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DESIGN

# Optimising hotel lighting to improve guest wellness

**W**elcome to our latest report in the Hotel Designs Lab series, which explores circadian science and recent technological advancements that are enabling a new chapter of wellness, through tunable lighting.

Hotel designers, architects and creatives who are unconventionally shaping a new era of hotel design experiences know that innovative lighting is a vital tool to create spaces designed around peoples' behaviour. Yet, wellbeing experts and scientists have concluded that our bodies are at odds with much of the lighting environments that exist today in hotels globally.

For a long time, the psychological – and sometimes physiological – human responses to light have been almost intuitively understood by designers. Now, after decades of research, we enter a new paradigm in circadian design, powered by innovative solutions inspired by nature itself. And that's what this report will investigate, because if we don't ask questions, how are we expected to evolve in an industry that is constantly shifting?

Hamish Kilburn, Editor, *Hotel Designs*.



## Contributors

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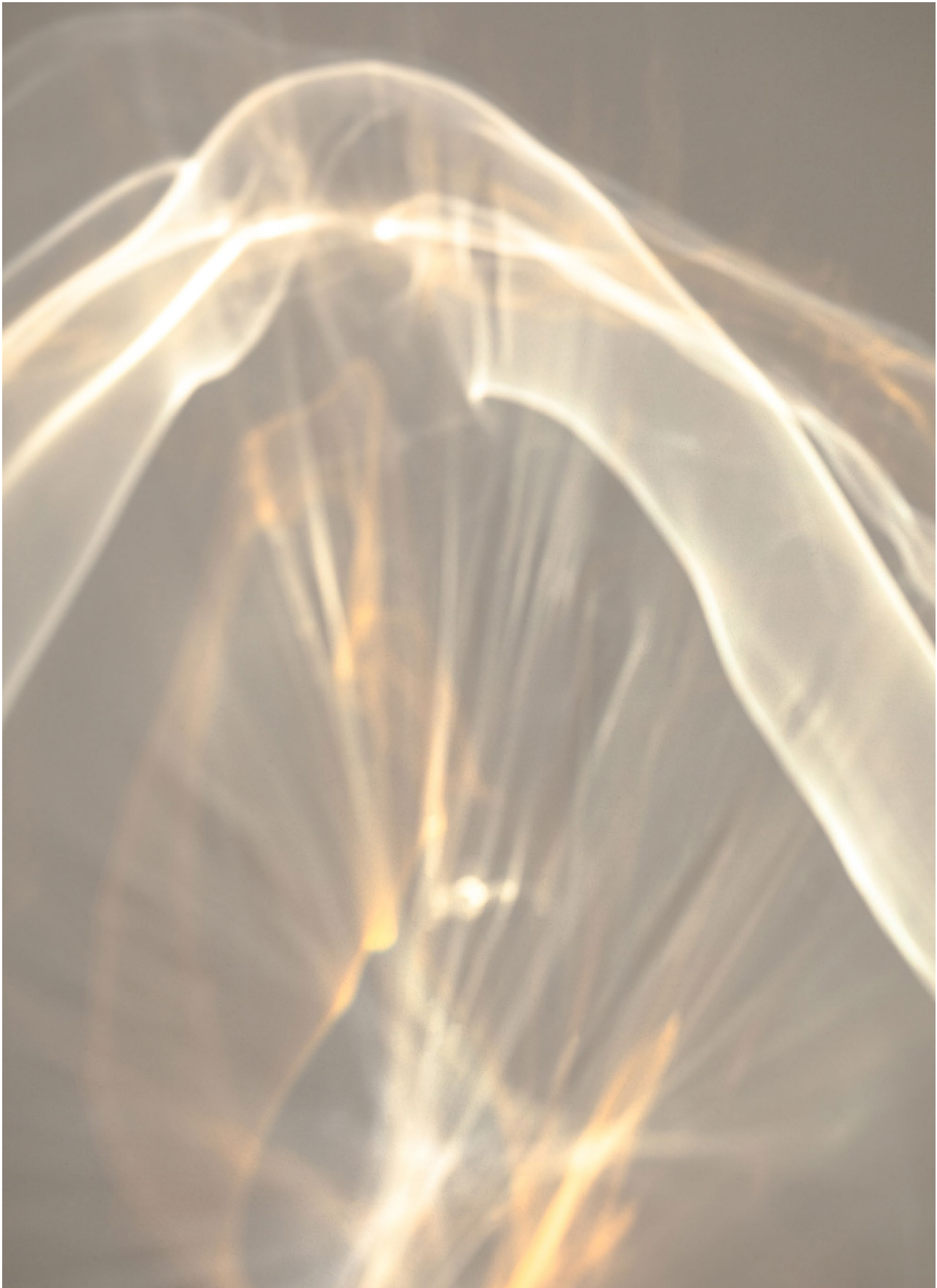
Experimental Artist  
I MISS YOU Light

