to be bright, whole color rendering is vital for a light embedded over a washbasin mirror. That's why brightness is not the central consideration in every design Synqroa creates.

**What is your vision for OLED technology in your company?**

In general, our products might appear to be standalone luminaires, but we are looking for effective ways to use the spectral properties, light distribution properties, and color rendition of OLED. We are thinking about integration into everyday devices, and about functional light sources for use in mental health treatment. We have already started working on specific projects that use the things we have learned to introduce OLED into a wider range of fields.



*The light from the OLEDs is reflected in the mirror from above achieving the mesmerizing effect of light floating in mid-air.*



# Balancing act

## Carl Stahl ARC and 'The Source'

Carl Stahl ARC GmbH is an international specialist in the design and manufacture of smart bearing structures for customized light installations and sculptures. Headquartered in Süssen near Stuttgart in Germany, the architectural division of the Carl Stahl group has around 180 employees covering all the service aspects of static analysis, structural engineering, design and materials necessary for creating sophisticated dynamic light ceilings and media facades. We talked to product manager Thomas Krieger about 'The Source' OLED installation at the new Aquis Plaza shopping mall in Aachen and the enormous variety of planning and production-related issues that went into creating one of the largest structures of its kind worldwide.

**Mr. Krieger, we see OLED technology gaining acceptance in ever more market segments as performance increases and prices go down. What technical considerations do you make when working with OLEDs on large-scale projects?**

One of the most important components in architectonic lighting installations is the light source itself, although the physical building and construction demands of the bearing structure also have to be considered. The material on which the OLEDs will be installed and the location of the power supply and drivers need to take dozens of aesthetic and thermal management factors into account.

**What other factors affect the implementation of OLED installation?**

Our clients require high flexibility regarding shapes, sizes and colors for projects, but they also require accessibility for maintenance work and want to know what can standard materials be incorporated in order to save costs. Standard components are a base for design ideas, but in the end the architects and designers want a customized solution. The dilemma is offsetting the advantage of a mass production regarding price and lead time against the aim of creating a unique and individual light installation.

*Work in progress: A detail of the construction work on The Source*



“Standard components are a base for design ideas, but in the end the architects and designers want a customized solution.”

**At 18.5 meters, The Source OLED installation at the new Aquis Plaza shopping mall in Aachen is among the largest of its kind worldwide. Does this project illustrate some of the competing factors you've mentioned?**

Designing the lightweight OLED sculpture had very special requirements regarding accessibility and the integration of hardware components in minimalist housings. The design language was very important for the customer in this case. Because of the soft and organic nature of the materials, it wasn't possible to use standard semi-finished products. We had to perform a balancing act between retaining accessibility to the hardware and hiding any screws or connections from sight. On top of this, restrictions on the maximum permitted weight of the overall construction forced us to make constant design optimizations to the building elements. The sensitivity of OLEDs to mechanical impact and the high-quality, pearl-effect paint finish placed additional demands on transportation and installation logistics. A huge amount of special transport equipment and protective packaging was required. But all of this extra effort paid off. Not a single OLED or surface was scratched or damaged.

**How did the customer react to all the changes along the way?**

In the end customer was delighted because we managed to work through an extensive list of requirements. The finished installation consists of 36, individual, two-meter platforms which extend up

through all three sales floors to the glass roof. Each platform bears 12 individually adjustable organic LEDs that create fascinating color changes and unusual lighting effects. The customer had the advantage of only having to work with one partner for the complete solution.

**In our last issue we ran a kind of 'making-of' feature for the Aquis Plaza. How long did the project take in total?**

The first contact with the customer was in July 2014. First sample elements were made in September 2014. After that we discussed and made samples of many different versions. The contract was assigned in June 2015 and the actual installation took place in October 2015.

**Do you have any new projects in the pipeline that make use of Lumiblade OLEDs?**

We are working on a lightweight OLED ceiling for huge areas based on a mesh sub-structure which allows huge span width without any intermediate fixation. The mesh will only be framed by edge ropes.

**It sounds more like a trapeze act this time!**

**What do you predict for the future of OLED use as more people become aware of it through large custom projects?**

It will be a similar development to the one we've seen with CRT and flat screens. The flexibility and compactness of OLED panels lend themselves to a huge variety of applications.



*A bright shopping experience: 'The Source' illuminates the Aquis Plaza in Aachen.*



# Is it daytime now?

Mariko Nakabe, owner of Taiyo Corporation, about lighting in her home and tricking a six-year-old with OLED lighting.

**You have the Synqroa hybrid light at home above your dining table. How does it feel sitting below it?**

It reminds me that Taiyo Corporation, which I represent, has positioned OLED as a new business field, and that, on a more personal note, I have advanced the design of my home. The overlapping timing of these two things gave birth to what is probably the world's first home based on the concept of OLED lighting, which goes beyond the idea of just introducing OLED as parts of lighting devices. As we handled OLED lighting in our business, we naturally wanted to gather evidence about it. But more than that, as a mother of young children, I saw the importance of providing the best light possible for them.

But that was an unprecedented effort, so it was really tough to introduce OLED lighting. OLED lights have not spread to lighting manufacturers, so we had to start from making OLED light fixtures. As this was a world first, house and furniture manufacturers were nervous about getting involved at first, but we held briefings about OLED lighting for their officers and designers, carefully explained product design, and clearly defined the ran-

ges of compensation liability. Ultimately, we persuaded them to get enthusiastic about this new endeavor.

Initially, we wanted to use OLED for all the lighting in the home, but different light sources are suited to different applications, so that didn't work out. But there were some places that brought out the characteristics of OLED light better, by combining conventional lighting with OLED lighting. For example, in the dining room, we took the idea of hybrid lighting – using conventional light with future light – to produce a beautiful pendant light that combines halogen bulbs with OLED lighting. People can use OLED lighting at mealtimes to enhance the colors of their food, and later on, they can switch to the halogen bulbs, which are better suited to relaxing in the evening and getting ready to go to bed. That made it possible to use the right lighting for each home life situation in an unprecedented way.

We introduced OLED under the “Home with the OLED lighting concept” in the following areas:

- Ceiling lights in bedrooms and basement rooms
- Cubic lights in staircase spaces



*Bright as daylight:  
The basement in  
Mariko Nakabe's  
home.*

- Dining room lighting (hybrid lighting, combining halogen bulbs with OLEDs)
- Working lights built into student desks
- Cosmetic lights embedded around the mirrors of washbasin stands
- Lights with combined indirect lighting embedded around the restroom mirrors
- Display cabinets for glass
- Mock window lighting for a basement
- One-touch, waterproofed lighting for a kitchen workbench (to be introduced).

**When did you become acquainted with OLEDs?**

**What were your initial thoughts? How has this changed?**

Taiyo Corporation was originally a specialist trading company that was strong in medical devices, so we focused on gentle OLED lighting in the medical field from an early stage.

But when we first saw OLED lighting panels, our impression was that their brightness might be inadequate for use as home lighting. In planning light fixtures for

my home, I was concerned about that point but when I actually tried living with it, it felt brighter than I had expected. In fact, I actually felt that it would be good to have dimming controls for places where the light source is directly visible from close up. Even soft light can feel dazzling, depending on the brightness of the surroundings and the distance and angle of sight, so I think there is plenty of scope for improvements in designs and installation locations. Being able to build up that kind of knowledge in a real living space is a major advantage in product development.

Everyone who visits our house is amazed by the light from the mock window in the basement. One characteristic of OLED lighting is that it has the same spectral properties as sunlight, so lighting made to resemble a window below ground can reproduce the feeling of brightness of the midday sun. There was a six-year-old kid among the visitors, and when he went into the basement at 7 pm he confused the lighting for sunlight, blurting out “is it daytime now?” When the specialist photo-

grapher from a house manufacturer photographed the basement, he was very interested in the odd feeling of setting the light to the same state as outdoor sunlight while underground. Experiencing this kind of impression for myself, of bringing sunlight to the enclosed atmosphere peculiar to basements, gave me a new feeling for the potential of OLED.

