OBSERVABLES

A convergence of space and time

Todd Margolis

January 17, 2026

Artist Statement

Intersecting Space & Time

In a world of constant scrolling and fleeting images, we are asked to observe everything but rarely given the chance to truly see. Observables is an invitation to slow down, to look closer, and to experience reality in a new way. This project uses cutting-edge technology not just to create art, but to explore the very nature of how we perceive space, time, and substance in an age where our physical and digital lives have become inseparable.

At its heart, Observables blends "the rocky grit of physical existence with the gassy translucency of our digital lives." We create sensory paradoxes—experiences where solid objects and virtual light coexist, where data feels tangible, and where time seems to stretch and suspend. This is achieved through a unique fusion of astrophotography, physically sculpted objects, and interactive virtual and augmented reality environments. The work draws inspiration from early 20th-century art movements that shattered traditional perspectives—like the fragmented forms of Cubism and the dynamic motion of Futurism—and re-imagines them within the immersive, experiential canvases of today.

The goal is to create "artifacts from a future we haven't yet reached"—not just objects to be viewed, but immersive events to be lived. These encounters are designed to provoke wonder, disorientation, and a heightened awareness of your own perceptual apparatus. By asking you to engage for longer, to navigate these hybrid spaces, Observables challenges the rapid consumption of modern media. It aligns with the "slow art" movement, championing a deeper, more contemplative connection between you and the work, moving beyond a momentary glance to a durational encounter.

Observables is the culmination of Todd Margolis's decades-long career at the intersection of art, science, and technological innovation. His journey has been a consistent exploration of perception, from co-inventing foundational Virtual Reality hardware (the Varrier™ display) at the Electronic Visualization Laboratory to directing large-scale immersive data projects at UC San Diego's Qualcomm Institute. This new body of work builds directly on the legacy of pioneering projects like the immersive VR journey of ATLAS in silico; the Museum of Future Objects (MOFO), which used Augmented Reality to place speculative artifacts into our world; and his interventionist public art with the Manifest.AR collective. Each step has been a sustained inquiry into how emerging technologies can fundamentally reshape human experience.

Ultimately, Observables is more than an exhibition. It is a perceptual laboratory. It provides the tools and the space to recalibrate your senses, question the nature of materiality, and see the world—and your place within it—differently.

Bang

Year: 2026 | Medium: Kinetic Installation (Latex, Pneumatics) | Dimensions: 48 x 24 x 24 inches

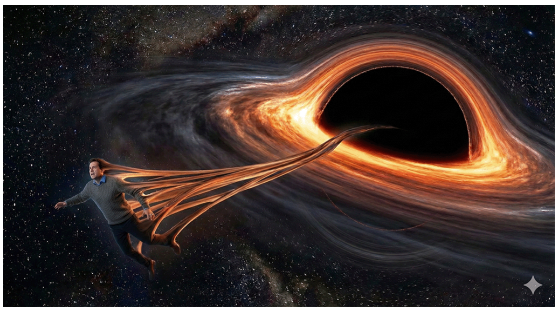
In the quiet of the gallery, a universe is born and collapses, again and again. Bang is a potent kinetic sculpture that transforms a common scientific instrument—a weather balloon—into a profound and tangible cosmic event. Through a starkly simple yet powerful mechanism, the artwork invites viewers into a direct, physical engagement with the fundamental rhythms of creation and destruction.

At the heart of the work is a large black weather balloon, whose deep, matte surface is speckled with countless white dots. Using a precisely controlled, closed-loop air pressure system, the artwork performs a relentless, meditative cycle. The balloon slowly expands from a dense, "singularity-like" state to a massive 5.5-foot sphere, holding its form before contracting back to its origin. This rhythmic inflation and deflation is the artwork's "cosmic breath"—a living, breathing entity whose presence alters the scale, sound, and even the subtle air currents of the room.

Bang powerfully evokes the cycle of cosmic creation and destruction—a tangible metaphor for the Big Bang and the hypothetical "Big Crunch." Its engagement with perception and negative space places it in dialogue with the minimalist and Light and Space movements.

