
ghost in the machine
TIMOTHY MAKEPEACE

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Curated by Thomas Drymon and Michael O'Sullivan

June 13, 2026 - August 9, 2026

American University Museum
at the Katzen Arts Center
Washington, DC

ghost in the machine

The philosophical concept of the "ghost in the machine" refers to the inextricable connection between the body and the mind — the physical and the ethereal. This exhibition expands on that notion, visualizing these states not as irreconcilable opposites but as elements in creative tension. It takes as inspiration the James Webb Space Telescope (JWST) but also includes other works. Matter and mind, space and time, the rational and the poetic, the mundane and the exquisite, all exist simultaneously: two halves of a whole.

At first glance, this body of work is diverse and wide-ranging in subject and style. But an essential theme runs throughout it. Each image exists in a liminal zone between the tangible and the intangible, harnessing the dynamic that links the material world to its immaterial presence.

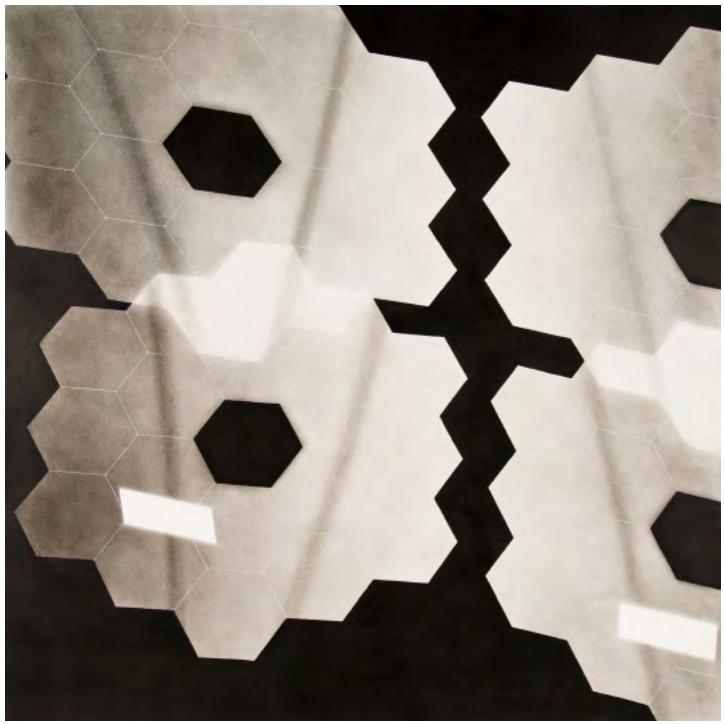
Engineered structures and instruments, celestial formations and orbital mechanics are all fodder for artistic exploration, drawing on Constructivism (which elevates common building materials and emphasizes geometric abstraction) and Precisionism (which reduces subjects to their basic geometric shapes). Rather than presenting subjects in a readily recognizable way, the intensive focus and composition in these works blurs the line between physical objects and ethereal elements. In the space between the grounded and the untethered, our human desire for meaning can transform even the most static structure — a sublime spirit animating the machine.

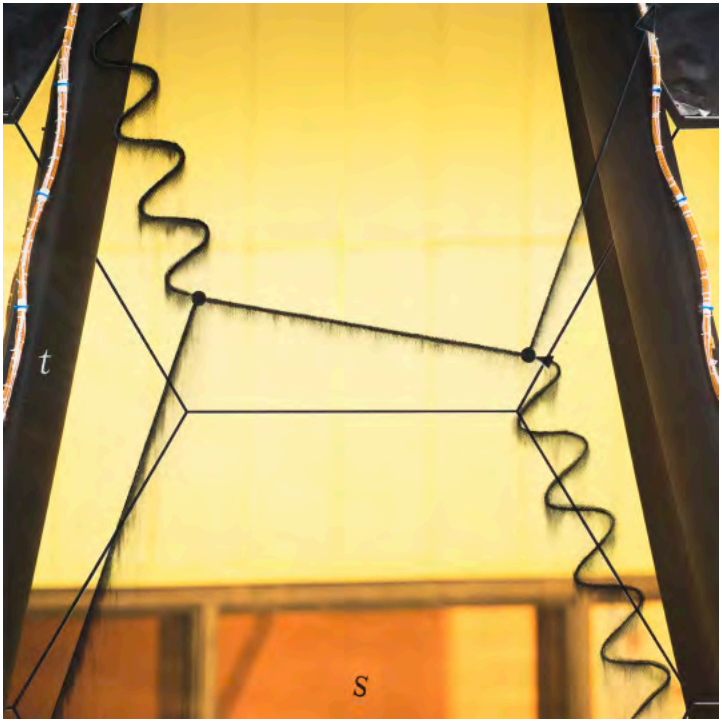
–Timothy Makepeace

Golden Primary Mirrors

An idea that has long been simmering in my mind is the contrast between the mundane and the exquisite. Many of my drawings of the James Webb Space Telescope describe an object of incredible precision, made with exotic materials, on the cutting edge of what is possible to build.

The main visual element of the Webb telescope is a 21-foot-wide gold-plated primary mirror, whose purpose is to collect and focus infrared light from the farthest reaches of the visible universe and all points in between. In order to render a mirror in a drawing, one needs to describe what it reflects. Instead of drawing what the JWST mirror will reflect, out in space, these drawings reflect the environment in which it was built, as well as the telescope itself, highlighting its sculptural qualities. Showing the instrument in the mundane fabrication room where it was being constructed sets up a dichotomy with its exquisite engineering, as well as with the transcendent universal knowledge it will help us gain.