**What has selling OLED luminaires to do with your main business of exporting medical devices?**

OLED lighting that is close to sunlight has excellent color rendition, without the risks associated with blue light, so it is suitable for medical workplaces that demand accurate work and diagnoses. As a gentle light for people, we expect to see OLED lighting used in various product applications including those in medical care. Therefore, we have been working in partnership with Synqroa on everything from product planning to the development and overseas sales of medical OLED lighting.

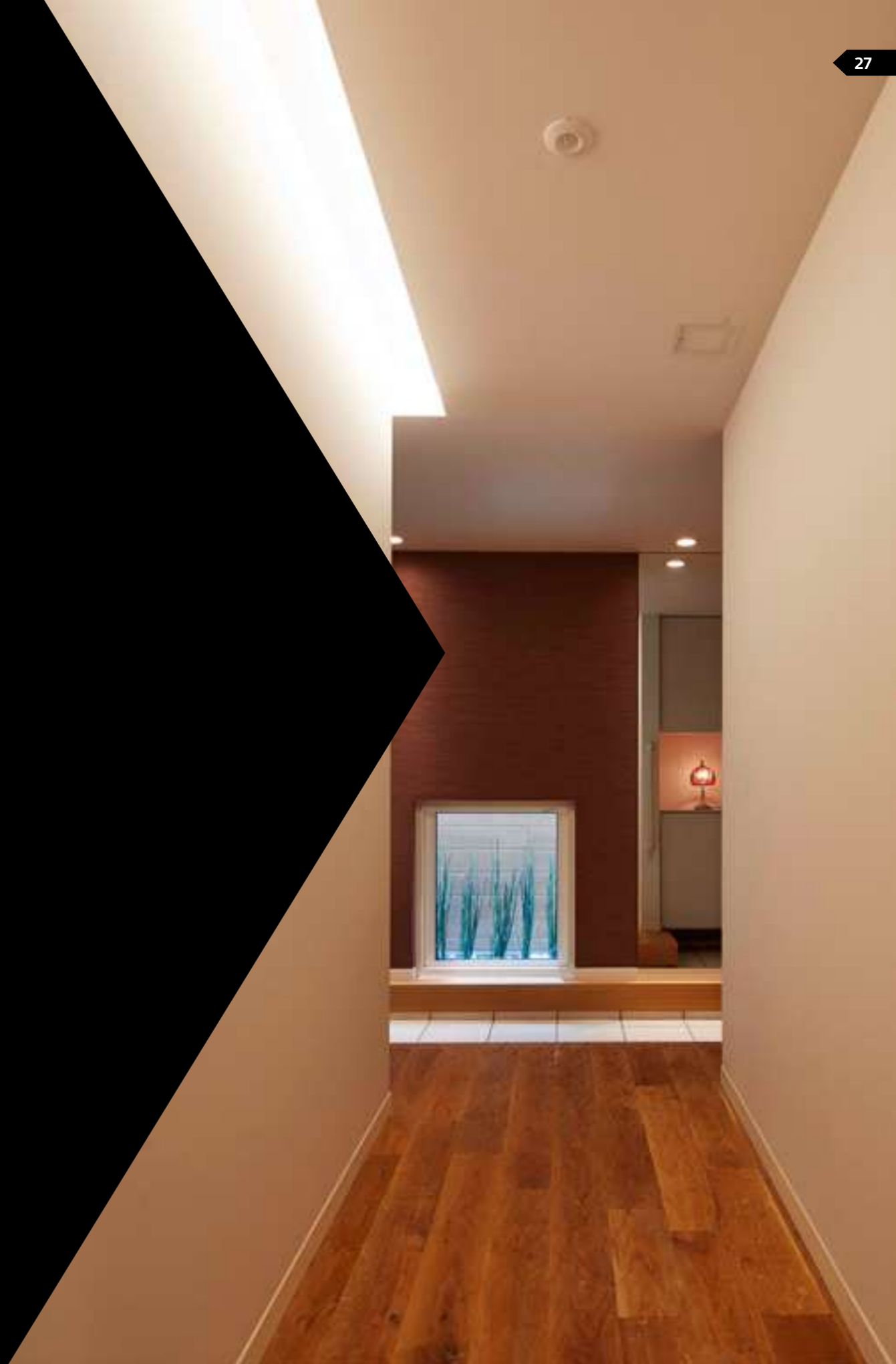
During this process we came to the conclusion that people needed gentle light in their homes. But the high price of OLED lighting before it moved into mass production was a bottleneck and we were told that the residential market was ten years away. This challenge motivated us to introduce OLED lighting to the residential market ourselves rather than waiting.

The first step, which we undertook with the house manufacturer Misawa Homes Co. Ltd., was the project of implementing OLED lighting in our own home. The participating organic EL lighting panel manufacturers were OLEDWorks, Lumiotec Inc., and the Pioneer Corporation (now in the process of product design). Synqroa is handling the optical design and product design of the organic EL lighting panels. And our home is the client. In the future, Taiyo Corporation will play a part in spreading organic EL lighting around the world. By bringing together major panel manufacturers, we have been able to create products that make the most of the features of each type of panel. We will be able to verify the effects in our home.

In advancing this project, we have discovered many issues to be overcome in spreading the use of organic EL lighting. We plan to step up our OLED lighting business and deal with these issues along the way. In 2017, we will be working on a project for OLED lighting in a factory. I think we will be able to report on that project next year.



*While creating a home for her family, Mariko Nakabe also created one of the world's first homes entirely based on the concept of OLED lighting.*





### What do you see for the future of OLEDs?

There is a worldwide movement to end the manufacture of incandescent and fluorescent lights. At the moment, the only other option is LED as a main light source. But in line with the approach of the right lighting in the right place that I mentioned earlier, I believe that OLED, which has many appealing aspects that differ from LED, merits consideration as another light source option.

One factor behind the fact that most manufacturers have so far resisted the mass production of OLED lighting is that they have not yet found real ways of using it. Our position here is one of putting forward new concepts in the OLED lighting field to contribute in any way we can to the wider use of this gentle light source for people. I would be delighted if this example of introducing OLED in the home helps bring people closer to OLED lighting, which is still regarded as a thing of the distant future.

## Taiyo Corporation

Headquartered in Tokyo, Japan, the Taiyo Corporation specialises in the export of medical equipment such as CT and MRI systems manufactured by Toshiba Medical Systems (now Canon). Their main client base is located in the Near and Middle East and North Africa. Mariko Nakabe's father founded the company in 1981. In 2014, Mariko took over as president of the company and moved the company into a new phase. Taiyo is moving into new areas of business activity including light planning and product design.

*For bright students only: A desk with integrated OLED lighting.*





# Toward the mainstream

Merck's new innovation center showcases OLED Lighting

Merck KGaA is a leading supplier of high-purity organic materials to the display, automotive and domestic lighting industries. The company's broad, international perspective on the OLED market allows it to track developments in applications – for example, the increasing use of OLEDs for distinctive automotive taillights, office lighting, desk lamps, artistic installations and retail. Merck also takes an active role in promoting OLED technology around the world. The company took part in the 2015 Harvard Design Smart Materials Conference in Chicago and presented exciting new OLED formats at the 2016 Light and Building trade fair in Frankfurt in cooperation with its development partners Konica Minolta, OLEDWorks and OSRAM. Involvement with the presentations and discussions from international architects on incorporating flexible OLED lighting into cutting-edge design has confirmed Merck's belief that the future of OLED lighting is moving toward more mainstream applications.

As a sign of this new confidence in OLED technology, Merck is investing in a new innovation center at the heart of its corporate headquarter in Darmstadt, Germany. The architecturally challenging center will be a hub for breakthrough technologies of the future, playing host to start-up companies and providing an exciting venue for innovation summits and workshops. As a clear symbol of the company's commitment to openness, transparency and innovative spirit, OLED lighting will be showcased in several areas of the building. Completion of the center is expected in 2017 and will be featured in the next edition Lumiblade Insider.



