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Abstract:

In the digital era, urban life is marked by overstimulation and attention fragmentation, contributing to chronic cognitive fatigue. This thesis explores how artificial light can evoke "soft fascination", a form of effortless attention theorized by Stephen and Rachel Kaplan within Attention Restoration Theory (ART). By recreating the perceptual qualities of nature through carefully designed dynamic light installations, the study investigates how artificial lighting might support mental restoration in urban domestic settings. A prototype installation was developed using horizon-inspired colors and slow transitions to replicate the aesthetic and cognitive characteristics of natural scenes. Combining methods from environmental psychology, design, material experimentation, and visual art, the project takes an interdisciplinary approach to explore how artificial light can do more than illuminate, it can offer mental space, emotional ease, and a subtle sense of presence within the noise of modern life.

The Quiet Light Project

Evoking Natural Calm through Artificial Light

Felipe Osorio-Guzmán Martina De Francesca

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1. Introduction

In an overstimulating world shaped by screens, rapid information flows, and limited access to nature, our ability to focus and recover is increasingly challenged. Many people now spend most of their lives indoors, often surrounded by functional or fixed light. In these spaces, light rarely invites pause or presence.

Soft fascination refers to the kind of experience where attention is gently held without effort. It is what happens when we observe slow-moving clouds, light filtering through leaves, or the play of reflections on water. These experiences engage our involuntary attention in ways that allow the directed, effortful system of attention to rest. According to ART, such moments support cognitive recovery and can restore mental clarity.

This thesis asks whether artificial light can offer a similar experience. Can it be used not just for illumination, but as a medium for perception and presence? Can it create space for reflection within everyday environments, particularly for those without easy access to nature?

The project builds on both artistic and scientific perspectives. Taking inspiration from natural environments by observing phenomena like the light of sunrise and sunset in a sea/sky horizon landscape, its colors and dynamics. Also, informed by perceptual techniques found in light-based artworks, a prototype was developed and tested in domestic contexts by turning screens already available to the user (TV, laptop, phone) into light-emitting objects. A layer of translucent material placed in front of the screen diffuses the image, transforming it into a soft, ambient glow. The result is not an image to be watched, but a presence to be felt.

The aim is not to replicate nature, but to abstract some of its perceptual and emotional effects. By working across disciplines like environmental psychology, design, neuroscience, and visual art. This thesis contributes to a broader discussion around restorative environments and light as a material for care. It proposes that when designed with intention, artificial light can not merely be a medium to allow visibility, but also support our mental health and help us recover and rest, and offers us contemplative experiences within the overstimulating rhythms of urban life.

> *Imagine if artificial light could provide an accessible experience that supports mental restoration and enhances well-being.*

2. Background

In contemporary society, pervasive screen usage particularly through social media has significantly reshaped the cognitive environment in which our attention operates. Each new post or interaction on social platforms demands rapid cognitive shifts making us enter a multi-tasking state of mind.

This phenomenon illustrates a broader problem: the overstimulation of the brain through digital and urban environments. Such environments saturated with information, notifications, visual stimuli, and multitasking demands contribute to chronic cognitive overload. Notably, this overload is not merely a byproduct of technology, but is also embedded in the socio-cultural fabric of productivity-driven, urbanized societies.

To frame this issue more constructively, we draw upon **Attention Restoration Theory (ART)** (Kaplan, 1989) that suggests that mental fatigue, stemming from overstimulation and sustained focus, can be alleviated by engaging with environments that invoke *"soft fascination"* promote a sense of being away, and do not demand active cognitive engagement.

However, the urban environments in which many people live lack access to restorative natural spaces, whether it's due to work hours, living in big cities, or other factors. In response, our proposal seeks to translate the principles of ART into a light-based installation. This installation will offer a spatial pause: a refuge within the overstimulating context of the city, where individuals can relax, reset, or simply engage in casual conversation in a calming, low-demand environment.

3. Overview of the Process

This thesis applies a transdisciplinary research design methodology, integrating artistic practice, environmental psychology, observational analysis, and user testing. The goal is not only to create a design solution that evokes soft fascination through artificial light but also to generate knowledge about how artificial environments can support restorative experiences.

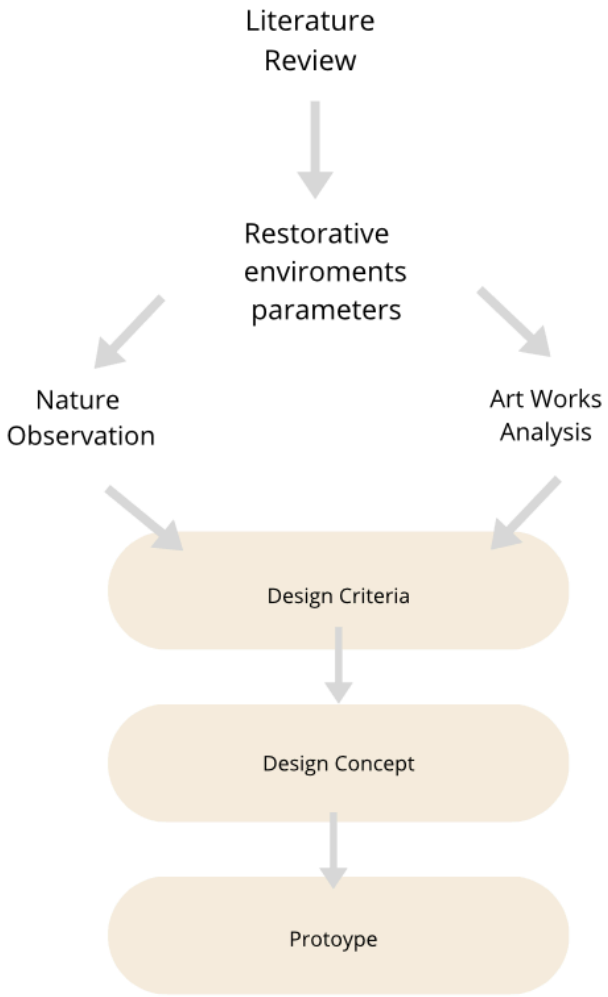


Figure 1, Methodology Structure.

3.1 Methodological Framework

The process methodology consists of six parts:

Literature Review and Theory

The first step was a review of literature from relevant fields:

Environmental psychology, particularly Attention Restoration Theory (ART) developed by Kaplan and Kaplan in 1989, which outlines how soft fascination and restorative environments function.

Neuroscience and perceptual psychology, focusing on attention fatigue, involuntary attention, and mental bandwidth (Basu et al. 2019).

Philosophy and sociology, Harmut Rosa's theory of resonance, which frames contemporary disconnection as a result of excessive control, and calls for more open, non-instrumental engagements with the world.

Artwork Analysis

A study of selected artworks and installations was conducted to extract strategies relevant to soft fascination and contemplation. This included works by:

James Turrell (Ganzfeld installations, *Aten Reign*)

Olafur Eliasson (*The Weather Project*)

Uta Barth (*Ground*, *…and to draw a bright white line with light*)

Christina Augustesen (*Daylight Instruments*)

Hiroshi Sugimoto (*Seascapes*)

Gerhard Richter (*Two Women*, *Apfelbäume*)

Carlos Cruz-Diez (*Chromosaturation* series)

These were selected for their use of abstraction, slowness, ambiguity, and immersiveness, qualities aligned with criteria for restorative environments. Each case was analyzed to identify relevant design techniques, particularly in how light, rhythm, and materiality were used.

Observation of Nature

To ground the project in real-world light dynamics, a field observation was conducted on March 20–21, 2025, during spring equinox at Amager Strand, the goal was to identify natural light rhythms that could be translated into an artificial medium, supporting the effects associated with soft fascination.

Color and Light Measurement

This approach aimed to create a temporal color palette inspired by the danish sky. The selection of hues and dynamic transitions formed the chromatic basis for the light sequences later used in the prototype incorporating theoretical analysis.

To bridge artistic observation with technical design, color and light, measurements were collected and analyzed using photoshop sampling from observational photography, Lux measurements (light intensity) and CCT (correlated color temperature).

Design Concept Development

Here we translated insights from both empirical observation and artistic analysis into a conceptual framework. This included the development of design principles around visual rhythm, material diffusion, and perceptual ambiguity. These principles became the foundation for the final prototype.

Prototype construction

Informed by the research a prototype was developed. Its construction relied on familiar technologies (TV, laptop, phone), diffused materials, and custom video sequences to explore how artificial light can evoke soft fascination in domestic contexts.

4. Literature Review

4.1 Attention Restoration Theory

Attention Restoration Theory (ART) originates from the work of environmental psychologists Rachel and Stephen Kaplan in the late 1980s and early 1990s. The Kaplans proposed that exposure to natural environments can help restore a person's directed attention, which becomes fatigued after prolonged use in tasks requiring focus. This framework was developed through a combination of theoretical exploration and empirical studies on human interactions with natural settings, suggesting that natural environments offer involuntary or "soft" fascination, which gently engages attention without effort (Kaplan & Kaplan, 1989; Kaplan, 1995).

The theory is rooted in William James's (1892) distinction between voluntary and involuntary attention, which the Kaplans built upon to explain why certain environments feel mentally restorative. ART has since become a foundational concept in environmental psychology, influencing urban planning, landscape architecture, and health design by emphasizing the cognitive benefits of green spaces. Subsequent research has supported its claims, showing measurable improvements in attention and mood after spending time in nature (Berman, Jonides, & Kaplan, 2008). The theory not only provides insight into how environments impact cognition but also offers practical implications for designing restorative spaces in increasingly urbanized societies.

In the literature review paper *Attention Restoration Theory II* (Stevenson et al., 2018), refines the conceptual understanding of attention within the framework of ART by distinguishing between different types of attention and clarifying how natural environments support cognitive functioning. According to ART, attention can be divided into two main categories: involuntary (effortless) and voluntary (effortful) attention. Voluntary attention, also known as directed attention, is the cognitive process required to maintain focus on tasks that do not inherently capture interest. This form of attention is finite and susceptible to fatigue after sustained use, it is a limited resource. ART posits that natural environments help restore this fatigued directed attention by engaging involuntary attention through soft fascination stimuli that are gently engaging without requiring cognitive effort ((Stevenson et al., 2018, p. 230).

Stevenson elaborates on the concept of *attentional effort* as the mental energy needed to sustain voluntary attention on non-automated or non-stimulating tasks. High attentional effort is typically needed in work or urban contexts, where distraction is common and cognitive

control must be actively maintained. Over time, this leads to what ART terms *directed attention fatigue*, characterized by reduced concentration, increased irritability, and a decline in cognitive performance. Natural environments, which elicit involuntary attention through aesthetically pleasing and non-threatening stimuli, allow this voluntary attentional mechanism to rest and recover, effectively reducing attentional effort (Stevenson et al., 2018, p. 234).

Furthermore, Stevenson introduces the idea of *mental bandwidth* as a broader cognitive resource that encompasses working memory capacity, attentional control, and executive functioning. Mental bandwidth is described as the overall capacity of the brain to manage information and perform cognitive tasks. ART suggests that exposure to natural environments not only restores attention but also replenishes mental bandwidth by reducing cognitive load and improving the brain's ability to filter out distractions. This holistic restoration supports complex tasks and decision-making, contributing to improved psychological functioning in both academic and professional domains (Stevenson et al., 2018, pp. 240–241).

By differentiating between directed and involuntary attention, defining attentional effort as a limited resource, and expanding the concept of mental bandwidth, Stevenson strengthens the theoretical basis of ART and highlights its relevance for understanding the cognitive benefits of restorative environments. These insights not only validate the original claims by the Kaplans but also provide a more nuanced framework for future research and environmental design practices.

According to Attention Restoration Theory, for an environment to effectively restore attention, it must exhibit four core characteristics: *being away*, *extent*, *fascination*, and *compatibility* (Kaplan, 1995). These elements define the psychological and perceptual qualities of a space that make it favorable to cognitive recovery. Among them, *soft fascination* is central, since it engages involuntary attention effortlessly, allowing directed attention (which becomes depleted through prolonged mental effort) to rest. Stevenson (2018) expands on these concepts by analyzing the sensory and structural features of natural environments, helping to abstract, transferable principles such as perceptual dynamics, spatial layering, and immersive cues that can inform the design of artificial environments that replicate the cognitive benefits typically associated with nature. Since the goal of this thesis is to answer if such benefits can be obtained by purely artificial means, these definitions become the milestones for our project.

We can concisely define the four key characteristics identified by ART as:

> **Being away**: The experience of psychological and/or physical distance from one's usual routines, obligations, or mental patterns.
>
> **Extent**: The environment must have a coherent scope and scale, rich enough in content and structure to feel like a "whole other world." It should invite exploration and give the impression of being part of something larger than the immediate surroundings.
>
> **Soft Fascination**: The quality of gently capturing attention without effort. In the case of *soft fascination*, the environment provides mildly engaging stimuli—such as rustling leaves or shifting light—that do not require focus or problem-solving.
>
> **Compatibility**: The degree to which the environment supports the individual's intentions and inclinations. A compatible environment feels easy to engage with and aligns with the user's mental or emotional state, encouraging restoration rather than resistance.

To define aesthetic qualities of the context, soft fascination is the characteristic that can help us the most in finding specific qualities. In particular, because it is generated by stimuli that are neither overly monotonous nor cognitively demanding. Natural elements like flowing water, birdsong, or tree branches swaying in the wind are commonly cited examples; they exhibit a balance of predictability and variability, this is what Stevenson (2018) refers to as "dynamic non-intrusiveness" (p. 238). These patterns allow attention to float and shift without demanding conscious control. When abstracted for artificial environments, this could take the form of slow visual transitions, ambient soundscapes, or gently moving light, all designed to be perceptually rich but *very low in semantic or emotional content*.

Spatial characteristics are also vital to achieving *extent* and *immersion*. Stevenson (2018) emphasizes that natural environments often feature layered depths, open horizons, and fractal complexity, all of which create a perception of *vastness and coherence*. Artificial environments can reproduce this effect through intentional spatial design—such as using perspective, light, and subtle movement to evoke depth, or structuring spaces with varying scales and pathways. This immersion is key to generating a sense of "being away," particularly when familiar contextual cues are removed or transformed.

Finally, to create the feeling of *being out of context*, a fundamental aspect of "being away," environments can challenge habitual perception by disrupting the usual relationships

between scale, material, or spatial logic. For example, abstract forms, ambiguous lighting, or altered gravity-like effects can dislocate the viewer from everyday expectations. If layered with dynamic but gentle sensory engagement and a sense of spatial coherence, such artificial environments could replicate the attentional benefits found in nature,offering rest, reflection, and cognitive restoration in fully constructed worlds.

Following closely how Kaplan and Stevenson describe this contextual characteristics, and detaching them from the most illustrative forms that refer to natural environments (leaves, birdsongs, water movements) it is not strange to start finding that tera are already a great number of contexts that show many of those characteristics, many buildings do this to a great degree, we can think of gothic cathedrals or the Blue Mosque in Istanbul, but most of the dynamic characteristics of light in such spaces are still governed by the natural light of the sun. We must look into the art world, especially the Light and Space movement that spawned during the 1960's in California, in order to find some of the most refined craftings of light that provide a solid precedent in a fully artificial experience that align with the context requirements that ART outlines.

Unlike *extent, being away,* or *compatibility*, which often rely on spatial or contextual conditions that have less variability, *soft fascination* operates at the intersection of perception and cognition *because* of its dynamism. It describes a state in which attention is gently held by stimuli that are neither overly monotonous nor mentally demanding, allowing the mind to rest while remaining engaged with ever changing phenomena. This makes soft fascination especially significant for mediums concerned with aesthetic experiences.

4.2 Artistic Medium: Case Studies

This section looks at how artists have used light to shape perception, affect time, and create immersive spatial experiences. These works serve as critical references, offering insight into how abstract, non-functional light can become a source of emotional resonance and perceptual stillness. Many of these installations are exhibited in museums, galleries, and other publicly accessible indoor spaces that, like churches, offer conditions for contemplative experiences. This is one reason we were interested in looking at them: they provide precedents for how built environments in urban contexts can support a different kind of attention.

James Turrell

Turrell is one of the most influential figures in light-based art. His Ganzfeld installations use uniform fields of color to eliminate edges and depth perception, producing a visual experience that feels both infinite and internal. Viewers describe losing their sense of orientation, floating in color, or experiencing a kind of temporal drift.

In *Aten Reign* (2013), for example, Turrell transformed the Guggenheim rotunda into a concentric cone of changing light. The color shifts were imperceptibly slow, encouraging visitors to sit still, gaze upward, and simply remain in the space. The work offered no narrative or interaction, just time and color, experienced through the body.

At MoMA, Turrell's installation *Inhabiting the Sky* (1980) blends daylight with artificial lighting, deepening the overall experience of the sky. Instead of relying on a fixed color, Turrell uses computer-controlled LEDs that adjust in sync with the exact timing of sunrise and sunset throughout the year. These lights slowly transition through carefully chosen hues, designed to interact with the changing colors of the sky during twilight. This meeting of light can make the sky appear almost solid, or as if it's dissolving into something fluid and intangible. By contrasting artificial light with the natural rhythm of daylight, the work creates a gentle shift in perception, one that invites stillness, wonder, and quiet attention.

This slow, non-demanding aesthetic aligns closely with the goals of soft fascination.

Figure 2, James Turrell "Inhabiting The Sky". 2005.

Olafur Eliasson

Eliasson's large-scale installations combine light, water, mirrors, and air to evoke natural phenomena. His *Weather Project*(2003), installed at Tate Modern's Turbine Hall, recreated a glowing sun surrounded by fine mist. Visitors responded by lying on the floor, gazing upward for long periods, treating the installation like a social space for shared calm.

The power of Eliasson's work lies in how it reframes the gallery as a space for collective stillness and reflection. The experiences are immersive but not didactic. They work through atmosphere, rhythm, and scale, qualities that inform this thesis's own focus on light as presence.

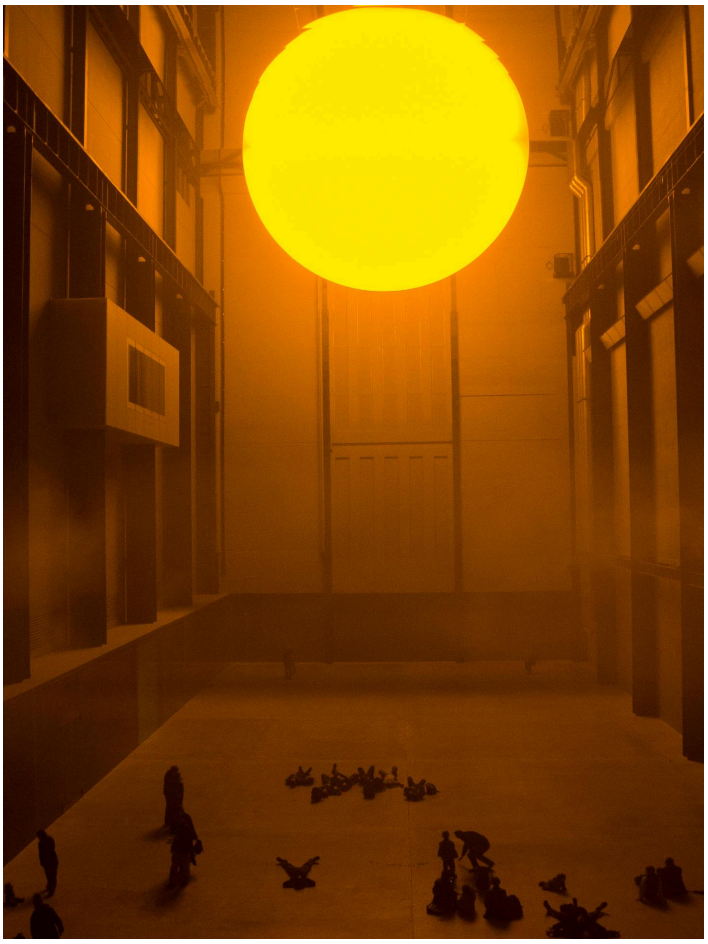


Figure 3, Olafur Eliasson "The Weather Project". 2003.