Like artists who use pigment or light to create seemingly bottomless voids, Bang uses its light-absorbing surface and shifting volume to dematerialize solid form. This work is a distilled, physical expression of Todd Margolis's career-long exploration of technology, perception, and immersive experience. While his digital work uses code and screens to transport the user, Bang achieves a similar perceptual shift using only air and latex, giving tangible, rhythmic form to abstract cosmological concepts of universal expansion and contraction.

Spaghettification



Year: 2026 | Medium: Virtual Reality | Dimensions: 7 x 6 x 12 inches

Spaghettification offers a visceral, firsthand encounter with one of the universe's most mind-bending phenomena. The artwork moves beyond mere illustration, crafting an immersive simulation that invites viewers to witness the dramatic distortion of an object as it crosses a black hole's event horizon - the infamous "point of no return." Rooted in Einstein's theory of general relativity, the piece makes perceptible the theoretical process of extreme tidal forces stretching matter vertically while simultaneously squeezing it horizontally.

This is not a passive observation, but an embodied experience of overwhelming transformation, designed to evoke the cosmic sublime: a profound sense of awe, fragility, and existential dread. The viewer is confronted with the disintegration of form as an object is elongated into a terrifyingly thin strand, just moments before vanishing into the singularity - the infinitely dense point where the laws of physics break down. Spaghettification thus transposes a purely theoretical concept into a lived sensation, challenging the limits of human perception and offering a confrontation with ultimate unknowability.

This work is a distilled expression of artist Todd Margolis's career at the intersection of art, science, and technology. For over two decades, Margolis has used advanced immersive technologies to visualize complex systems and transform abstract data into tangible, experiential art. His extensive background in Electronic Visualization and pioneering work in Virtual and Augmented Reality provide the robust framework for such a project.

This piece aligns perfectly with a consistent pattern seen in works like ATLAS in silico, which visualized particle physics simulations in VR, and his research developing "artistically impelled immersive environments for large-scale data exploration." Across his practice - from co-inventing the Varrier™ auto-stereoscopic VR display to leading interdisciplinary teams at institutions like the Qualcomm Institute - Margolis has consistently sought to create platforms that manipulate and extend human perception. Spaghettification is therefore not an outlier, but a signature achievement that leverages deep technological expertise to make the invisible forces of the cosmos palpable, continuing his enduring exploration of the dialogue between scientific inquiry and artistic expression.

Delayed Vision

Year: 2026 | Medium: Android app running on Galaxy A9+ Tablet | Dimensions: 11 x 7 x 1 inches

Imagine seeing yourself not as you are now, but as you were moments, or even an hour, ago. This series of video mirrors forces a visceral encounter with a profound truth of our universe: because light travels at a finite speed, all observation is an act of looking into the past. By introducing a precise, scientifically-calibrated delay into your reflection, each mirror makes this cosmic latency immediate and deeply personal.

The work dismantles the illusion of a shared, instantaneous present, rendering the self in the mirror perpetually out of reach—a version of you that has already vanished. The experience scales dramatically, moving from the subtly disorienting to the profoundly estranged. The mirrors cease to be mere surfaces for self-recognition and transform into portals, translating abstract astronomical data into a concrete, lived experience.

This work is a potent memento mori, a reminder that even in our most immediate self-perception, we are always confronting a ghost. It is the culmination of decades of artistic practice by Todd Margolis, who has consistently explored the intersection of perception, technology, and science. His extensive career in virtual and augmented reality, from co-inventing VR systems at the Electronic Visualization Lab to creating telepresence performances, has always questioned the nature of presence and the delays inherent in mediated communication. This series is a direct extension of that inquiry, grounding the technological manipulation of time not in artistic whim, but in the physical laws of the universe.