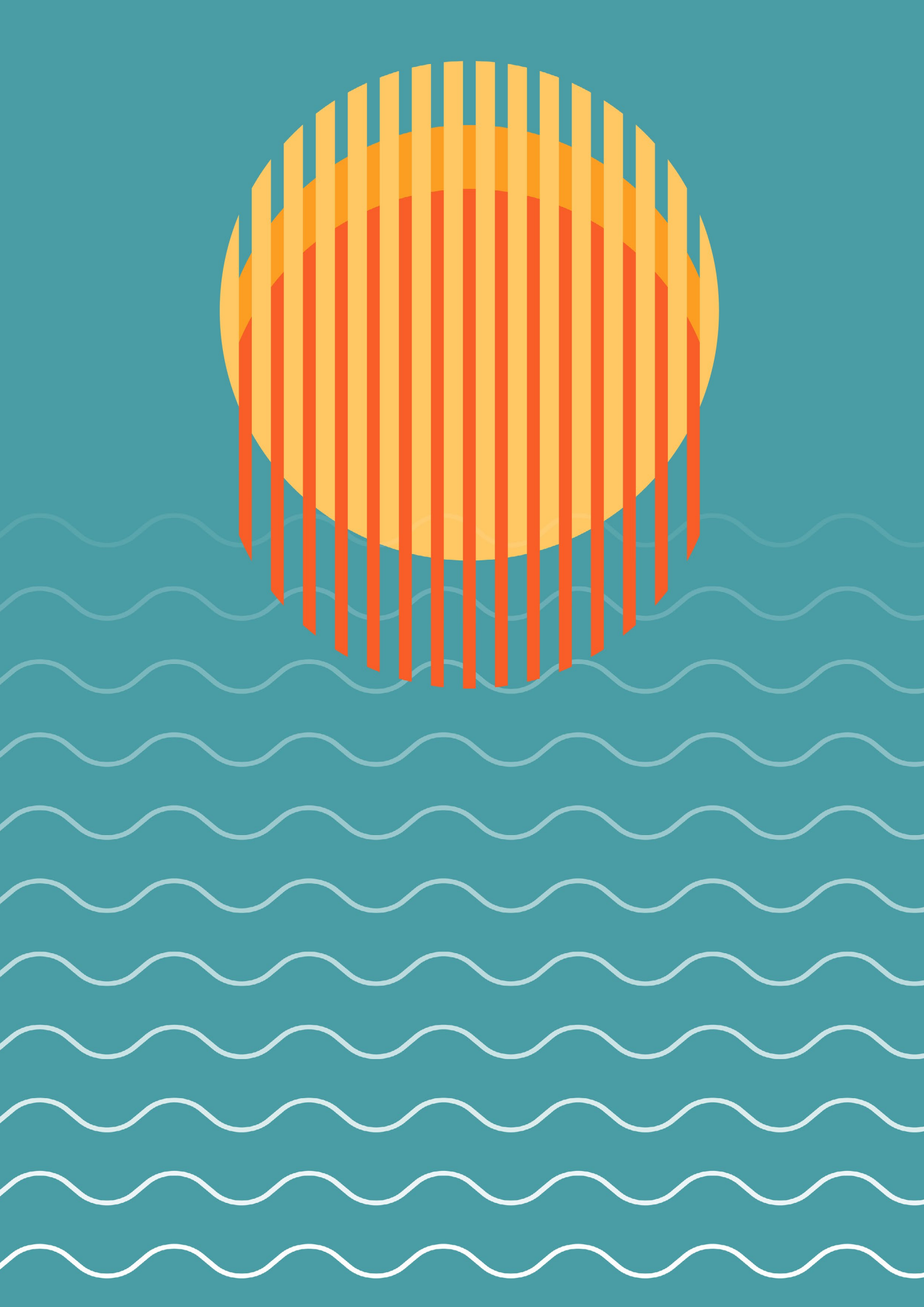
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# Follow the sun

## Circadian science

Circadian rhythms are physical, mental, and behavioural changes that follow a 24-hour cycle. These natural processes respond primarily to light and dark and affect most living things, including animals, plants and microbes.

