## LOG:: 11 Light wants crystal

…the new environment [that] . . . must bring with it a new culture.

Paul Scheerbart

Glass. It is not plastic. The object might feel like it, but it's not made of plastic. Historically it had been, with smaller screens embedded in a case made of plastic and metals. But now, digital devices have become full screen with less non-screen placed on the front side of the thin rectangular hand-sized object. All screen: to see, to touch.

Glass material is durable, scratch-resistant, and, most importantly, touch-sensitive. New materials like Gorilla Glass provide excellent display clarity, enhance visibility, minimize distortions, allow for solid and easy touch interaction on screen, enhance durability, and actually protect against daily usage—pocket in, pocket out, scratching and crashing, ohh, accidental drops. Glass also added style and visual appeal to the viewing experience.[[1]](#footnote-1)

The object became *sleek* and *modern*. Aesthetic appeal pushed for round edges and seamless finishes, generating fashion accessories with changing skins fitting outfits and handbags. Manufacturers using the transparency of glass experiment with colors and textures to provide an increasing amount of design options and personalization. Glass's smooth, reflective surface adds a touch of sophistication and elegance. You carry the object with you as a statement of you.

**GLAS / Verre / Glass / Crystal**

I run all the time like everybody else, I take the train each morning (I live in New Jersey) to slip into the cluster of prisms I see emerging beyond the Hudson, with its sharp cusps; I spend my days there, going up and down the horizontal and vertical axes that crisscross that compact solid, or along the obligatory routes that graze its sides and its edges. But I don't fall into the trap: I know they're making me run among smooth transparent walls and between symmetrical angles so I'll believe I'm inside a crystal, so I'll recognize a regular form there, a rotation axis, a constant in the dihedrons, whereas none of all this exists. The contrary exists: glass, those are glass solids that flank the streets, not crystal, it's a paste of haphazard molecules which has invaded and cemented the world, a layer of suddenly chilled lava, stiffened into forms imposed from the outside, whereas inside it's magma just as in the Earth's incandescent days.[[2]](#footnote-2)

Like many cities in the world, since the 2010s, Ankara's look has changed. Along the main roads, high-rises with reflecting glass surfaces have been built one after another. The glass curtain facade has been the representative standard for office buildings and skyscrapers for decades. More or less, they have a uniform appearance in cities worldwide; glass stands for the confidence of capital.

Contemporary glass architecture also gives us some idea about the possibilities of the material glass. Building glass is coated with a thin wash of color or stained, printed, lacquered, laminated, and used in conjunction with many other materials. Transparency and translucency vary in different forms. The crystalline character reappears with colorful shapes, broken surfaces, and asymmetries. In darkness and when lit from the inside, some buildings appear to be made simply of light.[[3]](#footnote-3) Glass pushes color to the foreground; translucency allows matte glass walls, playful illusionary settings of spaces, and exchanges between variations of interiors. Moreover, a glass surface is alive through light reflection and mirror effects.

Manufacturers like Zeiss are producing new multifunctional *Smart Glass* materials, which offer transparent holographic displays, enabling spatial computing as promoted by the latest personal VR, AR, and XR devices.[[4]](#footnote-4) Initially developed for space flight, the technology enables new lighting, display, projection, filtering, and touch detection. Glass is combined with transparent plastic surfaces, micro-optical structures, and holographic optical elements. This technology enables head displays for automobiles and aircraft, displaying augmented-reality overlays of vehicle status for the driver or pilot. The glass material can power holographic cameras and transparent displays with projected keyboards. Wherever glass is used, this technology can add a digital layer on any otherwise transparent surfaces, such as windows of buildings, screens, and side windows of vehicles, forming multiple imaginable usages. They are becoming on-demand communication screens. A layer is generated within a thin, transparent layer, sandwiched between glass sheets, to which ultra-high-precision optics are attached. Car windows might only be the start. The technology enables fluent switches in cockpits and smart home applications. It also allows direct eye contact between people in videoconferences by placing a transparent camera in the middle of a device's screen.

Glass is matter. It is light. Glass is immortal, and also fragile. Glass can be viewed in terms of its many profound contradictions: at once firm and delicate, solid and liquid, and formed of sand and ash, being of the earth but appearing otherworldly in its chemical complexity, and in the mysterious duality of its transparency: revealing and yet veiling, altering perceptions.