The Moon (1.3s delay)

The "Moon" mirror confronts you with a 1.3-second delay, a slight, uncanny hiccup in

The Sun (8m 20s delay)

In the "Sun" mirror, an 8-minute and 20-second gap separates you from your

Saturn (79m delay)

The "Saturn" mirror introduces a delay of nearly an hour and a half; the reflected self is

Star Trails

Year: 2023-2024 | Medium: Archival Pigment Prints | Dimensions: 20 x 30 inches each

In the photographic series "Star Trails" the night sky is transformed into a canvas for the captivating dance of celestial motion. Using the technique of long-exposure photography, individual stars are drawn out from mere pinpoints of light into mesmerizing streaks and elegant arcs. Each trail meticulously inscribes the path of our own planet’s relentless rotation through space. This is not a picture of stars moving, but rather a direct visualization of the Earth spinning on its axis beneath a fixed firmament. The technique brilliantly compresses hours of cosmic time into a single, silent frame, allowing us to perceive a motion that is otherwise imperceptible. The work offers a profound shift in perspective: we are not passive observers of a distant cosmos, but active participants on a moving world. By rendering the passage of time as a physical trace of light, the series makes the abstract geometry of our planetary existence a tangible, visual experience.

Geminid

Long exposure capturing the Geminid meteor shower streaks intersecting with star trails.

Dunes

Star trails rising above the silhouette of sand dunes, emphasizing the earth's horizon.

Goose Lake

Concentric star paths reflected in the still waters of Goose Lake.

Wildcat

Star movement captured over the equipment of fellow astrophotographers at a star party.

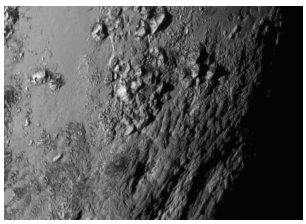
Horizons

Year: 2026 | Medium: Stereoscopic View-Master | Dimensions: 6 x 10 x 3 inches

The iconic View-Master, a symbol of childhood wonder, is reimagined by artist Todd Margolis as a complex portal to the cosmos. This custom experience presents seven stereoscopic images of our solar system, crafted initially not from illustration, but from authentic scientific data. By meticulously utilizing parallax data and rotational shifts captured by spacecraft, Margolis transforms raw information from missions like New Horizons and Mars Express into true 3D views of celestial objects.

Yet, these pristine scientific vistas are not left uninhabited. In a provocative artistic intervention, Margolis disrupts the purity of the data by embedding contemporary avatars of extra-planetary ambition within the scenes. With the simple, mechanical click of the viewer's lever, one might encounter the icy mountains of Pluto, only to find them scaled by a diminutive Jeff Bezos; turn the wheel again, and Elon Musk is revealed surveying the dust-strewn craters of Mars's moon Phobos.

The result is an intimate, personal encounter with the sublime, complicated by the uncanny presence of human ego. The artwork collapses the immense distances of space, placing both the grandeur of cosmic phenomena —like the explosive energy of a Solar Coronal Mass Ejection—and the caricatures of modern corporate spacefarers directly into your hands. It transforms abstract data into a visceral experience, inviting a private communion with sights otherwise inaccessible to humankind, while simultaneously questioning who gets to claim dominion over them.



Pluto (Detail)

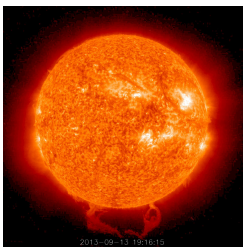
3D detail of nitrogen plains on Pluto featuring Jeff Bezos