Christina Augustesen

Augustesen's work bridges research and aesthetics. Daylight Instruments and color diffusion studies use acrylic, glass, and light to mimic the feeling of daylight through abstraction. The objects change slowly, react to weather, and invite users to observe without evaluating. The palette is soft, muted, often presented through diffusing materials, creating multiple gradients between tones. Augustesen shows how artificial light can be gentle and resonant without being literal. The work is especially relevant to domestic applications, suggesting how light can become part of the daily rhythm of a room.

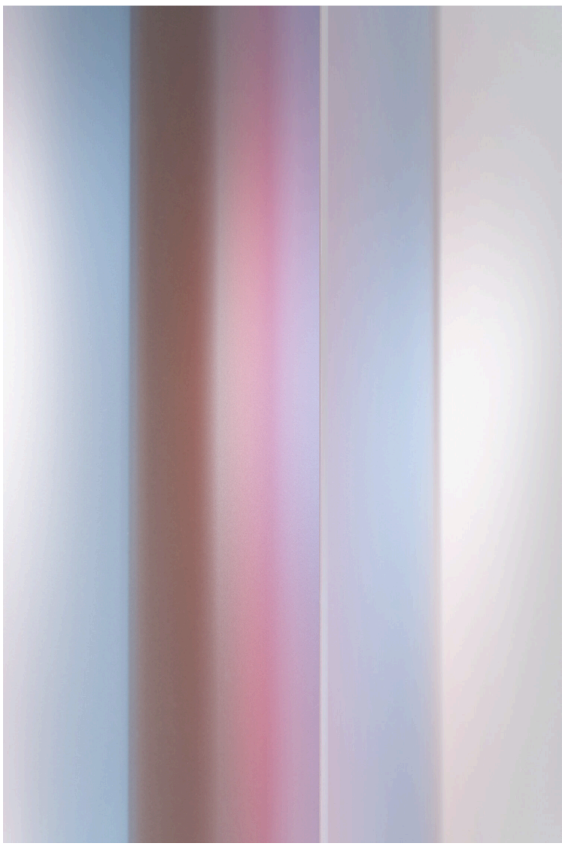


Figure 4, Christina Augustesen, "Daylight Objects". 2020.

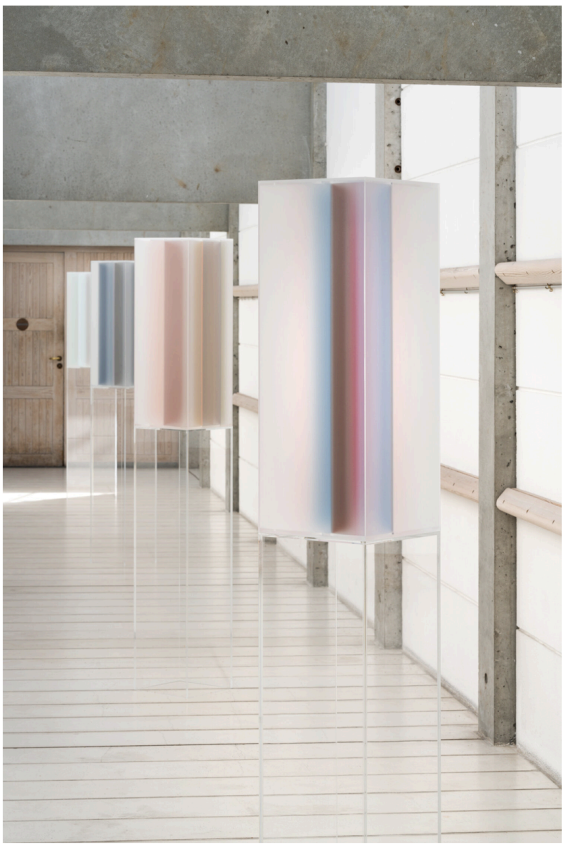


Figure 5, Christina Augustesen, "Daylight Objects", Installation View. 2020

Carlos Cruz-Diez

Cruz-Diez worked extensively with the dynamic properties of color, creating immersive environments that explored the temporality of visual perception. In his *Chromosaturation* series, viewers enter spaces composed of intense monochromatic chambers, typically red, green, and blue, that provoke optical afterimages and perceptual adaptation. These installations do not rely on image or narrative but instead create a direct engagement with color as an active, spatial condition.

His emphasis on chromatic autonomy, color freed from surface or form, demonstrates how perceptual change can occur within the body of the viewer. Cruz-Diez's practice underscores that color is not static; it is experienced through movement, time, and interaction. This has relevance for research concerned with how perceptual variation and chromatic rhythm can create conditions of immersion and soft engagement.

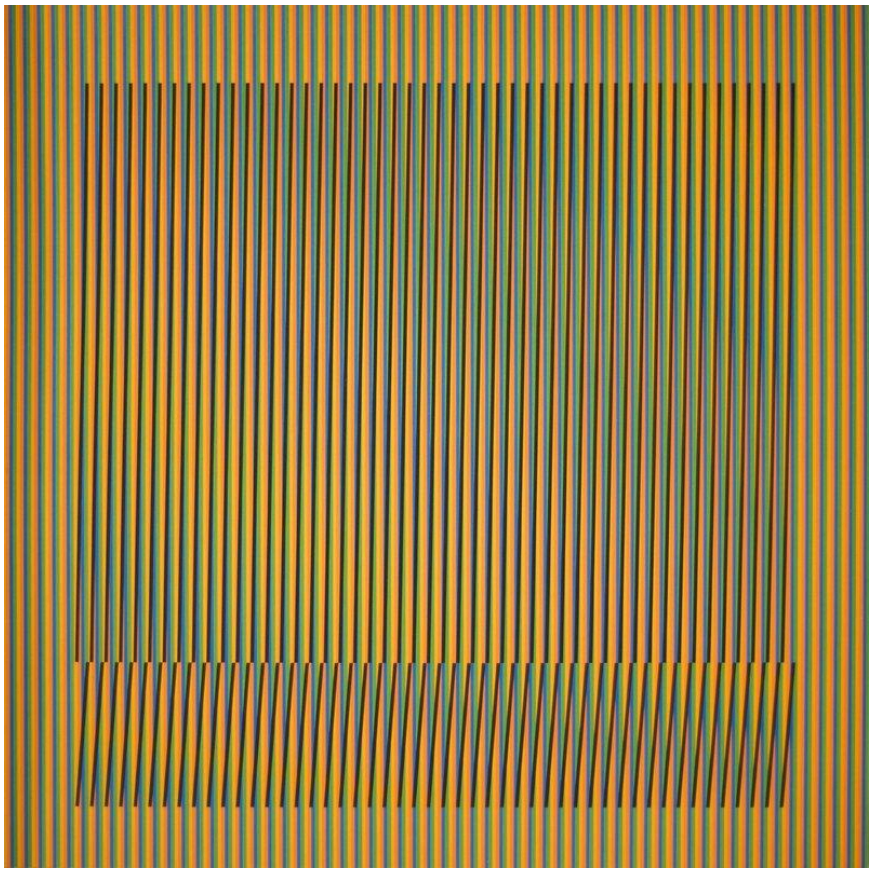


Figure 6, Carlos cruz Diez "Additive Color". 2013.

Uta Barth

Uta Barth's photographic work explores the subtleties of vision, perception, and time by removing traditional subject matter from the frame. Her images draw attention to the conditions of seeing, how light moves, how space holds presence, and how the eye drifts across familiar environments. Rather than offering a focal point, her work presents ambient, background visuality as something worth attending to.

In her earlier *Ground* and *Field* series, the camera is deliberately unfocused, reducing scenes to gradients of color and light. These works shift attention away from the object and toward the act of perception itself. Light on a curtain, a shadow across a floor, what is normally background becomes foreground. This way of working invites the viewer into a quiet, observational mode, where the experience of looking becomes the content.

Her more recent project, *...and to draw a bright white line with light*, extends this inquiry into temporality. Across a series of photographs, Barth documents how light enters her home through a window, casting a shifting white line across the space as the sun moves. The work tracks time not through narrative or event, but through the slow migration of light, marking its passage with stillness and repetition. Here, light is not only illumination, but a drawing instrument inscribing time onto space.

Barth's approach is highly relevant for work concerned with soft perception and mental slowing. She offers a model for how visual quietude can support presence, and how change, when subtle and gradual, can become a primary compositional element. Her photographs remind us that attention is not always about clarity, but about noticing what is already there, unfolding slowly across time.

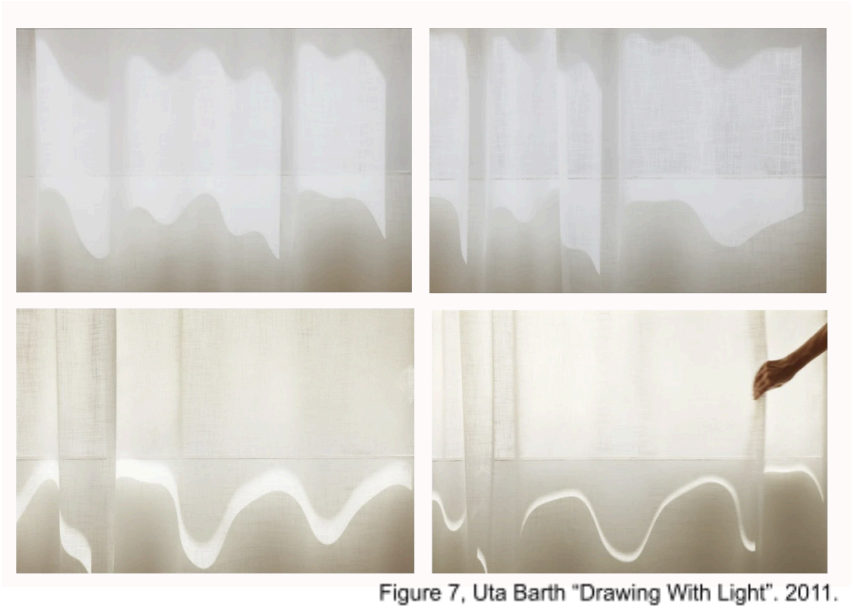


Figure 7, Uta Barth "Drawing With Light". 2011.

Hiroshi Sugimoto

In Hiroshi Sugimoto's *Seascapes*, every image follows the same compositional principle: a flat horizon line divides water and sky in equal parts. Taken from coastlines around the world, these photographs are technically similar, yet emotionally distinct. Changes in light, weather, and atmospheric depth transform each image, inviting reflection on time, place, and sameness.

Sugimoto's work reveals how spatial and perceptual complexity can emerge from simplicity. The horizon functions as both a formal and emotional threshold suggesting vastness, stillness, and contemplation. The format invites repetition without redundancy, asking the viewer to attune to subtle difference. This quality of focused minimalism, where composition supports reflection, can inform spatial design practices concerned with ambient depth.

Figure 8 HIROSHI SUGIMOTO, Lake Superior, Cascade River, 2003

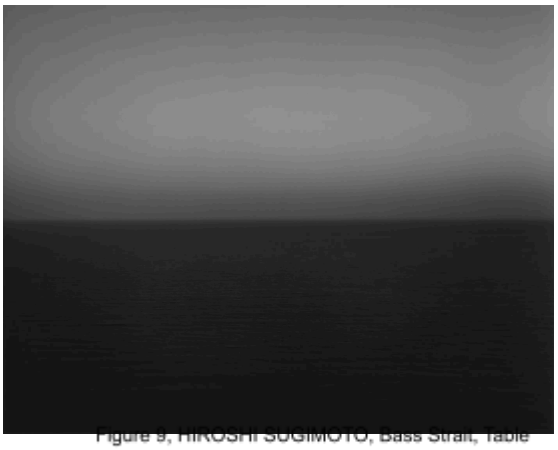


Figure 9, HIROSHI SUGIMOTO, Bass Strait, Table Cape, 1997

Figure 10, HIROSHI SUGIMOTO - Seascape, Cape-Breton, 1996

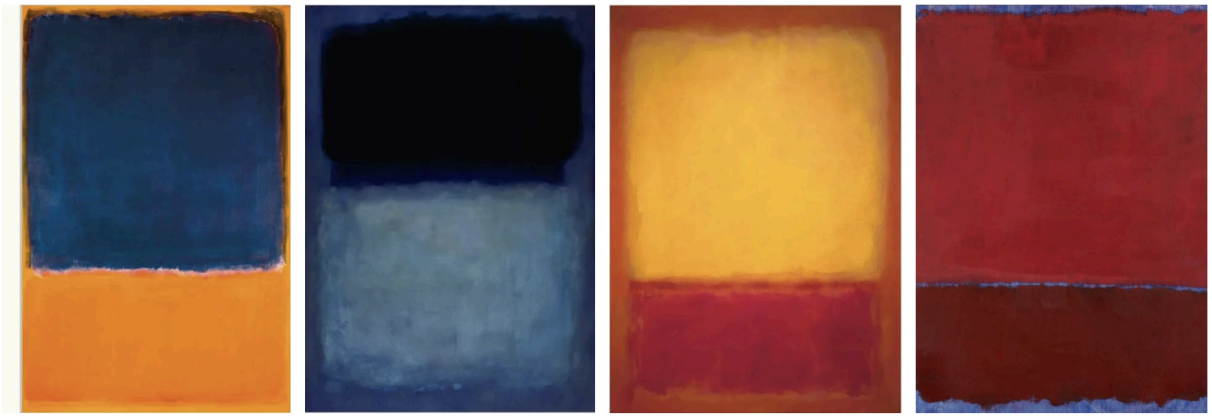
Figure 11, HIROSHI SUGIMOTO, Lake Superior, Cascade River, 1995

Mark Rothko

Mark Rothko's paintings are composed of softly rendered fields of color, often in large vertical formats, where rectangles float against luminous grounds. These works are abstract, but they are emotionally charged. Rothko sought to create experiences of intimacy, stillness, and transcendence. The viewer is meant not to interpret, but to feel: to stand in front of the painting and be enveloped by its scale, surface, and color atmosphere.

Rothko's early works often employed vibrant palettes, deep reds, ochres, and oranges layered into glowing fields. But in the later part of his career, his paintings darkened. The *Black Paintings*, created for the Rothko Chapel in Houston, replace luminosity with solemnity. In these near-monochrome works, shades of dark purple, black, and maroon create spaces that feel enclosed, silent, and weighty. The absence of contrast, combined with subtle variation in tone, invites prolonged looking and a deepening of awareness. Visitors to the chapel often describe a sense of compression or inward turning.

Rothko's compositional structure, a horizon-like division between fields, creates a threshold condition. The paintings seem to hover between surface and depth, presence and absence. His work demonstrates how spatial and emotional experience can be constructed through minimal formal means: color, proportion, edge, and rhythm.



Magenta, Black on Orange *Royal Red and Blue* *Rust and Blue* *Four Darks in Red*

Figure 12, Four paintings by Mark Rothko

Gerard Richter

Richter's Two Women is based on a found black-and-white photograph, the painting hovers between familiarity and anonymity. The composition is straightforward, two figures against a background, but the blurriness makes the faces lose their detail, contours melt into the surrounding air, and what remains is an ambiguous presence.

Richter applies the same strategy to his landscape paintings, such as Apfelbäume (Apple Trees) (1987). In this work, the blur is more atmospheric. A group of trees stands in loose formation beneath a pale, muted sky. The forms are softly blurred. The result is a landscape without detail, a visual memory rendered in low resolution. As with Two Women, the blurring does not obscure reality, it transforms it. The scene becomes less a depiction and more a sensorial presence.

It is a way of altering figurative images in order to produce a different perception of the image.

Figure 13, Gerard Richter,"The Two Women".1967.

Figure 14, Gerard Richter,"Apple Trees". 1987.

4.3 Artistic Strategies and Restorative Qualities

The artistic strategies explored throughout this chapter offer meaningful parallels to the qualities of restorative environments described by Attention Restoration Theory (Kaplan, 1995). Rather than relying on narrative, image, or stimulus, these artists work with light, perception, and composition to create conditions that can be immersive, open-ended, and emotionally resonant qualities that support mental deceleration and soft engagement.

Across this diverse body of work, we observe a recurring commitment to slowness, repetition, and perceptual ambiguity. These qualities are not passive but invite a different mode of attention, that is: soft fascination. In projects like Uta Barth's photographic studies of light or Cruz-Diez's chromatic chambers, perception is gently engaged over time, allowing the viewer to drift without the cognitive strain of interpretation. The viewer is invited to notice, rather than solve; to feel, rather than decode. This kind of sustained but low-demand attention fosters mental restoration by offering perceptual richness without overload (Basu, Duvall, & Kaplan, 2019).

Importantly, the spaces and visual conditions created by these artists also evoke a sense of being away not necessarily through physical distance, but by enabling a psychological removal from everyday demands. Whether through Turrell's horizon-less fields of color, Sugimoto's infinite seascapes, or Rothko's near-monochrome canvases, the viewer is drawn into a state of perceptual suspension. These experiences extend beyond the immediate image or space; they create mental rooms for reflection, presence, and openness.

At the same time, the formal and compositional clarity of these works give them a sense of extent—what Kaplan describes as a coherent environment that can be explored mentally. Whether it is the modular consistency of Sugimoto's seascapes, the atmospheric rhythm of Janssens' installations, or the chromatic cycles in Augustesen's daylight studies, each work provides enough continuity and variation to sustain attention over time. They create visual systems that encourage perceptual wandering and introspection.

Finally, these environments tend to align well with the needs and capacities of the viewer. They require no specific knowledge to engage, and they do not dictate a singular response. This compatibility between the structure of the work and the state of the observer is crucial to their effectiveness. The viewer is not asked to perform, decode, or react. Instead, they are given space to inhabit, interpret, and simply be.

Taken together, these works demonstrate how art can create the very conditions that Attention Restoration Theory identifies as necessary for mental renewal. Through their sensitivity to light, rhythm, and atmosphere, they show that visual environments can be both contemplative and cognitively restorative.