Glass can be transparent and translucent. You cannot see clearly through translucent material, as it has a blurry surface. Translucent construction in architecture acknowledges the separation of exterior and interior. Using subtle manipulations of visual perception, the ambiguity between the two realms is often the primary field of inquiry. It accompanies the interruption of space flowing across the exterior boundary of the building's spaces and its physical structure at its exterior face. The American architect and curator Terence Riley characterized this separation as a veil constituted by an imposed delay in apprehension between viewer and space beyond: a *triggered subjectivity*.[[5]](#footnote-5)

**Transparency**

The idea of in-betweenness is inseparable from glass. The material exists at a threshold, chemically speaking, and the debate continues as to whether glass is an amorphous solid or a super-cooled liquid. What is clear, though, is that glass exists as a state between a liquid and a solid. This means that despite having properties of both liquid and solid, glass is neither. It is too dense to be a crystalline solid and too cohesive in molecule structure to be a liquid.

In these glass-walled, *transparent* enclosures or environments, things are not as they seem; reality becomes skewed. A general belief in the transparent, vision-enabling properties of glass is evident in its incorporation into optical devices such as glasses, magnifying lenses, and camera lenses. However, early musings on the nature of glass allude to its illusory qualities, linked only in part to seeing.

In the 1960s Colin Rowe and Robert Slutzky’s influential essays on transparency set in motion critical discussion.

Transparency may be an inherent quality of substance—as in a wire mesh or glass curtain wall, or it may be an inherent quality of organization.[[6]](#footnote-6)

Rowe and Slutsky distinguished between two senses of transparency: literal, real transparency, and phenomenal, seeming transparency. Adrian Forty added a third sense of transparency: transparency of meaning (Adrian Forty, 2004).[[7]](#footnote-7) Forty build upon Susan Sontag’s statement that it should be clear that what is there should have no ambiguity between form and contents. The truth of material must exhibit its character.

The myth of transparency has haunted modernity. We are obsessed with everything being open and transparent: people revealing themselves to nature and each other, and society knowing everything about everyone. This transparency is often on display in buildings made of glass, where spaces flow into each other and light and movement are everywhere. Glass has always been more than just practical. It's been linked to fantasy, myths, and utopian dreams. Legends about glass, like King Solomon's palace, which was built of glass and water, show how glass can be both revealing and create illusions.

King Solomon used a glass floor to expose the Queen of Sheba's true nature. He wanted to know if she was a real woman or a genie (said to have hairy legs). The Queen, tricked by glass that looked like water, lifted her skirt to avoid getting wet, revealing her human legs. This story perfectly shows the paradox of glass architecture: it tells the truth through an illusion, truth and myth in the appearance of glass itself.[[8]](#footnote-8)

Leandro Erlich's *Swimming Pool*,[[9]](#footnote-9) first created in 1999, is an art installation with a glass floor permanently housed at the 21st Century Museum of Art in Kanazawa, Japan, with past temporary exhibits at MoMAPS1 and the Venice Biennale. The installation creates an optical illusion of a filled swimming pool through a very clever design: visitors above look down to see people walking at the bottom of what appears to be a water-filled pool, while those below experience the effect of being underwater through a glass ceiling with a thin layer of flowing water above it. The piece includes typical pool features like a ladder, allowing visitors to interact with the installation and experience the underwater illusion while remaining dry.

In medieval stories, glass symbolized pure, honest love. By the 1800s, its reflective nature made glass a symbol of self-absorption and the path to understanding oneself and changing. Paul Scheerbart's 1913 manifesto, *Glass Architecture*, envisioned a future filled with magnificent glass buildings on mountaintops bathed in colorful light. He believed glass architecture could create a utopian world, protected from harm and shining brightly. Paul Scheerbart and the architect Bruno Taut dreamed up a utopian architectural style based on extensive use of glass. This vision, largely unrealized, is slowly gaining recognition as a forgotten strand of Modern Architecture.

Scheerbart and Taut, however, saw their *Glass Architecture* as an inheritor to the Gothic cathedral. They admired how stained Glass in cathedrals created a unique atmosphere, filtering light and hinting at a heavenly realm. This artistic manipulation of light, they believed, could elevate people morally. Scheerbart even argued that daily exposure to beautiful glass would make people better! He saw it as more than decoration, but as a powerful force for good.

Paul Scheerbart viewed glass architecture as instead offering the possibility for a new cosmopolitan spirituality and a transcendent connection to nature. Glass, for Scheerbart, embodied the metaphoric potentiality of color and light, and the crystal was the natural form that symbolized these ideals. In Glass Architecture, he dreamt of buildings that were anti monumental, always changing, never the same.[[10]](#footnote-10)

Unlike many early modernist buildings that aimed to reveal the true nature of things, Glass in Taut's work wasn't about transparency but about creating an illusion of another, dreamlike reality. Instead of using glass to maximize light and create open spaces like the modernist architect Loos, Taut focused on colored glass and light. This wasn't about letting in more light, but bathing the space in a softer, colored light that filtered through the colored glass, creating gentler, more muted experience.