According to Dr. Charles Czeisler, Circadian Researcher at Harvard Medical, “as humans, we have an innate relationship with the sun, and its daily cycle, to maintain overall wellness. Light is the primary mechanism for this synchronisation. When properly aligned, a circadian rhythm can promote consistent and restorative sleep, digestion and mood. But when this circadian rhythm is thrown off, it can create significant sleeping problems, cardiovascular disease, obesity and other conditions.” Research is also revealing that circadian rhythms play an integral role in diverse aspects of our mental health.

Dr. Czeisler’s laboratory research is focused on understanding the neurobiology of the human circadian system and applying that knowledge to clinical medicine and occupational health. He is currently investigating how the timing, duration, intensity and wavelength of light affects its circadian resetting capacity.

Colour temperature and light intensity have emerged as important metrics when measuring lighting; they are closely aligned with workplace productivity and comfort.

The colour temperature of a bulb denotes how ‘warm’ or ‘cool’ the white light that it emits is. A warm white bulb would give off a softer, more yellow light, while a cool white bulb would have a more blue, more intense tone. Exposure to light in the morning, and blue/green light in particular, prompts the release of the hormone cortisol which stimulates and wakes us. In the late evening as the amount of blue light in sunlight is reduced, melatonin is released into the bloodstream and we become drowsy.

## Hotels + Designers can support guests’ circadian health & sleep



Improve mood by tuning lighting (colour temperature) based on the time of day.



Increase energy by providing guests with access to direct sunlight.



Optimise nutrition by serving meals around fixed times



Stimulate melatonin production by setting thermostat between 15.6 to 19.4 °C)

“

Thanks to advancements in research and lighting control technology, it is now possible to produce aspects of daylight indoors.

**Dr. Charles Czeisler**

Circadian Researcher  
Harvard Medical

# Interior light tuned with biorhythm improves guest wellbeing & staff productivity

In recent years, studies have been conducted on the impact of light on individuals and their wellbeing. It was proven that tuning the light colour temperature to amber tones can bring a warm-evening atmosphere and elicit positive moods to both guests and staff. Tuning our light sources in harmony with nature's rhythm provides exciting and innovative opportunities for hotels and designers alike.

British award-winning lighting manufacturer Franklite has been one of the pioneering companies in the design, manufacture and distribution of high quality lighting since 1973; supplying to both the retail and contract lighting markets. The team constantly strives to offer products that provide optimal value-for-money, and do not compromise on performance for aesthetics and vice versa; upholding its well-earned reputation as a leading lighting manufacturer.

Being the first producer to innovate and introduce low energy chandeliers to the hospitality sector many years ago, Franklite has since leapt forward with the release of its high-performance LED lighting, FRANKled, designed and manufactured in Britain.

**Why tunable light?** Having full control of light intensity and hue enables designers and spaces such as hotels, shops, boutiques, galleries and restaurants, the upper hand where the exposition of colours and details are crucial. Beyond aesthetics, there is a significant positive impact on human wellbeing and concentration made possible by both the frequency and amplitude of light modulation.

Franklite's purpose-built factory houses testing facilities that allow its team to conduct rigorous testing on all its products. Ensuring hoteliers and designers gain the quantitative and qualitative parameters of light, flicker-free dimming and smooth-colour temperature control that are tested with the brand's cutting-edge Goniophotometer and Spectrometers – sophisticated devices that are capable of evaluating and measuring key aspects related to the quantity and quality of light.





Winner of Best in British Product Design  
at The Brit List Awards 2021  
(accepted by Mark Lissauer, Franklite)



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We have been developing this product over a significant period of time. Due to the complexities, we are only now in a position to roll it out to the market.