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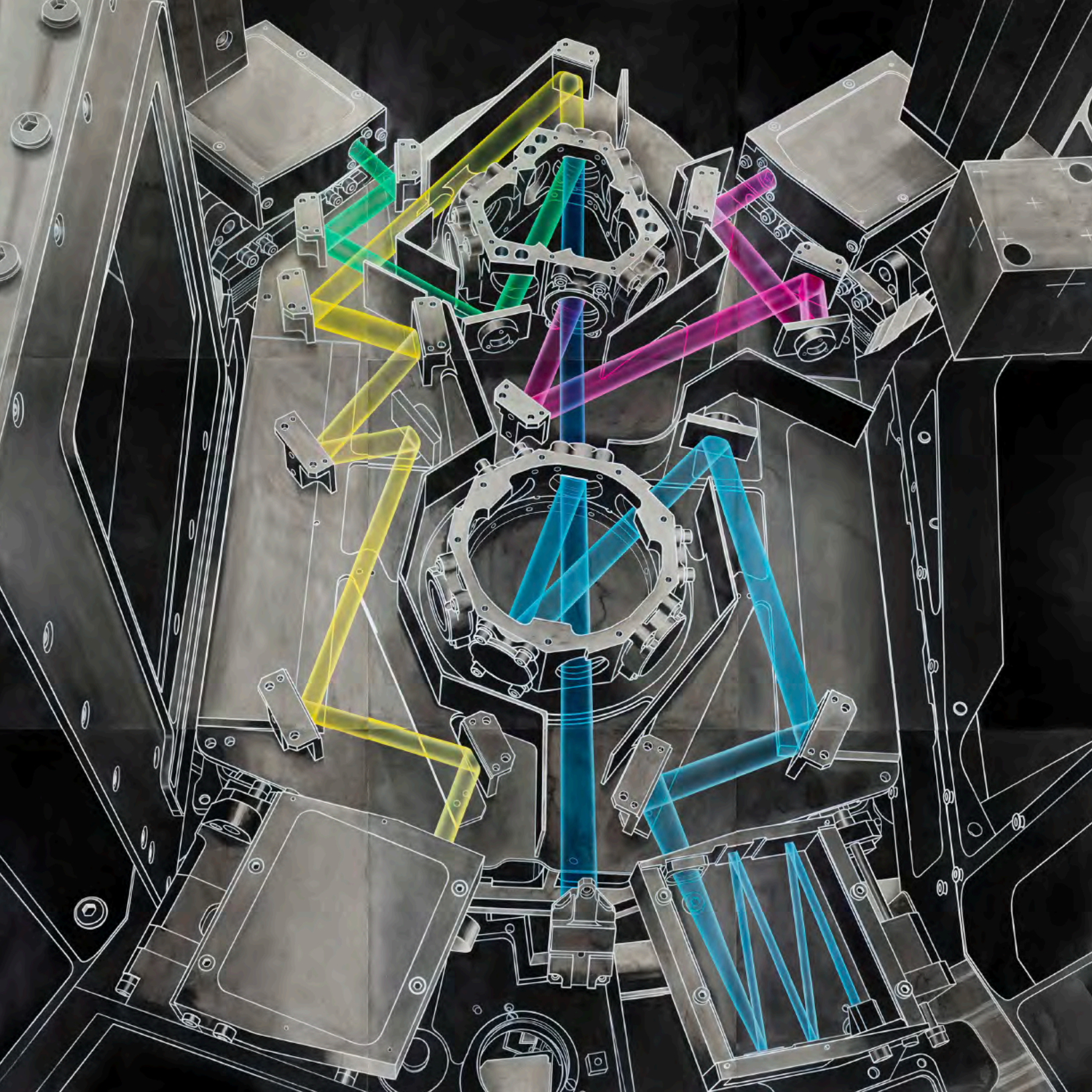
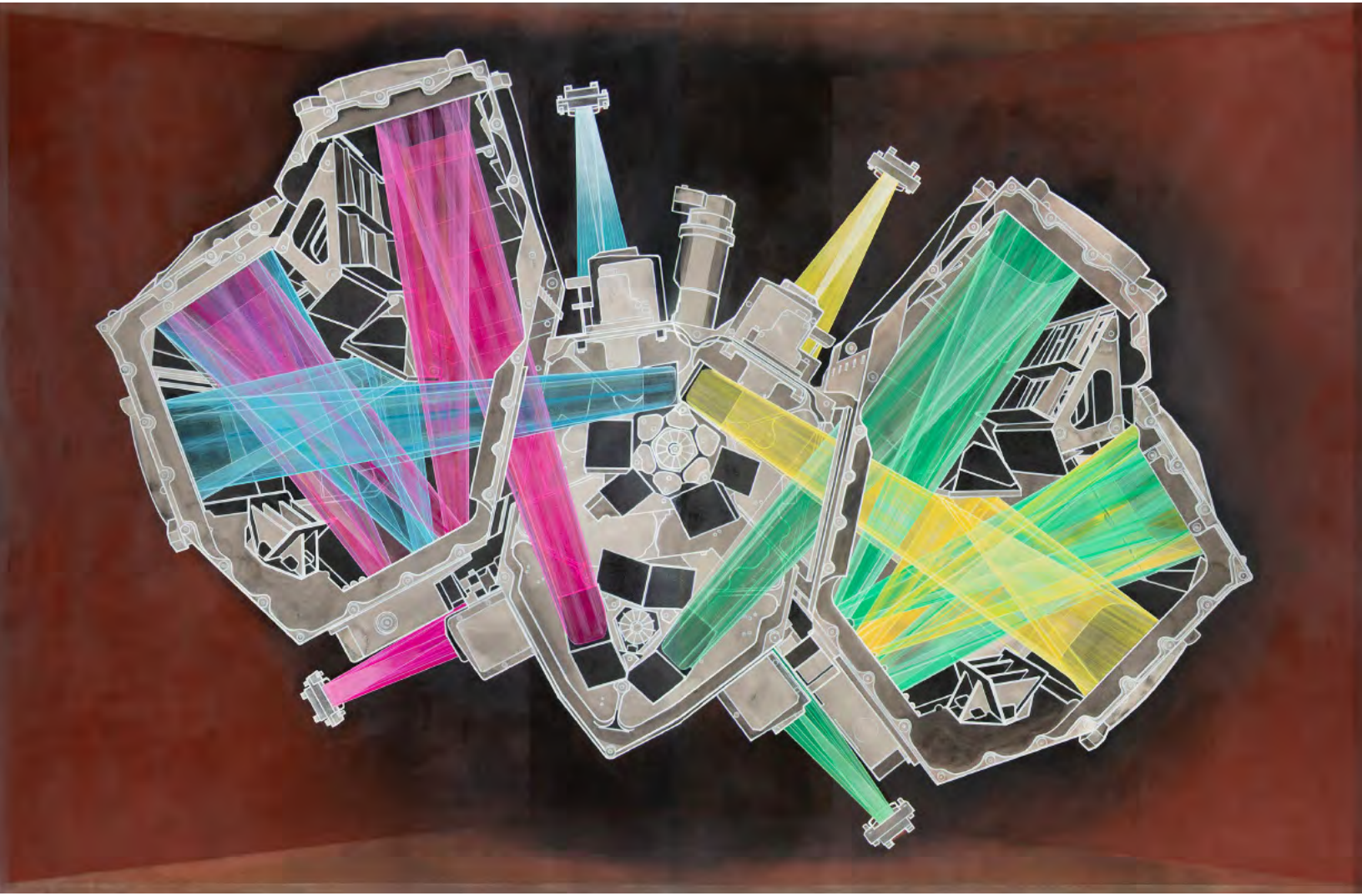
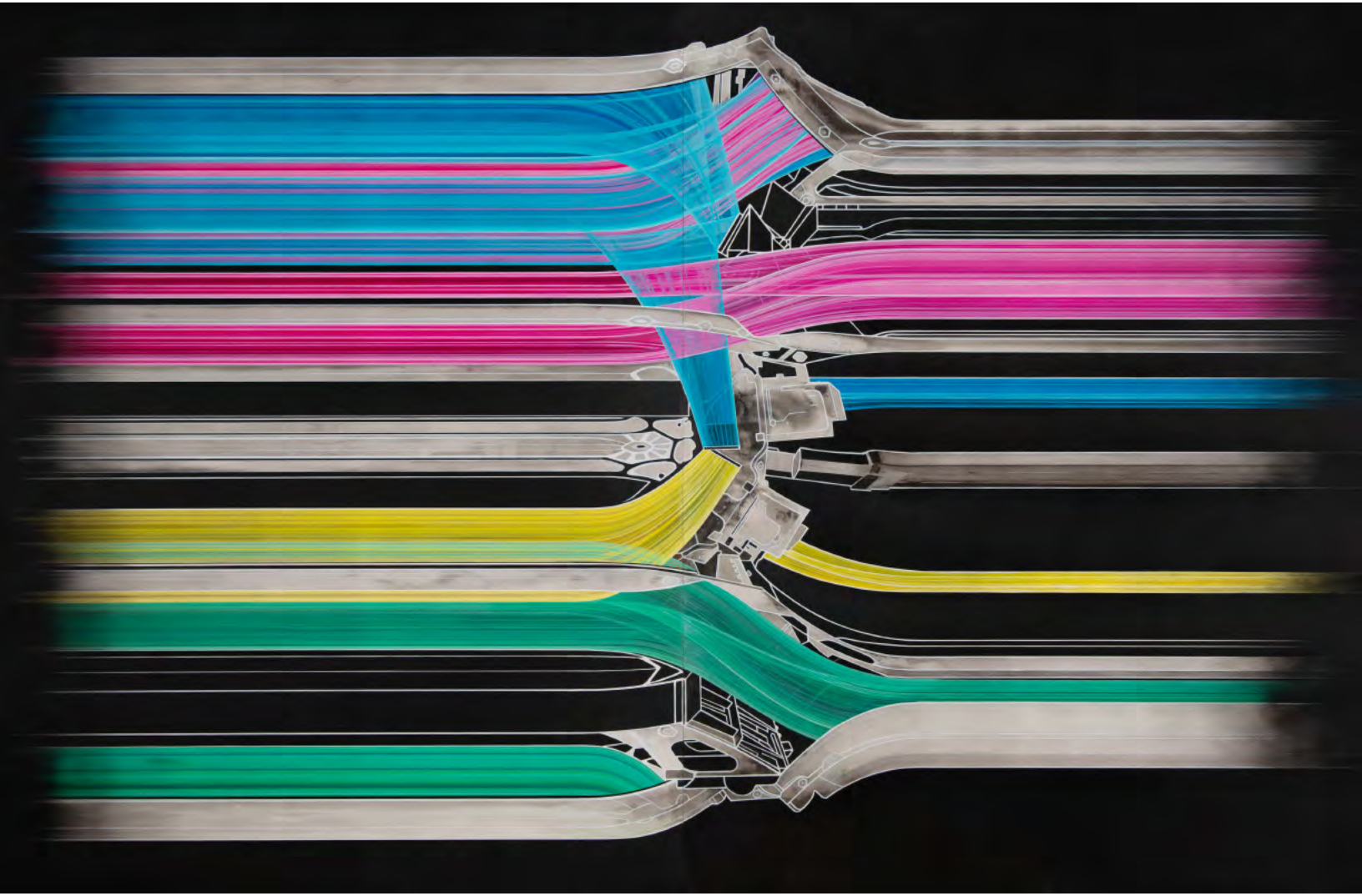
Ray Tracing

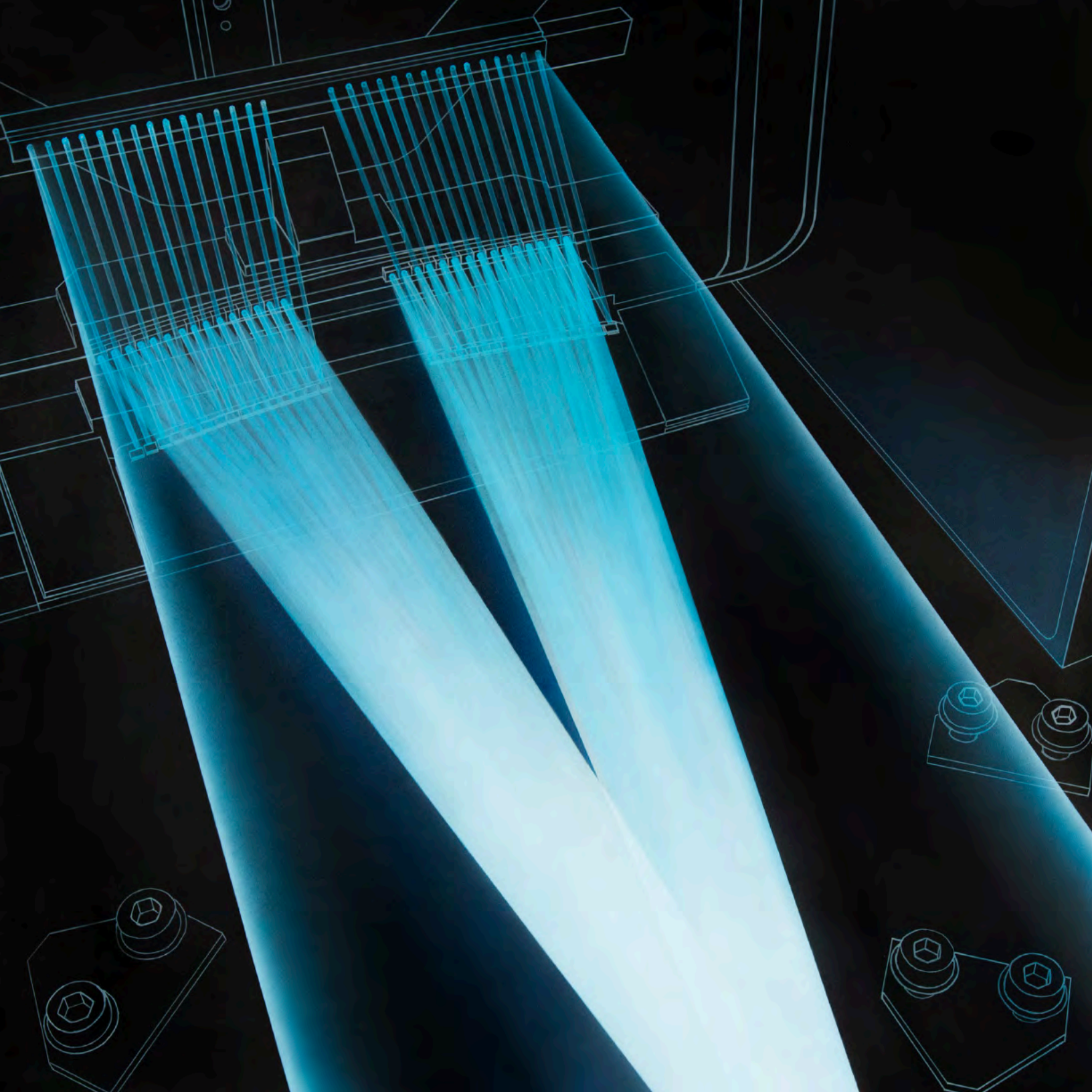
In the process of learning more about the Webb telescope and its capabilities, I came across a 3D model created by the European Space Agency, inventors of the Mid Infrared Instrument (MIRI) on board the JWST. The model shows collected light traveling a path through the imager's beam splitters and filters, reflecting across many different mirrors in a complicated pattern, which I saw as an ethereal sculpture made out of photons: the finite describing the infinite.