Only some of what's clear is genuinely transparent. Artists like Taut and Scheerbart believed colored glass could improve society, not plain glass. The word *transparent* itself has been misused, confusing how glass reveals the world. Historically, from ancient to modern architects, glass's symbolic meaning goes beyond its physical clarity. Glass can be invisible (like windshields or screens) and distort reality (like in scientific instruments). Even in modern architecture, perfect transparency is a myth, and glass can also represent hope for humanity. Buildings like Libeskind's Freedom Tower use glass not for its clarity but for its ghostly reflection and the way it creates a sense of absence. This reflects postmodern ideas of space and embodies the utopian vision of glass in a contemporary way.

We're bombarded with the idea that everything should be transparent: open, accountable, readily available. This ideal is especially pushed online, where transparent screens and easy access are the keys to a better world. But is transparency all it's cracked up to be? The dark side of transparency is the constant feeling of being watched (*black boxes*), the overwhelming amount of information (*black transparency*), and the frustration of unclear communication (finger smudges, bad connections).

**VIOLENT OPAQUE**

Instead of striving for perfect transparency, the art project by Malaysian curator Ray Tat and Gabriel de Sita *VIOLENT OPAQUE* proposes embracing the messiness of communication. It focuses on the *opaque* aspects of our digital world—things that are unclear, uncertain, and frustrating. This *violence* isn't physical, but rather the emotional impact of unclear communication. Examples of *VIOLENT OPAQUE* are the frustration of a blurry video call, the uncertainty of who you're talking to online, and the feeling of being watched without knowing who's watching. The project argues that by acknowledging the messiness of communication, we can have a more realistic understanding of our digital world.[[11]](#footnote-11)

When information is readily available, according to Byung-Chul Han, societies rely less on trust and more on control. Transparency doesn't build trust; it creates a system of constant monitoring. With instant communication everywhere, long-term planning becomes difficult because everything needs immediate attention. The continuous flow of information makes it harder to disagree or have different opinions. Transparency pressures everyone to conform. Transparency is a tool a neoliberal economic system uses to turn everything into data that can be controlled. Transparency overexposes people, making them vulnerable. It seems like freedom but leads to constant surveillance, as in social media becoming Bentham's panopticon. Transparency is an idea that sounds good on the surface, but when taken too far, becomes dangerous and controlling. In our fast-paced world, there's no room for privacy or reflection. This constant flow of information and communication disrupts everything.[[12]](#footnote-12)

Our society prioritizes constant display and image over substance. Everything is judged by its *exhibition value*, meaning its ability to be seen and consumed. This continuous display has a pornographic quality, where everything is exposed and devoid of hidden depths. This system thrives on *attention capital*, where the more attention something gets, the more valuable it becomes. This leaves no room for *dwelling* or appreciating things on their terms. There's only the pressure to be constantly showing off and seeking validation. In this culture of exhibition, only the visible matters. The *invisible*, anything that doesn't generate attention or fit the mold of the constant display, is deemed unimportant. This creates a society obsessed with external appearances without any inner depth or meaning.

Everything must become visible. The imperative of transparency suspects everything that does not submit to visibility. Therein lies its violence.[[13]](#footnote-13)

Images designed to be easily grasped (exhibition value) lack complexity. They are so clear that they become like pornography: obvious and lacking any challenge that might make you think, no brokenness, nothing to reflect upon. Further, faster communication comes at a cost. It simplifies things to speed them up, sacrificing depth for speed. This *anesthetic hypercommunication* ignores the senses, which are slower but would be more prosperous. Transparency, then, means a lack of sensory experience.

Transparency wants to eliminate all distance, making everything readily available. However, this destroys true closeness. Real proximity requires space for contemplation, which is impossible when everything is constantly in your face. This *tactile perception* eliminates the beauty of observing and reflecting. Transparency removes all sense of distance, creating a uniform state that's neither close nor far.

Pleasure requires some mystery. Transparency strips information bare, making it uninteresting and flat. While sometimes seen as negativity to be banished, mystery is a valuable cultural tool. It creates symbolism and depth, even if it is unclear.