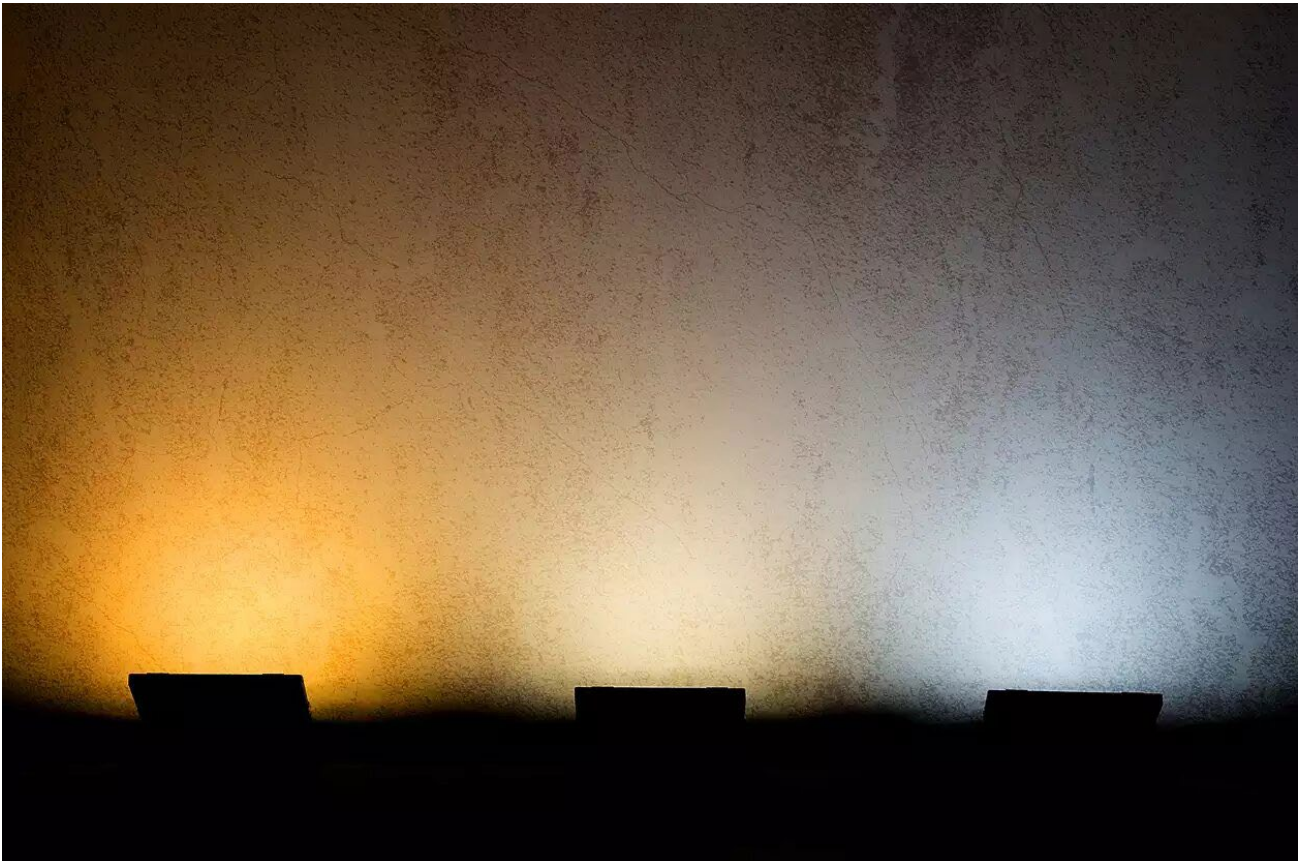
**Paul Robinson**  
Projects Manager at Franklite.



# The right **light** at the right **time**

- Mood setting
- Match interior décor
- Daylight-matching or simulation
- Change perceived temperature
- Signal activity change or stimulation