4.4 Resonance and Control

Sociologist Hartmut Rosa's theory of resonance offers a useful framework for interpreting this. According to Rosa (2019), resonance occurs when individuals enter into responsive, non-instrumental relationships with the world, relationships marked by mutual openness, transformation, and emotional significance. In contrast, modern society often emphasizes control, optimization, and efficiency, which tend to flatten experience and diminish the potential for genuine connection. Rosa argues that modern society's increasing obsession with control technological, scientific, and economic leads to a disconnection from the world. The more we attempt to optimize, predict, and manage, the more the world becomes mute and unresponsive (Rosa, 2021).

In artistic and spatial practices, this suggests a shift away from environments that respond to users in predictive or immediate ways. Instead of being adaptive or interactive in the conventional sense, many of the artworks considered here unfold slowly and indifferently. They do not change in response to the viewer but instead maintain their own rhythm. Viewers must attune to the work on its own terms: slowing down, lingering, and adjusting their sensory engagement. This asymmetrical relationship is central to resonance: the idea that meaning arises not from control, but from attentiveness and openness.

Rather than seeking to please, inform, or entertain, these works invite a different mode of presence. They ask for patience. The works of artists such as Olafur Eliasson exemplify this. His large-scale installations such as *The Weather Project,* do not ask for interpretation or interaction in a conventional sense, but instead invite the viewer into a space of sensory openness, they must adapt, slow down, linger, and recalibrate their perceptual rhythm. Their value lies not in responsiveness but in their quiet insistence on being as they are and allowing the viewers to *resonate* with them.

In terms of design principles we should strive for supporting and creating environments that resist immediate consumption, that do not compete for attention but hold space for it. Experiences where their value lies not in what they do, but in what they don't do, in what they allow.

4.5 Foundations for Restorative Light

This chapter establishes the conceptual and scientific foundations for understanding light and color as restorative media. Rather than treating color as fixed or decorative, we explore its behavior across different disciplines from physics and philosophy to visual art in order to inform the perceptual strategies used in the design concept.

A key reference in our exploration is artist Carlos Cruz-Diez, who challenged traditional views that treated color as secondary to form. Through a scientific and artistic lens, he described color as an unstable, autonomous phenomenon shaped by space, time, and perception.

We also examine scientific advances, from Newton's prism experiments to Helmholtz's trichromatic theory and the CIE's efforts to standardize color measurement. These milestones reveal how color perception sits at the intersection of physiology, physics, and culture.

Ultimately, understanding color in this multidimensional way helps us design environments that support presence, relaxation, and recovery, especially under artificial light. In doing so, we recognize color as a vital, human-centered tool for creating restorative spaces.

4.5.1 Approaches to Color Perception

One of our references discussing color is the artist Carlos Cruz-Diez, in his book *Reflection on Color* (1989). In this work, he explains how he applied a scientific structure to his art pieces, researching color and promoting interdisciplinary studies between art and color. As he states: "Just as intelligence without structure is useless for human beings. The first step consisted therefore, in elaborating a conceptual platform" (p. 12). "Art is a complex structure of communication, expression, discovery and invention. Man lives in an evolving world, and his existence is also an evolutionary event" (Cruz-Diez, 1989, p. 29).

He also points out that historically, despite various theoretical debates, color was consistently treated as secondary lacking true independence. It was primarily associated with beauty, art, and nature, forming long-standing connections among these domains. From Ancient Greece to the late 19th century, form was prioritized over color, as it was seen as more directly tied to the imitation of reality. Philosophers like Aristotle viewed color as the

product of the interaction between light and darkness, while alchemists considered it a property of matter that disappears in darkness (p. 12).

Isaac Newton first identified the color spectrum in 1666 by passing a beam of white light through a prism, which created a rainbow and revealed seven distinct color zones: red, orange, yellow, green, blue, indigo, and violet. Today, we understand that the visible spectrum is only a small part of the broader electromagnetic spectrum, with the wavelengths of color measured in nanometers. The human eye struggles to interpret colors at the extremes of the spectrum, such as red and violet, and is more sensitive to colors like yellow, green, and blue in the middle. Additionally, both infrared and ultraviolet light are invisible to the human eye. Of the visible colors, violet has the shortest wavelength, frequency, and energy (Perryman, 2018, p. 8).

The understanding of color perception has undergone significant shifts over the centuries, particularly with the advent of scientific theories in the 19th century. One of the most influential contributions came from Hermann von Helmholtz, whose trichromatic theory dominated color vision for much of the 19th century. Helmholtz's theory, first proposed in 1802, was grounded in the discovery of color mixing through the varying intensity of three primary wavelengths of light. "In the most basic sense, we see different colors because different objects absorb or reflect different wavelengths of light depending on their physicality or matter" (Perryman, 2018, p. 8).

As noted by Steinvall and Street in *A Cultural History of Color in the Modern Age*, Helmholtz's theory "explained this discovery by postulating three types of receptors in the human retina, each maximally sensitive to a different point in the visual spectrum, producing red, green, and blue experiences, respectively" (Steinvall & Street, 2017, p. 22). According to this theory, all other color experiences arose from the simultaneous stimulation of multiple receptors.

Helmholtz also took a physiological approach to color vision, positing that colors were not external properties, but rather sensations located inside the human mind, making their perceived location in the world an illusion. This sensation-based account appealed not only to physiologists but also to physicists, particularly those exploring the effects of light mixing. The trichromatic theory, with its focus on sensory experience, laid the foundation for understanding how colors emerge as a result of retinal stimulation, influencing subsequent research in color science.

As scientific understanding of color progressed, the need for standardized methods of measuring color became evident. This led to the establishment of the International Commission on Illumination (CIE), which introduced the 1931 color triangle in an effort to define color perception through measurable parameters. As Steinvall and Street explain, the CIE “proposed a one-to-one mapping of subjective qualitative experiences with objective physical similitude,” aiming to define color experience through key parameters: **hue, saturation, and brightness** (Steinvall & Street, 2017, p. 23). However, the committee faced difficulties in reaching consensus on subjective parameters, as it was challenging to quantify these qualities in a universally agreed-upon way.

L.A. Jones, a member of the CIE committee, further elaborated on the nature of color, stating that "color consists of the characteristics of light... of which a human observer is aware through the visual sensations which arise from simulations of the retina" (Jones, 1953, p. 26). This underscores the continued emphasis on physiological processes in understanding color, highlighting that color perception is inseparable from the sensory interaction between light and the observer.

Taken together, these perspectives color like not merely as a physical attribute, but as a perceptual experience shaped by light, time, and context. This understanding is essential for our project, which relies on dynamic, shifting light environments to create emotional and cognitive effects. It affirms that color, when approached as a living phenomenon rather than a static property, becomes a vital tool for designing restorative visual experiences.

4.5.2 The Dynamics of Color

Building on the previous discussion, we now focus on color’s behavior over time, how it changes in response to light, material, and viewpoint. Its perception is intrinsically tied to context, making it necessary to consider the environment in which it appears. As Carlos Cruz-Diez emphasizes, “Color was only ‘an anecdote of form’, a ground for reminiscence. It was never considered in its true nature, as a changing, unstable and ambiguous reality, conditioned to the fortuitous circumstances of light” (Reflection on Color, 1989, p. 15). This perspective challenges traditional conceptions of color, urging a reconsideration of its role as dynamic and context-dependent rather than static or secondary.

Another dynamic aspect of color perception is the role of the spectator. As Cruz-Diez notes, “I obtained subtractive combinations that can be modified depending on the spectator’s viewpoint, light intensity and surrounding color” (Cruz-Diez, 1989, p. 128). Color is not a property that exists independently of observation; rather, it emerges through interaction

between light, material, and the perceiver. This variability introduces a sense of contingency into the visual experience, aligning with the idea of soft fascination: perceptual engagement that invites attention without demanding it.

Cruz-Diez emphasizes that color exists in a state of constant transformation, generating independent realities. These realities are defined by their occurrence within specific spatial and temporal conditions. This shift enables a new kind of dialogue between the viewer and the artwork, one that is grounded in sensation, rhythm, and subtle variation.

This understanding of color as temporally and spatially contingent informs our approach to creating restorative visual environments. To initiate our investigation into the colors that evoke soft fascination, we began with the premise that this effect is most often achieved when color reflects the dynamics of natural settings. Based on this, we examined natural color wheel systems and environmental light conditions to identify which characteristics could be translated into artificial compositions.

Through this analysis, we observed that the saturation and layering of hues plays a critical role in producing the restorative effect associated with soft fascination. Gradual transitions from deeper to lighter tones, much like the shifting tones of the sky throughout the day, proved especially relevant. Cruz-Diez also speaks to this: “All colors and their combinations inherently exist in the natural world and influence our emotions, regardless of our conscious awareness or acceptance of this effect” (*Reflection on Color*, 1989, p. 51). These affective influences are not just aesthetic; they carry cognitive and emotional implications, helping to support mental deceleration and presence**.**

This led us to consider a core design question: Is there a minimum amount of colors necessary to evoke soft fascination? Drawing from our artistic references, we noticed that impactful visual experiences often relied on limited palettes. In some cases, a single hue, that, when modulated through light, material, and time, was enough to generate a strong contemplative effect. Inspired by this, we hypothesized that reducing the number of elements in a light-based composition might actually deepen the restorative response.

To explore this, we conducted an experiment inspired by James Turrell’s *Light Cells*. The aim was to test whether a monochromatic but dynamically modulated light field could evoke a similar sense of presence and mental slowing. Our findings support the idea that it is not the quantity of color, but its behavior, its rhythm, scale, and contrast, that matters most.

In this way, the design of artificial environments capable of supporting soft fascination must account not only for the selection of hues but also for their dynamic unfolding over time.

Color, in this sense, becomes a perceptual medium rather than a decorative surface. Its success lies in how it behaves, slowly, subtly, and continuously, in dialogue with space and attention.

4.5.3 The Ganzfeld Effect and The Necessity Of Dynamic Light

This chapter examines the Ganzfeld effect and its implications for lighting design. The Ganzfeld phenomenon illustrates how the human visual system responds to unchanging, unstructured light. Drawing from perceptual psychology and neuroscience, we use the Ganzfeld as a contrast to justify why dynamic, structured light is essential in environments designed to support mental restoration and soft fascination.

What Is the Ganzfeld?

The term "Ganzfeld," meaning “whole field” in German, was introduced by Gestalt psychologist Wolfgang Metzger in the 1930s. A Ganzfeld occurs when a person is exposed to completely homogeneous visual stimulation that fills the entire visual field. This can happen naturally for example, during snowstorms or when flying through dense clouds or artificially, using a uniformly lit dome or screen.

In a Ganzfeld, light reaches the eyes equally from all directions. The visual field contains no contrast, texture, edge, or gradient, no perceptual information. The brain, which relies on detecting changes in luminance, color, and form, is essentially deprived of structure. The result is a kind of perceptual disorientation or “blindness”. This gray fog, known as *Eigengrau* or ‘intrinsic gray’, results from the absence of structured visual input, perceived even in total darkness or visual uniformity (Wackermann, Pütz, & Allefeld, 2008).

Visual Effects and Perceptual Disintegration

Initially, observers in a Ganzfeld experience an inability to fixate. The visual field slowly loses color, decolorizing into a washed-out gray. Vitreous floaters, blood vessels, and internal eye artifacts may become visible. Prolonged exposure (10–20 minutes) leads to further perceptual changes, including:

- **Blank-outs:** temporary losses of vision
- **Loss of awareness of eye position:** difficulty distinguishing whether the eyes are open or closed
- **Hallucinations:** appearance of shapes or patterns in the absence of input

- **Sensory ambiguity:** reduced ability to differentiate internal from external stimuli

Importantly, any minor change in luminance or color, such as a blink or a subtle flicker, can restore perceptual clarity. This highlights a fundamental principle in sensory neuroscience: perception depends on change. When stimulation is invariant, the brain ceases to respond.

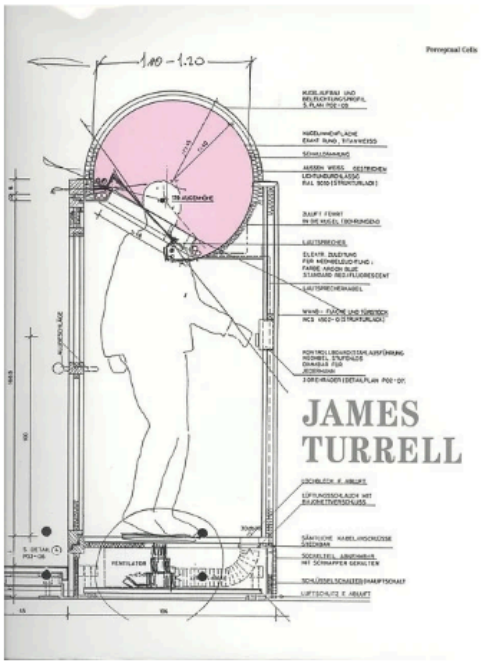


Figure 15, James Turrell, "Perceptual Cells".

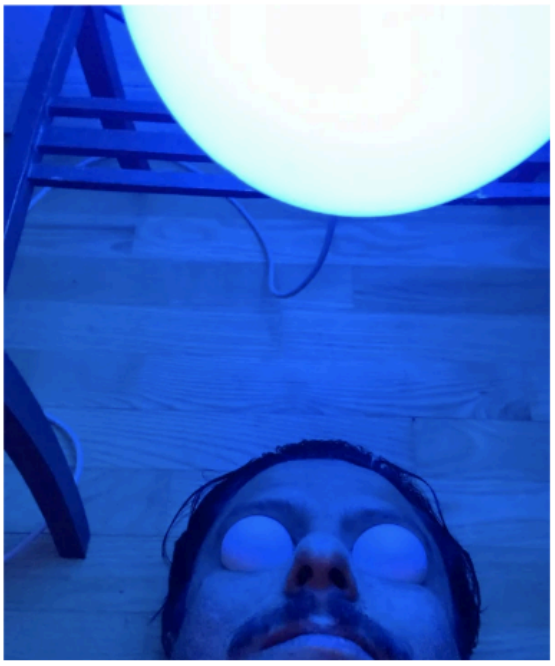


Figure 16, Experiment conducted by the authors.

The Ganzfeld illustrates what happens in the absence of perceptual structure. Although its effects are most extreme in lab or natural whiteout conditions, it provides a powerful cautionary tale for lighting design. If ambient lighting is too uniform, too static, or too neutral, it risks producing a mild version of the Ganzfeld effect, an experience that may induce discomfort, disorientation, or mental fatigue over time.

This is particularly relevant for domestic and architectural lighting that seeks to be "calm" or "minimal." While these goals are generally good, a totally flat lighting condition may backfire. As shown in Ganzfeld studies, the absence of perceptual anchors can lead not to peace, but to a sense of void. Without change, attention flattens. Without structure, perception drifts, not into soft fascination, but into confusion.

Also, The Ganzfeld challenges the assumption that bright light is always stimulating or restorative. In many cases, a bright, uniform field of light results in faster perceptual fading than dim, structured light. Long wavelengths (reds and oranges) tend to fade fastest, while

shorter ones (blues) create a stronger sense of darkening (Wackermann, Pütz, & Allefeld, 2008). This suggests that the restorative quality of light is not simply a matter of brightness, but of spatial and temporal complexity.

Dynamic light offers:

- **Temporal structure:** gradual change invites ongoing attention
- **Subtle variation:** even low-contrast motion is enough to engage the visual system
- **Prevention of fade-out:** color and luminance shifts prevent desaturation and gray-out
- **Support for soft fascination:** rhythm without overload encourages mental rest

In essence, our design solution should be a sort of counterpoint to Ganzfeld. It uses minimal light not to erase perception, but to hold it gently. It acknowledges the need for calm, but also the necessity of change. This balance between stillness and rhythm, softness and structure, is what allows the light to support mental restoration.

Broader Implications

The Ganzfeld phenomenon demonstrates a deep truth about the human brain: we are built to perceive change. Total uniformity is not neutral; it is a kind of deprivation. In this light, the pursuit of minimalism in design must be carefully moderated. Simplicity must include rhythm. Calm must include patterns, variations, small disturbances of the perceived homogeneity.

Lighting design that ignores this risks creating beautiful but psychologically flattening environments. By understanding the dangers of unstructured light, we can design better atmospheres, ones that soothe without silencing, and slow down time without dissolving perception.

4.5.4 The Horizon Line: Orientation and Abstraction

The horizon line is among the most elementary spatial references available to human perception. It not only describes the meeting point of land or sea with sky but provides a fundamental orientation for understanding where the body exists in relation to space. The horizontal axis is what defines what is above and what is below. In this sense, the horizon is not just visual, but existential, it anchors our position in space.

In the context of spatial perception and representation, the horizon line is inseparable from the principles of linear perspective. This system was first formalized in the early 15th century by Filippo Brunelleschi, whose experiments with architectural drawing demonstrated how a

fixed horizon line and vanishing point could create the illusion of a three-dimensional depth on a two-dimensional surface (Davies, S., et al. 2009). Beyond geometry, the horizon has continued to function as an anchoring element in both image and environment. In perceptual psychology, the ability to distinguish ground from sky, or to locate oneself in a spatial field, relies on such minimal reference points. The horizon provides the basic structure needed to establish figure-ground relationships and depth cues. This is particularly important when engaging with abstract or minimal visual environments, where representational content is absent.

In terms of restorative experience, the horizon supports soft fascination as defined by Kaplan (Kaplan, 1995) A visual representation without structure may lead to perceptual fatigue or disorientation, while one with too much information can overwhelm the viewer. The horizon, in its simplicity and stability, offers just enough spatial grounding to support mental rest. It permits abstraction and openness while providing a legible framework.

This tension between stability and openness, is at the heart of many visual practices concerned with minimal perceptual information. Hiroshi Sugimoto's *Seascapes* exemplify this. Each photograph is composed with a perfectly centered horizon line dividing sea and sky. The imagery is minimal, almost blank, but the composition is precise. Similarly, Mark Rothko's paintings make use of horizon-like divisions between soft-edged color fields. These works are not images of space, but they evoke spatial tension. The boundary between upper and lower fields in Rothko's canvases creates a latent horizon, suggesting weight and atmosphere. The viewer is not given a scene but an orientation, a perceptual ground upon which feeling can emerge (Rothko, 2006).

As noted in a wall at the exhibition *HAVET* at the Louisiana Museum of Modern Art in Denmark where some of Sugimoto's *Seascapes* where shown:

> *"Views on land are transformed by vegetation, geological processes and human intervention. But the view of the sea beneath the sky is one we share with the first humans."*

This observation points to a shared visual memory, one that transcends culture and time. The flat line of the sea meeting the sky is perhaps one of the few unaltered visual experiences that connects contemporary viewers with prehistoric ancestors. It is a spatial condition that has always existed and continues to offer the same perceptual and emotional cues: distance, openness, calm.

Since we are aiming to evoke contemplative or restorative effects, referencing the horizon explicitly or abstractly can provide the minimal structure needed to hold attention without directing it. It acts as a silent guide, supporting the viewer's position without imposing content.