The company sponsored the 2015 Harvard Design Smart Materials Conference in Chicago and presented exciting new OLED formats at 2016 Light and Building.

## Mental u-turn

The capio OLED is the surprising result of a collaboration between students and a company with tradition.



“It’s a completely new form with great visual impact.”

Regiolux is a leading, international producer of innovative, energy-efficient lighting systems with a proud tradition going back almost 65 years. Headquartered in Königsberg, Germany, the company’s 220 employees provide a vast range of high-quality technical luminaires for industrial and commercial use.

The capio OLED is the result of the partnership between Regiolux and a student project team under the direction of Professor Peter Raab at the Coburg University. The luminaire achieves excellent, glare-free homogeneity from all angles, making it particularly suitable for the office environment. As a company with its own in-house design team, it may seem strange that Regiolux chose to develop this OLED product for series production with the university. But, as Dr. Sylvio Schubert, Project Manager at Regiolux explains, the new technology invited “a fresh take with young designer minds. The result proved that we were right to do so.”

The concept for the suspended luminaire was the brainchild of Rebecca Hippeli, Johannes

Zurwesten and Andreas Vater. It involved arranging 10 OLED modules along a flat geometrical ribbon which is folded into a triangle at the center. The light intensity can be dimmed, creating a pleasant light with good color rendering suitable for all commercial and professional applications. “Our customers were delighted with such a bold and experimental design,” says Schubert. “It’s a completely new form with great visual impact and they love it.”

So what does Regiolux predict for the future of OLED technology following the successful cooperation and enthusiastic reception of the capio? “We think that solid state LED and organic LED have complementary application areas. LED is ideal for accented, high-efficiency light while OLED provides pleasant, homogeneous area-lighting. As a company with a tradition in cutting-edge technology, it’s important to keep exploring new possibilities within the lighting market.”



# Objects creating experiences

The fixtures designed by Birot Lighting are all about creating new experiences with light, while at the same time staying true to the principles of functionality and originality – a story of no contradiction.

Headquartered in Mexico, Birot is a family business founded in Argentina back in 1970. Dedicated to the design and manufacture of decorative and architectural fixtures, Birot has presence in several Latin American countries. Birot is dedicated to bringing their clients new and original lighting solutions with a focus on the hospitality and high-end residential sectors.

While strongly committed to originality and functionality in terms of a lighting object, Birot is truly built on the principle of enhancing the lighting experience.

**You've been working with OLED for a relatively long time. How did you become acquainted with OLEDs and what were your initial thoughts?**

My first interaction with OLED technology was at Light + Building 2010 when I saw and touched one of the first decorative luminaires with integrated OLED technology for the first time. After 10 years of working with decorative LED luminaires and the limitations they posed, such as the need for a heat sink and optical elements, the OLED really opened up a whole new world.

**Pablo Alvarez**, owner of Birot lighting, was introduced in the inaugural issue of Lumiblade Insider. Having jumped in early with the Pixelate luminaire, which used the Philips GL350 product, Pablo has a unique perspective on the evolution of OLED light engines. We caught up with Pablo to hear about his OLED journey.



“Our fixture is not only inspired by the shape and characteristics of the OLED panel, but integrates the light to the object itself, creating a unique lighting element.”

The possibilities arising from the new technology simply fascinated me. The following year I was fortunate to meet the Philips U.S. representative at the Lighting Fair in Mexico City. This triggered a lot of firsts! We quickly got access to the first OLED panels, and by 2012 we were able to complete the first prototype of the first integrated OLED fixture designed and produced in Latin America – Pixelate. It was the beginning of a dizzying and exciting path, which continues until today.

**Lumiblade panels are significantly brighter than other OLED engines. Does this feature effect your design approach?**

When we started producing OLED fixtures, we were using up to 6 modules per fixture due to the low lumen flux provided by the modules at that time. That made those fixtures big in size, but mostly in price. Today’s high lumen flux panels allow us to deliver a single pendant that gives enough light for most residential applications. This is a very important feature, since it makes our fixture much more competitive and ready to use as a single light.

**The response to the OLED light quality has been universally very positive. Did this OLED quality or their particular nature inspire you?**

We are inspired by light, of course, but mostly by the possibilities the light sources give us to work with it. We think that OLED technology enables light to be used in a very natural way, exposing the light source directly to the user. Our fixture is not only inspired by the shape and characteristics

of the OLED panel; it integrates the light into the object itself, creating a unique lighting element.

**You’ve stated that your market segment appreciates the high-tech look of the OLED panels. What role do you see OLED playing in the future and what synergies with traditional lighting technologies do you envision?**

I think the OLED technology plays a very important role in opening up new possibilities and formats in lighting. As LED technology brought many advances in terms of efficiency, OLED technology will open up new horizons in terms of functionality of light. As light surfaces start integrating into architecture, we will start to conceive light as part of it and not as a separate element. OLED technology will keep developing in terms of functionality and integration within the space.

As a light source used as part of luminaires, I think OLEDs will become more flexible and adaptable, allowing more freedom in the design process. I also see the market expanding with larger lighting surfaces and more efficient panels. But I do not think OLED will just be used in traditional luminaires – there will be more integration with architectural elements such as mirrors, windows and walls, etc.

**What other projects do you have in the pipeline or in concept stage which involve Lumiblade panels?**

We started using OLEDs several years ago with the Pixelate fixture. Due to the positive reception of Pixelate and OLED technology, plus the drop in

## Zhen – A revolution in 5 millimeters

Zhen accents the simplicity of OLED technology like never before by expressing the sophistication of this new light source in a simple pendant light. The design of Zhen shows the illuminated surface of the panel without additional elements on it, allowing its natural and uniform light bathe the ambient. Its 5mm thick aluminum structure accents another big advantage of OLED technology: fixtures based exclusively on the light sources without additional elements such as optics and heatsinks.

Zhen enhances the use of OLED technology in a lot of different ways, but it can also be used as a modular lighting system enabling dynamic light installations powered by programmable DMX drivers. Thanks to the luminous flux delivered by the new FL300 panel, this luminaire is perfect for most residential and hospitality uses. Zhen can also be ordered with the mirror finish OLED panel, which perfectly matches the chrome finish of this sophisticated piece.



the prices of OLED panels and the rise in the lumen output, we decided to introduce the new Zhen Light, a simple fixture that allows OLEDs to be used in many different ways. For next year we are working on a new fixture that experiments with the use of OLED light thru natural stone.

We will keep developing OLED lighting fixtures with the main goal of offering our clients designs that accent technological progress in an esthetic and functional way.



# Form follows installation

Sculpturing negative space with an OLED installation by Vision Quest Lighting



Larry Lieberman,  
President of  
Vision Quest Lighting

Larry, we're delighted that you have agreed to participate in this issue of Lumiblade Insider and share your personal OLED story. The response to OLED lighting from participating customers has been overwhelmingly positive and, at the same time, our features also serve them as a valuable tool in their own marketing.

This issue celebrates OLED lighting's arrival for use in a wide range of products. Although we have and will continue to feature many cutting-edge, custom projects, we also want to show the way in which OLEDs are becoming more relevant to everyday life in areas such as transport, healthcare, task and general lighting and dual purpose architectural lighting that cleverly combines design and function.

#### Could you briefly describe Vision Quest Lighting as a company?

Vision Quest Lighting has been providing custom lighting solutions to the hospitality sector at a national level for 20 years.

#### What do you like about working with OLED luminaires?

What I love about OLEDs is their incredible thinness and brightness. This really inspires you to take advantage of these unique aspects and design a product that could not be made with any other technology. For me, OLED is more about negative space and how you sculpt that into the product.

#### When did you first become acquainted with OLEDs? And have your initial perceptions changed over time?

I've been aware of OLEDs for many years now. It has always been an efficient light source but the color rendering used to be too green and not really suitable for decorative lighting. About three years ago the color temperature and CRI made a massive leap in quality and that was the game changer for me. The combination of economic and esthetic applicability adds considerable value to your design.