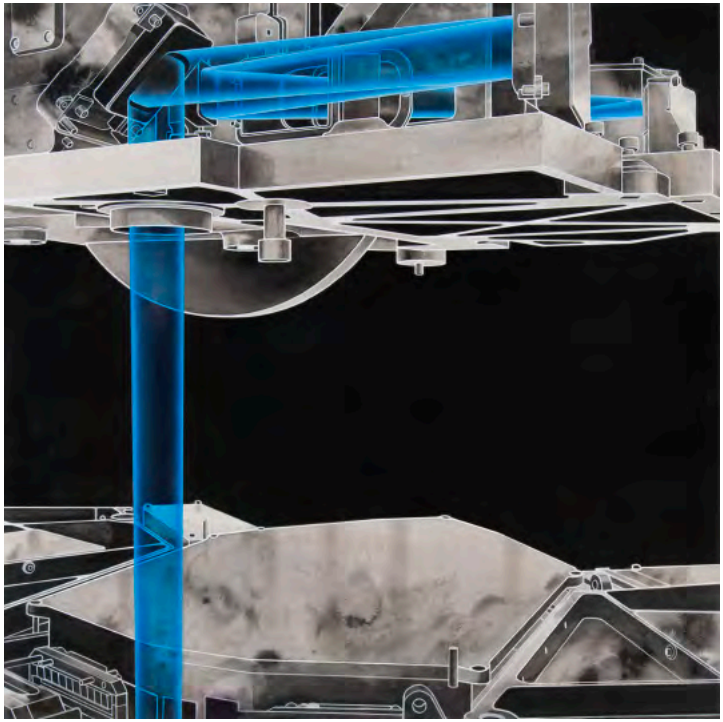
I also made derivative works from the MIRI drawing where I used a computer-generated image effect that smeared and stretched the image, creating beams of light from beams of light, further abstracting an abstract machine.







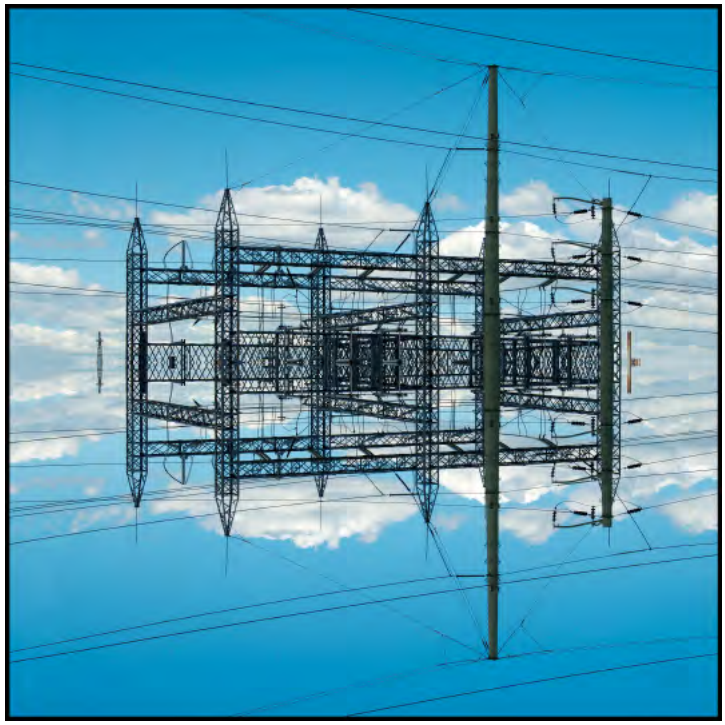


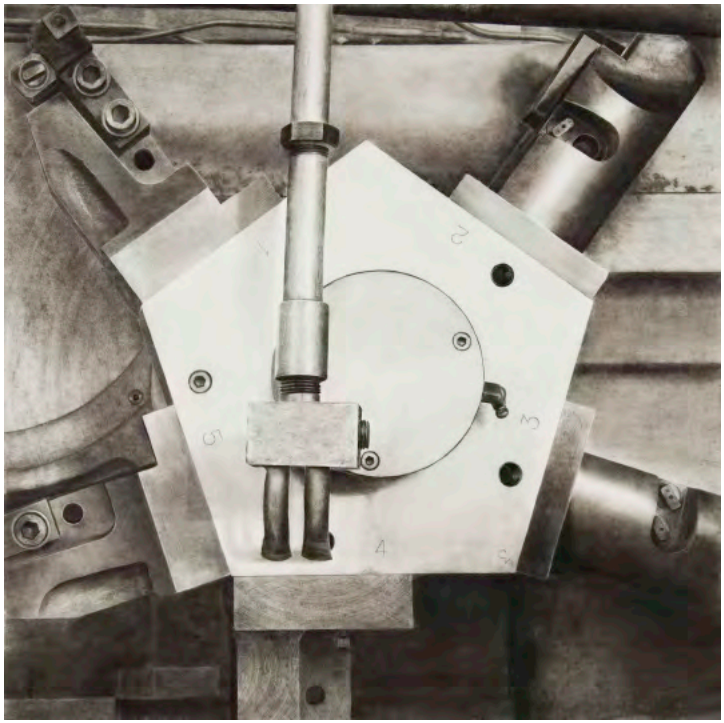


Earlier Work

Predating my interest in the Webb telescope, I have long been fascinated by the visual impact of industrial structures, landscape and the interplay between architecture and nature. The built environment tells a story of interaction and flux. Just as the presence of a structure changes the land, the natural environment changes the structure. In “High Voltage Blue,” for instance, I manipulated the photographic image to explore these dynamic influences and the potential for metamorphosis. This duality informs all my work: a fundamental tension between realism (or description) and abstraction.

“Up Down Yellow Circle” and “Pentagon Hub” share some of the same formal and conceptual ideas: geometry, color as object, photorealism as abstraction. They traffic in another form of duality as well, contrasting the solid with the ephemerality of time and nostalgia.






UP
DOWN

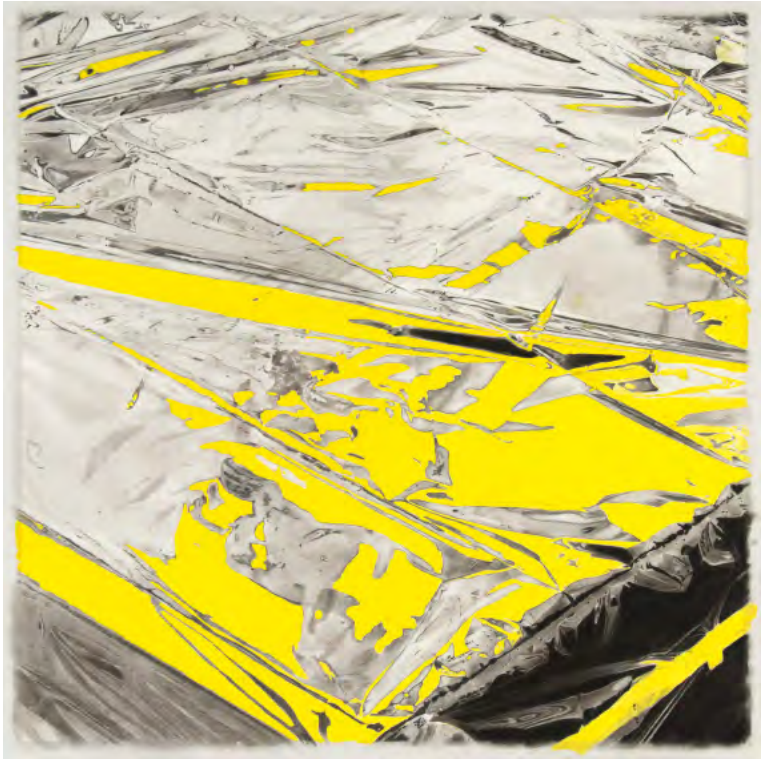
Reflective Heat Shielding

This series features details of the Webb telescope's structure, housing the systems that keep it functioning. It is covered with a highly reflective foil, called Kapton, to keep its contents cool. These drawings are derived from photos I took while JWST was under construction.

I have been asked: "Why spend a month or two drawing an image in charcoal and pastel instead of just taking a photograph?" One thing I have come to enjoy about this process is the counterintuitive idea of using a very imprecise medium, like soft charcoal, to render the image of one of the most technically advanced and precise objects ever devised. Charcoal is also one of the most primitive and ancient tools for drawing, and I am using it to describe an extremely advanced tool of science, one that was shot a million miles into space to help unlock some of the mysteries of the universe. I find this to be an interesting juxtaposition.

I also appreciate how drawing with charcoal mimics the tonality of black-and-white photography better than using pencil, pen or paint. I love the gradient tones that charcoal can produce. I spent a portion of my life practicing the craft of photography and have been seduced by its rich tonality. But by directly drawing the image with charcoal and pastel, instead of printing a digital image, I find more artistic freedom.

Every mark I make with charcoal or pastel or an eraser is a translation of the original photograph. Even the smallest mark is an interpretation that creates an abstraction in the service of transcribing a photograph. In a way, I have become the printer of the photograph.



Objects in Mirror Are Closer Than They Appear

In a wide-ranging career, it's not a single look that Tim Makepeace is after, but rather a singular idea.