4.5.5 Diffusion, Blur and Perception

In natural environments, diffusion appears as fog, mist, or haze. These phenomena obscure detail, dissolve edges, and create a kind of mysterious uncertainty. Distance becomes harder to measure, forms lose their boundaries and space becomes ambiguous. A blurred field is one where things are still visible, but not fully graspable. This softening of forms can support what Kaplan defines as soft fascination: a state of gentle attentiveness where directed focus can rest (Kaplan, 1989). By reducing clarity without eliminating structure, diffusion creates presence without pressure. As Stevenson notes, environments that support restoration often include stimuli that are subtly dynamic but also non-intrusive, this conditions that engage involuntary attention while allowing cognitive recovery (Stevenson et al., 2018)

This approach resonates with the work of artists like Gerhard Richter, whose blurred paintings disrupt clarity to evoke uncertainty, memory, and slowness. In Richter's case, blurring resists the immediate readability of photographic imagery, opening space for reflection and re-interpretation. Similarly, in the context of light, blurriness delays recognition and creates a visual pause. It removes the symbolic and emphasizes the sensory. The experience becomes less about seeing a thing, and more about being with it.

In terms of spatial experience, diffusion affects how we read distance and depth. In fog or mist, the boundary between near and far collapses. What is close appears to float; what is distant disappears. This ambiguity creates a form of openness not defined by visibility, but by atmosphere. Appleton's theory of prospect and refuge emphasizes the emotional impact of such ambiguity: partial concealment offers not just protection, but also the space for imagination and calm (Appleton, 1975)

4.5.6 Light Measurements

As lighting designers, the way we perceive and communicate light goes beyond intuition, it requires a shared vocabulary. Metrics like **lux** and **CCT** (correlated color temperature) offer us objective reference points for the creative dialogue.

CCT

In lighting design, using a precise range of wavelengths can support biophilic goals by mimicking qualities of natural light,helping users feel more tuned to outdoor rhythms and environments. For example, mimicking the natural spectrum of daylight can support our circadian rhythms, especially in spaces without access to real sunlight (Houser & Esposito, 2021). This helps create a sense of time and connection to the outside world.

On the other hand, we can also select specific wavelengths to evoke particular moods or natural settings. Whether it's the warm tones of sunlight or the cool hues of water, the spectrum becomes a tool not just for visibility, but for emotional and sensory storytelling in space.

Lux

Understanding lux levels at dawn, noon, or dusk provides a valuable foundation for designing spaces that resonate with the natural rhythm of the day. These measurable values offer essential reference points, allowing us to compare outdoor light conditions, including horizon views, with the qualities of light we create indoors.

5. Nature Observation and Analysis

5.1 Study Of Colors of Danish Horizon During Equinox

The horizon is intrinsically linked to open views and access to nature, as it allows us to engage with the dynamic interplay of the sky. However, the horizon is a concept less perceptible in urban environments, particularly in cities with tall buildings, where it becomes obscured. In contrast, it is only when we are at the edge of something, such as the boundary of a landscape, that we are able to see the horizon. The experience of witnessing the horizon and observing the ever-changing dynamics it presents can serve as a restorative moment, providing a sense of mental reset and tranquility.

For this reason we made a study case to the Danish horizon during spring equinox day from Sunrise til Sunset. The sunset was located in Amager beach, an open horizon view and the sunrise was in the lakes in Norrebro, fusing ourselves in the color of the sky.

The procedure of the color analysis was to take pictures each 15 minutes from sunrise to sunset and then subtracted the colors in ten points in each picture.

This type of the color selection process from sunrise to sunset was conceptually by Aristotle's early theorization of color. He is credited with establishing one of the earliest known linear color scales, which spans from white, symbolizing the brightness of midday, to black, representing the absence of light at midnight. According to Aristotle, all colors emerge from the dynamic interaction between light (white) and darkness (black) (Perryman, 2018, p. 14). This philosophical framework informed our temporal approach, emphasizing the evolving qualities of light across the day as a means to construct a nuanced and contextually grounded color palette inspired by the danish sky that produces the effect of soft fascination.

5.1.1 Characteristics of the Location

The timelapse was conducted at Amager Strand, Copenhagen, on March 20-21th, coinciding with the spring equinox. Photographic documentation was carried out from sunrise to sunset.

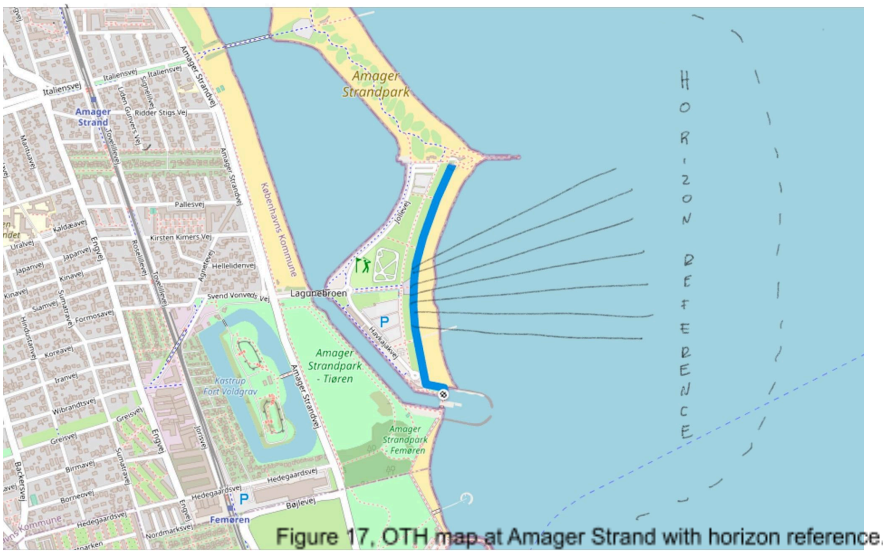


Figure 17, OTH map at Amager Strand with horizon reference.

Amager Strand is a beach located in Copenhagen and represents the closest accessible point from the city where an unobstructed view of the horizon is available. The location presents a “hybrid panorama” where nature, infrastructure, and human activity coexist. At this location you can observe:

I. Unobstructed Horizon

Amager Strand provides a clear, open view of the eastern horizon across the Øresund Strait.

II. Wind Turbines and Renewable Energy Infrastructure

A defining feature of the view is the presence of offshore wind turbines, visible in the distance.

III. Maritime Activity

The Øresund is a highly trafficked waterway, and various ships, ferries, and boats regularly cross the horizon line.

IV. Industrial Elements

Depending on the direction of view, parts of Copenhagen’s industrial harbor can be seen along the horizon, including cranes, chimneys, and shipping infrastructure.

V. Birds and Coastal Wildlife

Amager Strand is also home to a variety of bird species, both migratory and local. Their presence introduces moments of unpredictability and life to the scene.

VI. Wind and Atmosphere

The wind shapes the experience of the horizon both visually, through rippling waves,and physically, adding a tactile element to the environment.

Figure 18, Sun Path of location, Amager Strand, Copenhagen.

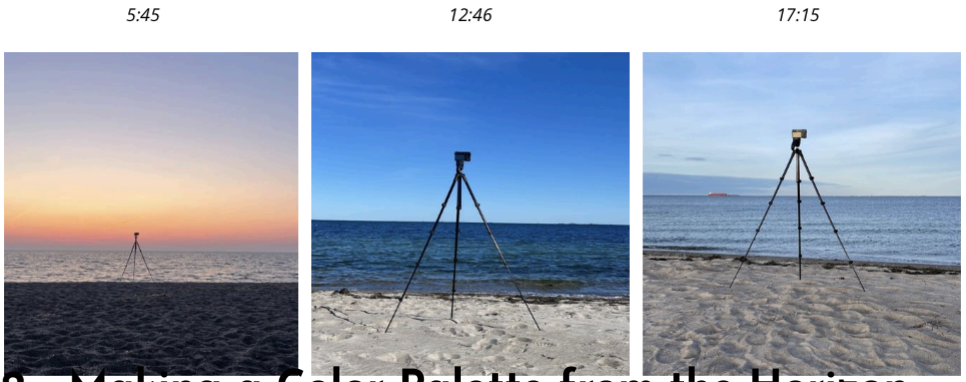


Figure 19, Process pictures by authors.

5.2 Making a Color Palette from the Horizon

5.2.1 Structure for colors selection

To guide the color selection process, we developed a structured grid overlay on the image, dividing it into ten distinct sections. Within each section, we identified a specific intersection

point where the guidelines crossed. The color values at these intersection points were then extracted, resulting in a curated color palette representative of the Danish sky during the equinox. This palette is the case study we were studying around the color dynamic to apply to our design solution.

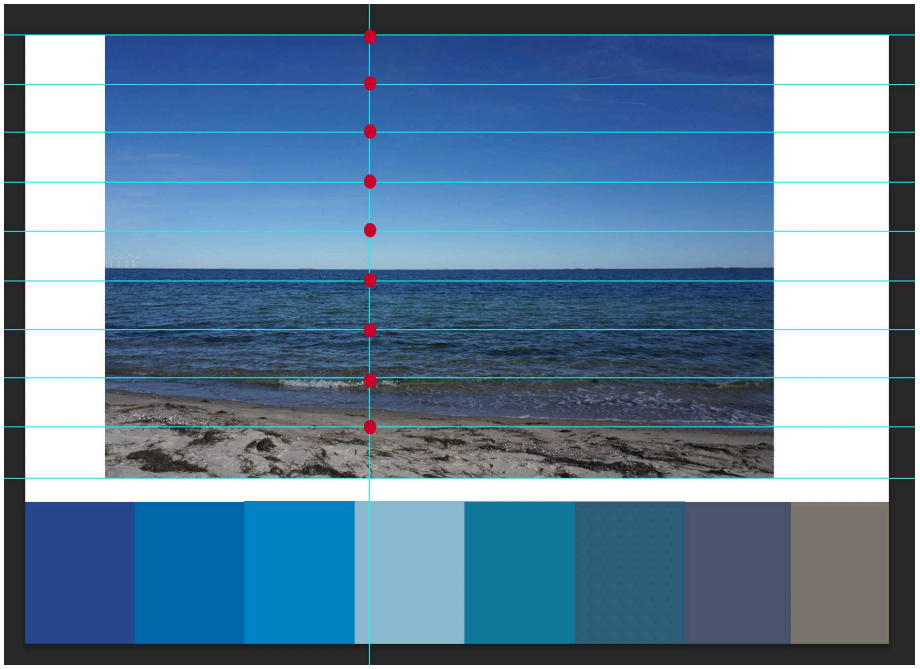


Figure 20, Grid base structure in Photoshop Adobe Software for extraction of colors from the respective palette.

5.2.2 Extraction of colors and measurements

In this section, we explore the subtle temporal dynamics that arise in natural environments. By observing how light interacts with moving elements like wind and surface texture, we identify perceptual rhythms that can inform the atmospheric behavior of artificial light. We

map the colors of the horizon observed during the equinox directly to their corresponding *lux* (light intensity) and *CCT* (correlated color temperature) values at each moment of the day. This integration allows us to not only capture the chromatic qualities of natural light but also to ground them in measurable lighting parameters that inform design decisions.

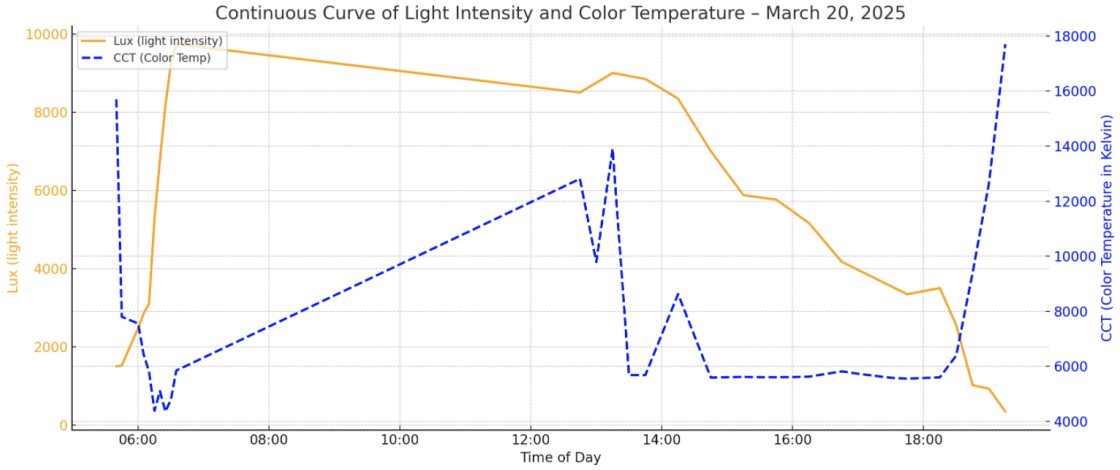


Figure 21, *The orange line represents the light intensity (lux) throughout the day. The blue dashed line shows the changes in color temperature (CCT).*

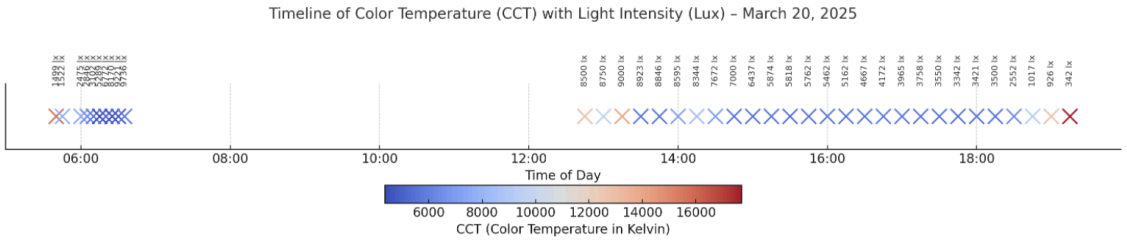


Figure 22, *Each colored dot represents the color temperature (CCT) at that time of day, using a spectrum from warm (sunrise/sunset) to cool (midday sky). Above each dot, you'll see the lux value (light intensity), showing how bright the light is at that moment.*

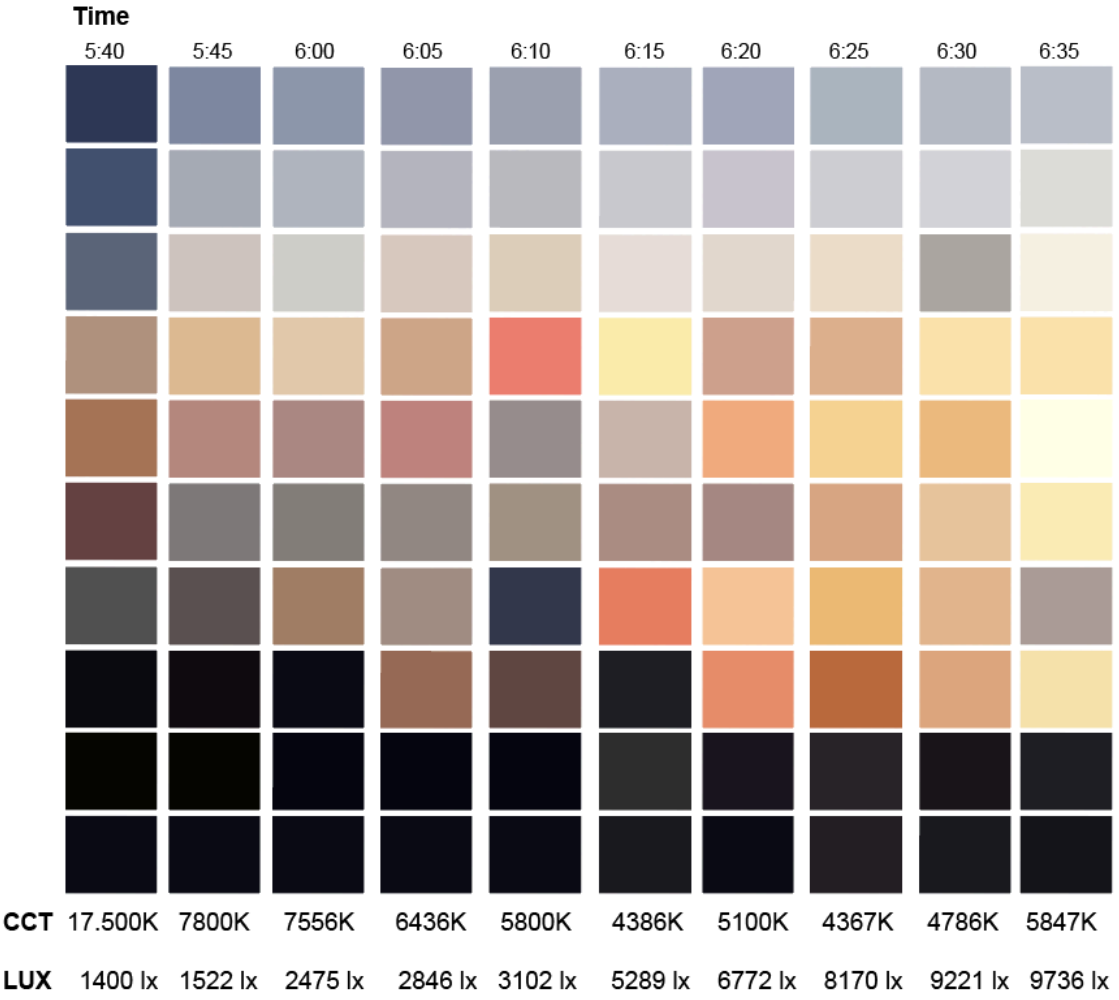
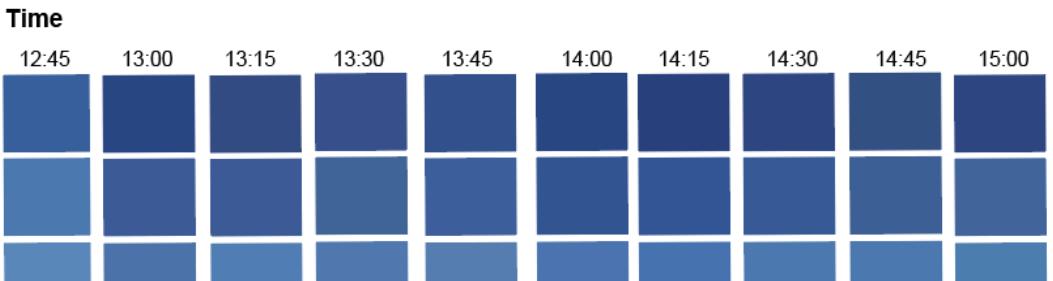
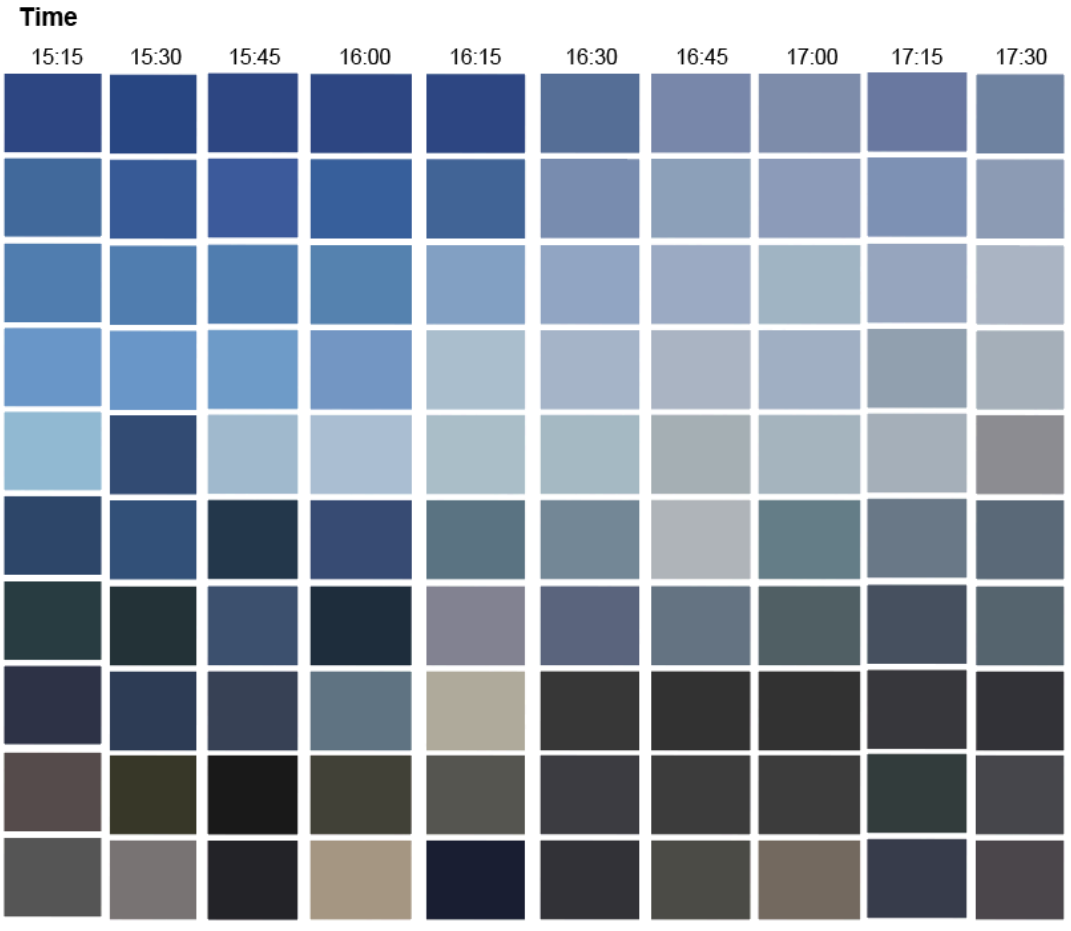


Figure 23, Pallet of colors extracted from Sunset with CCT and LUX references.




