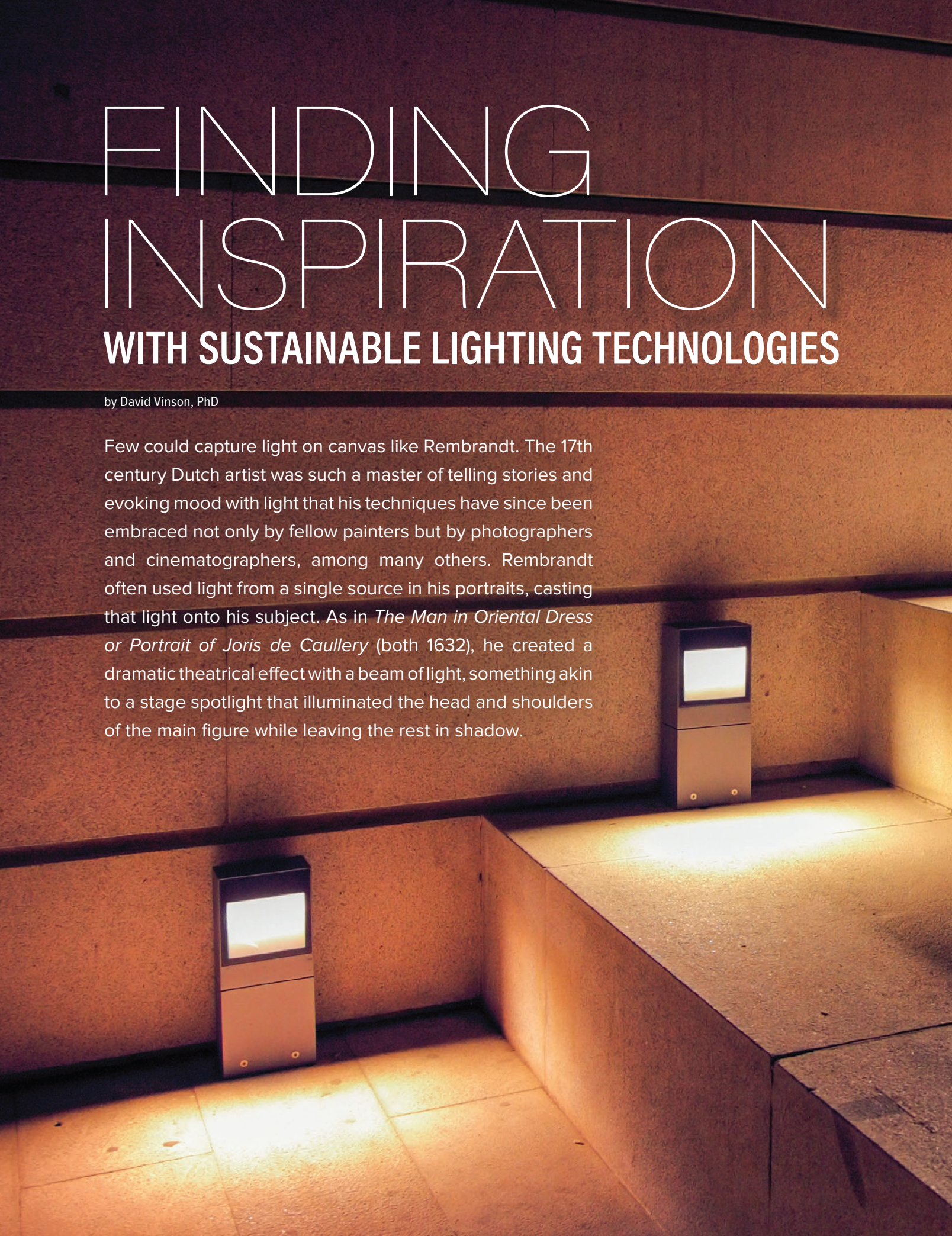


FINDING INSPIRATION

WITH SUSTAINABLE LIGHTING TECHNOLOGIES

by David Vinson, PhD

Few could capture light on canvas like Rembrandt. The 17th century Dutch artist was such a master of telling stories and evoking mood with light that his techniques have since been embraced not only by fellow painters but by photographers and cinematographers, among many others. Rembrandt often used light from a single source in his portraits, casting that light onto his subject. As in *The Man in Oriental Dress* or *Portrait of Joris de Caullery* (both 1632), he created a dramatic theatrical effect with a beam of light, something akin to a stage spotlight that illuminated the head and shoulders of the main figure while leaving the rest in shadow.