In essence, technology acts as an extension of our senses and nervous system. Cameras capture what we see, and digital media reflects our thoughts and emotions. Social media, in particular, reveals the unconscious aspects of society as a whole. The digital world totalizes algorithms, calculations, and accumulation. It takes existing forms of communication, like pictures and movies, and makes them adaptable and endlessly reproducible.[[14]](#footnote-14)

**Crystal Palace**

The 1851 *Great Exhibition* showcased a significant shift in British society. The focus moved from aristocracy and beauty to the middle class and industry. Notably, the *Crystal Palace*, a giant glass and iron building filled with global products, embodied this change. Following Walter Benjamin, Hiroki Azuma compares it to an arcade, a space for leisurely browsing. This aligns with the idea of the tourist as a *flâneur*, someone who casually wanders and observes. The tourist, as a contemporary figure, like a window shopper, is drawn by chance encounters and discoveries, sometimes uncovering things locals might prefer hidden. This *drifting* nature is critical to understanding tourists. It has both limitations and potential for exploration.[[15]](#footnote-15)

Moreover, the image of the arcade and that of the Crystal Palace is also deeply related to nineteenth-century political thought. It is well known that the great imaginative socialist Charles Fourier used the arcade as a model for designing the building for his ideal community of *phalanges*. In other words, Fourier saw the shopping mall as a utopia, or at least thought it could serve as a foundation for such a utopia. The emergence of the arcade, a new space for consumption where a new class of people supported by new industries and new technologies congregate, provided a new utopian image for contemporary socialists.[[16]](#footnote-16)

Fyodor Dostoevsky's novella *Notes from the Underground* criticizes the future vision of another writer, Nikolai Chernyshevsky. A key symbol in this critique is the *Crystal Palace*. Chernyshevsky saw the *Crystal Palace* as a model for a future society. This society would be wealthy and comfortable, with people living in beautiful, modern structures. Dostoevsky's *Underground Man* hates this idea. He calls the *Crystal Palace* a *chicken coop* because it represents a world without room for rebellion or individuality. People would be stuck in a perfect, boring society, unable to express anger. The *Crystal Palace's* focus on technology and consumption as the path to happiness disgusts the *Underground Man*.

Two opposing visions of the future are confronted. The Utopian Dream is a future filled with connection, shared experiences, and potentially even freedom from work thanks to technology. This vision is similar to ideas of utopian socialism and the *Californian Ideology*. It reflects the concept of a globally unified humanity, achieving *the unity of mankind*. Dostoevsky's character, theUnderground Man, rejects this utopian dream entirely. He doesn't care about technological advancements or the homogenization of the world through consumerism. The Underground Man's rebellion isn't about the specifics of the utopia but the very idea itself. He believes humans have the right to be unhappy, irrational, and even *cringeworthy*. He sees forced happiness as a loss of his individuality and humanity.

*The Underground Man* becomes the archetype for those who reject a future of forced happiness and sameness, valuing the right to experience suffering and individuality over a comfortable but uniform existence.

**Arcades**

Walter Benjamin notes, reflecting on the arcades of Paris, that a society lost in dreams doesn't learn from the past. Everything seems both wholly new and repetitive. Even the feeling of something being cutting-edge is a dreamlike distortion, like the idea of everything eternally repeating. Their perception of time is chaotic and layered, just like their perception of space. Once this society becomes conscious, they start categorizing things based on political and religious ideas. These categories act as a filter, slowing down the constant flow of events and form history. Just as a crystal formation captures light, these categories capture the flow of time. Similar to how a full stomach doesn't directly influence the dreams of a sleeper, the economic situation doesn't directly appear in a society's dreams. However, it does get interpreted and reflected in their dreams. When they wake up, they can finally understand the true meaning behind those dreamlike interpretations.

Unlike artistic creations, technological advancements succeed when their social impact is clear and easy to understand. This is why things like glass architecture are successful - they are transparent in their purpose. These early shopping malls were a forerunner of modern department stores. They were built during a time that Balzac described as a period of extravagant displays. Filled with luxury goods, these arcades blurred the line between art and commerce. Everyone admired them, and they became a major tourist attraction. Described as miniature cities, these glass-roofed walkways offered a luxurious shopping experience under the first gas lights.[[17]](#footnote-17)

The second condition for the emergence of the arcades is the beginning of iron construction. The Empire saw in this technology a contribution to the revival of architecture in the classical Greek sense. … Empire is the style of revolutionary terrorism, for which the state is an end in itself. Just as Napoleon failed to understand the functional nature of the state as an instrument of domination by the bourgeois class, so the architects of his time failed to understand the functional nature of iron, with which the constructive principle begins its domination of architecture. These architects design supports resembling Pompeian columns, and factories that imitate residential houses, just as later the first railroad stations will be modeled on chalets. *Construction plays the role of the subconscious.* Nevertheless, the concept of engineer, which dates from the revolutionary wars, starts to gain ground, and the rivalry begins between builder and decorator, Ecole Poly technique and Ecole des Beaux-Arts.[[18]](#footnote-18)

For the first time in the history of architecture, an artificial building material appeared: iron. It undergoes an evolution whose tempo accelerates. The rail becomes the first prefabricated iron component. Iron is used in arcades, exhibition halls, and train station buildings that serve transitory purposes. At the same time, the range of architectural applications for glass expands. However, the social prerequisites for its widened application as a building material will come to the fore only a hundred years later. In Scheerbart's *Glasarchitektur* (1914), it still appears in the context of *utopia*.[[19]](#footnote-19)

As a new way of producing things emerges, people imagine a future shaped by the new and the old. These visions are like wishes, reflecting a desire to overcome limitations while holding onto familiar aspects. At the same time, they push away anything outdated, even the recent past. This yearning for something new can sometimes lead to a romanticized version of the distant past, a time without social classes.