Time
15:15
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17:00
17:15
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CCT 5616K 5609K 5605K 5610K 5625K 5721K 5818K 5730K 5657K 5584K
LUX 5874 lx 5818 lx 5762 lx 5462 lx 5162 lx 4667 lx 4172 lx 3965 lx 3758 lx 3550 lx

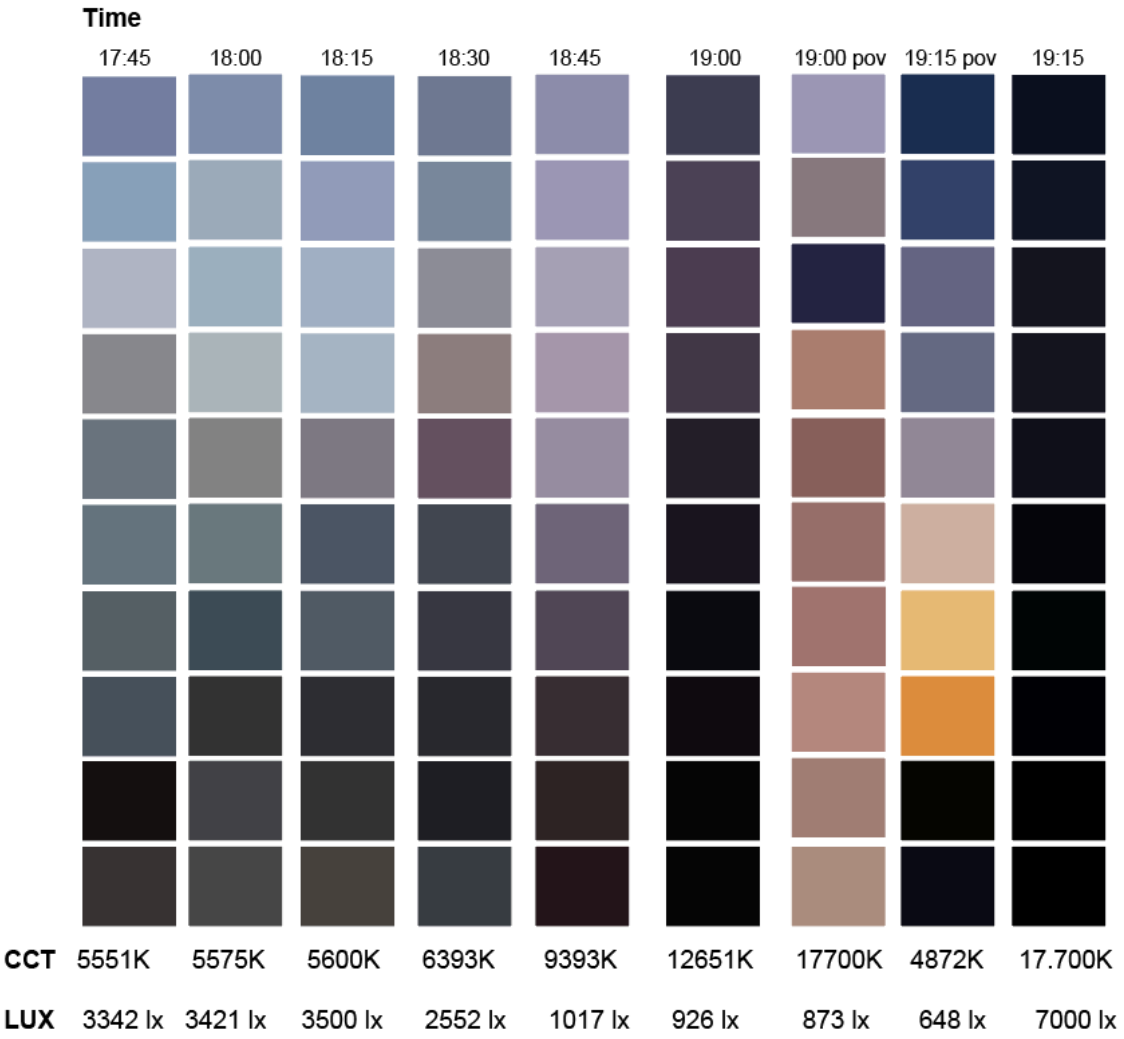

Figure 26, Pallet of colors extracted from Sunset with CCT and LUX references.

5.2.3 The Color Palette

Figure 27, Pallet of colors extracted during sunrise time with time lapse technique.

Figure 28, Pallet of colors extracted during the day with time lapse technique.

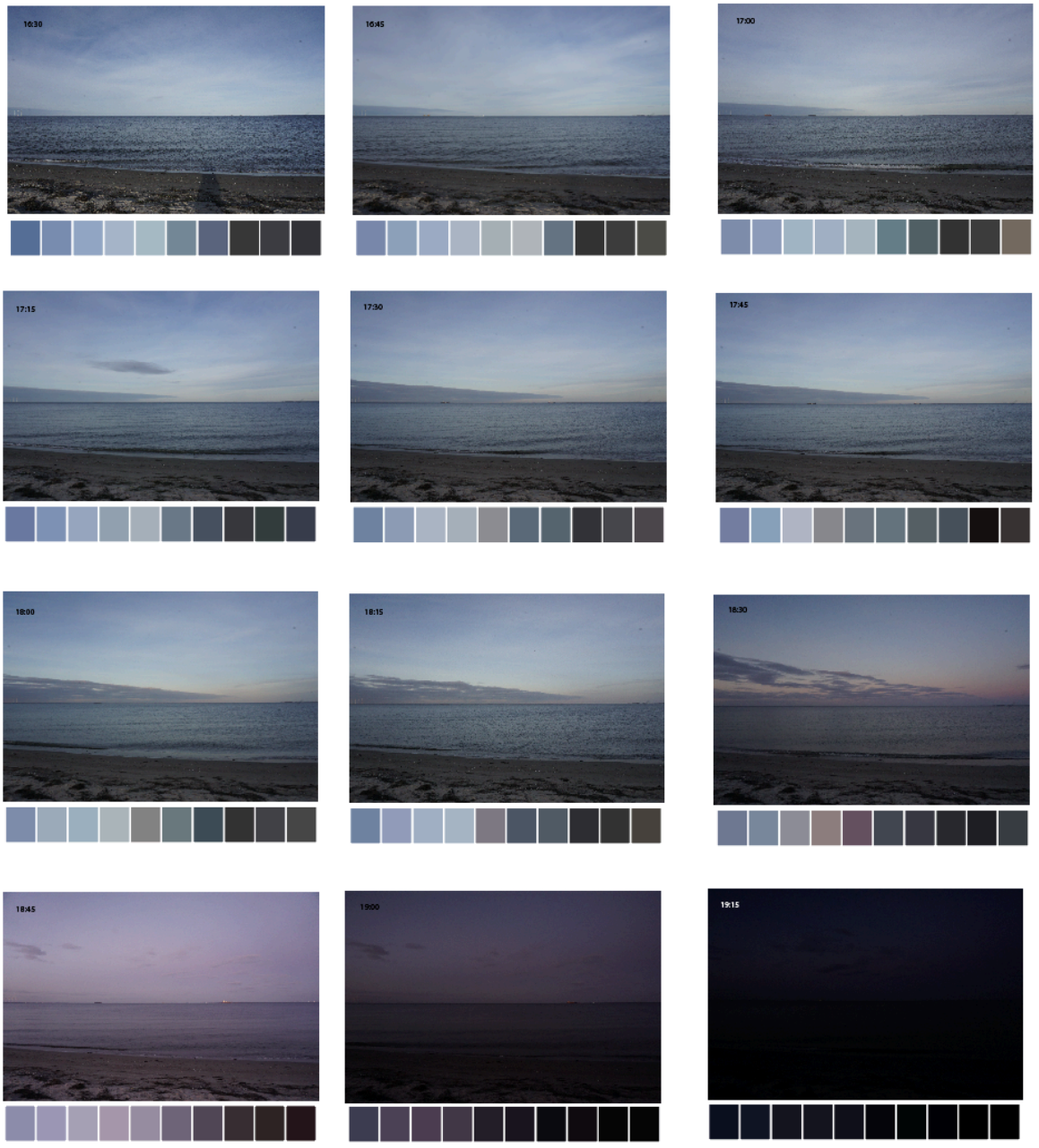

Figure 29, Pallet of colors extracted during sunset with time lapse technique.

5.3 Dynamics From Natural Environments

As part of our exploration of dynamics in natural environments, we conducted a series of photographic observations focusing on the interaction between light, wind, and natural materials. By capturing patterns, shadows, and light parameters, we documented how the quality of wind, in relation to sunlight, influences visual dynamics in outdoor settings.

Our photographs reveal how sunlight creates shifting shadow-patterns on diverse surfaces such as grass, wood, metal, and cement. These interactions highlight the constantly evolving nature of this elements.

This time-based approach provides insight into the temporal dynamics of natural patterns and the fluid relationship between wind and sunlight as they interact with the environment.

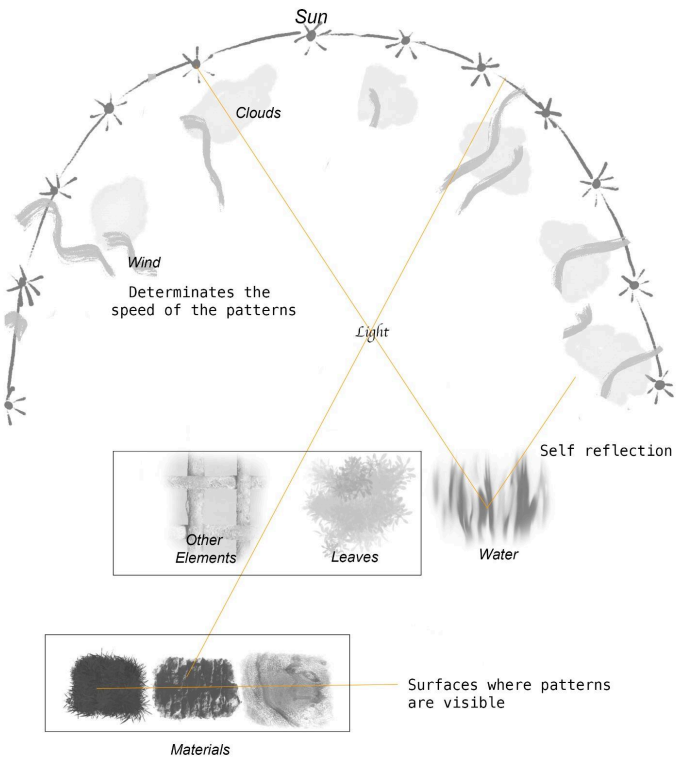

Figure 30, natural process of light patterns diagram.

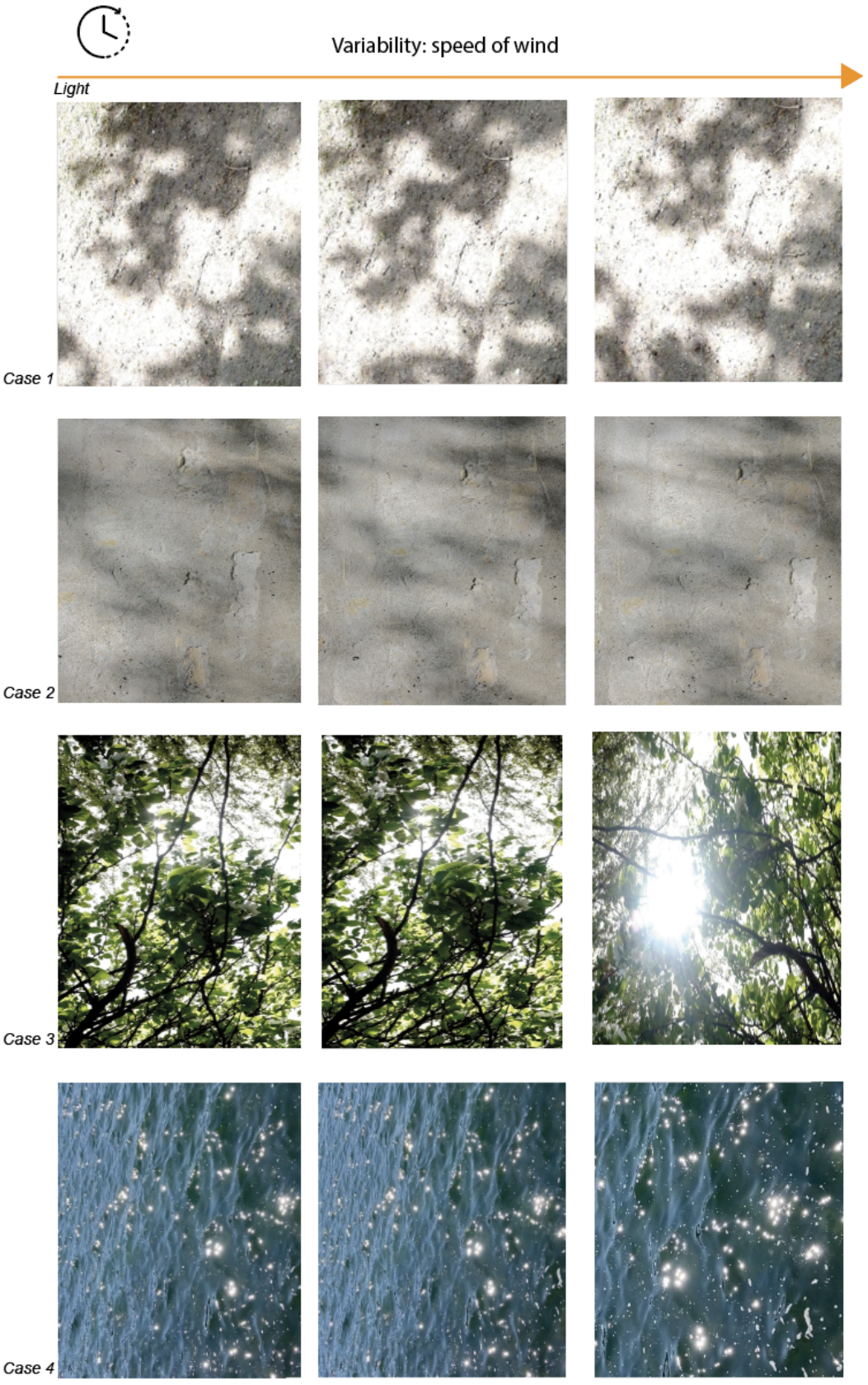

Figure 31, Speed of light patterns, photos by author.