He even inspired “Rembrandt lighting,” a technique of capturing light still used today in the visual arts. What one sees is a triangle of light falling beneath the subject’s eye and on the shaded side of the face. The effect is stark and dramatic, in which a distillation of light and shadow enhances the subject’s relationship to the physical world while also calling attention to the subject’s interiority. This use of light and shadow suggests something elemental about what it means to be human.

Rembrandt would have been a fine photographer, and devoted cinephiles can spot his influence on Murnau’s *Nosferatu* or in the works of Bergman, Antonioni, Hitchcock, and so on. He would have made a wonderful architect, too. After all, he was adept at conveying the relationship between light—natural or man-made; usually light from a candlestick—and the physical spaces that contained his subjects. He was drawn to light and to the full range of feelings that light could evoke, and one can only marvel at how

he managed to convey all of this nuance on a two-dimensional canvas. Even if by intuition only, we each grasp the essential role of light. In the realm of higher education, we are aware of the ways in which lighting technologies can transform indoor and outdoor spaces on campus. Light makes our campuses safer and more functional, and the way we use lighting technologies can magnify the beauty of our architectural spaces and campus grounds. On-campus lighting also works as a powerful recruitment tool for prospective students, faculty, and staff. Rembrandt’s mastery of creating light to inspire a range of feelings teaches a lesson about the role light plays in altering our perceptions of the material world. We can internalize this lesson and apply it as we endeavor to unlock the full potential of what our campuses offer.

When Lighting Goes Wrong

At various points in our daily lives, we are often spoiled by good lighting. This situation is ideal, an indication that a balance has been struck

between aesthetics and functionality. Such moments may happen as we sip coffee and read at the library, or as we work on our computers in the office, classroom, or wherever we spend the majority of our time on campus. When lighting works, we tend not to notice it. But we certainly do take notice when lighting is insufficient—if we cannot see as we should, or when light is harsh, uninviting, or distracting in its artificiality. Such problems may reflect a larger concern, in which the architectural space has been conceived as an object to be viewed from a detached position rather than as a habitat to be experienced. When lighting goes wrong, it may be due to the lighting technologies already in place or to a lack of natural light, or both.

Occupants are uncomfortable in poor lighting, and it is not uncommon for spaces either to have too little or too much light. Moreover, harsh or dim spaces can hinder people’s progress in working and learning. When lighting goes wrong, it can make people sluggish, impact their moods, or even cause anxiety.



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Interior Lighting Options: Beauty, Functionality, and Sustainability

Occupants of any space, indoor and outdoor alike, need lighting that provides adequate visibility. This point, while obvious, is too often overlooked at the design stage. To design with lighting in mind allows for quality lighting conditions. Product teams can provide not only functional and comfortable spaces, but those that are sustainable, efficient, and cost effective.

A wide variety of sustainability issues intersect with architectural lighting. When developing an integrated approach to sustainable lighting, various challenges should be anticipated, most notably light pollution, the life-cycle impact of lighting products, and chemicals of concern. Light pollution includes over-lighting, light trespass, in addition to the impact of lighting on plant and animal life in the surrounding ecosystem. A related concern is the impact of light pollution on nearby buildings and communities. Regarding the life-cycle impact of lighting products, designers should work with manufacturers over time to reduce the embodied