*This luminaire has 17 levels with 340 individually controlled OLED tiles. It is controlled by DMX. Each plate can be removed for repairs.*





*The OLED installation at a New York investment firm was designed for a private client by Robert A.M. Stern Architects, LLP*

**Do you envision OLED taking over from traditional lighting technologies in certain areas?**

I think OLEDs will continue to be specialty product into the near future, although reduction in price and standardized design platforms are creating new opportunities for use in many new areas. The aerospace and automobile industries will probably benefit most in its current state, however high end decorative lighting will continue to grow in use.

**You have previously mentioned that you now think more in terms of product platforms and families – can you comment on that?**

The physical shape of OLEDs has presented a design challenge in terms of providing the customer with a way of repairing the fixture. Fortunately, OLEDWorks has recently addressed this issue with new, socket-like design platform options.

**What OLED projects do you have in the pipeline at the moment? How do you see your product lines developing?**

I want to design a product line around the negative space I can create with the source. If the OLED can just provide an extra 2 hours a day then I can get it done! Custom luminaires using DMX control in particular showcase OLED's capabilities to the highest level and are a pleasure to work with.

Vision Quest Lighting does not provide products at a retail level but if we did, I would certainly design a line around this source.

**What advantages do Lumiblades have over other OLED lighting systems?**

We only use the Lumiblade product. We have never had a problem with the products we've worked with, and the product support is more like a partnership than a vendor relationship. The parts need to be small and elegant to show the light off to its best advantage. If we are going to sell a high end product we want the highest quality parts that give us the best overall value. We feel that Lumiblades meet this criteria without question.



# White – it's not just noise

“White is movement and rest, activity and passivity. White is purity and clarity. White is dimensional space; it is immaterial. White is pure energy (...) White is active; it is constantly changing, expansion and contraction alternate with each other, occur simultaneously and can barely be separated. (...) Never ending, white expands, it is space without limitations. (...) It sets us in a state of suspension and takes up the weight.”

So wrote the artist Raimund Girke who, from the 1950s, achieved an incredible range of variation

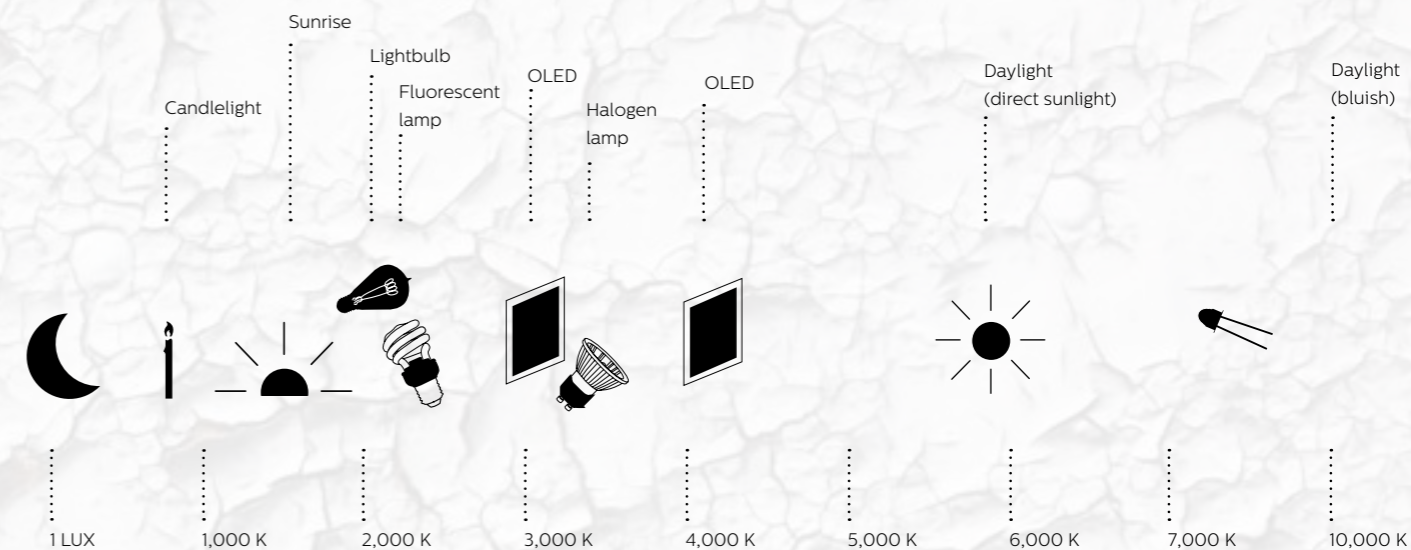
## What's your story, Lord Kelvin?

The kelvin was named after William Thomson (1824-1907) who later became Lord Kelvin. At the age of 24, he introduced the thermodynamic temperature scale that to this day is used to measure color temperature in kelvins. Lord Kelvin was Professor of Theoretical Physics at the University of Glasgow and presumably wrote his scientific papers by the light of the then common kerosene lamp with 1,500 kelvins. However, he also lived to witness the triumphant introduction of electric lighting, invented by Thomas Edison, and the first light bulbs. The most widely used light color in our range today is between 2,700-3,200 kelvins. It generates a sense of well-being and security.

in his monochrome works by moving and layering color and creating structure of the maximum reduction – in white.

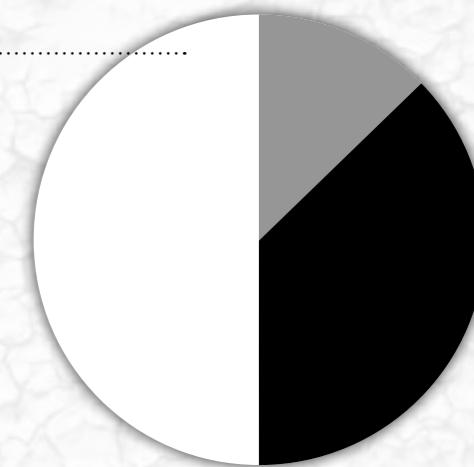
Just as in the visual arts, white is also seen as multifaceted in lighting design. White is not just white – this mnemonic is one of the basics of lighting design.

But which white do we encounter in everyday light? And what effect does it have on us?



The most widely used light color in our range today is between 2,700-3,200 kelvins. It generates a sense of well-being and security.