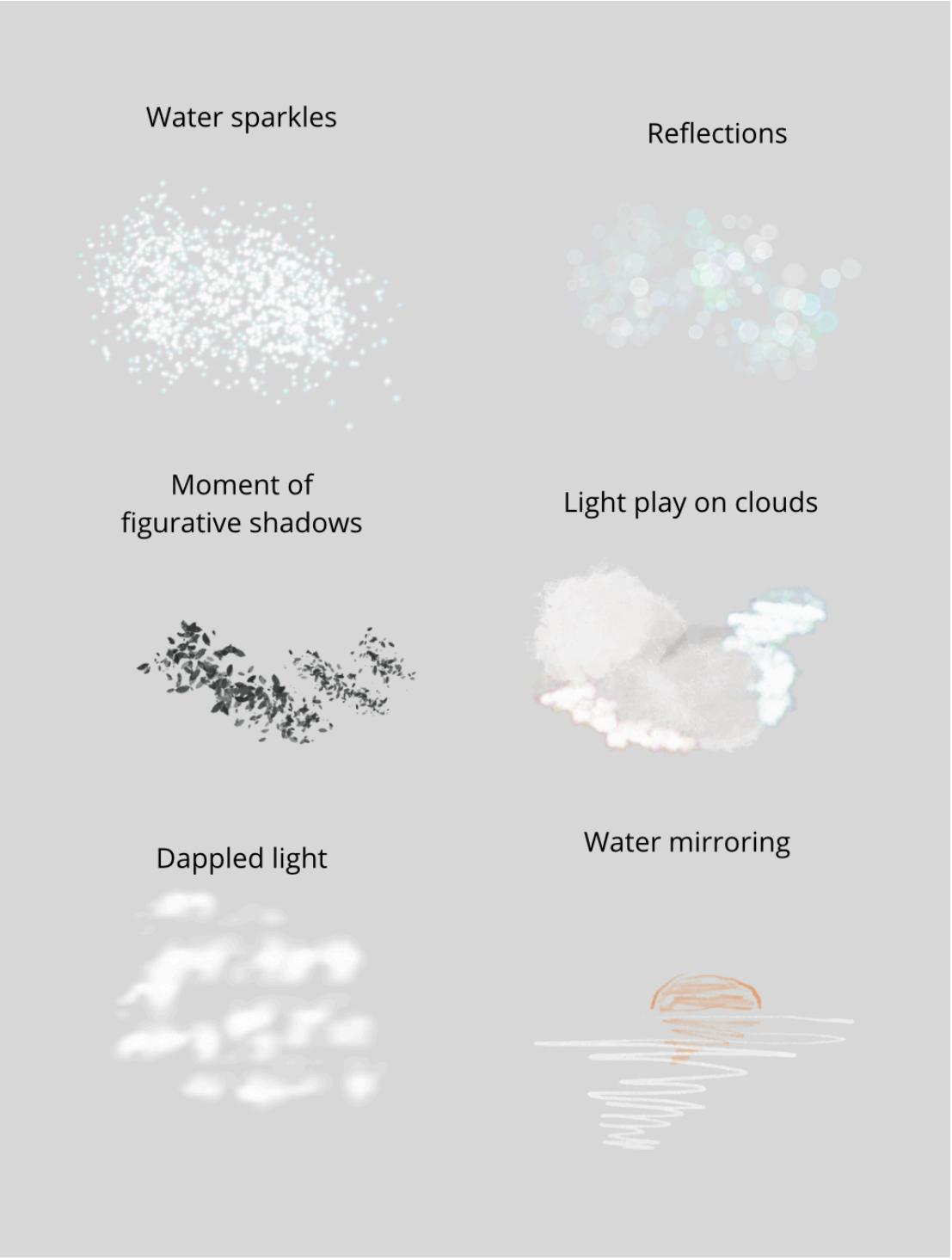

Figure 32, *Illustration of light patterns by the author.*

6. Design Concept

This chapter presents the design concept developed in response to the central question of this thesis:

> *How can artificial light provide an accessible experience that supports mental restoration and well-being.?*

6.1 Introduction: Creating Calm Through Light

Informed by Attention Restoration Theory (ART), our objective is to explore how dynamic, ambient light, when carefully crafted, can offer moments of visual and mental relief within overstimulating domestic routines. This approach recognizes the psychological toll of urban life, prolonged screen exposure, and indoor confinement, particularly in regions with long periods of low natural light.

The design rests on three key criteria:

Restoration
A delicate, yet surprising dynamic light, offering visual variation that supports the brain's ability to rest and recover from focus fatigue.

Accessibility
Easy home-use, offering a moment of calm within the overstimulating routines of everyday urban life, especially for people spending many hours in activities that deplete attention.

Atmosphere
The light should create a space for reflection and presence, maintaining its own quiet rhythm that invites the user to tune in.

These criteria reflect a commitment not to reproduce nature, but to evoke its restorative effects through abstraction, rhythm, and ambient design. To meet these goals, six design principles were developed. Each responds to one or more of the criteria above, guiding how

artificial light can create a perceptually rich and emotionally supportive experience in everyday life.

6.2 Design Principles

Each principle responds to the central aim of this thesis: to offer a calm, perceptually engaging experience of soft fascination through artificial light, accessible to people who may not have regular contact with restorative natural environments.

I. Soft Fascination Through Visual Experience

(Supports: Restoration)

At the heart of this project lies the concept of soft fascination. To support mental restoration, the visual composition is intentionally designed to **gently capture attention without demanding it**. Gradual transitions in color, subtle shifts in brightness, and layered movement engage involuntary attention—the effortless, immersive mode of seeing described by Kaplan & Kaplan (1989) and later expanded by Stevenson (2018).

These slow, non-intrusive variations mirror natural rhythms, such as drifting clouds or flickering leaves, that hold our gaze just enough to allow the mind to rest. In doing so, the design enables the kind of **cognitive recovery** associated with restorative environments.

II. Aleatory Logic a Feeling of Contingency

(Supports: Atmosphere)

Natural environments never repeat themselves. Even familiar landscapes change subtly with light, weather, and movement. To replicate this gentle unpredictability, the design should integrate a randomized layer that introduces variation every time it is experienced.

This element ensures that the experience never feels static or artificial. It maintains a low level of surprise, enough to **prevent habituation without demanding focus**. Like the shimmer of water or the flutter of leaves, this randomness invites curiosity without requiring interpretation.

III. Resonance, Not Control

(Supports: Atmosphere)

Rather than adapting to the user or responding to touch or sound, the design should maintain its own rhythm. This approach is informed by Hartmut Rosa's theory of resonance, which suggests that meaningful experiences emerge not from control or efficiency, but from attunement—moments where the world "responds" not by changing, but by becoming perceptible in a new way (Rosa, 2021).

In this sense, the light object is not interactive; it is present. It does not respond to input, but invites the user to slow down, observe, and linger. This **asymmetrical relationship** is key: the user adapts to the light, not the other way around.

IV. Intentional Use and Preparation

(Supports: Restoration / Atmosphere)

Just as a walk in the forest requires **a decision, a preparation, and a physical shift**, engaging with the design should do the same. Its relation with the user depends not just on the visual properties, but also on the intentionality of use. The user must choose to disconnect from habitual screen behaviors: media, productivity, stimulation, and **set the stage for restoration.**

This setup can become a kind of ritual. Turning on the object, adjusting the surroundings, and choosing to be present with it constitutes a small but powerful act: an invitation to shift one's relationship to both technology and space.

V. Transformation of Familiar Technology

(Supports: Accessibility / Atmosphere)

A central aspect of this design is its use of **already available technology**. By transforming a digital screen, a TV, laptop, or tablet into a light source, the project removes the need for specialized tools or smart lighting systems.

At the same time, the design physically transforms the screen appearance and its presence in the space. By covering the device, it **blocks its normal functions and shifts its identity** from a tool of stimulation to a source of ambient support. This deliberate interference breaks the habitual logic of media consumption, encouraging the user to engage with the experience.

VI. Flexible Setup and Spatial Personalization

(Supports: Accessibility / Atmosphere)

Although the object is simple, it is not passive. Its power lies in its ability to **reshape familiar environments**. Once activated, it creates a distinct **light zone** and alters how a space is felt. Even a very familiar corner of a room can take on a new quality when washed in a soft dynamic light.

The design also encourages users to **arrange the space around the light**, adapting the environment to suit their own intuition. Whether it's used beside a bed, on a shelf, or in a corner for meditation, the object encourages the user to transform their everyday surroundings into something more reflective, soft, and open. While not imposing a specific usage, every user can have a level of intimacy in their approach.

6.3 Components of the Design Concept

To implement the design principles outlined above, the concept was developed around four interrelated components:

A) Repurposing Screens as Light Devices

Screens are the dominant visual interface of contemporary life. They structure how we work, communicate, consume, and rest. Often within the same physical environment, we do all these things without displacing ourselves. Yet their function is almost always tied to active engagement: they deliver information, demand interaction, and contribute to overstimulation and fatigue. This project reimagines the screen not as a carrier of content, but as a medium for presence.

Rather than replacing the screen, we use it as it is, turning its ubiquitous presence into an opportunity. It no longer serves productivity, distraction, or entertainment, but instead offers a quiet perceptual experience. This change is not technological, but perceptual.

By playing a video sequence on the screen, consisting of slowly changing colors and gradients based on the research made, the screen becomes a luminous field. Its light no longer represents content. This shift is fundamental: the screen emits without showing, affects without addressing, and is present without being dominant.

This new function is only effective if the screen's original associations are interrupted. It must cease to be available for its normal uses. In our design, this is achieved by physically blocking the screen's interface with a diffusion material, turning it into a backlit surface that

emits colored ambient light. The act of covering the screen helps to encourage the user to adopt a different relation to the object.

Using the screen as a light source has additional advantages. It capitalizes on widely available technology, requires no new devices or investments, and introduces a new mode of interaction within familiar objects. Rather than designing from scratch, this approach works by reconfiguring what already exists.

B) Accessibility and User Integration

The design should work with what users already have: a digital screen. Whether it's a television, a laptop, or a tablet, we build on this familiar infrastructure, avoiding the need for new or specialized equipment. This choice lowers the entry barrier significantly, making the experience more inclusive and adaptable to different home environments.

However, accessibility is not simply about convenience. It also involves inviting the user into a different mode of engagement in a way that contrasts with the stimulation and task-oriented uses associated with screens. The object must be intentionally activated, requiring the user to shift their attention from content consumption to perceptual presence. This mirrors the mental effort required to leave one's home and go for a walk in nature: it is not automatic, but once initiated, it offers a different quality of experience.

The user must prepare the environment and themselves. This may involve dimming surrounding lights, adjusting the placement of the object, or simply choosing to spend a moment with it rather than using the screen for entertainment. These acts create a behavioral and perceptual shift that is central to the concept. The light object becomes a tool not only for atmospheric change but for encouraging a form of deliberate self-care. It fosters reflection, intentionality, and a recalibration of attention.

This form of use aligns with what Anne-Marie Willis (2006) discusses in her theory of designing as ontological practice: design is not only about shaping objects but about shaping how people exist and act in the world. By repurposing a screen as a meditative light source, the design hopefully will help users create new habits, to become slower, quieter, and more attuned to presence. In this way, accessibility is inseparable from transformation: it is about enabling ease while also inviting a rethinking of everyday behavior.

Our design does not seek to replace nature (nothing can substitute the multisensory and embodied experience of being in nature), but to offer an alternative within spatial and temporal limitations. Especially in urban environments, during winter months, or under

conditions of sensory overload, access to restorative nature is often restricted. In such cases, an intentionally designed light experience that is easy to set up, easy to access, and easy to integrate can offer a quiet moment of perceptual pause. This is not a replacement for natural experience, but a supplementary tool for care within the home.

C) The Diffusion Box

One of the most critical elements in shaping the perceptual experience is the material placed in front of the screen. This layer, typically a translucent or semi-opaque sheet, transforms the sharp, glossy, high-resolution display into a diffuse, glowing field of light. It blurs visual information, softens edges, and replaces clarity with insinuation. By reducing visual sharpness and detail, the material slows down the act of seeing, encouraging a more sensorial and less analytical form of attention.

This aligns directly with the project's ambition to evoke soft fascination. Where high-resolution content typically demands focus, the blurred surface brings ambiguity. It invites involuntary attention and offers something to perceive without requiring interpretation or meaning.

This approach is informed by artists and designers who explore the perceptual effects of softness and ambiguity. Christina Augustesen's work with diffusion boxes demonstrates how filtered light, layered materials, and shifting hues can give a sense of lost dimension inside the frame of her sculptures. Gerhard Richter's blurred figurative paintings use visual uncertainty to delay recognition and invite emotional engagement. These practices show how reduction, softness, and slowness can shift attention from information to perception with the material interface of the design.

In spatial terms, the diffused light produced by the material interface also affects the surrounding environment. The glow no longer sits on the screen's surface, it expands into the room. It spills onto walls, floors, and surrounding objects. Light becomes a spatial medium; the object scatters light and creates a luminous zone.

Finally, the material interface distances the object from its origin as a screen. It conceals visual cues associated with digital media, keyboards, icons, pixels, and recognizable device shapes, replacing them with a white geometrical surface that transmits every color from within.

D) Abstract Horizons Video

The visual material used in the video is composed of a set of animated images that function as the core of the experience. These sequences are not designed to be watched as content, but as motion. The images unfold slowly over time and are projected through the translucent material placed in front of the screen. They are inspired by horizon-like structures. In nature, horizon landscapes have an apparent stability while in reality they are always changing. The design draws from this dynamicity; it is made mostly of transitions and layered gradients to mimic the dynamic qualities of slowly shifting skies, cloud cover, or sea surfaces without becoming representational.

To maintain engagement without overstimulation, the video also integrates **a layer of unpredictability**. At times, the movement changes direction, intensity, or hue in ways that are not regular or anticipated. This prevents visual habituation and encourages the kind of gentle attention that defines soft fascination. The viewer is never asked to focus or decode, but instead to notice change as it emerges and dissolves.

Following the horizon study we conducted, we began to reflect on how to communicate our findings in a subtle and evocative way that could capture the soft fascination and inspiration drawn from the colors and atmosphere of the Scandinavian horizon. Rather than depicting the horizon directly, we chose to abstract it through both the materiality of our design objects and the creation of horizontal color gradients. This allowed us to explore the relational nature of color perception: how a color is never seen in isolation, but is instead shaped by the colors surrounding it and the context in which it is embedded. Through the development of 40 different gradient compositions, we observed that the perception of color shifts depending on adjacent hues, their spatial arrangement, and their temporal unfolding.

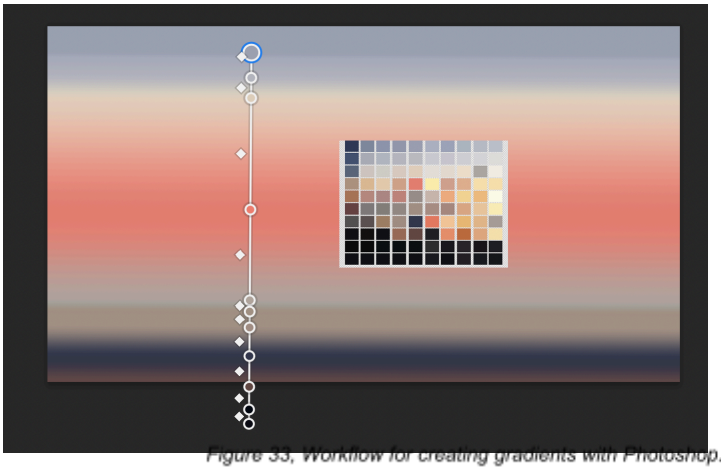

Figure 33, Workflow for creating gradients with Photoshop.

5:40

17:15

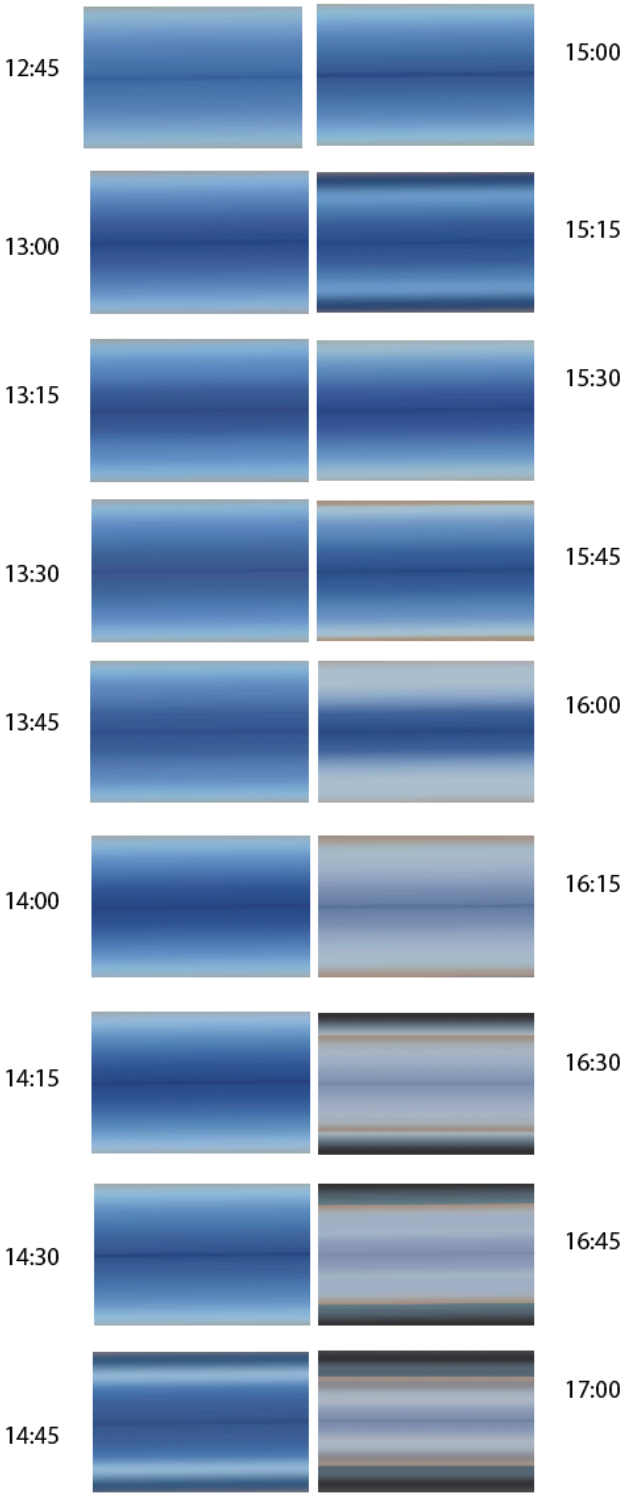

Figure 34, Gradients during the day.

7. The Prototype

The prototype was developed as a material translation of the design concept. It builds upon the four key components introduced in the previous chapter: screen integration, accessibility, diffusion, and video composition, to form a device/experience. Rather than functioning as a display device, the screen is reimagined as a soft, luminous presence. This transformation is achieved through video, material diffusion, and spatial integration.

Figure 35, Prototype process picture.

7.1 Construction and Components

The prototype consists of three essential elements: a 40-minute video sequence, a digital screen (TV, laptop, or smartphone), and a sheet of PLEXIGLAS mounted approximately in front of the screen. The video, composed of slow, horizon-inspired color transitions, is not intended for content consumption but serves as a source of diffuse ambient light.

No additional lighting equipment is used. The setup relies solely on repurposing everyday devices to emit perceptually soft and ambient illumination. Three custom-built diffusion boxes were constructed to test different screen sizes:

Laptop Box

This mid-scale prototype was designed for laptop use and tested with a **MacBook Pro 16" (2023)**, which features a Liquid Retina XDR display with a typical brightness of **600 cd/m²** under SDR settings (Apple, 2023).

The diffusion sheet used was a slightly white, translucent piece of PLEXIGLAS, unfortunately without a manufacturer's reference. The material was then manually sanded to approximate the satin finish of the GS FA1.

Using a lux meter, we calculated a light transmission of the PLEXIGLAS at **91.1%**.

The **effective luminance** of the laptop and diffusion box combined is approximately **546.6 cd/m²**.

The screen's width and height are approximately **35 cm × 20 cm**.

Using the same formula (Luminance × Area), the **total light output is approximately 38.6 cd**.

Figure 36, AI-generated sketches.

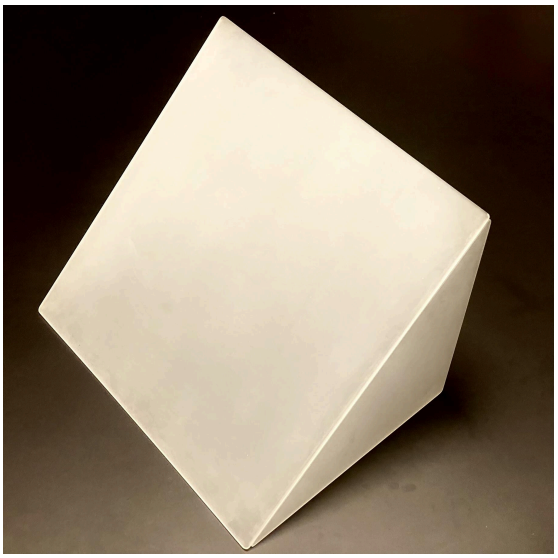

Figure 37, Photo by author.