Pluto

Plutonian mountains where Neil deGrasse Tyson definitively red-

Phobos

Irregular Martian moon where Elon Musk plants his flag from a

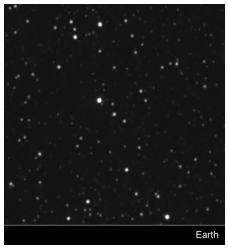


The Sun

Capture of solar coronal ejections framing a giant, gold-

Asteroids

Asteroid field featuring James Cameron searching for rare



Proxima Centauri

Our nearest star, Proxima Centauri, where Professor Avi

The Moon

Lunar landscape view featuring Michelle Hanlon as a security

Audio Counter

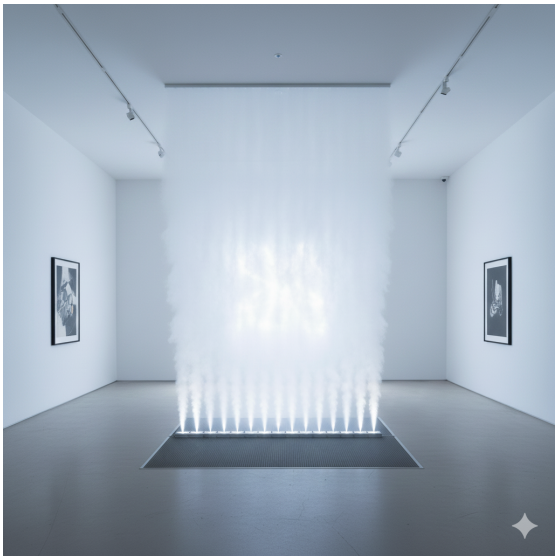
Year: 2026 | Medium: Generative Audio

This audacious auditory experiment invites you to listen to the immense scale of the observable universe. Our cosmos holds an estimated 2 trillion galaxies, each teeming with hundreds of billions of stars; to simply count them would take an astonishing 6.3 quadrillion years. This artwork transforms that incomprehensible number into a tangible, sensory experience.

Using generative algorithms, the piece sonifies this cosmic data, creating a vast soundscape where the star count of each galaxy is represented by a specific sound frequency. The result is a mesmerizing and overwhelming "chorus of the cosmos" that plunges the listener into a profound, visceral encounter with the immeasurable. By shifting our perception of scale from a visual map to an aural immersion, the work invites us to confront the limits of human perception. Can the ear truly differentiate two trillion distinct tones, or will they converge into an undifferentiated hum—a sonic "white noise" of the universe? This central paradox evokes a simultaneous sense of awe and insignificance, forcing a confrontation with humanity's place within an unfathomable expanse.

This piece is a natural culmination of artist Todd Margolis's two-decade career exploring the intersection of art, technology, and large-scale data. From developing immersive discovery platforms for scientific research in Virtual Reality to his academic work collaborating with musicians on "Scalable Auditory Data Signatures," Margolis has consistently sought to translate vast, abstract information into meaningful human experiences. Here, he extends that inquiry to the ultimate dataset: the cosmos itself. The artwork resonates deeply with the mission of Observables, which explores the contrast between the ancient, enduring universe and the fleeting, ephemeral nature of the digital sound attempting to capture it. The work becomes an artifact from a future we haven't yet reached—an endless, self-organizing sonic tapestry that embodies our ambition to comprehend the incomprehensible, rendering the sublime audible for the very first time.

The Edge



Year: 2026 | Medium: Laminar Flow Fog Screen | Dimensions: 70 x 30 inches

This work uses advanced laminar flow technology—a technique that creates a perfectly smooth, undisturbed stream of air—to sculpt a seemingly impossible object: a perfect, thin wall of fog. It stands in the space like a slice of a cloud, a smooth, touchable plane that appears solid yet yields to the slightest touch. The wall is a physical boundary that is also an invitation. Visitors are encouraged to approach it, to see their reflection dissolve on its surface, to reach out and feel the cool, fine mist, and then to step through it.

The installation is a physical metaphor for the edge of the observable universe. This cosmic boundary is not a wall in space, but the limit of what we can see—the point beyond which light has not had time to reach us. Like that boundary, the fog wall is visible and tangible, yet it is also permeable. Walking through it does not reveal what lies on the other side; it simply envelops you for a moment in the very substance of the boundary itself. The experience transforms an astronomical concept into an intimate, personal encounter, creating a profound awareness of the limits of our own perception and challenging us to reconsider the nature of edges, both physical and conceptual.