That, at least, is what he told *The Washington Post* 25 years ago. Yet over a career in which his attention has turned from the high voltage wires, coal terminals, water towers, silos and other begrimed behemoths of the post-machine-age American wasteland to the most powerful infrared space observatory ever devised, those words remain as true today as they did then.

So what is he looking for?

His pursuit is of something ineffable: an intangible, even unnameable transcendence that is not to be found in the grand, untamed landscapes that once captivated Albert Bierstadt and his peers but in what man has built. He has proven himself, over time, to be an obsessive connoisseur of the concrete.

In 2017, as part of NASA's public outreach, Makepeace was invited, along with several other artists, to create art inspired by the Webb telescope while it was still under construction at the Goddard Space Flight Center in Greenbelt, Md. Launched on Christmas Day, 2021, the telescope is now traveling through space, one million miles from Earth, on a mission to gather information about the farthest reaches of the visible universe.

This exquisite technological marvel (which Makepeace likes to call "the epitome of all the machines humanity has ever made") has consumed him ever since. Not just what it looks like, but, more importantly, what it does and the questions it raises: What is the relation between the physical and ephemeral; space and time; the finite and the infinite; the cosmic scale and the subatomic? Do we

loom large or small in an expanse whose boundaries we have not even begun to define?

It is no accident, for this most curious of artists, that a telescope is itself a tool of looking. One this powerful is also, as Makepeace points out, a kind of time machine. Light takes time to travel across space, he explains, meaning that we observe distant objects as they appeared in the past, not as they appear today. Looking deeper into the universe allows us to see light from millions — or billions — of years ago.

As he always has, Makepeace was looking for something less obvious.

He began, as ever, with the object itself, taking photographs of the telescope's dominant visual element: the 21-foot-wide gold-plated primary mirror, designed to collect and focus light from far away stars. Here, those photos have been rendered as a series of charcoal-and-pastel drawings, highlighting the mirror's reflectivity. The reflections are of the room in which it was being built, as well as of the telescope itself, accentuating its quasi-abstract sculptural qualities.

A mirror is also an excellent metaphor. In a poetic sense, a mirror can represent a kind of magical portal. (Think Lewis Carroll.) In a more prosaic way, the mirror is emblematic of the exhibition itself — a portal to other worlds but something more if we allow it.

When we stand in front of a mirror, we can be faced with observations, realizations, and contradictions, often about ourselves. Tim's work illustrates this, dancing between abstraction and representation, intimacy and immensity, the material world and its immaterial presence.

One drawing in the show," Kapton Membrane on Spacecraft Bus # 3," is shown side-by-side with its mirrored twin. Makepeace calls it an "echo," and explains that it is a stencil, or cartoon, that was used to make the first image. You can see

the artist's fingerprints, in smudged charcoal, all over it, like residue of the process of its creation. Its inclusion in the show seems to be a way of saying, "Look. I am here. I've been here all along."

Over time, Makepeace's JWST-inspired work has grown to encompass much more than pictures of the telescope itself. Makepeace centers himself not just as someone whose connection to the telescope runs deep, but at times affords us a perspective from the point of view of the telescope itself — both voyager and voyeur. He creates works like the star trails by placing himself in a position to trace the paths and locate the telescope in that trajectory. He devises tools to record the orbit of the telescope. He has become the voice of the machine and is inviting us to listen and see.

He has painted the supermassive black hole, Sagittarius A*, at the center of our Milky Way. Also, he has created trippy, light-show fantasias — "ethereal sculpture made out of photons," he calls them — based on the interplay of light bouncing off the telescope's mirrors.

It's the stuff of science, but also of dreams: not just wonky but wonderful (meaning full of wonder).

The critic Mark Jenkins once wrote of Makepeace's images of industrial architecture that the artist renders "the commonplace sublime." That's true here too, except that there's nothing commonplace about the Webb telescope. In an exhibition that tries to convey a sense of boundlessness — a show that aims to evoke even a fear-inducing sense of awe and grandeur about the cosmos — some might see a trace of the divine.

That isn't the artist's intent. Man, in the form of the scientists and engineers who designed and built the Webb telescope, is the only creator, lowercase c, whom Makepeace venerates.

There is of course, a parallel between the genius of those whose handiwork is at the center of “Ghost in the Machine” and Makepeace himself, who invents new ways of looking at — and thinking about — the entirety of the visible universe. By lavishing his single-minded scrutiny on a single subject, he ends up not worshipping an idol of technology but rather paying homage to the spirit of inquiry that inspired its creation, imbuing this machine with a kind of specialness — an aura — that supersedes its function.

He seems to allow us, even encourage us, to connect to something external, solid, grandiose. It might be easier and less painful than listening to the ghost in our own machine. Quiet voices inside all of us that seek connection, love, pleasure and pain. That laugh, cry, grieve, lose, languish, succeed.

Yet he also seems to suggest that if we stand in front of the work, like the mirrors in the show, and tune out the noise all around us and wait, we might find the answers we are seeking somewhere in the space between. That we might be reminded, as forgers of this golden device perched high above, of both our own awesomeness and our own smallness in the infinite space of the universe.

It is man who is Makepeace’s true subject. And that’s a transcendent enough idea.

Michael O’Sullivan
Thomas Drymon
Curators

Letters Home

These images show the position of the Webb telescope as a small streak against the stars and, in the case of “Letter Home,” against the constellation Leo during the night of March 16, 2022, traveling at .2km/ sec, faintly reflecting sunlight at a dim magnitude 16, sending back a few photons communicating with me — like a letter home.

I have spent a great deal of time thinking about, and making drawings about, the physical object that is the telescope. This results in a bond with it that has spanned a distance ranging from 30 feet — the distance from which I first photographed it in the clean room — to its current distance of one million miles from Earth. After it reached its final solar orbital position, the common thought was that no one would ever see it again. But I discovered that a couple of amateur astronomers had the same desire I had, which was to find and image JWST, and that they were able to do so using a relatively large telescope.

I don’t have a large telescope, so I had to invent an imaginary one of my own. Using positional data from NASA, adjusted for my home in Washington, I composed an imaginary astro photograph.

I decided on a theoretical exposure of about 30 minutes which would produce a tiny streak of light across the image, showing the JWST traversing a fraction of the sky. I tried to make the path as thin and faint as I could to convey its small size compared to the vastness of space. I also wanted the drawing to be as accurate as possible, so I drew the correct stars in the background at the time of the drawing’s conception, with their appropriate magnitude and position. I also included some faint white lines indicating the visible constellations for reference.

Ghost in the Big Machine

This 25-foot-wide drawing was inspired by a convex wall in the American University Museum.

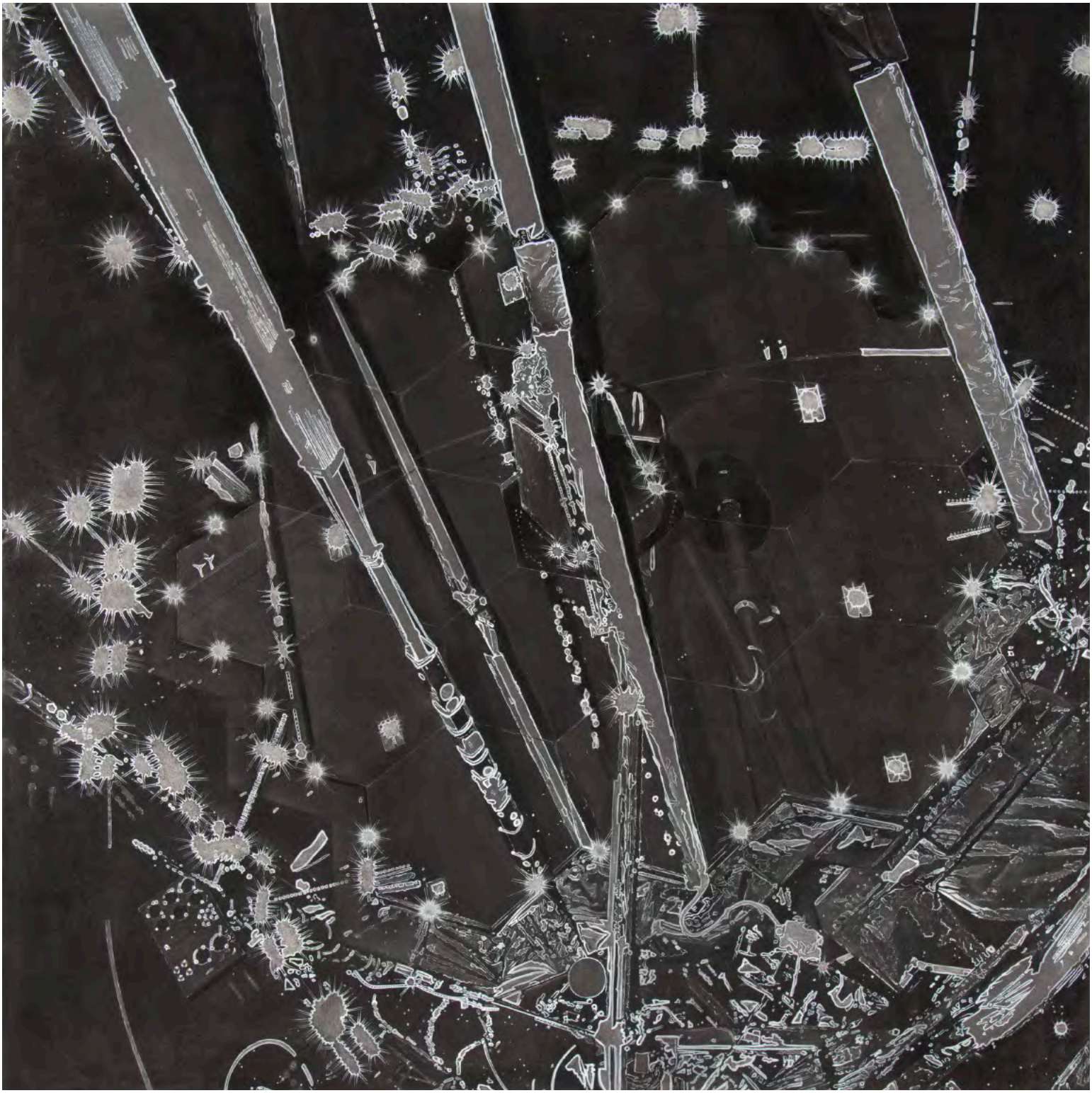
Because of the tight radius of the curved wall and the length of the drawing, a viewer cannot see both ends without traveling, on a viewing path similar to a planetary orbit. Einstein's theory of spacetime tells us that light travels in a straight line, through space, but space is curved. To emphasize this concept: the drawing is curved around the wall; the frame is curved; the line connecting the two ends of the piece is curved; the rendering of the orbital path of the stars around a black hole is curved; and the viewer's path around the piece is curved.