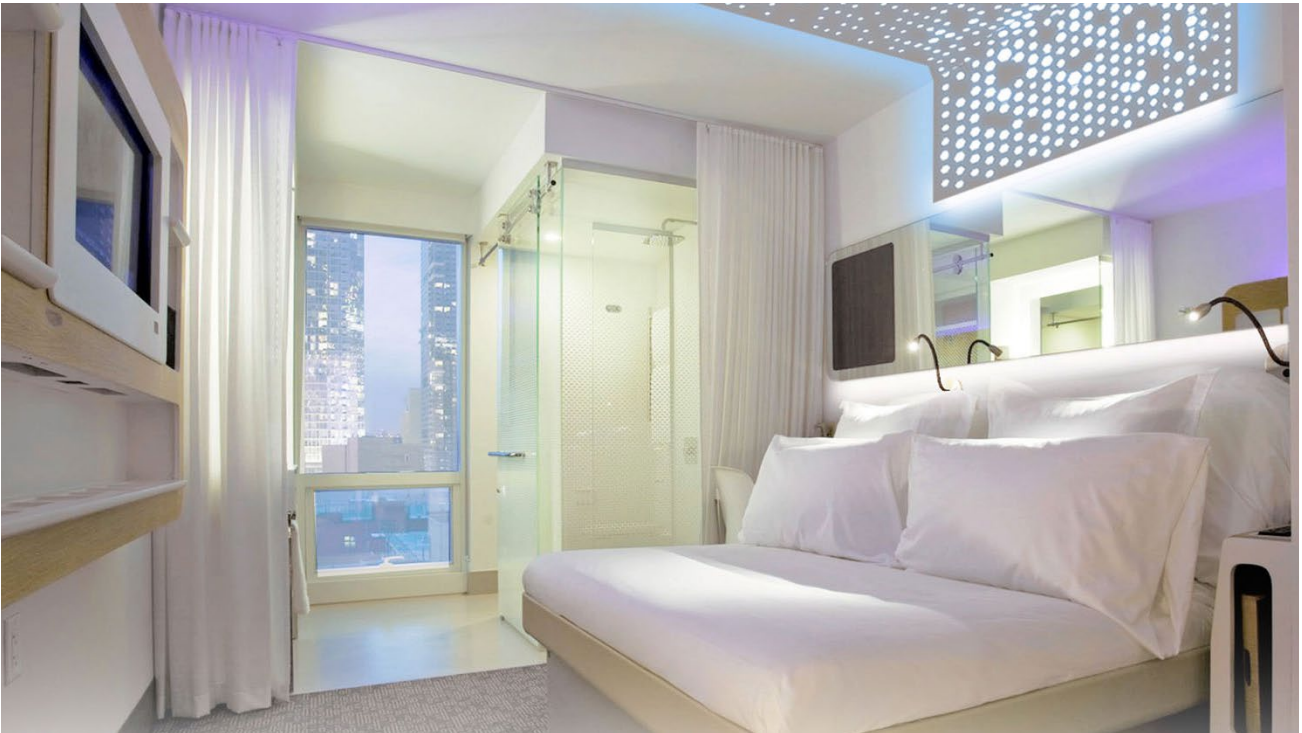


The resulting product is superior to retrofit lamps and other integral LED engines available on the market. It offers the appearance of the classic candle design that can be incorporated into a wide range of Franklite classic and contemporary fittings. It can also be easily incorporated into existing light management systems, or be the core of new ecosystems of light appliances. Franklite's L11 tuneable white fittings are compatible with the Casambi and DALI systems. The Casambi system employs a low-energy Bluetooth technology that allows the user to control all aspects of light from their smartphone or tablet.



# Circadian on the rise

inspired circadian design



The Dream Cabin inside YOTEL Boston is a living lab where guests are actively experiencing circadian science in action. The room itself incorporates the correct spectrum and intensity of light to help alert the brain in the morning or prepare the brain for sleep at night and sets temperature levels to optimise the sleep process. The pilot is the result of the hotel brand's collaboration with Suzanna Gombos, Stack + Co. Architecture + Construction, and Dr. Steven Lockley, a neuroscientist and circadian lighting expert based at Harvard.



Dr Helga Schmid is an author, lecturer and artist, and founder of Uchronia (time utopia), a platform for critical and imaginative thought on our contemporary time crisis, challenging current perceptions and offering alternative ways of being in time. In her work, she creates immersive installations, time-based performances and temporal experiences.

She recently partnered with Somerset House to develop an innovative 24-hour event that incorporated circadian stages of daylight and night, including sunrise and sunset. Guests were invited to interact with installations, conversations, performances and recordings designed around the six stages of human circadian rhythms (movement, intuitive, sleepiness, sleep, wake-up, concentration and nap).