For over two decades, my work has explored the intersection of technology and perception, creating immersive environments that make intangible ideas tangible. From building Virtual Reality worlds that visualize massive scientific datasets to developing Augmented Reality experiences that overlay digital information onto our physical space, my practice has consistently focused on how we encounter and understand boundaries. This installation is a logical extension of that inquiry, moving beyond the screen to create a purely physical, yet technologically mediated, experience. Where my past work in VR and AR used digital portals to explore new realities, this fog wall provides a physical one. It synthesizes a career of technological research with a fundamental question about the human condition: how do we relate to the things we can perceive but not fully comprehend? The fog wall offers no answers, only the direct, sensory experience of standing at the edge.

Now & Then

Year: 2021-2026 | Medium: Archival Prints | Dimensions: 20 x 30 inches each

In the Now & Then series, I explore the profound reality that astronomy is, at its core, the study of the past. Every photon captured by my lens carries a "history of travel," revealing not where a star is today, but where it was when its light began its journey across the void. To bridge the gap between human history and cosmic time, I use AI to generate contextual scenes of the specific historical era on Earth when that light first departed.

By inserting the astronomical subject into these reconstructed landscapes and applying textures like fossilized rock, flaking parchment, or ancient stone etchings, I aim to materialize the "latency" of the universe, making the deep time of the cosmos tangible through the lens of human heritage.

Whirlpool

Fossilised into the appearance of ancient rock, this image captures

Andromeda

Rendered as a primitive stone etching, this piece portrays our

Eagle

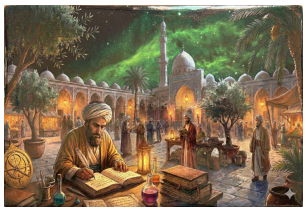
Presented as a Neolithic stone carving, this work depicts the

Orion

Visualized on weathered, flaking parchment, this artwork captures

Horsehead

Created with the aesthetic of a Migration Period tapestry, this



California

Styled as a medieval illuminated manuscript, this image captures

Veil Nebula

Presented as a weathered Roman fresco, this work depicts

Neighbors

Year: 2026 | Medium: Cast Material

This project presents a series of tactile reliefs created from scientific data of cosmic objects and phenomena, marking a compelling intersection of scientific rigor and artistic translation. It fundamentally recalibrates our relationship with the universe by transforming remote, abstract data into tangible, touchable sculptures. The work invites a haptic engagement—a direct connection through touch—with phenomena previously confined to sight or conceptual understanding. Here, you can run your fingers over the actual craters of the Moon and the surface of Mars, their topographies recreated from remote sensing data. You are also invited to explore physical interpretations of events and structures that have no solid surface: the warped spacetime around a black hole, the vast density of the Milky Way, and the fleeting, dynamic form of a solar flare. This act collapses immense astronomical distance into personal, intimate proximity. By bypassing purely intellectual or visual perception, the work fosters an embodied cognition, constructing a deeply personal and immediate connection to the cosmos rooted in our most grounding sense.

The work situates itself within a contemporary lineage of art that leverages scientific data to evoke a new kind of technological sublime—an experience of awe mediated not by a vast landscape, but by the elegant translation of complex information into physical form. This project is a natural culmination of artist Todd Margolis's career-long exploration of making the invisible visible and the digital tangible. Drawing on decades of experience in 3D fabrication and designing immersive virtual reality systems—translating scientific data into experiential environments—Margolis now inverts his process. Instead of creating virtual worlds from data, he materializes data into real-world artifacts that we can hold and feel. Echoing ancient reliefs that embedded narratives in stone, these sculptures embed the discoveries of 21st-century science into their very texture. They transform scientific data from abstract information into a palpable presence, creating a bridge between the unseen forces of the universe and our most direct, human sense of touch.

Mars

Scaled ceramic relief model of the planet Mars, based on MOLA altimetry data.

Milky Way

Tactile representation of the Milky Way galaxy structure, emphasizing the galactic plane.