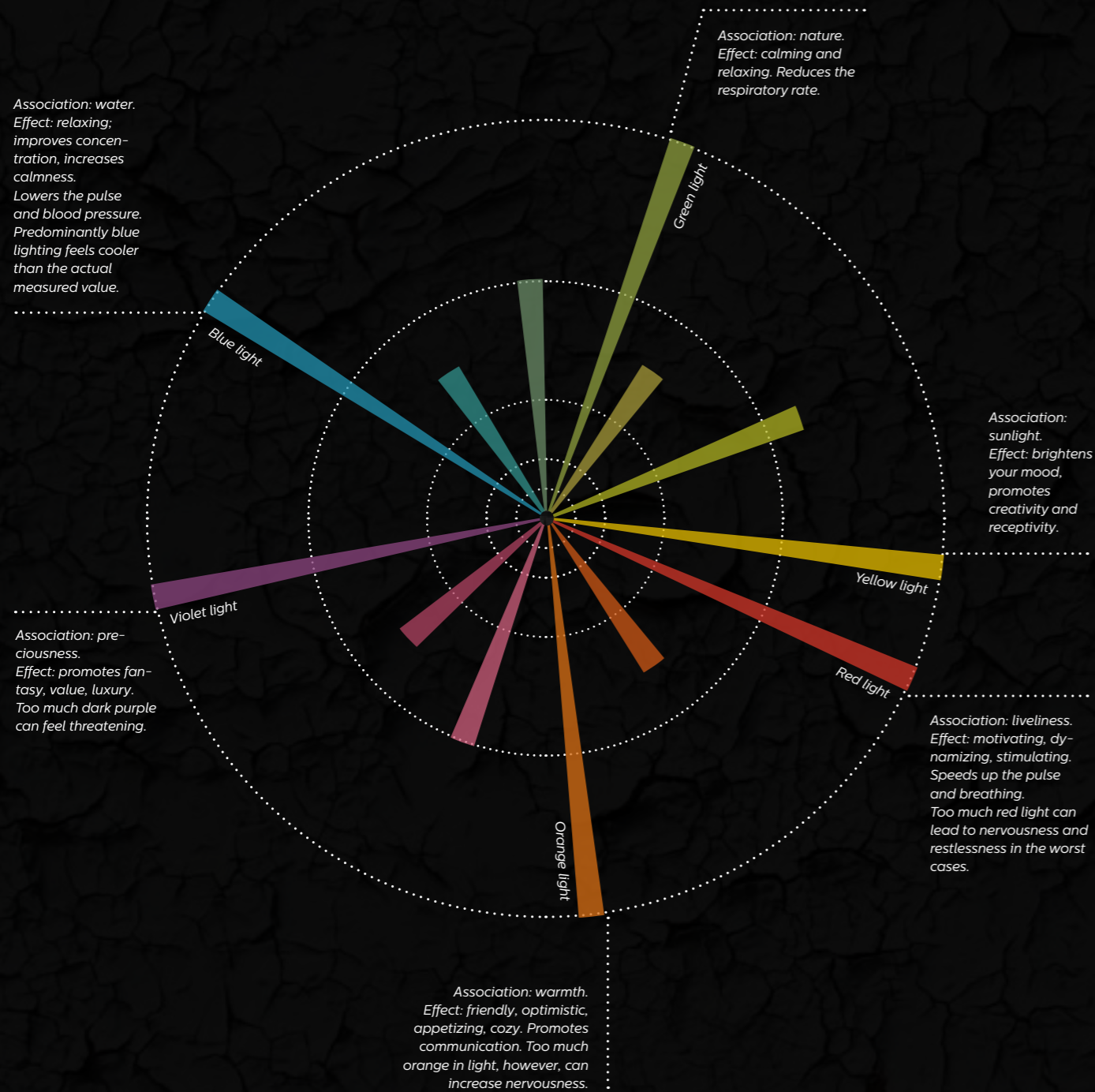
White is the brightest of all colors. Like black and gray, it is an achromatic color. White is not a spectral color, but it results from a mixture of individual colors that evokes the same color impression, like sunlight.



**Neutral white**, with values of between 3,300-5,000 kelvins, generates a more matter-of-fact atmosphere. It is an unpretentious, friendly accompaniment to hard work and brings even the smallest details into sharp focus with its clarity. It likes contrast and emphasis and works best wherever activity prevails, but also at a get-together around the dining table.

**Warm white**, with values under 3,300 kelvins, is the more emotional of the different whites. Alternating between red and yellow, it is reminiscent of the light mood created by an advanced sunset. It spreads comfort and well-being and this impression increases the lower the kelvin value.





# Light is emotion

... and emotion makes us human. Because of light we feel safe on the streets at night, welcome at restaurants and cozy at home.

Could lighting soon become an interactive and intelligent part of our public and private environment? When entering a room, light technology could, for example, recognize what mood we are in – and respond accordingly. For many years, researchers and lighting designers have been working on relating light and people's moods to each other. Successes with light colors have been celebrated with so-called "light showers" and research projects that have increased the learning potential of entire school classes. Accepting light color as an integral part of light design has increased the potential of creative lighting.

But what exactly do light color coefficients add to achieve more naturalness? We know that blue light promotes concentration: Can math problems be solved more easily if blue light is complemented with an interplay of light and shadow? Can refracted, green-yellow light, reminiscent of sunlight in a forest canopy, make us happier and more relaxed at our desks? An inspiration and a challenge for

architects and lighting designers can perhaps best be summarized by quote from the British architect Lord Norman Foster: "Any engineer can calculate the amount of light which is needed to read a book. But where is the poetic dimension of natural light: the constant change of an overcast sky, the serendipity of shadow, the lightness of dappled sunlight?" It remains to be seen what innovations await us in the future in this regard.



# Designers rise to creative challenge

How much of architecture and interior design is influenced by light? Maybe the better question is how much isn't.

A beautifully lit space is the pinnacle of brilliant design. To design a space with the right combination of light and shadow, accent and illumination, is the mark of a true master. They light their spaces to make us feel productive at work, snug at home, or elegant during a night on the town. They bend the light, shape it and weave it, the "threads" coming from windows, doors and lighting elements.

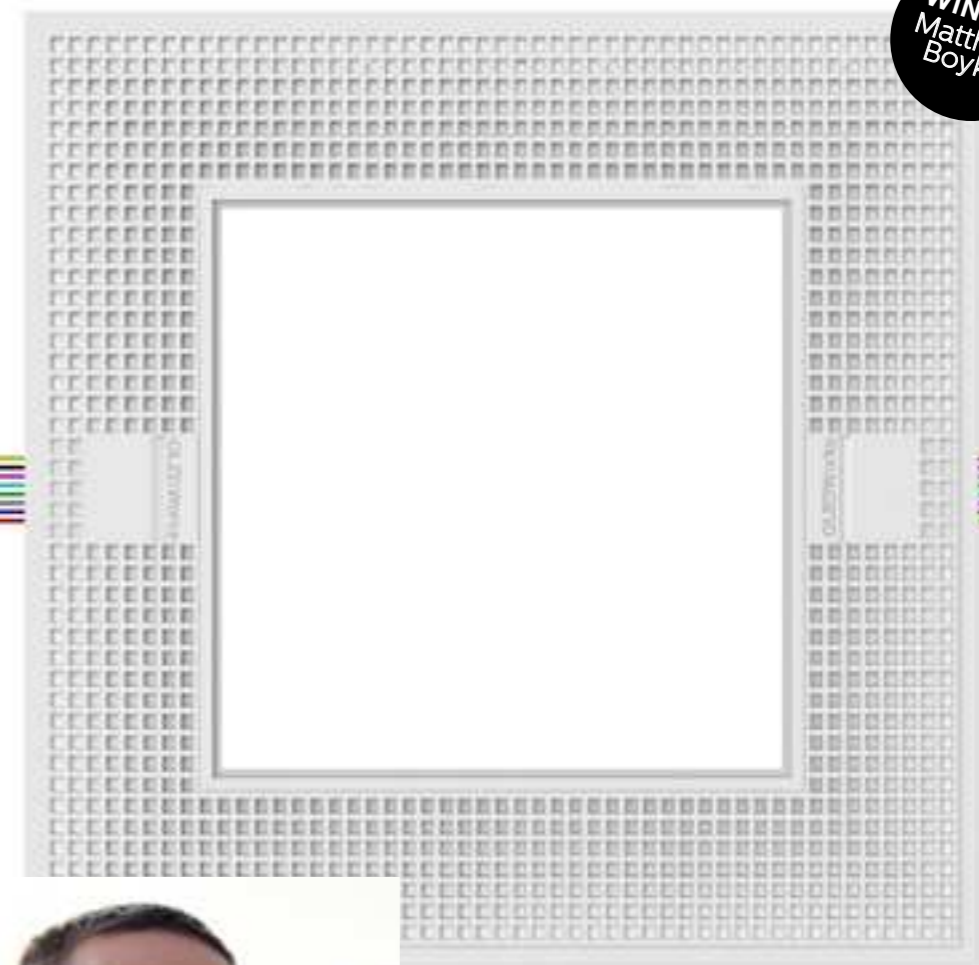
Lighting elements are, along with natural light, the most important components in the designer's palette. That palette grew immeasurably with the development of OLED (Organic Light-Emitting Diode) panels, such as OLEDWorks' Lumiblade, currently the brightest panel on the market.