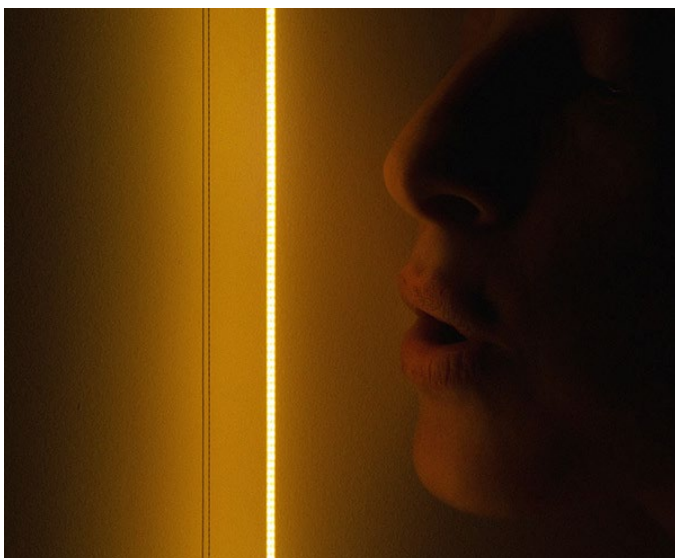
[Hotel Designs Lab Q&A with Dr. Helga Schmid here](#)



Equinox Hotel Hudson Yards is a hotel with Equinox's largest ever health club at its heart. Designed by Joyce Wang, the hotel features 212 'cool, dark and quiet' guestrooms and suites designed by Rockwell Group to act as a respite from the city. The rooms are 'ultimate sleep chambers' with soundproofing, blackout shades and an exclusive bed system. Wang also created a 'rhythm of timber archways' in the spa treatment rooms, to evoke the feeling of an inner sanctuary.



Zedwell Piccadilly has been designed Shanghai based architects, Neri & Hu, as a destination that promotes a 'good night's sleep'. Guestrooms have been designed on the principles of Feng Shui; sleeping up to eight guests in one room, the spaces have been crafted using natural materials such as solid oak. Each guestroom features noise reducing walls, floors and doors, and warm yellow mood lighting.



'I miss you' is a sensitive light that is controlled by blowing on a suspended filament, created by experimental artist Sara Bozzini in collaboration with Tiago Rorke. Composed only of essential components, this is a naked, totally exposed light. The user's breath regulates the intensity of light. The person controlling the light is its dimmer. Regulating breath is a meditative practice, which lowers mental activity while raising consciousness and awareness.

# An insider's guide to next-level design thinking

When working as the Vice President - Global Design Strategies at Marriott International, David Kepron had the unique opportunity to rethink the design of the Westin hotel guestroom experience. In this project his team and the brand team agreed that while the existing guestroom was perfectly acceptable, it lacked a unique feature that would make it broadly identifiable as something uniquely Westin. The design strategy was based on biophilia and the team chose to focus their attention on the idea of 'owning light'.

If one were to canvas hotel companies, guests and designers of hotel properties, we would likely find agreement among them that lighting in hotel rooms is generally very poor. Kepron believes that designers of those spaces focus more on the object, the light fixture, than necessarily the light quality that supports enhanced experiences in the hotel room.



Our focus on lighting in the room would be directed at light as a medium, developing profound guest experiences by mapping light quality over day parts to match our circadian rhythm

**David Kepron**

Architect and Designer at NXTLVL Experience Design

Lights would be activated by the swing of the door and an illuminated ceiling plane would cast shadows across the walls and floor area in the vestibule as if you were walking under the umbrella of a tree. This dappled light effect created a direct connection to biophilic design and ideas like forest bathing. More than this, the interaction between the lighting system and the human occupant created what he called a "welcoming cognitive handshake" that connected the experience of the guest directly to how the room was changing aesthetically.

The whole idea of circadian rhythm and understanding that our internal biological clock establishes a foundation for wellbeing is something that is now becoming more frequently discussed. Nevertheless, we have a lot of environments that have been built years ago, and continued to be built even today, where lighting is poorly considered. Our exposure to light from our waking moments to when we begin to doze and finally fall asleep is critical to myriad biological functions.

According to Kepron, "we spend a lot of time looking at objects and form and spatial relationships between things but don't spend as much time using light to sculpt interiors, to shape experience, to provide focal points and create signature moments along the customer journey making staying at any hotel more memorable."



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