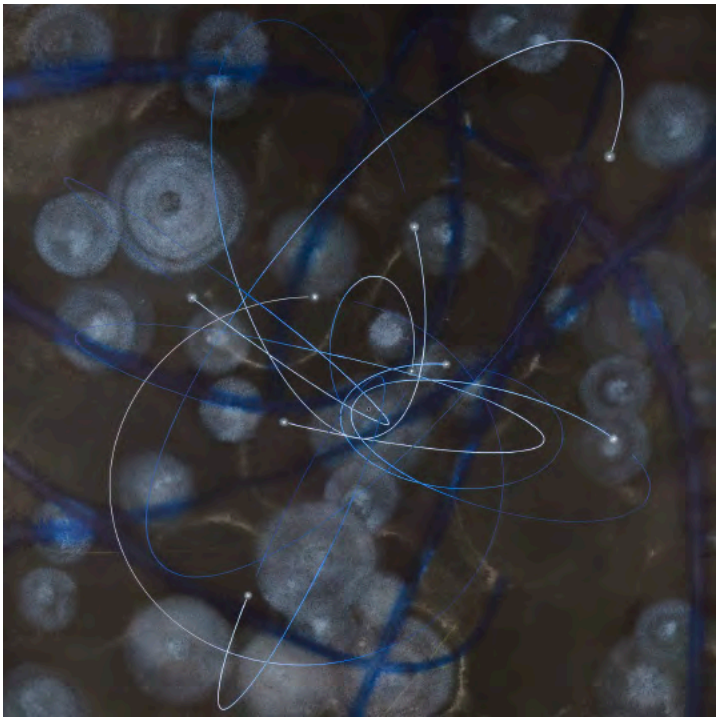
It is an image with two discrete parts: left and right; space and time; beginning and end; theoretical and material. The two sides are tenuously connected by an amorphous line that resembles dust, gas or cosmic debris. On the left: the black hole at the center of our galaxy with nine stars orbiting it. A black hole can be described as a zero-dimensional point of infinite density, a singularity where spacetime and general relativity break down catastrophically. However it is described, it remains unknowable and intangible.

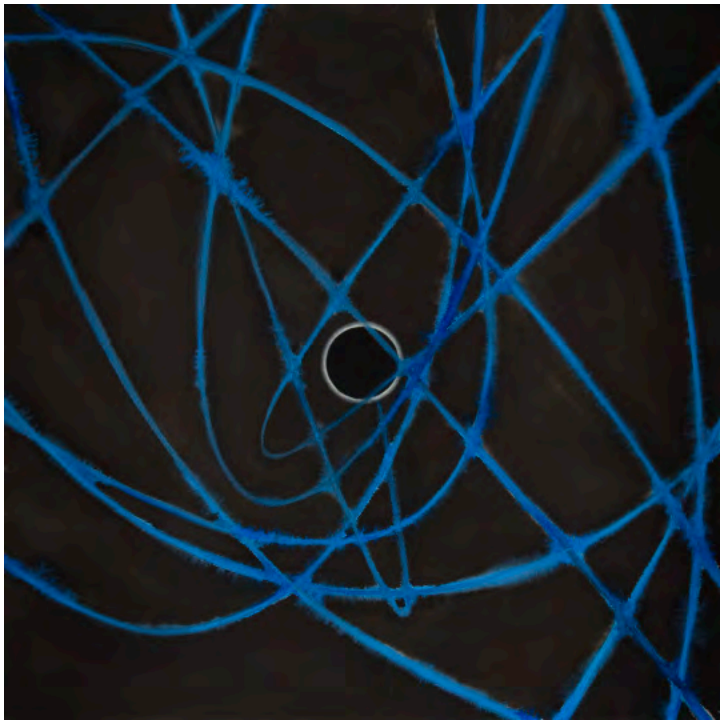
The right side of the drawing — the tangible side — is a detail of the Webb telescope's Mid-Infrared Instrument (MIRI) light path. It is a rendering of a machine built for imaging the infinite.

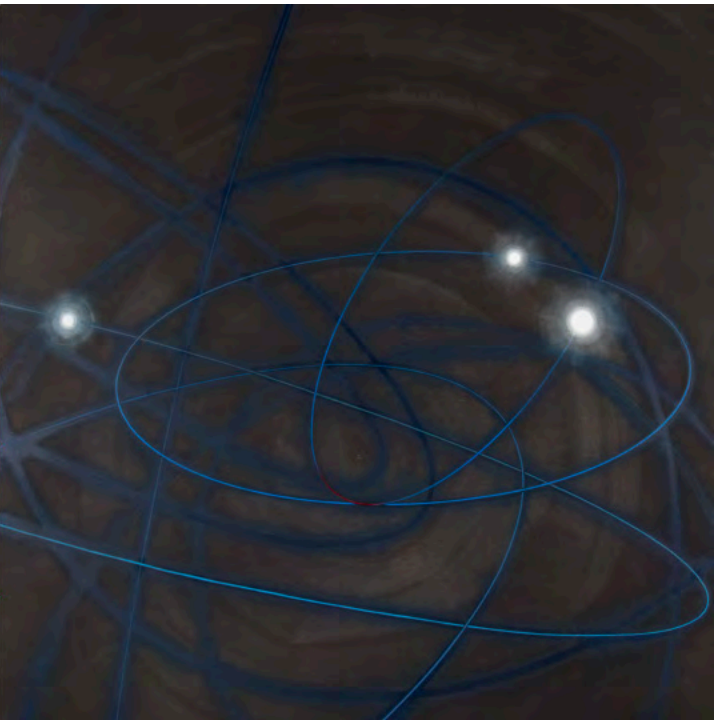
JWST Cryo Testing

This drawing is based on a photo of the Webb telescope in a cryogenic pressure chamber. One of the many things NASA tested before launch was how the light from simulated stars was imaged, collected and transmitted. The lights are drawn in a way that intensifies their appearance and makes them feel more celestial, while also keeping the photographic qualities of the primary mirror and the reflections of the ceiling, juxtaposing the mundane and exquisite.









The Center of Our Galaxy

After working on a series of drawings inspired by the Webb telescope, I became interested in one of its many intended purposes: the use of its infrared camera to investigate the very center of mass of our Milky Way galaxy.

These paintings, based on astronomers' recent observations of the center of our galaxy, map the stars in that region. They calculate the orbital paths and periods of the stars closest to what they have determined to be a supermassive black hole, named Sagittarius A* (Sgr A*), 26,000 light-years from Earth.

Based on a 3D model made from data collected by the UCLA Galactic Center Group using the Keck Telescope in Hawaii and the Very Large Telescope Facility in Chile's Atacama Desert, I drew elliptical shapes depicting the paths of the closest stars orbiting Sgr A*.

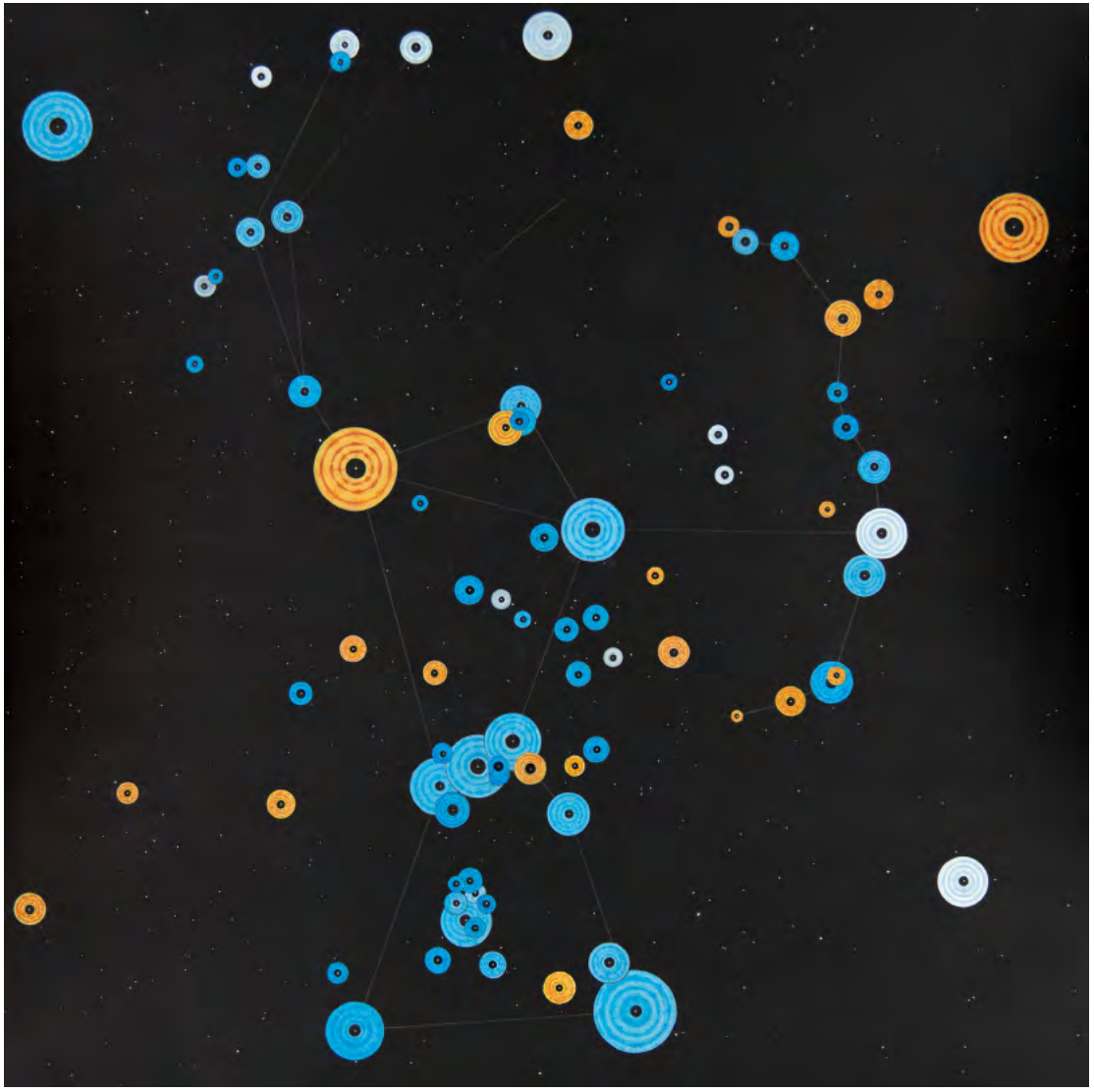
Like much of my previous work, this series focuses on geometry, but instead of depicting the shapes of physical objects, these paintings describe the theoretical geometry of stars' orbital paths around a crushing point of terrible beauty.