OLED panels are substrates coated with organic compounds that emit light when exposed to an electrical current. They cast warm, diffused light without bulky diffusers and generate very little heat while maintaining uniform brightness. With the development of OLED on Corning® Willow® Glass they can also easily conform to curved surfaces without breaking. This unique combination of properties makes OLED panels something that has never existed in the lighting designer's palette: a simple yet functional light source that inspires endless design possibilities.

OLEDWorks has teamed up with glass technology and optics pioneer Corning to create unique and conformable next-generation OLED lighting solutions. This pairing of two technology leaders enables unique OLED panels that can be conformable and reliable. OLEDWorks, the only North American OLED manufacturer, was an early innovator in the field and whose founders were pivotal to the world's first active matrix OLED display in their role with Eastman Kodak. Corning has applied its decades of experience in optics and glass technology to develop high-performance, low-cost substrates.

OLEDWorks and Corning have joined innovation facilitator Nine Sigma to inspire the design community's interest in OLED lighting. In 2016, they announced "Lighting Without a Bulb," an international contest that challenged designers to create innovative lighting concepts that showcase OLED panels' thinness, lightness, coolness to the touch, and color quality. Contestants were asked to create designs by using the following OLED panels made by OLEDWorks: Lumiblade Brite 1, the newly introduced Brite 2, the Keuka module with a built-in driver, or the amber marker light.

WINNER  
Matthew  
Boyko



*'Surface Integrated Sockets' enables designers to mount lights in spaces like stairwells and recessed areas with the ease of hanging a picture frame.*

“Boyko looked at a challenge and developed a solution.”

– The judges

WINNER  
Mike  
Garner



*Soft, diffused light for corners and accent spaces: Designers can connect the modules of the 'Hexy' at the points of the 'X' in geometric arrays of lights that spread out across a ceiling until they look like a glowing origami sculpture.*



“A good example of using OLED’s simplicity in a very elegant and functional way.” – The judges

“We’re trying to do with OLED lighting what previous generations did with materials like glass and steel,” said Dr. Dipak Q. Chowdhury, Division Vice President and Program Director, Emerging Innovation Group, Corning. “Just as glass, steel and concrete needed masters like Frank Lloyd Wright, Philip Johnson and Walter Gropius to show their full potential, we’re looking for creative minds to show OLED’s full range of esthetic possibilities in creative new OLED-based lighting designs.”

The challenge drew an enthusiastic response from the design community. Their concepts expanded the boundaries of lighting by realizing the elegance and functional practicality of OLED panels. Their concepts had to combine creativity and utility. The judging favored creative simplicity that showcased the spare beauty of OLED panels.

At the same time, designs had to be practical to manufacture and have applications in the retail, hospitality, residential or medical lighting markets. Each winning design was awarded a \$10,000 prize.

“We wanted beautiful, useful products that could be made available to everyone – not \$200,000 showpieces,” said Chowdhury.

Lighting Without a Bulb received more than 48 submissions from around the world. Contestants included students, engineers, and lighting experts. Some designed furniture, lighting fixtures and accessories. Others seized on OLED lighting panels’ special properties to take light to unexpected places. One designer incorporated OLED panels into a pool canopy to provide shade in daylight and lighting at night. Another applied the same concept to a lighting fixture of lightweight silk embedded with OLED panels that looked like a fabric chandelier.

The three winning designs, announced on September 21, ranged from unapologetically whimsical to unquestionably practical. In each case, the designers expressed a vision for their concept and backed it up with layers of detail in their proposals.

#### And the winners are

Simplicity was the essence of Matthew Boyko’s winning design. Boyko, of Society Creative, USA, took a different tack from most of the other designers. Where their designs emphasized OLED lightings’ esthetic qualities, Boyko went hard-core functional and elegantly simple.

His ‘Surface Integrated Sockets’ is a mounting unit with a plastic rim and power conduits. It enables a designer to integrate OLED lighting panels into large arrays. Boyko’s artist’s conceptions illustrated how designers can mount lights in spaces like stairwells and recessed areas with the Surface Integrated Socket almost as easily as hanging a picture frame.

“It’s not a light fixture per se, but a way to mount an OLED panel to a surface. It’s very simple, and looking at it for the first time at the conceptual level it doesn’t seem that remarkable. But the detail in the execution helped us realize how deeply the designer thought about solving the practical issues of integrating OLED lighting panels into a space,”

said Giana Phelan, Director of Business Development at OLEDWorks. “It was a very well-presented concept right down to specifics like including a step by step integration process. Where other designers took the OLEDs at face value and said ‘let’s make a light,’ he looked at a challenge and developed a solution.”

Mike Garner of MSG Lighting, USA, was among the many designers whose concept represented OLED’s aesthetics. Based on the same fundamental concept – easily integrated modular lighting units – his two ‘Hexy’ designs literally took lighting in completely different directions: horizontal and vertical.

Garner’s first concept is a horizontal lighting array made of individual modules that look like either the letter ‘X’ with an extra bar in the middle or pieces of the DNA helix, depending on your perspective. Each module consists of a central panel housing the wiring and controls and is connected to four OLED lighting panels.



“The OLED is beautiful in its minimalism, and you can’t say that about any other light source.”

Designers can connect the modules at the points of the “X” in geometric arrays of lights that spread out across a ceiling until they look like a glowing origami sculpture. The Hexy light can fill various sized and shaped spaces by simply adding modules to extend soft, diffused light into corners and accent spaces.

Garner’s other take on the Hexy concept uses vertical modules to create OLED chandeliers that extend down from the ceiling. The vertical module has a central panel, like the horizontal Hexy module. Instead of the “X” or helix shape, though, the vertical modules consist of two folding panels attached to the central panel. They can be repositioned in a variety of shapes and attached to other modules to create lights that cascade down from the ceiling like flowering tropical plants.

“Mike’s designs are good examples of using OLED’s simplicity in a very elegant and functional way,” said Phelan. “Designs that used the simplicity most effectively did better in the competition because that is such a singular quality of OLED lighting. It’s beautiful in its minimalism, and you can’t say that about any other light source.”

Sadyr Khabukhayev, a student at Izmir Institute of Technology in Turkey from Kazakhstan combined esthetics and practicality to help people who live in dark apartments. His ‘Greenlight, Blending

with Nature’ concept integrates OLED panels into square and triangular storage modules that can be configured into wall units, sideboards, coffee tables and bedside tables.

Aimed at apartment dwellers, Khabukhayev’s modules turn walls and dark corners into usable storage space accented by OLED panels. One of his illustrations shows a floor-to-ceiling array of modules in a geometric pattern of squares and triangles accented by lights and green plants. Khabukhayev was able to mount the OLED panels inside the modules without sacrificing their streamlined appearance, giving them a light, contemporary feeling.

#### Other inspired ideas

The broad spectrum of inspired ideas extended through all of the entries. Two engineering students, Kurt Moore of Clarkson University and Flo de Sande of the Rochester Institute of Technology USA, took OLED lighting into the wilderness. They designed a multi-purpose camp light made of an OLED panel in an impact-resistant housing with a kickstand.

For backpackers who need to cut every unnecessary ounce from their loads, the OLED camp light weighs a fraction of a conventional lantern and casts a broader, more even light than a flashlight or headlamp. Recharged with a solar panel, the unit requires no batteries or hand-cranked generators.

Mike Kane, an industrial designer with Kiwiseed Design of Fairport, New York, developed a concept similar to the camp light that takes advantage of OLED’s lightness and thinness.

His ‘Oglow’ light is an amber OLED panel mounted on a hinged case. Powered by either an outlet or a rechargeable battery, it can be mounted anywhere or used as a portable light. When the hinge is opened, Oglow is a table light. When closed and hung from its built-in loop, it’s a work light that casts a subtle glow on a hospital bed, or a child’s night light that’s safe and cool to the touch, or a safety light for the top of a staircase. Oglow’s thin form blends into any interior and is compact for travel.