Inspired by the rise of machines, Charles Fourier envisioned a future where people live together harmoniously, free from the moral corruption of the business world. His phalanstery, a giant communal living space, is described with intricate details that function like machinery but are built with human passions and desires. This *human machine* creates a paradise, a wish for a perfect society that echoes throughout history, a heaven on earth.

Fourier took inspiration for his phalanstery from the arcades and shopping centers he saw around him. He flipped their purpose, transforming them from commercial spaces to places of residence. This colorful, idyllic vision contrasted with the strict forms of his era. Even later writers, like Zola, show the influence of Fourier's ideas, even as they move away from the specific details of his utopia. Benjamin points out the rise of panoramas. Panoramas, large-scale painted views, marked a turning point. They emerged alongside the technological advancements of iron and Glass construction, suggesting a move away from traditional artistic forms. Panoramas aimed for extreme realism, using techniques to depict changing light and movement. This focus on capturing real-life details foreshadowed photography and film.

Parallel to this was a new type of literature mirroring panoramas. Panoramas influenced a style of writing that presented snippets of life and information, similar to how panoramas combined foreground details with background landscapes. This literature also reflected social changes, depicting the working class within a broader societal context. Panoramas became a way for city dwellers to connect with nature, bringing the countryside into the urban environment.

With his knowledge of lighting and scenic effects, the inventor of photography, Louis Daguerre, collaborated with diorama painters from 1821 and owned himself a profitable diorama theatre in Paris. In 1839, his panorama burned down. Daguerre was able to save his experiments, daguerreotype specimens, notes, and equipment and publicly announced his invention just a couple of months later: the daguerreotype.

**The Glass House**

To live in a glass house is a revolutionary virtue par excellence. It is also an intoxication, a moral exhibitionism, that we badly need. Discretion concerning one's own existence, once an aristocratic virtue, has become more and more an affair of petit-bourgeois parvenus.[[20]](#footnote-20)

*A lens in the landscape* is how the photographer Welling described Philip Johnson’s glass house.[[21]](#footnote-21) Philip Johnson, following the footsteps of his mentor and collaborator Mies van der Rohe, writes about his glass house:

The multiple reflections on the 18’ pieces of plate glass, which seem superimposed on the view through the house, help give the glass a type of solidity; a direct Miesian aim which he expressed twenty-five years ago: *I discovered by working with actual glass models that the important thing is the play of reflections and not the effect of light and shadow as in ordinary buildings.*[[22]](#footnote-22)

Johnson chose these words to accompany the most captivating photograph in his pathbreaking 1950 essay detailing the influences on his new home. The photograph of the north end of the west wall depicts Johnson reading at his desk. More importantly, the giant pane of glass absorbs the entire landscape and sweeps trees onto its reflective surface—what Johnson irreverently referred to as *very expensive wallpaper*.

Modern architecture started as a broad movement with many goals. It aimed to create a perfect society through innovative design and technology, and its supporters avoided calling it a *style*. In 1920s Europe, these architects believed in using honest materials (especially glass, steel, and concrete) and letting the building's function determine its form. They saw architecture as a way to improve society as a whole. The one person who kept changing modern architecture from a movement to a style was Philip Johnson. In 1932, Johnson, a young curator at the Museum of Modern Art, helped introduce to American audiences what he, together with Henry-Russel Hitchcock, called the International Style. Both insisted on calling it a Style (with a capital S). They also used other words like *contemporary* and *current*. This switch to calling it a Style had a significant impact.

Johnson later reminisced about the publication that accompanied the exhibition:

One of the points that the book made was a key one—that the Modern movement was a *style* similar to Gothic or Baroque, and it was that point which caused the objections from practicing architects.[[23]](#footnote-23)

Johnson wouldn't become a practicing architect for a decade; he eventually designed his own houses that perfectly embodied the minimalist style of Mies van der Rohe. The houses—the Glass House and the Brick House, completed in 1949 on his estate—could be seen as the pinnacle of Modern architecture. However, this achievement also marked the movement's decline. For Johnson, Modernism became just another historical style from which to draw, as seen in his later architectural works.