Moon

Topographic relief of the lunar surface, allowing the viewer to touch the craters and

Sun

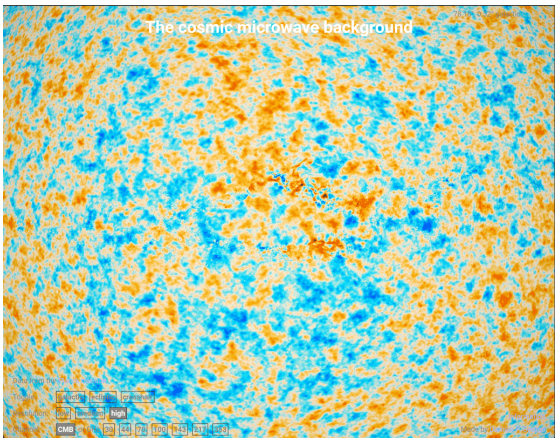
Sculptural interpretation of solar flares and surface activity, solidified in cast material.

Black Hole

Physical visualization of an event horizon, giving form to the invisible pull of a black hole.

CMB

Year: 2026 | Medium: Virtual Reality | Dimensions: 7 x 6 x 12 inches



This Virtual Reality experience offers a direct, personal encounter with the origins of our universe. You are positioned within a sphere mapped with the Cosmic Microwave Background (CMB)—the faint energy leftover from the Big Bang, often called the oldest light in the universe. Rather than observing data on a screen, you are literally placed inside it. Floating in this primal afterglow, the abstract measurements of cosmology are transformed into an enveloping visual fabric, making the universe's birth not just something to be seen, but to be felt.

This visual immersion is synchronized with a unique audio landscape that represents the Doppler effect, the same phenomenon you hear in the changing pitch of a passing siren. Here, the soundscape gives a visceral dimension to the cosmic motion, expansion, and vast timescales embedded within the light. The experience collapses the immense observational distance between us and the dawn of time, aiming to inspire a state of awe and recalibrate our sense of scale, self, and connection to the grand cosmic narrative. It presents the fundamental story of our universe not as a cognitive exercise, but as a direct, perceptual immersion.

Redshifter

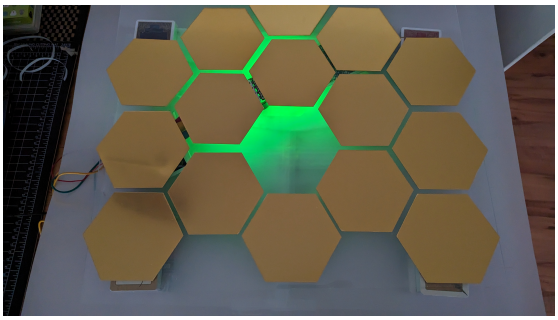
Year: 2026 | Medium: Room Installation | Dimensions: 70 x 30 inches

Before you stands a massive, hyper-realistic screen, a digital mirror reflecting the gallery and you within it. But this is no ordinary mirror; it is a window looking down an impossibly deep corridor of time and space. As you watch figures on the screen—your fellow visitors, perhaps even yourself—recede into this virtual distance, a profound transformation begins. First, their image stretches and shifts into the deep, ruby hues of "redshift," the same visual evidence astronomers use to see the universe expanding.

Further on, they fade beyond visible light, becoming ghostly, high-contrast monochrome figures as if seen in infrared. The most striking effect is that of time itself unraveling. With increasing distance, adults seamlessly de-age into children, then into tiny, near-static newborn infants. This is a direct and poignant visualization of "lookback time," the cosmological principle that to look out across the universe is to look back into its primordial past. At the absolute limit of perception, these infants dissolve completely, fading into the grainy, gray static of the Cosmic Microwave Background—the faint, persistent echo of the Big Bang, the earliest light in our universe. "The 1089th Step" is an immediate, visceral experience that translates the grand, abstract narrative of the cosmos into a tangible and deeply personal journey.

This work is a powerful culmination of Todd Margolis's career, which has consistently pioneered the use of emerging technology to create profound human experiences. His extensive background in developing immersive systems—from inventing new VR hardware to creating "expressive virtual reality contexts" for large-scale scientific data in works like "ATLAS in silico"—provides the technical and conceptual foundation for this piece. "Redshifter" situates itself in the lineage of Light and Space art, but instead of architectural light, it uses sophisticated digital simulation to manipulate our perception. It is not merely an illustration of science but a direct phenomenological inquiry, using the "live feed" to implicate us directly in its cosmic timeline. The installation evokes a modern "technological sublime," harnessing digital media to inspire the same awe and existential reflection that vast natural landscapes once did. By collapsing 13.8 billion years into the length of a gallery hall, the work transforms complex physics into an embodied encounter, bridging the unfathomable scale of the universe with the intimate scale of a single human life and asking a fundamental question: how do we perceive our place within this grand, unfolding story?