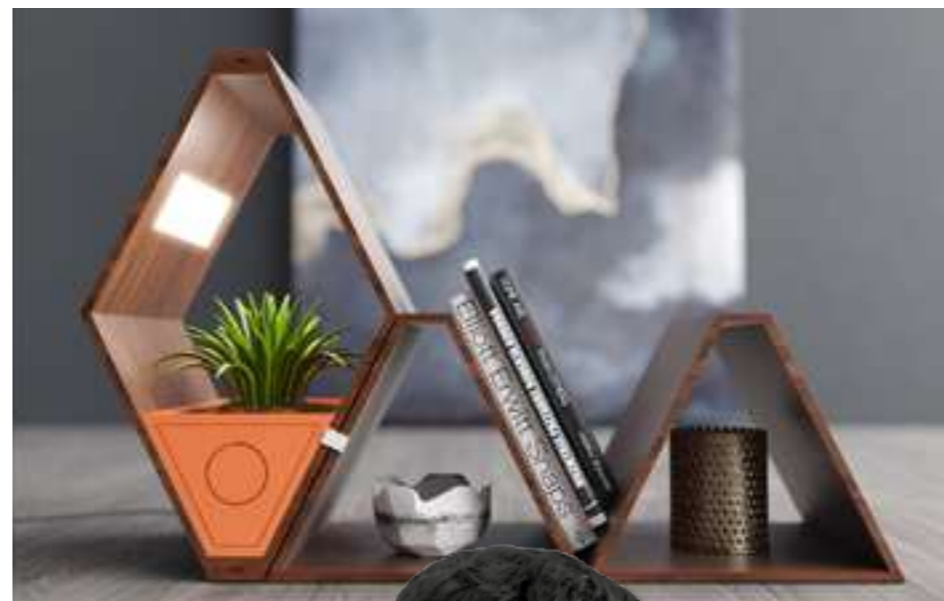


WINNER  
Sadyr  
Khabukhayev

Contrasting with the unassuming Oglow, designer Chris Herbold created his ‘Eksoled’ wall light as a distinctive element for room design.

Eksoled is a slim, stylized ‘X’ divided into two lighted triangles and a third triangle that houses a control panel. Narrow OLED panels mounted on the inner surfaces of the triangles provide the illumination. One triangle casts a white light for general use while the other glows amber for nighttime accent lighting. Users can set a timer on the control panel to vary the lighting to their own preference, depending on the time of day or night.

“All of the designers did a very good job and surprised us with the creativity of their ideas and their thoughtfulness,” said Chowdhury. “The design concepts were even better than what we expected. We asked each of the participants to transform the lighting paradigm by showcasing OLEDs’ uniqueness. They did that and demonstrated how a cutting-edge lighting technology can be creative, practical and accessible at the same time.”



‘Greenlight,  
Blending with  
Nature’:  
Lighting-up  
time for dark  
and small  
apartments.



Khabukhayev mounted OLED panels inside the modules, giving them a light, contemporary feeling.

# Design with skill and sensitivity

Andreas Vogler Studio is an architecture and design firm. Its founder Andreas Vogler has worked on space and aircraft interiors supported by his interdisciplinary background in innovation development. The studio straddles the fields of aerospace, art and architecture and pursues a pull-technology innovation approach.

Driven by curiosity and intelligence, the company uses its scientific methodology and efficient tool-sets to generate intrinsic solutions. The designs combine expertise with common sense and humanistic values. Recently the studio has been developing a high speed train – the AeroLiner3000 – with the German Aerospace Center, DLR. We asked for some of his thoughts on design, light and his latest project.

“I think the future of OLED is bright. I have never before encountered an artificial light that so closely replicates the colors of sunlight. I think the emotional power of the light will lead to its breakthrough, and I can't wait to work on another project with it. Since working on human missions to Mars, I have become very conscious of the direct impact light has on us physiologically and psychologically, much like music. We should emphasise this aspect more fully rather than simply fulfilling the lighting standards set for public transport.

“Andreas Vogler Studio straddles the fields of aerospace, art and architecture and pursues a pull-technology innovation approach.”

I am not quite sure how 'Swiss' my approach is. To a certain degree, I think it probably is. The Swiss generally want to make products that are meaningful, precise, of the best quality at the given moment, and elegant looking. However, I think that would be a general description of a good designer. Italians, Poles, Brazilians, Germans and Koreans work in my office. Good design nowadays is international in as much that we seek solutions to global problems.

I think the special approach of our studio is that as designers, we are willing to dive deeply into the technology to explore its potential for innovation. We work with engineers from the beginning of a project and try to understand their work as part of the collaboration. Our background in different fields like aerospace, architecture and art, allows to cross fertilize the disciplines.

But it is important to talk about the emotional quality of light, and thus also the emotional quality of design. Having good light is crucial to enhancing the perception of space and probably the most economic way of doing so. There are so many poorly lit spaces around us in transportation and in public buildings. Unfortunately, many people think, when there is illumination, there is light. But the difference between the two is like noise and music. Like music, light requires poetic skills and sensitivity. Everybody can put a light in a room, but not everybody can 'enlighten' a space. As designers, we constantly train our artistic skills and sensitivity, which is very important to create meaningful products.”



“The space available for the installations on the AeroLiner3000 project was very limited. The project is a double-decker train for UK, which has much lower tunnels than here on the continent. We had to save each inch of space. This had several consequences which made the use of OLEDs a natural choice. The very thin installation width, low heat emission and a comfortable glare-free illumination, even when sitting close to it. Obviously, we also want minimal energy consumption and off-heat. We were not really satisfied with the current LED technology in terms of the light quality and the way the small light points produced glare. We were also disappointed with the current solutions for illuminating trains. They are technically too cold, unemotional and lack elegance for the nighttime traveler.”

“Many people think when there is illumination, there is light. The difference between the two is like noise and music.”

*The AeroLiner3000 highspeed train has been designed in cooperation with the German Aerospace Center (DLR). It offers more passenger capacity with less noise and CO<sub>2</sub> emissions.*

*The new, lightweight construction made a double-decker design with large windows possible.*



*Interior of the AeroLiner3000: Elegant forms, discreet colors and high-quality material provide a classy travel experience.*

DLR had already evaluated illumination technologies for their NEW Generation Train (NGT) project before we began working with them on AeroLiner3000. At the end of their evaluation process, OLEDs offered the most potential for the future. While the light distribution is similar to that of fluorescent lights used in trains today, OLEDs, in contrast to LEDs, are glare-free and don't require an additional diffuser. OLEDs can be manufactured flexibly, which, together with their low-voltage specifications and excellent light quality, offers high integration potential for ceilings. The lifetime and efficiency of OLEDs is improving year by year.”

“Since first reading about OLEDs I have been sure that it is the future of lighting technology.”

“I think I first read about OLEDs back in the 1990s and I remember seeing them about 10 years ago at the Light & Building fair in Frankfurt. I was fascinated by the glare-free quality of their light. Some of the OLEDs presented resembled real sunlight at different times of the day. Since then I have been sure that OLEDs are the future of lighting technology. LEDs are already a success today, and have virtually replaced lightbulbs and fluorescent lights. I can well imagine that, in 10 years from now, OLEDs will find their place in the illumination of spaces, both in transportation and buildings.



*Coziness and clean lines are by no means a contradiction.*

## Open your **Wollet**

Modular Lighting Instruments has been putting the right light, in the right amount, at the right place since 1980. The company's passion for technology, humor and beauty is reflected in its distinctively off-beat product campaigns and a reputation for creating architectural lighting with 'attitude'.

As frontrunners for over 36 years, it perhaps comes a little surprise that Modular's latest luminaire takes full advantage of the possibilities offered by OLED technology. 'Wollet' is a study in timeless simplicity comprising just three components: a rigid housing, a thin OLED light source and a special hinge that allows the light plate to be tilted through 180°. "If we'd used standard LEDs, Wollet would have been a much more complex light fitting," explains designer Jeffrey Huyghe of Modular Lighting Instruments. "The OLED technology and the driver are built into the unit, which means we have been able to pare Wollet down to the bare essentials."