Modernism meant the negation of the past, an annihilation of history. Early twentieth-century avant-gardes declared an absolute rupture with the past. F. T. Marinetti spoke for many avant-garde artists when in 1909 he exclaimed:

Do you, then, wish to waste all your best powers in this eternal and futile worship of the past, from which you emerge fatally exhausted, shrunken, beaten down? [[24]](#footnote-24)

Johnson's Glass House—the structure and the estate—can be seen as one attempt to redo modernism with a sense of history. This seems contradictory. Nevertheless, the Glass House embodies a Modernism born not of necessity, ideology, or functionality but rather of exhibitions and books—in a word, history. Where Modernists fancied themselves creators *ex nihilo*, Johnson's 1950 essay on the Glass House enthusiastically cited source after source, from the Acropolis and Karl Friedrich Schinkel to Le Corbusier and Mies van der Rohe.[[25]](#footnote-25)

Johnson turned his estate into a personal museum, or in his words, the *diary of an eccentric architect*. In a 1970 TIME Magazine article entitled *The Duke of Xanadu at Home*, art critic Robert Hughes emphasized that *most of all, in Johnson's view, people need a sense of history.*[[26]](#footnote-26)

A traditional Modernist genealogy of the Glass House follows the bread crumbs left by Mies in his Farnsworth House (1945–51), through Pierre Chareau’s Maison de Verre (1928–32), all the way back to Joseph Paxton’s Crystal Palace (1851). One might add Walter Gropius’s Dessau Bauhaus (1925–26) or the Galérie des machines (1889) and the other great glass and iron constructions clustered around world exhibitions in the late nineteenth century. The story is the same. The maxim is light, air, openness—in a word, transparency.[[27]](#footnote-27)

Johnson emphasizes a processional approach to architecture, where the building unfolds and reveals itself gradually through movement and time. The design of the approach road ensures visitors experience the full depth of the Glass House from multiple angles, surpassing the experience at the Acropolis, where visitors can only perceive three corners at once. The diagonal approach reveals the building's depth in stages. Johnson allows visitors to see all four corners through the transparent structure.

However, Johnson's processional architecture is designed for a small, elite audience, unlike the public experience of the Acropolis. With its private studies and intimate tours, the Glass House estate resembles the processional experience of 18th-century mansions, not the public spectacle of modern architecture often celebrated.

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**Light**

At the heart of every smartphone, laptop, and modern electronic device lies an invisible technological marvel that depends on light. While we often think of light technology in terms of photography or architecture, its most profound impact may be actually in the realm of semiconductor manufacturing.

ASML in Veldhoven produces advanced chip-making machines—photolithography machines which are used to produce computer chips. ASML is partnering with Zeiss in Jena, which provides the sophisticated optical systems essential to ASML's extreme ultraviolet (EUV) lithography machines. These machines use incredibly precise light patterns, projected through specialized lenses, to create the microscopic circuits that power our digital world.

The process is akin to an ultra-precise form of photography, but at a scale so small it challenges our imagination. Using light, these machines pattern circuits onto silicon wafers, creating structures at the nanoscale - thousands of times thinner than a human hair. This light-based manufacturing process has become the foundation of modern computing, enabling the creation of increasingly powerful chips.

The implications of this technology extend far beyond the clean rooms where chips are manufactured. Every time we use a smartphone, start our car, or interact with any modern appliance, we're relying on components that were created by these machines. It's a reminder that while we often focus on the digital nature of modern technology, its physical foundation rests on our ability to harness and control light with extraordinary precision.

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To say that light is a medium is a refusal to realize that there are at least three definitions of light. Light can be a Signal of information (I use electricity to transmit impulses that, in Morse code, mean particular messages); light can be a Message (if my girlfriend puts a light in the window, it means her husband has gone out); and light can be a Channel (if I have the light on in my room I can read the message-book). In each of these cases the impact of a phenomenon on the social body varies according to the role it plays in the communication chain.[[28]](#footnote-28)