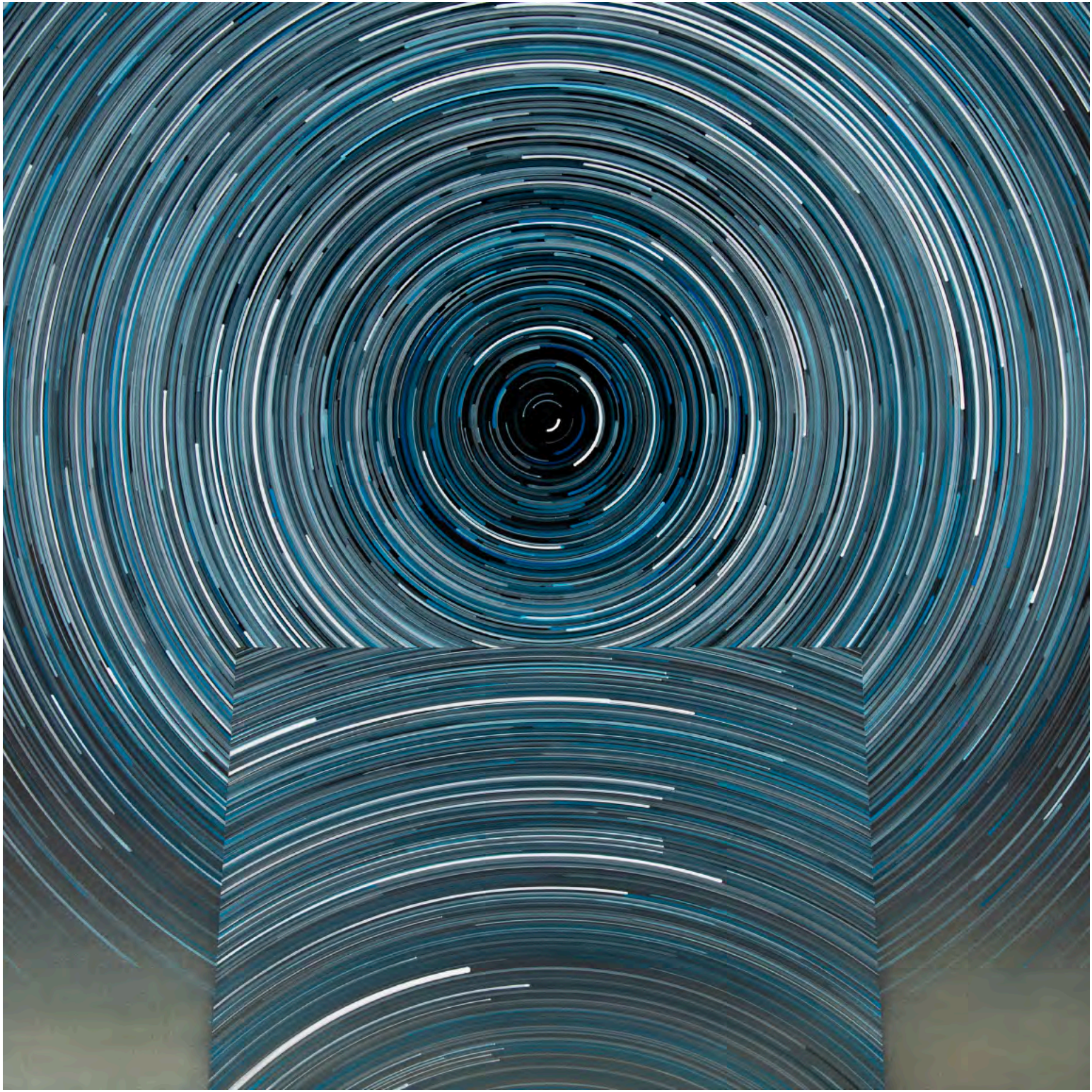
Defocused Stars of Orion with JWST

This image is of the constellation Orion with its stars defocused, showing their spectra and magnitudes.

Last year, I finally acquired a telescope, but it is not powerful enough, by far, to see the distant JWST, located a million miles from Earth, so I have been using it to view a variety of bright stars. I discovered that, instead of focusing properly on a star, which results in a small whitish dot, I can defocus my telescope so the image of the star is blurry. That makes the star's light spread out and its colors more apparent, creating an abstract composition.

After consulting the positional data for the Webb telescope, which NASA's Jet Propulsion Laboratory makes public, I learned that the telescope would be traversing the constellation Orion in November of 2025. I included its trajectory in this piece, adding a faint line, visible above the hunter Orion's head.





