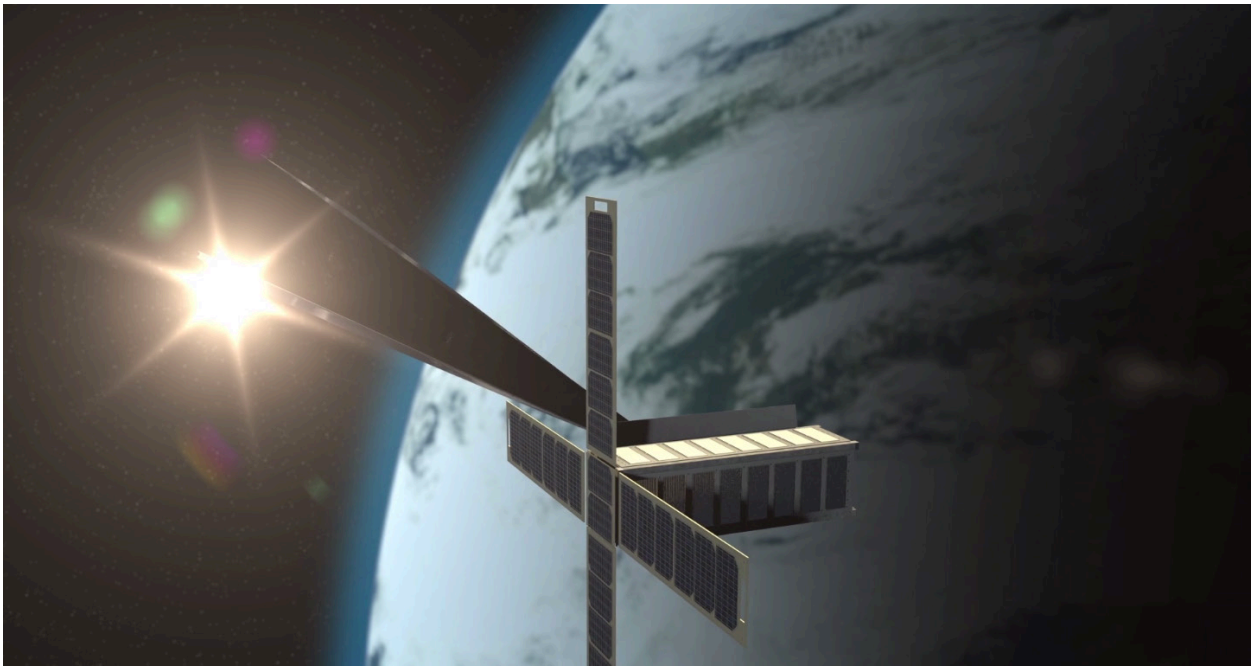
Sohn, Timothy. "SpaceX Is Launching A Piece Of Art Into Orbit," *Wired.com* (November 26, 2018).

WIRED



Artist Trevor Paglen has built a nano-satellite that will trail a 100-foot-long balloon visible from Earth. He calls it art for art's sake and says it's intended to evoke awe and wonder.

When a SpaceX Falcon 9 rocket launches Saturday from Vandenberg Air Force Base, north of Santa Barbara, California, its payload will include 64 small satellites from 34 organizations and 17 countries, each having paid launch broker Spaceflight Industries a hefty fee to be blasted 350 miles up and released into low earth orbit.

Most of these satellites are destined to carry out some utilitarian purpose, be it communications, observation, or science. But there is one small satellite among them that aims to do nothing more than entice people around the world to enact a primal, atavistic urge: to look up at the night sky and wonder what's out there.

It's April, and that satellite's creator, the artist Trevor Paglen, is sitting in the lobby of a Hampton Inn in West Covina, California, 20 miles east of downtown LA, explaining the rationale behind the project he's calling the Orbital Reflector.

"The point for me really was to create a kind of catalyst for looking at the sky and thinking about everything from planets to satellites to space junk to public space and asking, 'What does it mean to be on this planet?'" says Paglen, who has come to California to witness some crucial prelaunch tests on his creation. "It's a timeless question in some ways, but the content of the question is always changing."

Paglen has described the project, which was undertaken in partnership with the Nevada Museum of Art in Reno, as "the first satellite to exist solely as an artistic gesture." As gestures go, it's not cheap—its budget of $1.5 million was funded by the museum, private donors, and a Kickstarter campaign—but it's certainly true to its name.

The Orbital Reflector project is “a way to do an artwork that exists at and thinks about the scale of the planet,” says Paglen, who was photographed in Studio City, California, in November 2018.

Once in orbit, it will deploy a 100-foot-long, 5-foot-wide balloon made of high-density polyethylene coated with titanium dioxide powder that will reflect light back to earth, making it as visible to the naked eye as a star in the Big Dipper, a work of public art streaking across the night, visible to anyone who looks up into a clear sky at the right time, and trackable via the project’s website and a partnership with the Starwalk 2 app.