Sky Watcher



Year: 2026 | Medium: Mixed Media Light Sculpture (Arduino, Makeon Controller, LEDs, Vellum, Gold Acrylic) | Dimensions: 24 x 24 x 3 inches

"Sky Watcher" emerges as a compelling contemporary artifact, a data-driven light sculpture that bridges the vastness of the cosmos with the intimacy of human curiosity. Inspired by the iconic honeycomb geometry of the James Webb Space Telescope, the piece serves as a living infographic for the amateur astronomer. It pulls real-time information from astronomical APIs, analyzing crucial conditions like cloud cover, lunar phase, and atmospheric transparency (how free the sky is from haze) and seeing (how steady the air is). When these elements align for a perfect night of deep-sky imaging, the sculpture awakens. It doesn't flash or blare; instead, it projects a soft, vellum-diffused glow, transforming abstract data into an embodied, anticipatory experience.

This subtle illumination functions as a potent prompt for human perception. The artwork doesn't merely present information; it materializes readiness. It fosters a relationship of patience and attunement, training the observer to read the environment through an aesthetic filter, elevating a functional notification into a moment of sublime potential. The eventual act of bringing out the telescope completes a feedback loop, cementing the sculpture as an interface not just between data and light, but between a human desire for cosmic connection and the ephemeral generosity of the heavens. It becomes a living, pulsing index of astronomical serendipity, imbuing a scientific pursuit with ritualistic grace.

Artist Bio

Todd Margolis's artistic practice bridges the profound gap between the human and the cosmic. His work makes the universe's most abstract concepts—vast distances and deep time—tangible and deeply personal. For over two decades, he has created artworks that do not just show us images of the cosmos, but instead build new ways for us to perceive our place within it.

This practice is rooted in a rare synthesis of artistic vision and pioneering technological development. An alumnus of the University of Illinois at Chicago's legendary Electronic Visualization Laboratory (EVL), Margolis has spent his career not merely using technology but inventing it—from co-creating VR hardware systems like Varrier™ to serving as Technical Director for major art/science research centers. He treats code as a material and light as a structural element, crafting interactive immersive environments that have been exhibited internationally from the Museum of Contemporary Art, Chicago to the National Academy of Sciences. This new body of work is a direct extension of a long-standing investigation into virtual and augmented realities, seen in acclaimed projects like ATLAS in silico and Special Treatment.

Central to this work is the reality that astronomy is the study of the past. Because light travels at a finite speed, every photon captured by a lens is a "light fossil," carrying a history from an era we never inhabited. In his Now & Then series, Margolis explores this "time travel vision." Using AI, he generates contextual scenes from Earth's history—from the prehistoric to the dawn of the Renaissance—that match the exact moment light first departed a celestial object. By digitally fabricating these historical styles—rendering subjects as stone etchings, on flaking parchment, or as objects fossilized into rock—he materializes the immense latency of the universe, transforming the night sky from a collection of distant objects into a readable archive of our shared human and cosmic heritage.

His large-scale installations extend this inquiry to the very limits of perception. Works like The Edge explore the "shifting shoreline" of the cosmic horizon, using elements like a fog wall to create a physical "curtain of uncertainty." This boundary represents the final wall of sight—the point where our vision fails and the unknowability of our own past begins. Ultimately, Margolis's work is a compelling fusion of art, science, and technology. Leveraging deep expertise in AI, data visualization, and virtual reality, he constructs new perceptual shorelines for the viewer—making the imperceptible visible and the incomprehensible intimate, and offering a direct experience of our place within the vast, unfolding narrative of the universe.