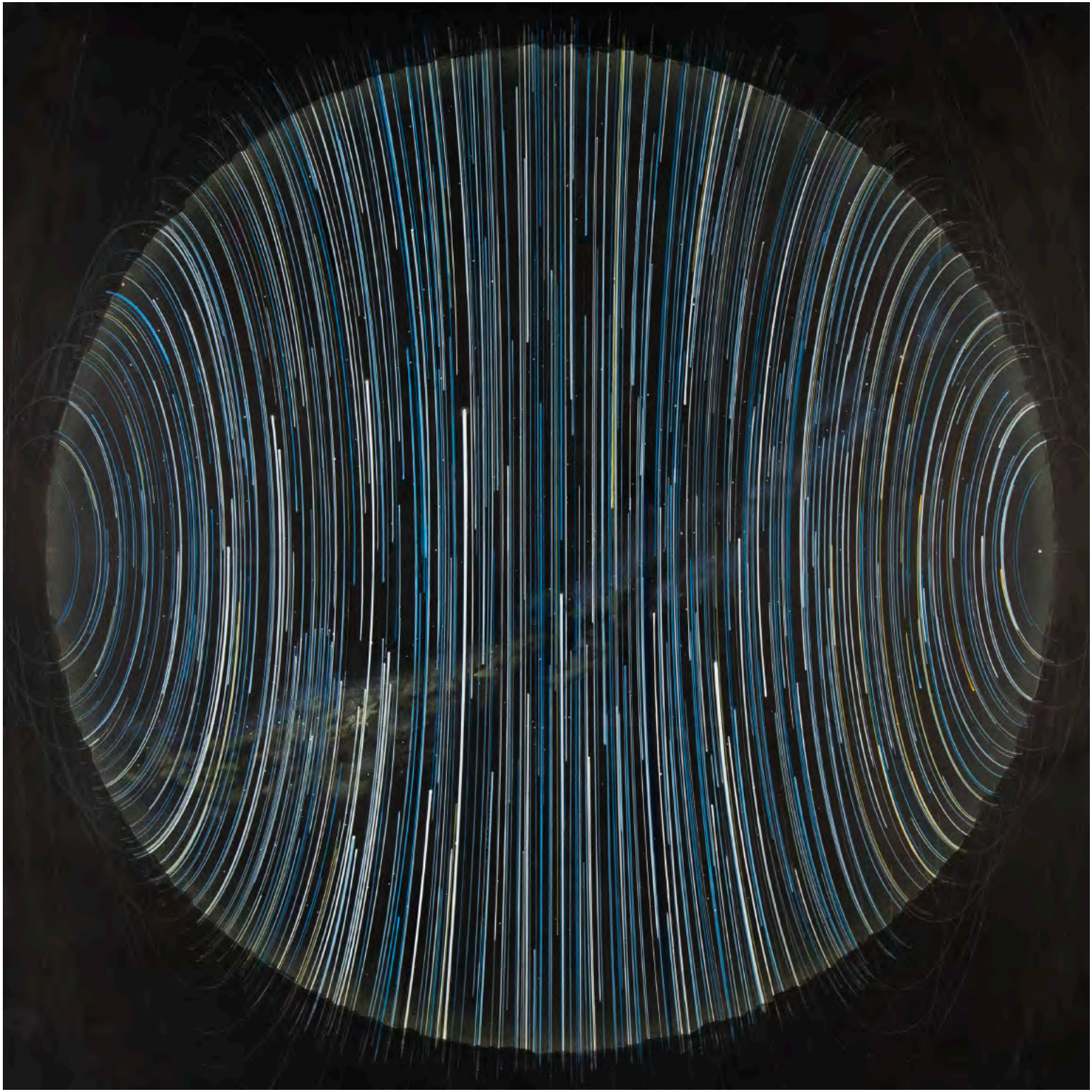
Journey Across the Stars

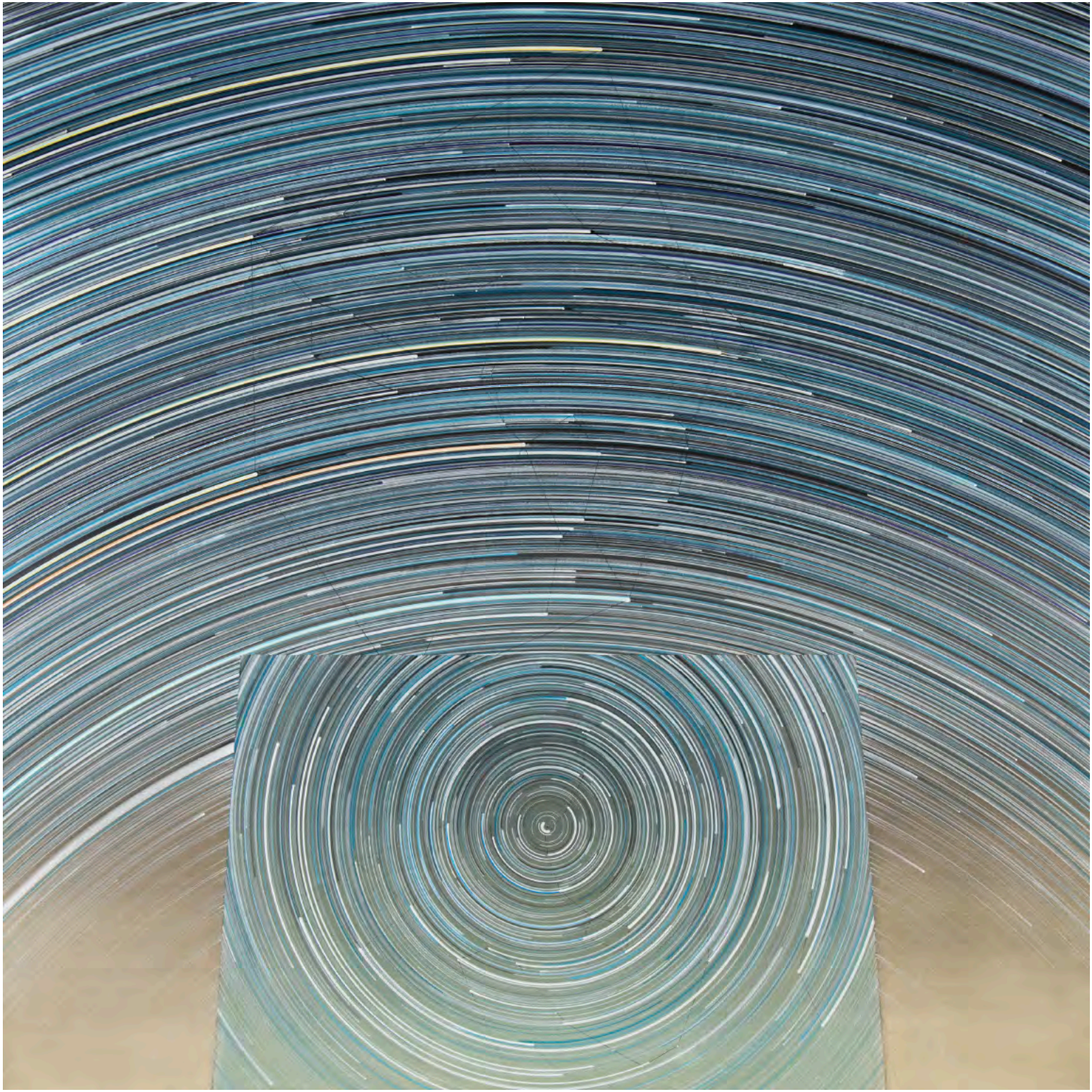
For my Star Trails series, I wanted to show the Webb telescope's journey across the stars and constellations. The Polar Star Trails and Mirror drawings show the stars circumnavigating the celestial north pole. Using an imaginary camera, I created a time-lapse image of the stars traveling an arc of 90 degrees in the northern sky. But when I realized that the telescope would be located behind me in the southern sky, I solved the problem by holding up an imaginary mirror in front of the camera, enabling me to capture both the polar stars and the southern sky, including the JWST. The image can be hard to read because of the many star trails, but on close inspection, you can make out several notable stars, constellations and the Webb telescope traversing the sky.

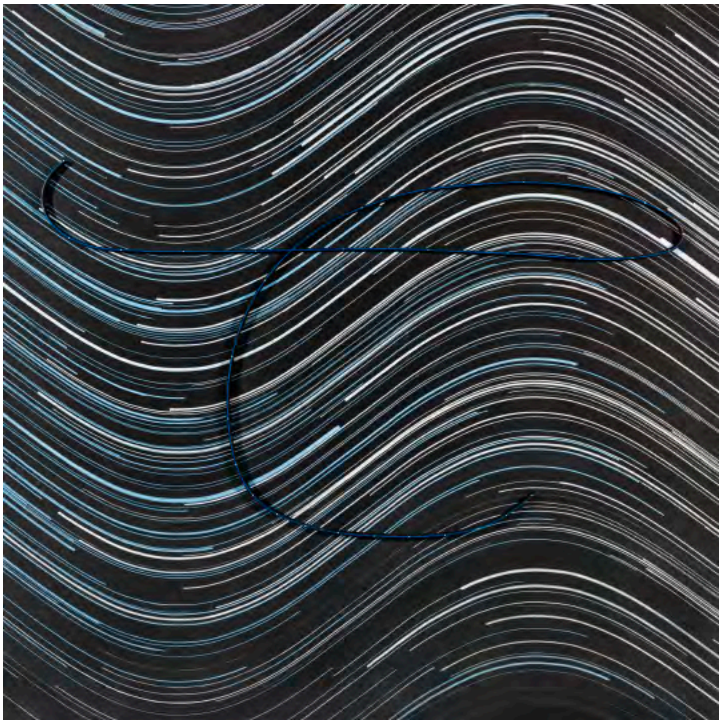
"360° Star Trails at the Equator" is from an imaginary trip to a mountain top at the equator, where I pointed my imaginary camera directly upward to record how the stars and JWST travel in an apparent straight line. Toward the periphery of the drawing (the poles), the straight lines give way to elliptical lines.

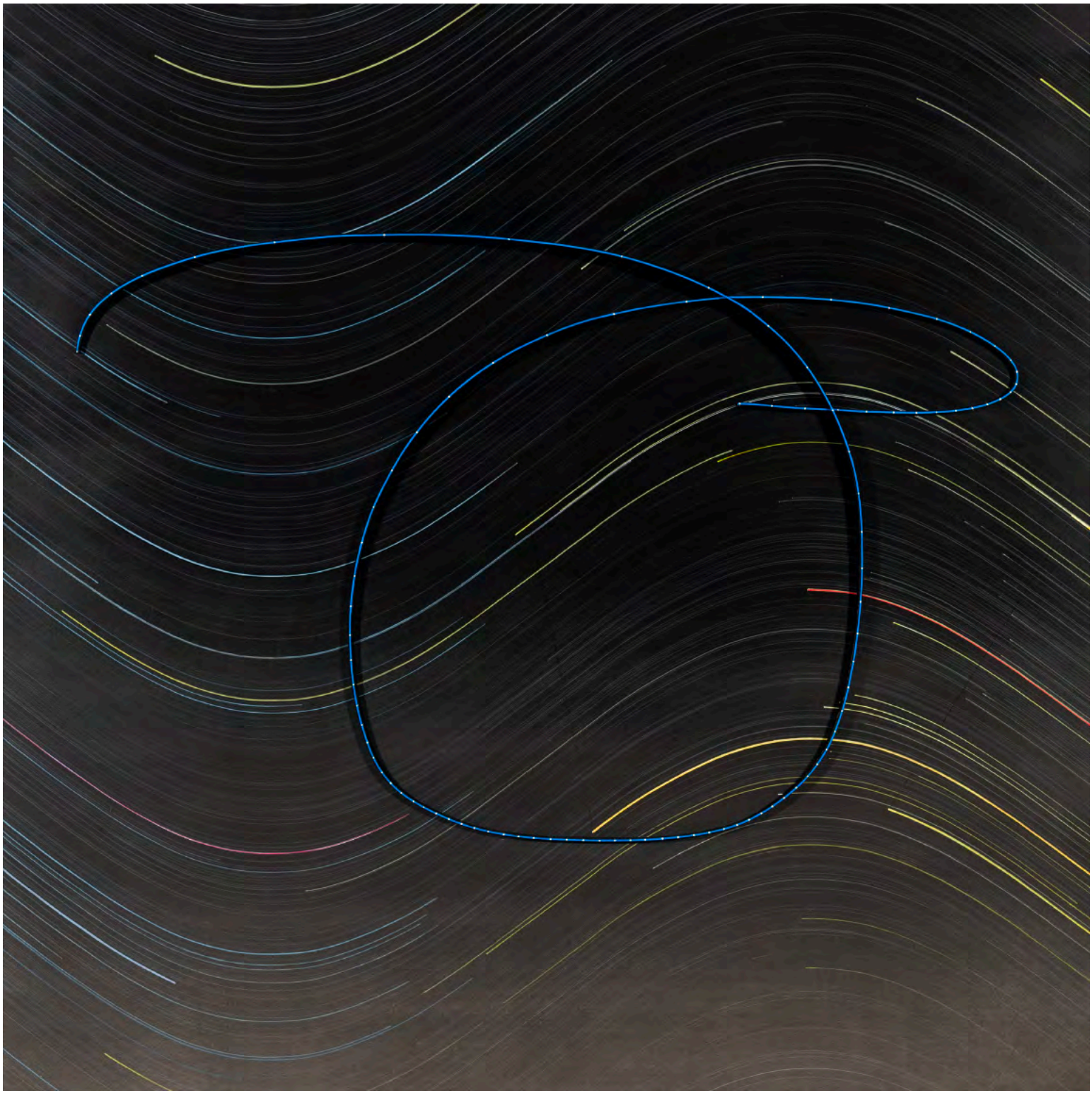
For my Orbital Path drawings, I wondered what the telescope's journey would look like over the course of a year or so. Using my same imaginary telescope and camera, along with NASA's data, I took an imaginary photo every night at midnight from my backyard pointing south. I then plotted JWST's path to produce the looping shape that describes its journey across the sky.

The backgrounds of the drawings consist of a sinusoidal rake of the distant stars as they would appear, smeared across the sky during a year-long camera exposure. The results were these unique sculptural shapes.