TV Box

This version was built around a 55-inch LG television (LG 55UH615V) with an IPS panel and edge LED backlighting. The manufacturer reports a typical luminance of **390 cd/m²** (LG, 2016).

A factory-finished PLEXIGLAS **GS FA1** sheet, with a satin matte surface, was used as the diffusion layer.

Using a lux meter, we calculated a light transmission of the PLEXIGLAS at **94.9%**.

The **effective luminance** of the TV and diffusion box combined is approximately **370.1 cd/m²**.

The screen's width and height are approximately **122 cm × 68 cm**.

By multiplying luminance by area (Luminance [cd/m²] × Area [m²]), we estimate a **total light output of approximately 308.6 cd** for the TV prototype.

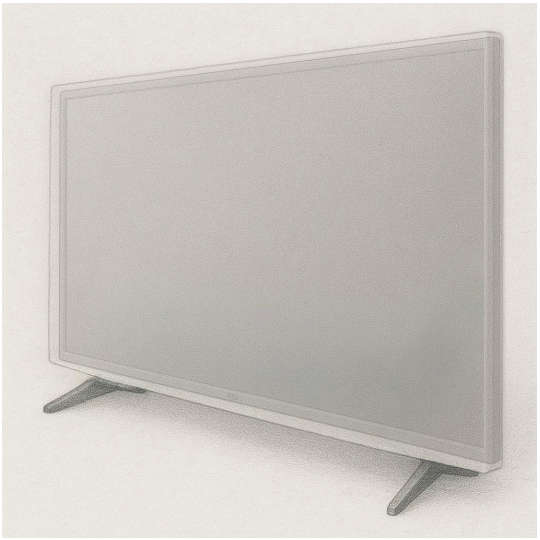

Figure 38. AI-generated sketches.

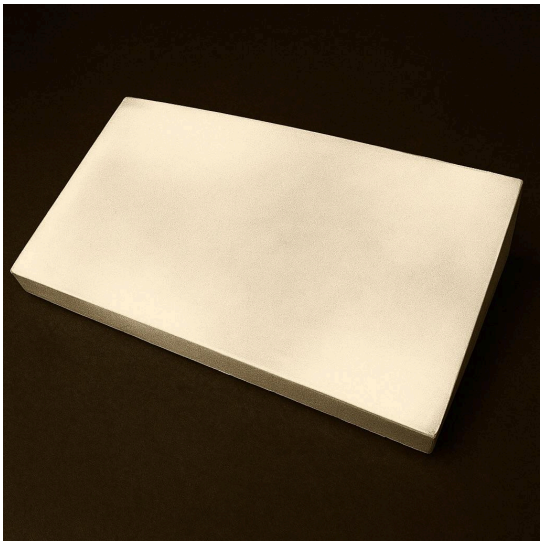

Figure 39, Photo by author.

Phone Box

The smallest prototype was constructed using an **iPhone 11 Pro**, which features a Super Retina XDR OLED display with a reported brightness of **800 cd/m²** (Apple, 2019).

For this version, we used a clear, glossy PLEXIGLAS **XT 0A000 GT** sheet, which has a manufacturer-specified transmission of **92%** (Evonik, 2018). The material was then manually sanded to approximate the satin finish of the GS FA1.

Using a lux meter, we calculated a light transmission of the PLEXIGLAS at **89.7%**.

The **effective luminance** of the phone and diffusion box combined is approximately **717.6 cd/m²**.

The screen's width and height are approximately **13 cm × 7 cm**.

Using the same formula (Luminance × Area), we estimate a **total light output of approximately 6.7 cd**.

Figure 40, AI-generated sketches.

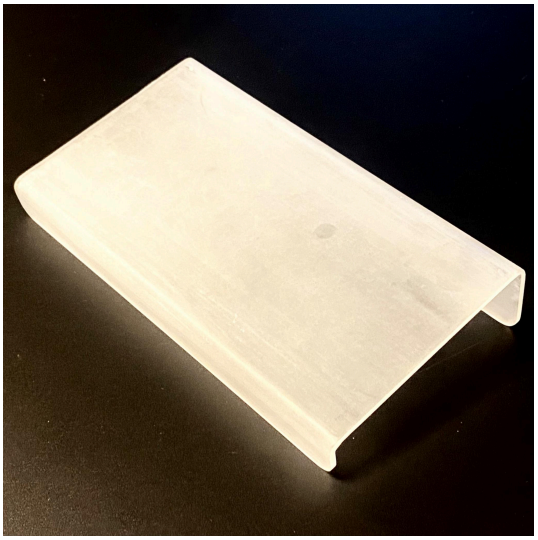

Figure 41, Photo by author.

7.2 Light Performance

Although the iPhone displayed the highest measured luminance, it contributed the least perceptible light to the room. This apparent contradiction is explained by total luminous output, which is a function of both luminance and screen area.

Figure 46 illustrates the relationship between screen size, effective luminance (after diffusion), and total light output. It confirms that the TV, due to its large surface area, emits the most light overall, followed by the laptop, with the phone emitting the least. This explains why the spatial impact of the TV box is most significant, despite lower luminance per square meter.

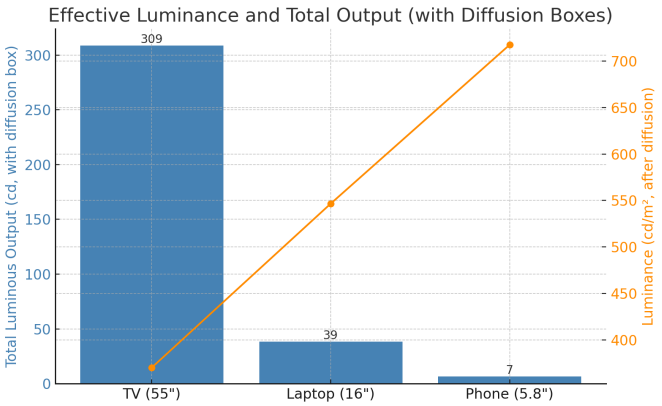

Figure 42, Graphic comparison of luminance levels across the three prototypes.

7.3 Building Process

Each prototype was made by hand, using plexiglass, sandpaper, and patience. The frames were built to fit each device.

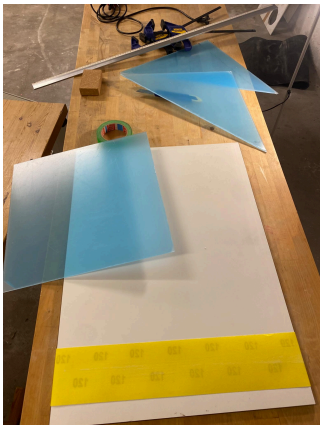

Figure 43, Prototype process.

Figure 44, Prototype process.

7.4 The Video Sequence

The light in the prototype is generated by a 40-minute video composed of slow color transitions and layers of moving patterns. A timeline of the images overall sequence, while overlapping patterns introduces internal motion. Occasionally, unexpected hues emerge from the blending of images during transitions, colors that fall outside the familiar horizon palette and act as small moments of surprise within the calm progression.

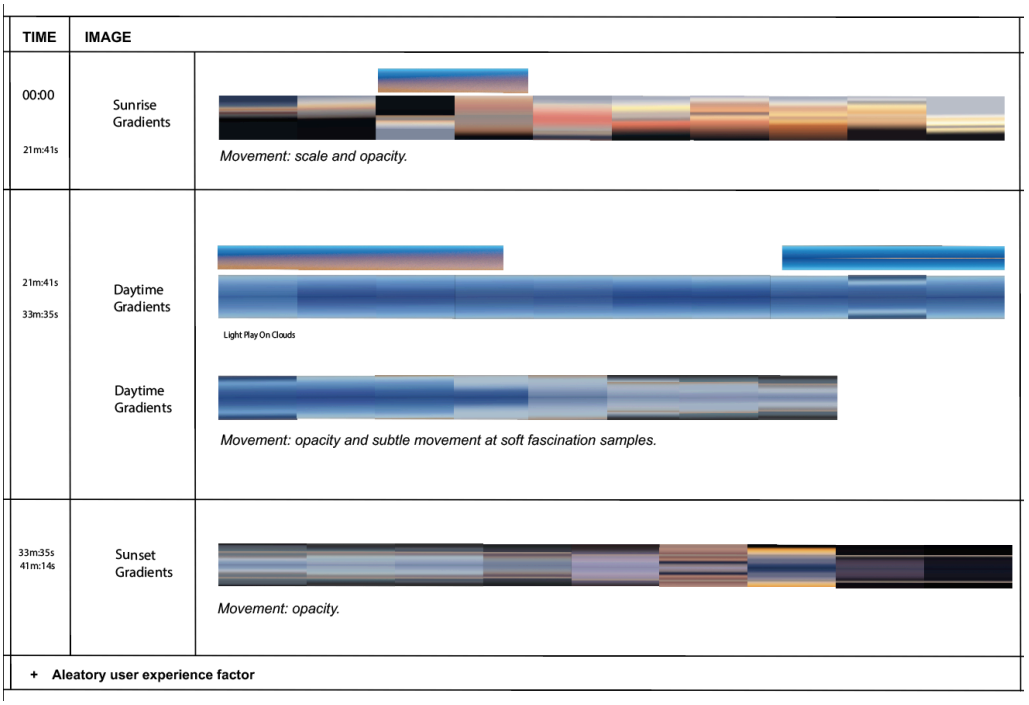

Figure 45, Timeline of the video used in the prototype.

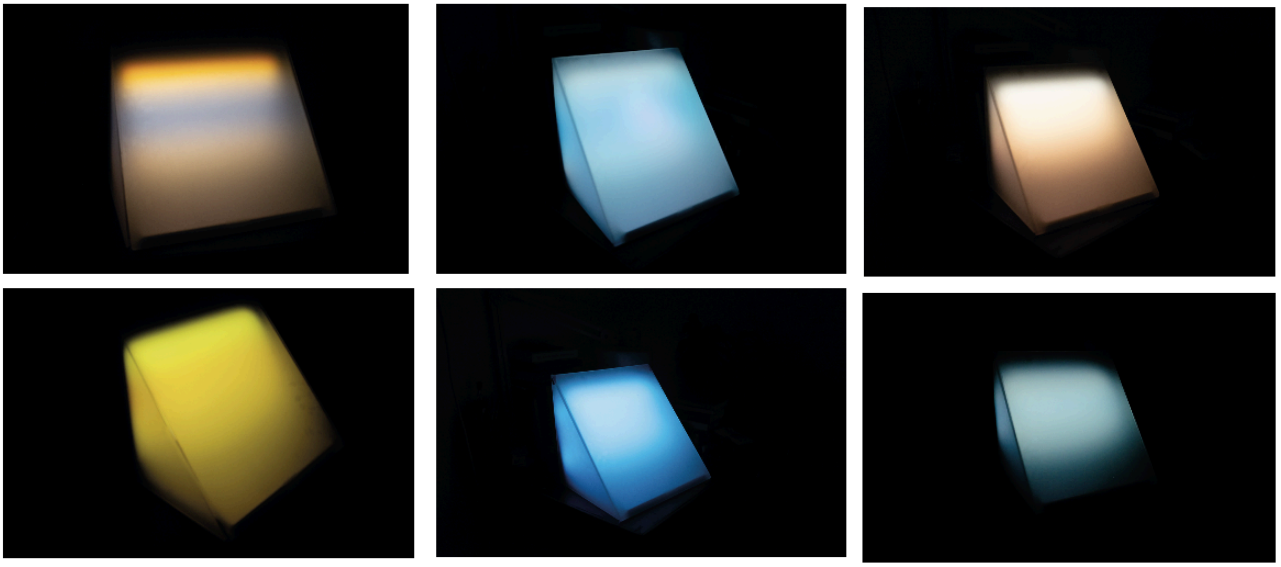

Figure 46. Laptop-based prototype shown at different moments within the video.

7.5 In Context

The following images show the three versions of the prototype in use, placed in a domestic setting.

Laptop Box

Figure 47, Laptop prototype installation in living room setting.

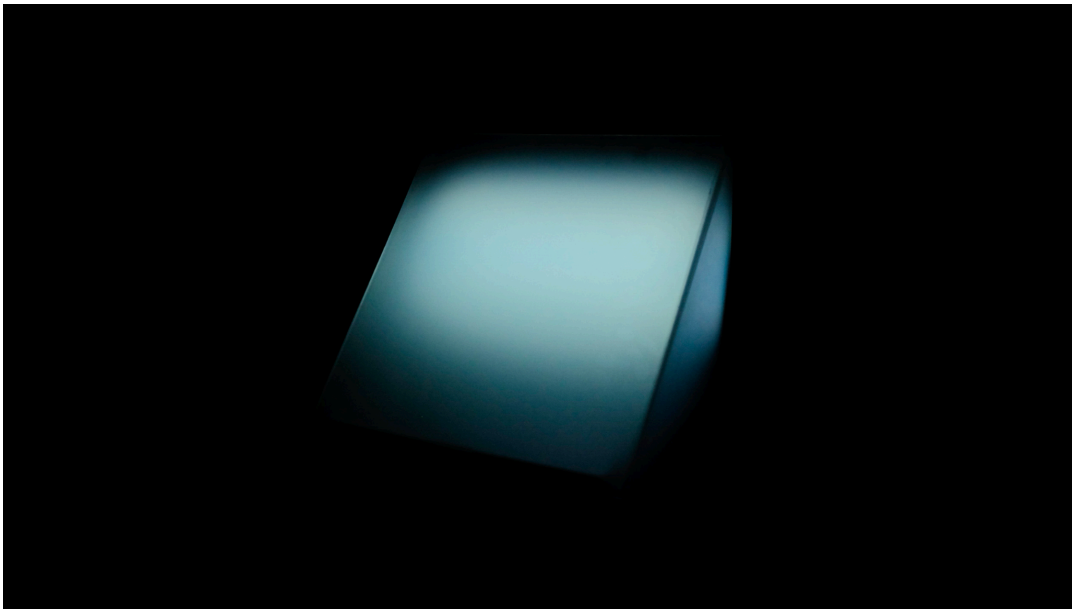

Figure 48, Laptop prototype installation in living room with lights off.

TV Box

Figure 49, TV screen prototype installation in living room setting.

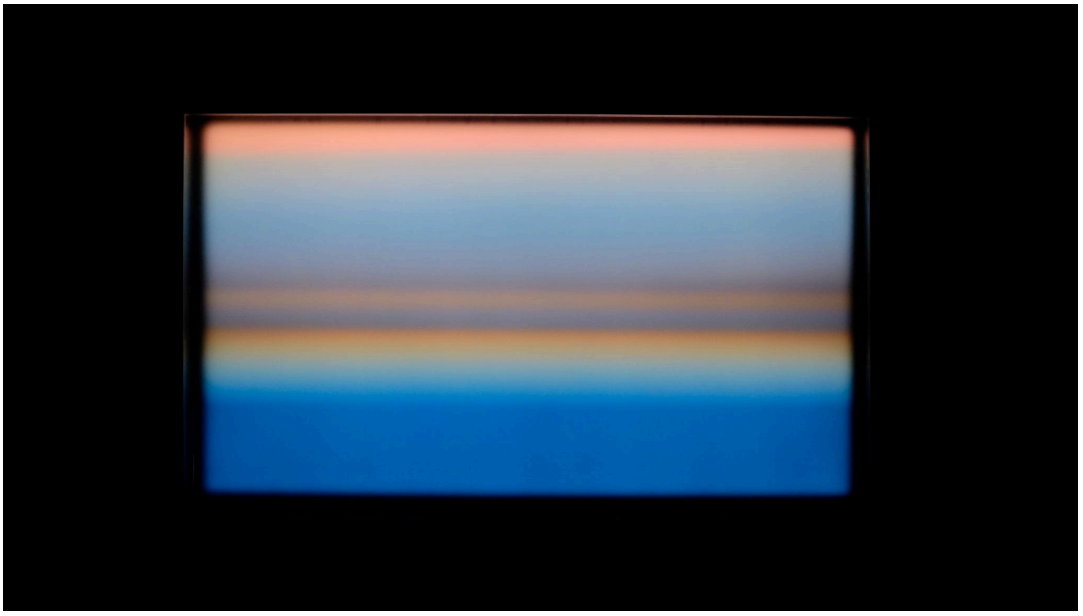

Figure 50, Integration of video composition and Plexiglas placed on screen.

Phone Box

Figure 51, Phone prototype installation in living room setting.

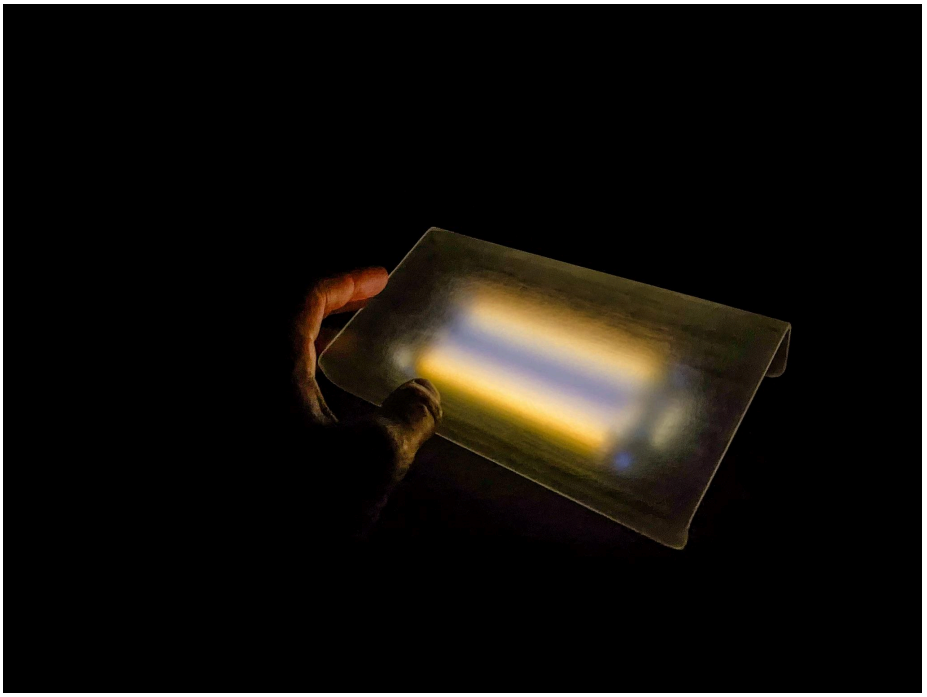

Figure 52, Integration of video composition and Plexiglas placed on iphone screen.

7.6 Outcomes From The Prototype

As a first iteration, the prototype successfully demonstrates how accessible technology and minimal physical interventions can be used to create atmospheres aligned with restorative environmental principles. Designed not to inform or interact, but simply to emit a quiet, slow presence, the installation reframes familiar devices as tools for perceptual rest.