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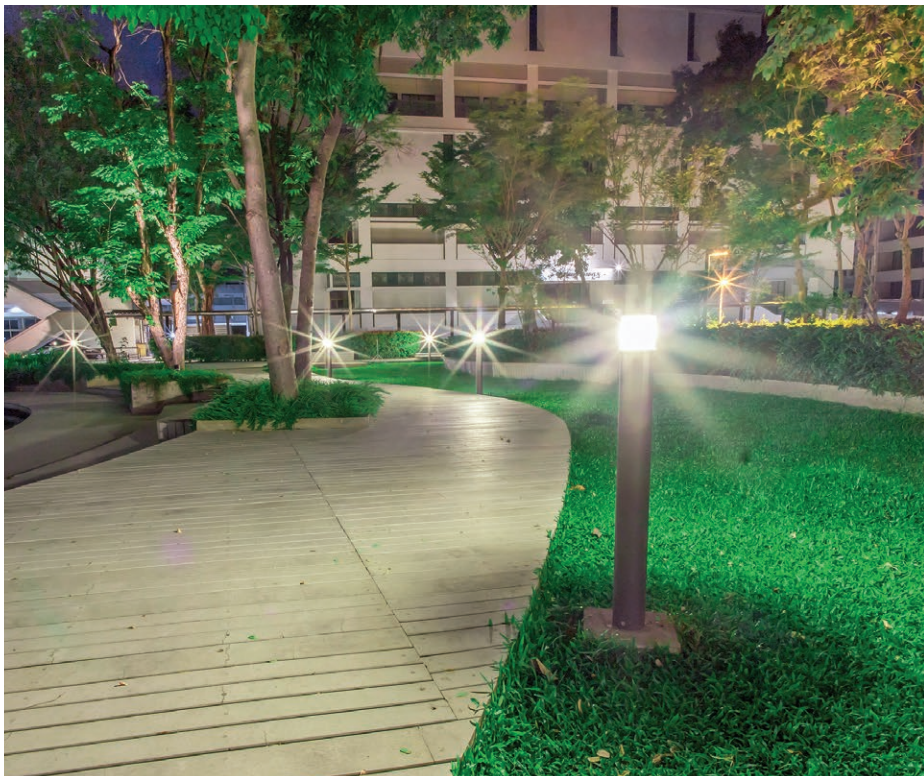


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energy and carbon cost of fixtures, luminaires, and lamps. To help extend the life of a building and further reduce its impact on the environment, lighting can be designed so that it can be retrofitted and adapted to align with future advances in technology. Designers should likewise work with manufacturers to reduce the level of toxic materials in lighting products. For instance, compact fluorescent lights contain highly toxic mercury; these can often be replaced with LEDs, which are mercury-free.

The proliferation of affordable LED and CFL bulbs has revolutionized how we illuminate indoor spaces on campus. As garish as some preliminary models were, today's offerings are just as attractive as their incandescent predecessors. The market for sustainable lighting has also seen novel work emerge from lighting designers who have reconsidered the way we use materials to create lamps. For instance, there are lamps now available that harness the power of bioethanol to create an LED lantern, one with enough additional power to charge an iPhone. We have

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access to rechargeable lamps, LED bulbs that boast a lifespan of twenty-three years, and fixtures that use corrugated cardboard made of FSC-certified paper sourced from forests that replant more trees than are harvested. The installation of task lighting is yet another sustainable and cost-effective option. Planners should consider individual reading lights inside study spaces and dorm rooms, those which replace overhead ambient lighting but use a fraction of the energy. Similarly, floor lamps prevent excessive overhead lighting while adding to the ambiance of an interior space. Dimming technology is another option for sustainable lighting because it uses less wattage and extends the life of a lightbulb.

Outdoor Lighting: Challenges and Solutions

While outdoor lights at night provide clear benefits in terms of safety and navigation, the artificial brightening of the night sky can disrupt human sleep patterns, disorient

migratory birds, hinder astronomical research and, of course, waste electricity. To this latter point, data from the International Dark Sky Association (IDA) indicates that a third of all outdoor lighting in the U.S. is wasted, and largely by unshielded fixtures that allow light to spill where light is not needed. This waste alone costs facility owners some \$3.3 billion each year. Further, the IDA contends that wasted illumination is responsible for twenty-one million tons of carbon emissions annually, making light pollution a factor in dialogues concerning climate change.

The good news is that innovative lighting technologies are readily available, and these aid in keeping our campuses safe, beautiful, and easy to navigate. Better yet, they cut down on nighttime light pollution. As with indoor lighting, LED bulbs can be used outdoors and are energy efficient. One can even purchase outdoor LED lights that run on solar power. Motion-sensor lights can be installed along walkways; candles and torches are green

solutions that provide a softer illumination than solar powered lights; using light fixtures that shield light from the top and sides reduces unnecessary glare and brightness; and lights positioned closer to the ground enhance the beauty of campus grounds while reducing energy costs and shielding the night sky from harsh, glaring light.

With sustainable lighting technologies, leaders in higher education have an opportunity to enhance the beauty of their campus grounds, to create a greener path for the planet, and to save money in the long-term. Let us not forget Rembrandt and the lesson he imparts: light has transformative power.



ABOUT THE AUTHOR: Dr. David Vinson has a PhD in English with specializations in transatlantic literature and cultural studies. He is a committed scholar, teacher, and dad. If you ever meet David, avoid the subject of soccer. His fandom borders on the truly obnoxious.

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