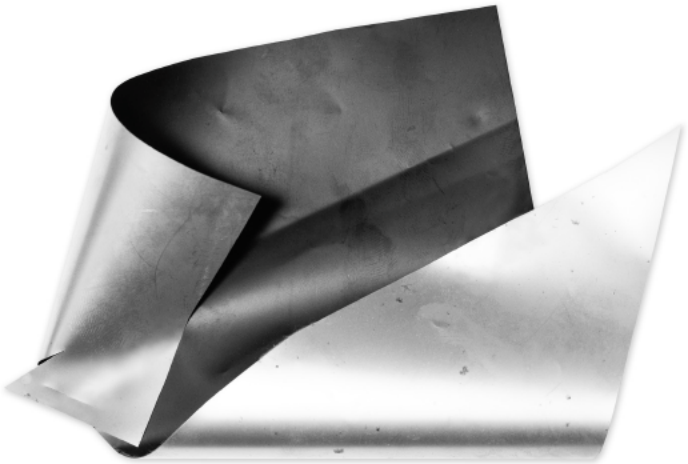


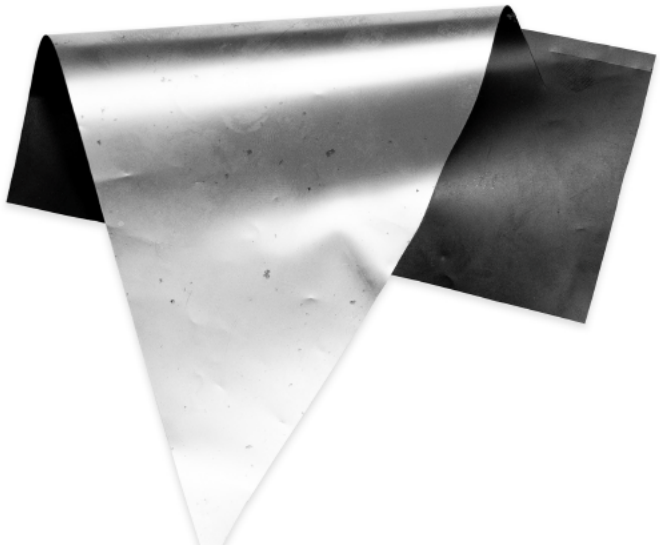


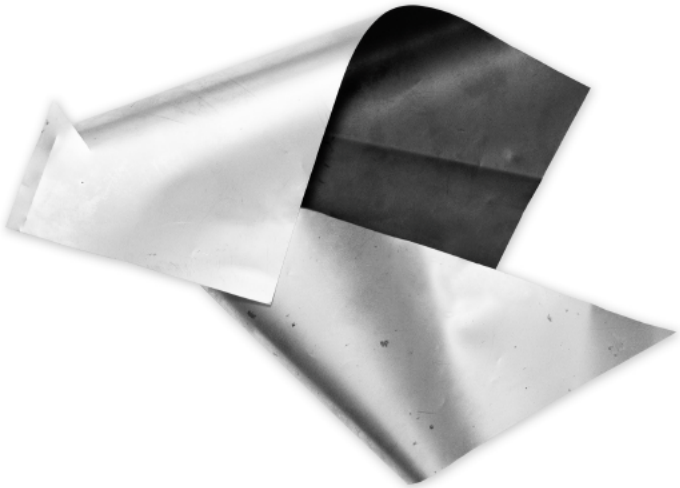


Foil Abstraction

A couple of years ago, someone who worked on the telescope's optical systems reached out to me. He had a leftover piece of Kapton foil — a highly reflective film used in the aerospace field — and wanted me to have it. I was thrilled to have this remnant, knowing that the other part of it is, at this writing, in an orbit one million miles away, 16 degrees above the southern horizon. To me it's a treasure that reminds me of my connection to JWST, and to preserve that idea, I photographed it in a variety of folded configurations that created a new set of abstract shapes.







Tim Makepeace

Timothy Makepeace is a Washington DC-based artist who has worked in photography, sculpture, drawing, painting, as well as various combinations of these. His subjects range from gritty industrial infrastructure to his current fascination: the exquisite James Webb Space Telescope. His artwork explores the interaction of engineered structures, geometry, orbital mechanics, and nature.

Influenced by Constructivism, a movement which elevates common building materials and emphasizes geometric abstraction, Makepeace investigates the interplay between realism and abstraction, as well as between the physical and ephemeral. He is both a photographer with a sculptor's eye, and a sculptor with a photographer's eye; as such, the works reflect a degree of physicality as well as immaterial presence.

Makepeace received a BFA from Cornell University, and studied at the Corcoran School of Art and the Smithsonian Institution. He has exhibited widely and received multiple DC Commission on the Arts and Humanities fellowships.

Michael O’Sullivan

Michael O’Sullivan is an award-winning Washington writer, editor and critic, From 1993 to 2023, he covered visual art and film for The Washington Post, earning a Special Recognition Award at the 2010 Mayor’s Art Awards and the second place prize for critical writing in 2012 from the Virginia Press Association. He has organized and juried exhibitions for several Mid-Atlantic art spaces, including Conner Contemporary, Studio Gallery, the Greenbelt Arts Center, Maryland Federation of Art’s Circle Gallery, the Joan Hisaoka Healing Arts Gallery and the Delaware Contemporary.

Thomas Drymon

Thomas Drymon is an artist and curator living in Washington, DC. Since 2010, he has curated and presented more than 20 exhibitions in galleries, exhibition spaces and in his own art spaces (harmon art lab and doris-mae) where he pursued contemporary curatorial initiatives. He has collaborated on theatrical performances, serving as director and visual and audio content creator.
Prior to running his art space, Drymon curated exhibitions locally under the auspices of Thomas Drymon Selects and in conjunction with Mid City Artists. He was founder and publisher of *spoonfed*, a queer arts journal published from 1995-2000 and distributed locally and nationally to wide acclaim.

Exhibition List

Golden Primary Mirrors

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JWST-Central Baffle Detail, 2019, charcoal and pastel on paper, 43" x 43"

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Left: JWST Vertical Primary Mirror, 2017, charcoal and pastel on paper, 43" x 43"

Right: JWST Ceiling Reflections #2, 2018, sumi ink, charcoal on paper, 43" x 43"

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Left: JWST Recumbent Primary Mirror, 2017, charcoal and pastel on paper, 43" x 43"

Right: JWST vs. QED v. 2, 2021, charcoal on digital print, 25" x 25"

Ray Tracing

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MIRI Light Path Jumbo composite, 2026, sumi ink, acrylic paint, on paper, 156" x 156"

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Ray Tracing-MIRI onboard JWST, 2025, gouache, sumi ink, acrylic paint, on paper, 106" x 71"

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Ray Tracing-MIRI Derivative, 2025, gouache, sumi ink, acrylic paint, on paper, 106" x 71"

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NIRSpec Light Path v. 2, 2026, sumi ink, acrylic paint, on paper, 43" x 43"

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Ray Tracing-MIRI Derivative Study v. 1, 2025, acrylic paint, on paper, 43" x 43"

Right: Mid-Infrared Instrument Light Path, 2025, sumi ink, acrylic paint, on paper, 43" x 43"

Earlier Work

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High Voltage–Blue, 2010,
digital image on paper,
69″ x 69″

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Left: Pentagon Hub, 2016, charcoal on paper, 43” x 43”

Right: Up Down Yellow Circle, 2017, charcoal, pastel on paper, 43” x 43”

Reflective Heat Shielding

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Top left: JWST-Kapton Membrane on Spacecraft Bus #3–Echo, 2023, charcoal finger prints, tape on paper, 43” x 43”

Top right: JWST-Kapton Membrane on Spacecraft Bus #3, 2023, charcoal and pastel on paper, 43” x 43”

Bottom left: JWST-Kapton Membrane on Spacecraft Bus #1, 2022, charcoal and pastel on paper, 43” x 43”

Bottom right: JWST-Kapton Membrane on Spacecraft Bus #4, 2023, charcoal and pastel on paper, 43” x 43”

Letters Home

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JWST-Journey Through Sagittarius v. 1, 2023; sumi ink, acrylic paint, on paper, 43” x 43”

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JWST-Journey Through Sagittarius v. 2, 2023, sumi ink, acrylic paint, on paper, 43” x 43”

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JWST-Letter Home, 2023, sumi ink, acrylic paint, on paper, 43” x 43”

Ghost in the Big Machine

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Ghost in the Big Machine,
(Simultaneity and the Flow of Time),
2026, acrylic paint on canvas,
300” x 52”

JWST Cryo Testing

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JWST Cryo Testing, 2019, charcoal, ink and graphite on paper, 43” x 43”

The Center of Our Galaxy

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Galactic Center of Mass-9 stars v. 3, 2020, sumi ink, india ink, acrylic paint on paper, 43" x 43"

Galactic Center of Mass-Energetic v. 1, 2020, sumi ink, india ink, acrylic paint on paper, 43" x 43"

Sag A* with 3 stars, 2020, sumi ink, india ink, acrylic paint on paper, 43" x 43"

Defocused Stars of Orion with JWST

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Defocused Stars of Orion with JWST, 2025, sumi ink, acrylic paint, on paper, 43" x 43"

Journey Across the Stars

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Polar Star Trails with JWST Orbital Path v. 1, 2024, sumi ink, acrylic paint, on paper, 43" x 43"

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360° Star Trails at the Equator, 2024, sumi ink, acrylic paint, on paper, 43" x 43"

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Polar Star Trails with JWST Orbital Path v. 2, 2024, sumi ink, acrylic paint, on paper, 43" x 43"

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Left: JWST-Orbital Path Across the Sinusoidal Rake of the Stars v. 1, 370 days, 2023, sumi ink, acrylic paint, on paper, 43" x 43"

Right: JWST-Orbital Path Across the Sinusoidal Rake of the Stars v. 2, 292 days, 2023, sumi ink, acrylic paint, on paper, 43" x 43"

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JWST-Orbital Path Across the Sinusoidal Rake of the Stars v. 3, 291 days, 2023, sumi ink, acrylic paint, on paper, 43" x 43"

Foil Abstractions

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JWST Frill Scrap v. 1-4, 2025, digital images on paper, 13" x 13"

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ghost in the machine

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