“The goal has been to build this out like it’s the exact opposite of every other satellite,” says Paglen, who has a long history of art projects that chart the dark world of government surveillance. Where other satellites might spy or photograph or measure, his will be defiantly, whimsically useless. It will remain in the sky for at least two months and then will burn up in the atmosphere on re-entry. “It’s a way to do an artwork that exists at and thinks about the scale of the planet.”

The peripatetic Paglen has just flown in from Berlin, where his studio is based, but where, as his career and travel schedule have accelerated, he spends ever less time. He’s wearing his usual uniform of white T-shirt, dark jeans, and boots. A pair of aviator-style sunglasses sit on the table next to his phone and a bottle of Cherry Coke Zero. He’s jet-lagged and seems a little depleted.

Developing the Orbital Reflector has been a long and complicated process, one that Paglen has been juggling amid other projects and collaborations and museum shows and lectures.

Mark Caviezel, left, one of the engineers on the project, works with Paglen, center, and project manager Zia Oboodiyat.

The 44-year-old artist is hitting his mid-career stride in a full sprint—he won a Macarthur Foundation "genius" grant last year and the Nam June Paik Art Center Prize this year, and he has a major retrospective currently up at the Smithsonian Museum of American Art in DC. Paglen has emerged as one of the most incisive and relevant provocateurs of our heavily surveiled age, a producer of timely and often tech-infused work, much of which has focused on the security state and the increasingly quaint notion of privacy.

He has a PhD in geography from Berkeley and has pioneered a field he calls "experimental geography," investigating the spatial implications of these invisible worlds with the goal of making us, finally, see them. He has trekked to "blank spots on the map" to photograph secret military bases; he learned to scuba dive so he could photograph undersea data cables that have been secretly tapped; he's charted the course of spy satellites and surveillance planes; and he's sent a series of images, *The Last Pictures*, into deep-space orbit in an attempt to create a monument that might outlast our planet.

Orbital Reflector is a logical extension of the questions Paglen has been asking, with ever-greater reach and complexity, for two decades. It is also a timely call for all of us to look a little more closely at the booming space industry. And just as Paglen's terrestrial work asks viewers to try to see the physical shape of the hidden world around them, his foray into extraterrestrial space is meant to draw attention to the way the heavens are increasingly intruded upon by man's best and worst intentions and the unintended consequences that go along with them.

Paglen wants you to know that for every Hubble telescope gazing outward at the galaxies beyond ours, there are dozens more satellites whose electronic eyes are trained on Earth itself—monitoring, broadcasting, transmitting, watching.

Space, in other words, is not benign. One of the other payloads launching on the same rocket, he makes sure to note, "is basically like a commercial spy satellite. They wouldn't call it that, but that's what it is."

It's getting close to dinnertime, and other members of the Orbital Reflector team begin gathering in the lobby before heading to a nearby restaurant. Amanda Horn, the director of communications for the Nevada Museum of Art, who has played a crucial role in shepherding every aspect of the project, comes in and sits down next to us. "I want to introduce you to Zia," she says to me, "and you can ask him about some of the technical aspects since we have a little time now."

"Perfect," Paglen says. "We were talking about drag coefficients and the implications for balloon design."

If Horn is responsible for keeping this train on the track, then engineer Zia Oboodiyat, the project manager and veteran of a lifetime's worth of satellite launches, is tasked with making sure it runs. A gregarious man who fled Iran as a boy, the semiretired Oboodiyat met Paglen in 2011 while working on his *Last Pictures* project. He writes poetry and has a philosophical bent, and as we rehash various questions about the complications and potential difficulties of the launch, he seems at peace.

"As much as possible, we predict the risks and test for them and simulate the conditions the satellite is going to face. That is what the test tomorrow is for: to simulate the dynamic forces of the launch conditions," Oboodiyat says. "We have done our analysis, we have checked our assumptions, but there is a risk with any and all space programs."

Horn hands him an envelope, and he pulls out four patches that Paglen and the museum have made as part of the project. Paglen has long had an ethnographer's interest in the culture surrounding this secret world and has collected the patches commissioned by various top-secret government programs and agencies, typically featuring snakes or skulls or an octopus.

His tongue-in-cheek versions for Orbital Reflector are cartoonish, with mottos that mostly seem like inside jokes about the tedium of the process of building your own satellite: "Orbital Reflector Logistics / In Space No One Can Hear You Complain"; "Reno, We Have a Problem / #NotMyProblem"; "Ad Astra Per Cartam" ("To the stars through paperwork"). Oboodiyat picks up a blue circular patch with an embroidered image of a smiling blond man and reads the pink-lettered slogan across the top.

"Space is hard?" he reads, laughing at first. "Space *is* hard."