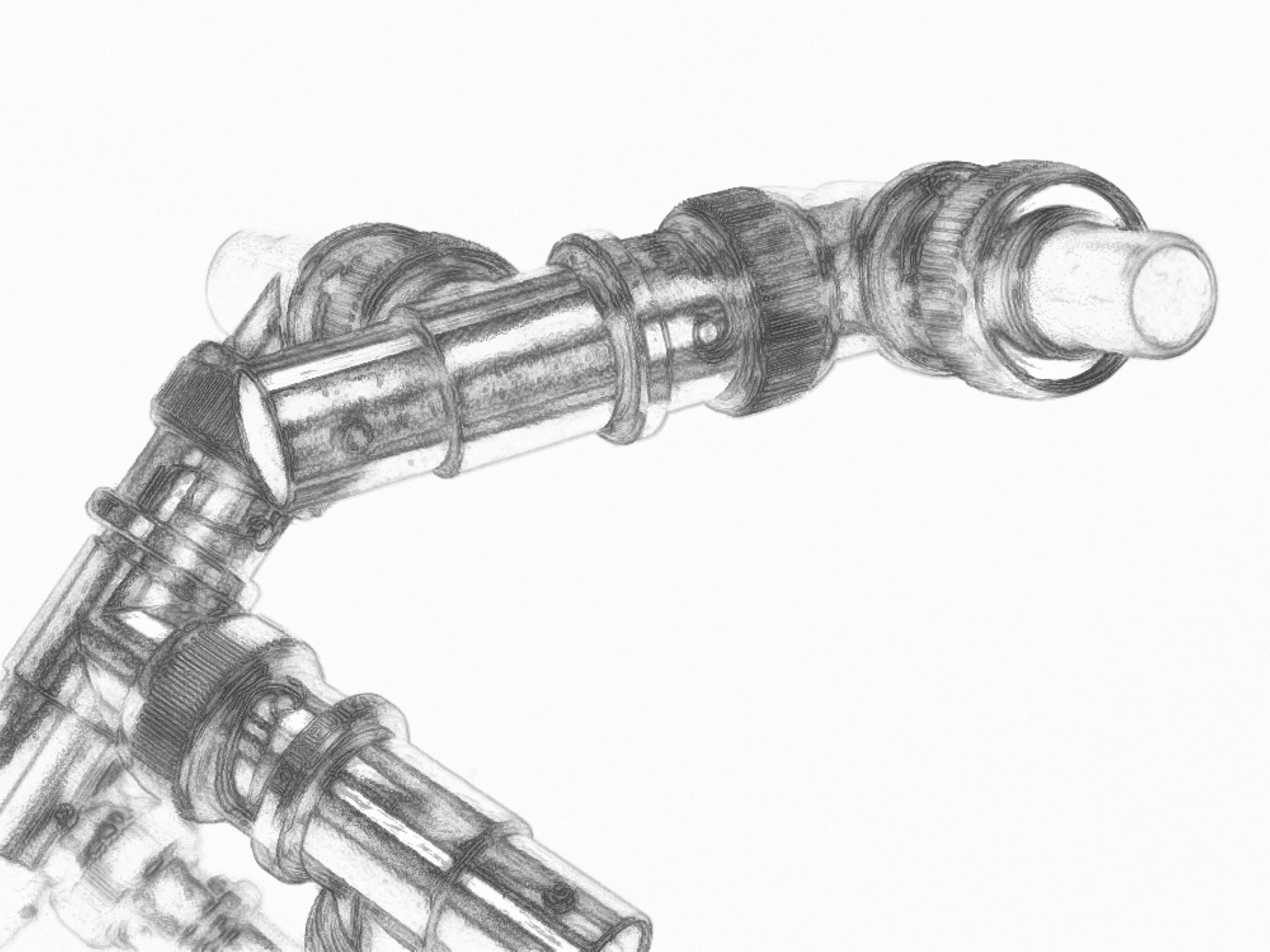


Fig. 12 YOU

*Now objects perceive me*, the painter Paul Klee wrote in his Notebooks. This rather

startling assertion has recently become objective fact, the truth. After all, aren't they talking about

producing a *vision machine* in the near future, a machine that would be capable not only of recognising the contours of shapes, but also of completely interpreting the visual field, of staging a

complex environment close-up or at a distance? Aren't they also talking about the new technology

of *visionics*: the possibility of achieving sightless vision whereby the video camera would be controlled by a computer? The computer would be responsible for the machine's - rather than the

televiewer's - capacity to analyse the ambient environment and automatically interpret the meaning of events. Such technology would be used in industrial production and stock control; in military

robotics, too, perhaps.[[29]](#footnote-29)

- Paul Virilio

1. Travis Sharrow, Unveiling the Brilliance: The Truth Behind Why Smartphones are Encased in Glass, Softandtech March 25, 2024. https://softhandtech.com/why-do-smartphones-have-glass/ [↑](#footnote-ref-1)
2. Italo Calvino, Crystals. In: Calvino, Italo. t zero (Translated from Italian by William Weaver), New York: Harcourt, Brace & World, 1969. [↑](#footnote-ref-2)
3. Barbara Linz, Glass = Glas = Verre. H.f. ullmann, 2009. [↑](#footnote-ref-3)
4. ZEISS at CES 2024. Multifunctional Smart Glass for a wide range of application