That said, the prototype has clear limitations. The video sequence is fixed at 20 minutes and does not adapt or loop dynamically. While lux measurements were used to estimate light transmission, no calibrated photometric equipment was available to verify spectral behavior or color accuracy. The prototype also lacks interactivity—but this was a deliberate choice. Rather than reacting to the user, the piece is intended to continue independently, offering an experience of constancy rather than control.

Though not formally tested, brief feedback from peers who encountered the prototype in use offered recurring themes. The experience was described as “calming,” “soft,” and “like a sunrise.” Some mentioned wanting it in their own homes, as a tool to unwind or create a more peaceful atmosphere. These impressions, while anecdotal, align with the project’s aim: to support a different mode of attention, one that does not demand interpretation or effort.

This first step opens space for future explorations—whether through refined video behavior, new spatial integrations, or more structured evaluation. But even in its current state, the prototype offers a quiet proposal: that artificial light, when designed with restraint and intention, can do more than illuminate. It can soften, slow, and invite a different kind of presence.

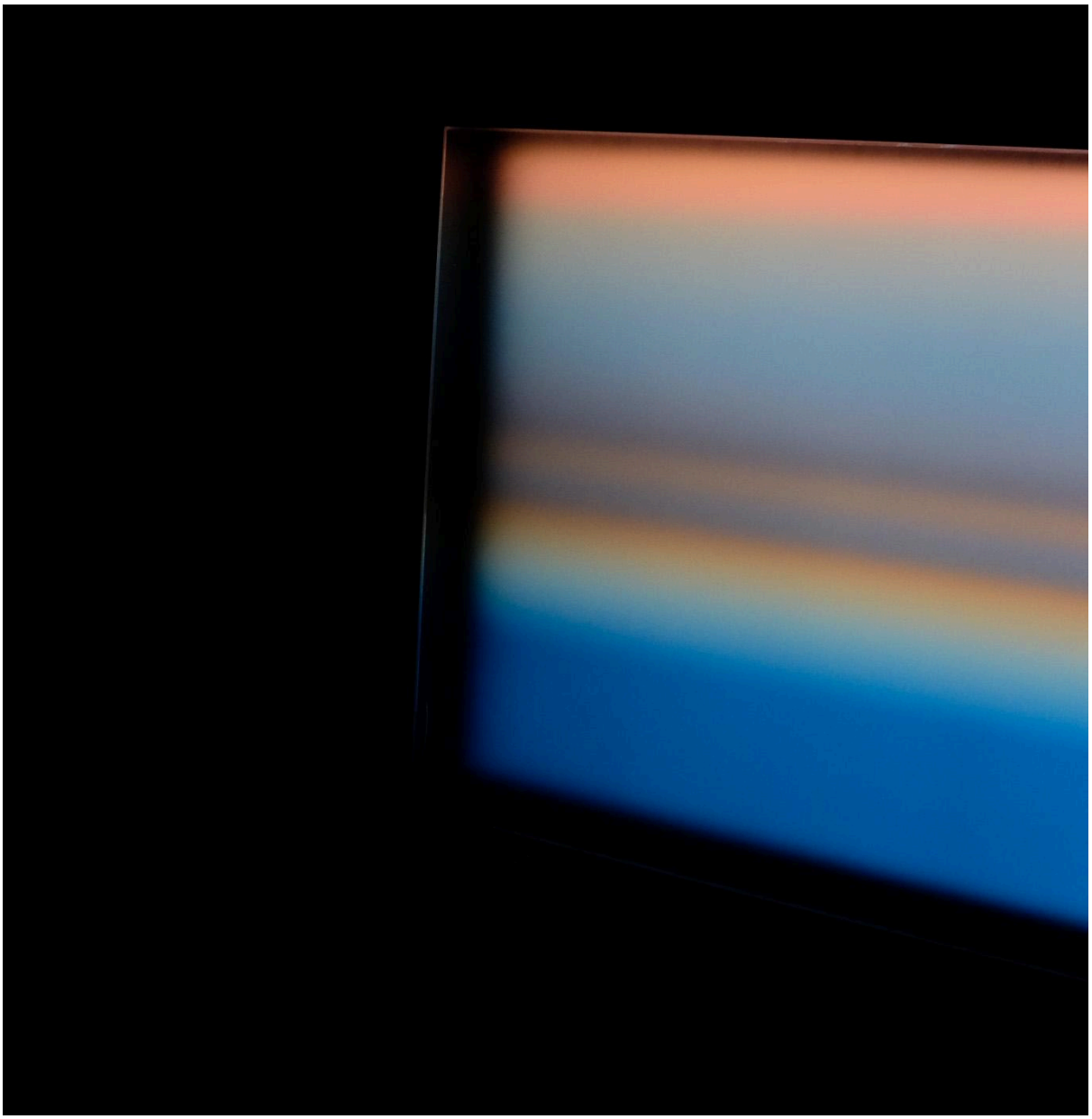

Figure 53, Integration of video composition and Plexiglas placed on TV screen.

8. Future works

This project offers a starting point, both technically and conceptually, for further explorations into how to approach artificial light to offer restorative qualities without falling in a literal translation of imagery from nature. While the prototype shows how ambient light can be designed through familiar technologies and minimal interfaces, several directions remain open for expanding into its experiential evaluation and thinking of other contexts to apply it.

8.1 Assessing Restoration More Rigorously

To move beyond anecdotal observations, future work could investigate whether the experience of the prototype supports measurable cognitive restoration. One possible approach is to apply the **Attention Network Task (ANT)** protocol, as proposed by Stevenson (2018), this method allows for the evaluation of alerting, orienting, and executive attention. Integrating such a framework could offer a clearer picture of the cognitive effects of the elements proposed in the design concept, allowing for a refinement and further development of them. As well it would provide evidence-based fundation for claims about the effectiveness of the design.

Physiological tools such as **EEG**, **eye tracking**, or **heart rate variability (HRV)** could also be employed to observe how the body responds to the installation. These tools are common in environmental and interaction design research and may help to detect subtle shifts in cognitive or emotional states. At the same time, their presence might become counterproductive: **the more we try to measure the effect, the more we risk disrupting it**. Wearing sensors or being watched by a camera may interfere with the very ability to relax or “let go,” which is central. Future studies will need to negotiate this tension carefully.

As a softer, more accessible method of evaluation, we also developed a brief questionnaire, combining Likert scale ratings with open-ended questions. While informal in scope, this format could serve as a departure point for capturing subjective impressions and perceived effects from users, and can complement more structured user studies in the future like the ANT protocol suggested above by registering how participants experience and not just how they perform.

8.2 Expanding the Context of Use

Though the prototype was designed for a domestic environment, its qualities suggest broader applications. In hospitals, public institutions, or therapy spaces, an experience that asks nothing from the user could contribute to a sense of calm or orientation. In educational or work environments, it might support mental resets between periods of intense focus. These are spaces where overstimulation is common and it could help establish a different rhythm.

9. Discussion & Conclusion

This project began from a simple curiosity, an interest in the idea of **soft fascination**, and a desire to understand how it might be explored through light. The initial question was speculative: could artificial light, used as the protagonist element and not to render other things visible, be designed to offer an experience that produces soft fascination? Very early in the process, it became clear that artists across disciplines and decades have been creating spaces and experiences that align strongly with the principles of Attention Restoration Theory, whether consciously or not. Their work felt deeply relevant, and this thesis became, in part, a modest homage to those pioneering artist and thair work, to those who have crafted environments of solace in a world of increasing information overload, anxiety and instability.

The thesis also wants to steer away from representational approaches in design when using nature as inspiration. The more the viewer is asked to interpret or recognize “this is a tree,” “this looks like a this or that landscape” the more cognitive effort is required. And that effort interrupts the possibility of simply experiencing a phenomenon without the need to interpret it. This is why one of the main ambitions of the thesis was to argue for a more abstracted translation of natural dynamics**,** to work with movement, rhythm, and color without invoking the burden of translation and meaning.

The prototype became a testing ground for this approach, and a proof of concept that minimal, familiar technologies can be reframed to create new perceptual conditions. It is not a finished product, but rather a proposition: that light, when stripped of function and symbolism, can still **do something essential**.

The hope is that this work can inform future colleagues, not only in architectural lighting design, but also in performance and scenographic contexts, where the role of light is always more than illumination. This thesis has also shaped our own way of working, reminding us that the most subtle gestures often carry the most resonance.

Ultimately, this project is a contribution to the ongoing conversation about what light can do, beyond visibility or effect, as a medium for presence, perception, and care. That light does not need to instruct, reveal or perform in order to have impact. In this way, *The Quiet Light Project* is a gesture toward a way of thinking about design that values resonance over interaction, atmosphere over information, and the quiet possibility that not everything has to be understood in order to be felt.

Acknowledgments

This project would not have been possible without the support, insight, and encouragement of many people. We would like to thank our thesis supervisor, Nanet Mathiasen, for her gentle guidance and critical perspective throughout the process.

To Ellen Kathrine Hansen and Ana Maria Osorio, thank you for your inspiring conversations and thoughtful feedback along the way. Your ideas helped to ground this work in crucial moments.

This thesis is the result of many quiet contributions, warm conversations with friends and colleagues and the unconditional love and support of our families, who have endured our absence from across the ocean.

Gracias infinitas.

We also acknowledge the use of OpenAI's ChatGPT as a tool for language correction and image processing, throughout the writing process.

Appendix

Glossary

Ambient Light / Ambient Media

A form of lighting or sensory design that stays in the background. Ambient media are not meant to be focused on directly; they influence atmosphere, mood, and perception without demanding attention. Examples include slow-changing color fields, environmental sound, or scent diffusion.

Blurriness

Soft, unfocused visuals that reduce stimulation and guide attention gently (based on design principles in visual ergonomics).

Color Field

A visual technique where large areas of a single or gradually shifting color create a calm, immersive effect. In art and lighting, color fields are used to slow down perception and evoke emotional responses. Artists like Mark Rothko and James Turrell have used color fields to create contemplative environments.

Directed Attention

A type of attention that requires focus and mental effort. We use it to stay on task, avoid distractions, and process information. Directed attention is a limited resource; when used too much without breaks, it becomes depleted, leading to fatigue.

Ganzfeld Effect

A perceptual phenomenon that occurs when the visual field is filled with uniform, unstructured stimulation—like fog or a solid color light field. Under these conditions, the brain struggles to anchor visual input, sometimes leading to a sense of timelessness or altered awareness. While often used in experimental psychology or art, the effect relates to the soft fascination goals of this project.

Hard Fascination

The opposite of soft fascination. These are experiences that capture attention through intensity or novelty, like social media, video games, or fast-paced video. While stimulating, they do not allow for mental recovery. Instead, they often increase fatigue.

Involuntary Attention

This refers to attention that is captured automatically, without effort. Involuntary attention is often triggered by sensory events that are interesting but not overwhelming, like rustling leaves, moving clouds, or soft changes in light. Environments that support this kind of attention allow the mind to rest while staying gently engaged.

Mental Bandwidth

A term used to describe the brain's limited capacity for processing and managing tasks. When too much of this bandwidth is taken up—by stress, decision-making, or distraction, it becomes harder to focus or reflect. Restorative environments protect or restore bandwidth by reducing demand and offering space for reflection.

Mind Wandering

When thoughts drift away, it can support creativity and mental refreshment.

Restorative Environment

A physical or sensory environment that helps people recover from mental fatigue. Such environments typically offer a sense of distance from daily tasks, a feeling of immersion or extent, and stimuli that are compatible with restful attention. While often associated with nature, restorative environments can also be created through design.

Soft Fascination

A concept from ART that refers to environments or stimuli that hold our attention in a gentle, non-demanding way. Soft fascination allows the mind to rest and recover from fatigue. Examples include water surfaces, tree movement, and slowly shifting light.

Questionnaire:

Instructions: Please reflect on your experience with the experience. Rate each statement based on how strongly you agree or disagree using the following scale:

1 = Not at all, 2 = A little, 3 = Somewhat, 4 = A lot, 5 = Extremely.

Then, answer the open-ended questions briefly.

Likert Scale Questions

1. The experience captured my attention effortlessly, without requiring much mental effort.
   [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

2. The experience had qualities that held my interest naturally.
   [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

3. The experience drew my attention to a variety of interesting visual elements.
   [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

4. The experience felt like a break from my usual mental demands or stresses.
   [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

5. The experience provided relief from unwanted demands on my attention.
   [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

6. The experience created a sense of being in a different environment, separate from my daily routine.
   [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

7. The experience felt rich and coherent, like it created its own world or atmosphere.
   [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

8. There was enough in the experience to keep me engaged without feeling overwhelmed.
   [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

9. The experience felt compatible with my preferences and interests.
   [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

10. I felt calm and relaxed while observing the experience.
    [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

11. The experience helped me feel more positive than before.
    [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

12. The experience helped me gain a clearer perspective or focus.
    [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

Open-Ended Questions

13. Which specific features of the experience (e.g., colors, patterns, movement) were most engaging or calming for you?

14. How did the experience affect your mental state or ability to focus?

15. How would you implement this experience in your life?

Thank you for your responses!

References

Apple. (2019). *iPhone 11 Pro – Technical specifications*. Apple Inc. https://support.apple.com/kb/SP806

Apple. (2023). *MacBook Pro 16-inch (2023) – Technical specifications*. Apple Inc. https://support.apple.com/kb/SP854

Appleton, J. (1975). *The experience of landscape*. Wiley.

Augustesen, C. (2020). Daylight instruments. *Idoart.dk*. https://www.idoart.dk/kalender/christina-augustesen-daylight-instruments

Basu, A., Duvall, J., & Kaplan, R. (2019). Attention restoration theory: Exploring the role of soft fascination and mental bandwidth. *Environment and Behavior, 51*(9–10), 1055–1081. https://doi.org/10.1177/0013916518801729

Berman, M. G., Jonides, J., & Kaplan, S. (2008). The cognitive benefits of interacting with nature. *Psychological Science, 19*(12), 1207–1212. https://doi.org/10.1111/j.1467-9280.2008.02225.x

Böhme, G. (2017). *The aesthetics of atmosphere* (J. A. Chr. Hanes, Trans.). Routledge.

Cruz-Diez, C. (1989). *Reflexión sobre el color*. Fundación Jesús Soto.

Davies, S., Higgins, K. M., Hopkins, R., Stecker, R., & Cooper, D. E. (Eds.). (2009). *A companion to aesthetics*. John Wiley & Sons.

den Dekker, A. (2023). *Design for soft fascination: Bringing the outside in* (Master's thesis, Delft University of Technology). TU Delft Repository. http://resolver.tudelft.nl/uuid:eae4544d-2b94-4013-993e-4efeddbd0f59

Eliasson, Ó. (2003). *The weather project* [Installation]. Tate Modern.

Evonik. (2018). *PLEXIGLAS GS/XT – Technical information*. https://daemenkunststoffen.nl/wp-content/uploads/2019/10/Datasheet-Plexiglas-GS-en-XT.pdf

Ghersinich, E. (2021). *The spirit of things: Biophilic light in urban environments* (Master's thesis, KTH Royal Institute of Technology). KTH Royal Institute Repository.

Hekkert, P., & van Dijk, M. (2011). *Vision in design: A guidebook for innovators*. BIS Publishers.

Helmholtz, H. von. (1802). Trichromatic theory of vision. [As cited in Steinvall & Street, 2017]

Houser, K. W., & Esposito, T. (2021). Human-centric lighting: Foundational considerations and a five-step design process. *LEUKOS*. [Add volume, issue, and page numbers or DOI]

James, W. (1892). *Psychology: The briefer course*. Henry Holt.

Jones, L. A. (1953). *CIE Reports*. International Commission on Illumination.

Kaplan, R. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology, 15*(3), 169–182. https://doi.org/10.1016/0272-4944(95)90001-2

Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. Cambridge University Press.

Kirkwood, G., Rampes, H., & Tuffrey, V. (2005). The effectiveness of mindfulness-based stress reduction therapy. *Journal of Psychosomatic Research, 57*(1), 35–43. https://doi.org/10.1016/j.jpsychores.2004.08.012

LG. (2016). *LG 55UH615V product page*. LG Electronics. https://www.lg.com/uk/tvs/lg-55uh615v

Mullainathan, S., & Shafir, E. (2013). *Scarcity: Why having too little means so much*. Times Books.

Nanthakumar, P. (2020). Mindfulness meditation and well-being: An integrative review. *International Journal of Caring Sciences, 13*(2), 1015–1022.

Newton, I. (1666). *Opticks*. [Original work – use publisher or edition if referencing a specific one.]

Noera, S., Simeone, G., & Neuhoff, L. (2024). Designing contemplation: A framework for ambient experience. *Journal of Design Studies*. [Forthcoming]

Pallasmaa, J. (2012). *The eyes of the skin: Architecture and the senses* (3rd ed.). Wiley.

Pascoe, M. C., & Bauer, I. E. (2015). A systematic review of randomized control trials on the effects of yoga on stress and mood. *Journal of Psychiatric Research, 68*, 270–282. https://doi.org/10.1016/j.jpsychires.2015.07.005

Perryman, L. (2018). Color perception and materiality. [More publication details needed]

Rosa, H. (2021). *The uncontrollability of the world* (J. C. Wagner, Trans.). Polity Press.

Rothko, M. (1950s). *Color field paintings* [Various works].

Smallwood, J., & Schooler, J. W. (2006). The restless mind. *Psychological Bulletin, 132*(6), 946–958. https://doi.org/10.1037/0033-2909.132.6.946

Steinvall, A., & Street, S. (2017). *A cultural history of color in the modern age*. Bloomsbury Academic.

Stevenson, M. P., Schilhab, T., & Bentsen, P. (2018). Attention restoration theory II: A systematic review to clarify attention processes affected by exposure to natural environments. *Journal of Environmental Psychology, 59*, 226–235. https://doi.org/10.1016/j.jenvp.2018.09.002

Sugimoto, H. (1980s–present). *Seascapes* [Photographic series]. https://www.sugimotohiroshi.com/seascapes

Terman, M., Terman, J. S., & Ross, D. C. (1989). A controlled trial of light therapy for seasonal affective disorder. *Archives of General Psychiatry, 46*(10), 915–921. https://doi.org/10.1001/archpsyc.1989.01810100035006

Turrell, J. (2013). *Aten Reign* [Installation]. Solomon R. Guggenheim Museum.

Wackermann, J., Pütz, P., & Allefeld, C. (2008). Ganzfeld-induced hallucinatory experience, its phenomenology and cerebral electrophysiology. *Cortex, 44*(10), 1364–1378. https://doi.org/10.1016/j.cortex.2007.05.003

Willis, A.-M. (2006). Ontological designing—Laying the ground. *Design Philosophy Papers, 4*(2), 69–92. https://doi.org/10.2752/144871306X13966268131514

Zimmerman, J., Forlizzi, J., & Evenson, S. (2007). Research through design as a method for interaction design research in HCI. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 493–502). ACM. https://doi.org/10.1145/1240624.1240704