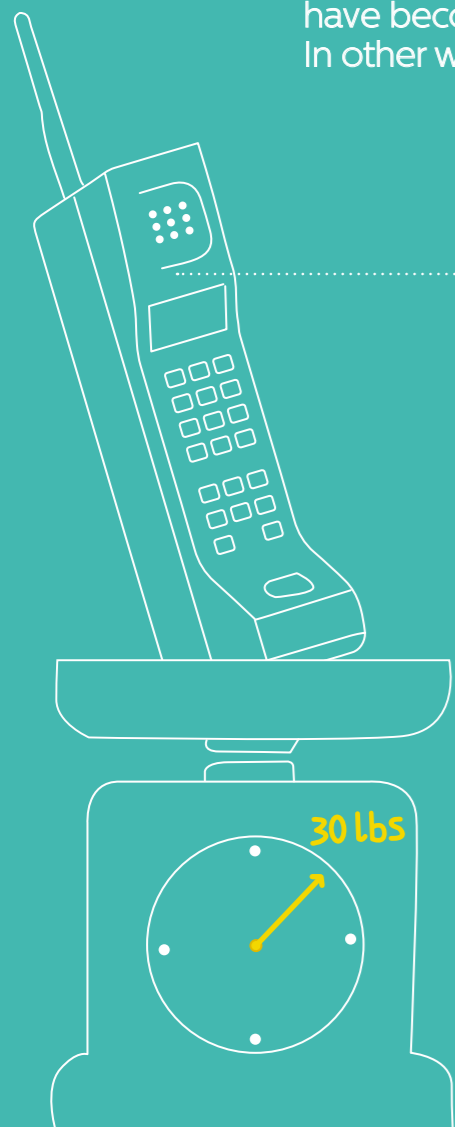
Wollet is available in black and white for wall or recessed ceiling mounting. Modular designed the luminaire with homes and the hospitality sector in mind, where it is perfectly suited to subtle, cozy bedside lighting. True to its name, Wollet opens like a wallet along the hinge to emit a beautifully soft, diffuse light. "Architecture is about the integration of a space into a wider context and light defines that space," according to Modular. With Wollet, the company has synthesized these objectives with the architectural application of OLED lighting technology.





# Who would have thought?

Once considered dangerous or at best a pointless distraction, these inventions have become vital parts of our daily lives. In other words, they have all arrived.



### 1. The cell phone

First introduced in the 1950s, cell phones were made for use while driving and weighed up to 30 pounds. Not exactly a gadget that encouraged mobility. Nevertheless, people became obsessed with the idea of being constantly available wherever they were. By 2015 there were as many cell phone subscriptions as there were people on the planet – around 7.4 billion.

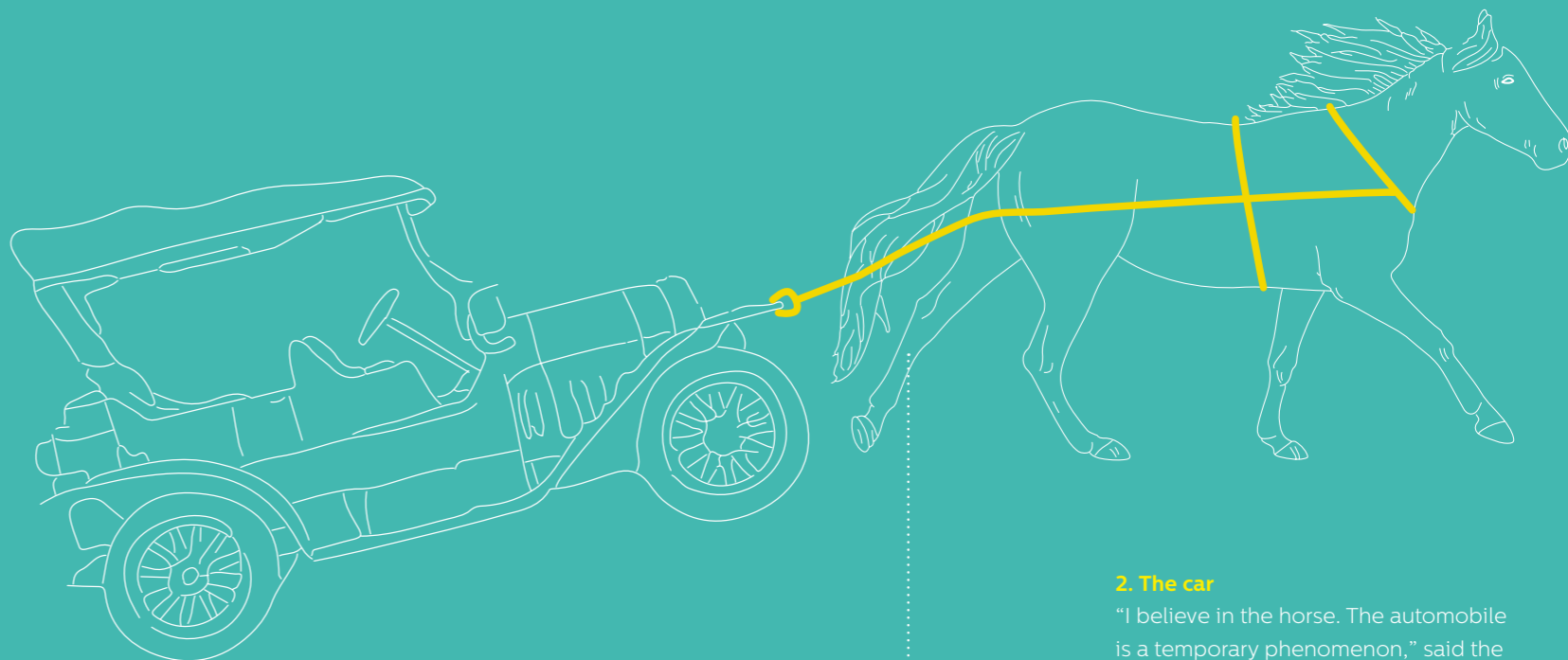
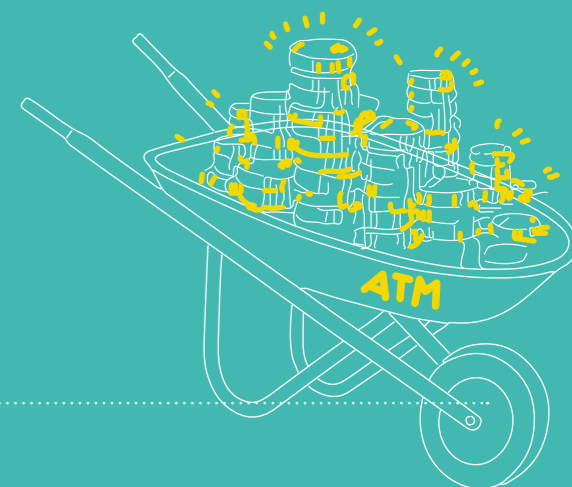


### 3. Jeans

When Levi Strauss invented the Jeans in 1873, his aim was to produce hard-wearing clothing for hard-working people. He could barely have imagined his workers' pants as a high-fashion staple, even less so with heels and handbags.

### 4. The credit card

The invention of the Chipcard in 1968 marked a revolution in our relationship to money: It made cash available from an ATM whenever it was needed and, more often than not, dispensed with its use altogether. Warnings that people would lose track of their spending proved prescient with global private credit card nearing 1 trillion U.S. dollars. Credit cards also contain vast amounts of information about our spending habits and personal decisions – second thoughts, anyone?



### 2. The car

"I believe in the horse. The automobile is a temporary phenomenon," said the last German emperor Wilhelm II, reflecting Europe's sense of unease with the rapid pace of modern development in the late nineteenth century. A feeling we can maybe still relate to in 2017.

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We shall not  
cease from  
**exploration,**  
and the end of all our  
**exploring will be**  
to arrive where  
**we started**  
and know the place for  
**the first time.**

T. S. Eliot

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