   Press Release 14 Dec. 2023. - https://www.zeiss.com/corporate/en/about-zeiss/present/newsroom/press-releases/2023/microoptics-ces.html [↑](#footnote-ref-4)
5. Annette Fierro, The Glass State: The Technology of the Spectacle, Paris, 1981 - 1988, The MIT Press 2006: 99 - 100. [↑](#footnote-ref-5)
6. Colin Rowe and Robert Slutzky, Transparency: Literal and Phenomenal, Perspecta, vol. 8, 1963: 45–54, JSTOR, https://doi.org/10.2307/1566901. Accessed 9 Jan. 2025: 161. [↑](#footnote-ref-6)
7. Adrian Forty, Words and Buildings: A Vocabulary of Modern Architecture, Thames & Hudson 2004: 288. [↑](#footnote-ref-7)
8. Rosemarie Haag Bletter, The Interpretation of the Dream-Expressionist and the History of the Crystal Metaphor, The Journal of the Society of Architectural Historians‘, Vol. 40, No. 1, Mar., 1981: 23. [↑](#footnote-ref-8)
9. Leandro Ehrlich: Swimming Pool. Oct 19, 2008–Apr 12, 2009. https://www.moma.org/calendar/exhibitions/4922. [↑](#footnote-ref-9)
10. Glass! Love!! Perpetual Motion!!! A Paul Scheerbart Reader. Edited by Josiah McElheny and Christine Burgin. University of Chicago 2014. [↑](#footnote-ref-10)
11. Video Vortex XI Kochi 2017 Conference Report. 23 – 26 February 2017, Kochi, India. https://networkcultures.org/blog/publication/video-vortex-xi-kochi-2017-conference-report/ [↑](#footnote-ref-11)
12. Byung-Chul Han, The Transparency Society, Stanford University Press 2015. [↑](#footnote-ref-12)
13. Han 2015. [↑](#footnote-ref-13)
14. Byung-Chul Han, Digitale Rationalisten und das Ende des kommunikativen Handelns, 2013 page 28 [↑](#footnote-ref-14)
15. Walter Benjamin, The Arcades Project, tr. H. Eiland and K. McLaughlin, Cambridge, MA: Belknap Press, 1999: 158. [↑](#footnote-ref-15)
16. Hiroki Azuma, Philosophy of the Tourist, Urbanomic 2022. [↑](#footnote-ref-16)
17. Benjamin 1999: 465. [↑](#footnote-ref-17)
18. Benjamin 1999. [↑](#footnote-ref-18)
19. Benjamin 1999: 4. [↑](#footnote-ref-19)
20. Walter Benjamin, Surrealism, in Reflections: Essays, Aphorisms, Autobiographical Writings, Peter Demetz ed., transl. Edmund Jepcott (New York: Harcourt Brace Jovanovich, 1978), p. 180. Cited after Maison de Verre pg 4 … [↑](#footnote-ref-20)
21. Noam M. Elcott, Reflections on Glass Houses. 2011. https://www.columbia.edu/cu/arthistory/faculty/Elcott/Elcott-2011-Reflections-on-Glass-Houses.pdf Jan. 09, 2025. [↑](#footnote-ref-21)
22. Philip Johnson, House at New Canaan, Connecticut (1950). Reprinted in David Whitney and Jeffrey Kipnis, Philip Johnson: The Glass House. New York: Pantheon Books, 1993: 13. [↑](#footnote-ref-22)
23. Philip Johnson, Foreword to Hitchcock, Henry-Russell and Johnson, Philip. The International Style. New York: W. W. Norton, 1995: 16. [↑](#footnote-ref-23)
24. Filippo Tommaso Marinetti, The Founding and Manifesto of Futurism 1909, Futurist Manifestos, ed. Umbro Apollonio, Boston: MFA Publications, 2001: 23. [↑](#footnote-ref-24)
25. Elcott 2011. [↑](#footnote-ref-25)
26. Robert Hughes, The Duke of Xanadu at Home, 1970. Reprinted in Whitney and Kipnis, Philip Johnson: The Glass House: 56. [↑](#footnote-ref-26)
27. Elcott 2011. [↑](#footnote-ref-27)
28. Umberto Eco, titled Towards a Semiological Guerrilla Warfare and published as part of his

    essay collection Travels in Hyperreality, where he refutes what Marshall McLuhan said about light as a medium http://tesugen.com/archives/03/10/eco-on-media. [↑](#footnote-ref-28)
29. Paul Virilio, Vision Machine. 1994: 59. [↑](#footnote-ref-29)