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Mark Caviezel, one half of the engineering duo from Global Western, the firm that built the Orbital Reflector, opens a black Pelican case to reveal a gleaming aluminum rectangle about the size of a large loaf of bread. "All right Trevor, there's your bird," he says, pulling it out with a delicate flourish. "That's your aircraft."

It's 8 am the next morning, and we are in a nondescript industrial park in Covina at the nondescriptly named Consolidated Laboratories. Walking through its roll-up door feels like stepping into a time warp, a cavernous space that was half machine shop and half storeroom for computer towers and machines that look like they've been there since the 1970s.

The term "space age" tends to conjure some notion of slick futurism, but we forget that the first space age and all its Cold War-era investment happened half a century ago. That era's aerospace industry powered vast swathes of southern California's economy, largely on the back of military and defense spending at NASA's Jet Propulsion Lab in Pasadena and a surrounding constellation of private contractors like Hughes, which was based in nearby Fullerton. Some of those USA-made machines—including the computers that run them—were built to last and are still in use for tests like these.

"It reminds me of the day I started working in this industry," says Oboodiyat as one of the technicians inserts an 8-inch floppy disk and begins booting an archaic-looking machine connected to a wardrobe-sized unit labeled "5427A Vibration Control System." "A lot of this stuff in here really belongs in the Smithsonian."

The futuristic cube—the actual satellite sits inside the anodized aluminum case, which replicates the exact size of its pod on the launch vehicle—is the only shiny thing amid all the drab relics. But though it looks out of place, its being there makes perfect sense. The facility is still very much operational and is just the sort of place Paglen has spent years looking for and writing about, a node of the defense-industrial complex hiding in plain sight, disguised only by its banality.

Caviezel seems to confirm this suspicion. "They usually don't have many spectators for a thing like this. Not a lot of cameras," he says. "Most of the folks coming through here—Lockheed, Boeing—the last thing they'd want is people to know they'd been here."

Indeed, our group, which includes the Global Western team of three, Oboodiyat, Horn, a cameraman from the museum, a documentary crew from Australia, and me, seems to spook our hosts a little.

"Usually I'm here alone," says Larry, the technician running the test, "so this is a bit unusual." Oboodiyat tries to explain the project to him: "It's art, it's science, it's both. It's unique."

Caviezel warned me previously that the so-called shake-vibe test the unit would be undergoing would not be the most exciting thing: The satellite unit would be bolted to a metal plate attached to an electrodynamic "shaker," which would send high-frequency vibrations through it to simulate the rigors of launch, only more violently. "It's not a lot of huge action, so I hope you're not disappointed. The most exciting thing might be attaching and detaching the unit," to allow the same tests to be run along the x, y, and z axes.

As I watch the technician meticulously attach the satellite to the platform with parallel aluminum braces bolted into the baseplate, "exciting" is not the word that comes to mind. The shaker itself looks like a cement mixer attached to a welding table. "This is a later model for us; it was probably built in the '80s," Larry says when I ask. "These things last for a lot of years."

Sitting at a nearby table, Paglen answers a few questions for the documentary crew and checks his phone. He has a flight to catch for a speaking engagement at Berkeley, and he's getting anxious to head to the airport. As much as he wants to stay and observe, things are moving slowly, and they've been saying "five more minutes" for about an hour.

"Hey Trevor, don't take off, Larry says we're good to go," says Gary Snyder, the other half of the Global Western team.

"This first portion won't be very impressive," Larry says. "It's pretty quiet." Then he hands out earplugs, and all eyes turn to the small silver box. The machine kicks on with the sound of a semi truck badly in need of a tune-up, but otherwise, as promised, nothing much seems to happen.

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It has been a long journey to this point for Paglen, no matter how anticlimactic it seemed to watch a cube of metal being vibrated at frequencies beyond what the human eye can detect. His father was an Air Force ophthalmologist and the family lived on bases in Maryland, Texas, and California before settling at the airfield in Wiesbaden, Germany, when Trevor was in junior high.

He returned to the states for college at Berkeley, where he studied religion and music and got involved in prison activism, leading to a series of sound recordings done in various prisons by means of a concealed microphone. In its exposure of a hidden world, that project was a harbinger of things to come.

Paglen went on to an MFA at the Art Institute of Chicago before embarking on a PhD in geography back at Berkeley, where, the story goes, he was poring over USGS aerial photos, looking for prisons, when he stumbled on massive redacted areas denoting secret military sites. He first visited Nevada's Area 51 in 2003, which proved the starting point for a body of research that became his dissertation and, eventually, the book *Blank Spots on the Map*, in which Paglen charts the geography of secrecy, the physical presence of the "secret state within a state."

"Geography tells us that secrecy is always bound to fail," Paglen writes in his 2009 book *Blank Spots on the Map*. Using a long exposure at night, he made this photo of an observatory in West Virginia's National Radio Quiet Zone ("They Watch the Moon") in 2010.

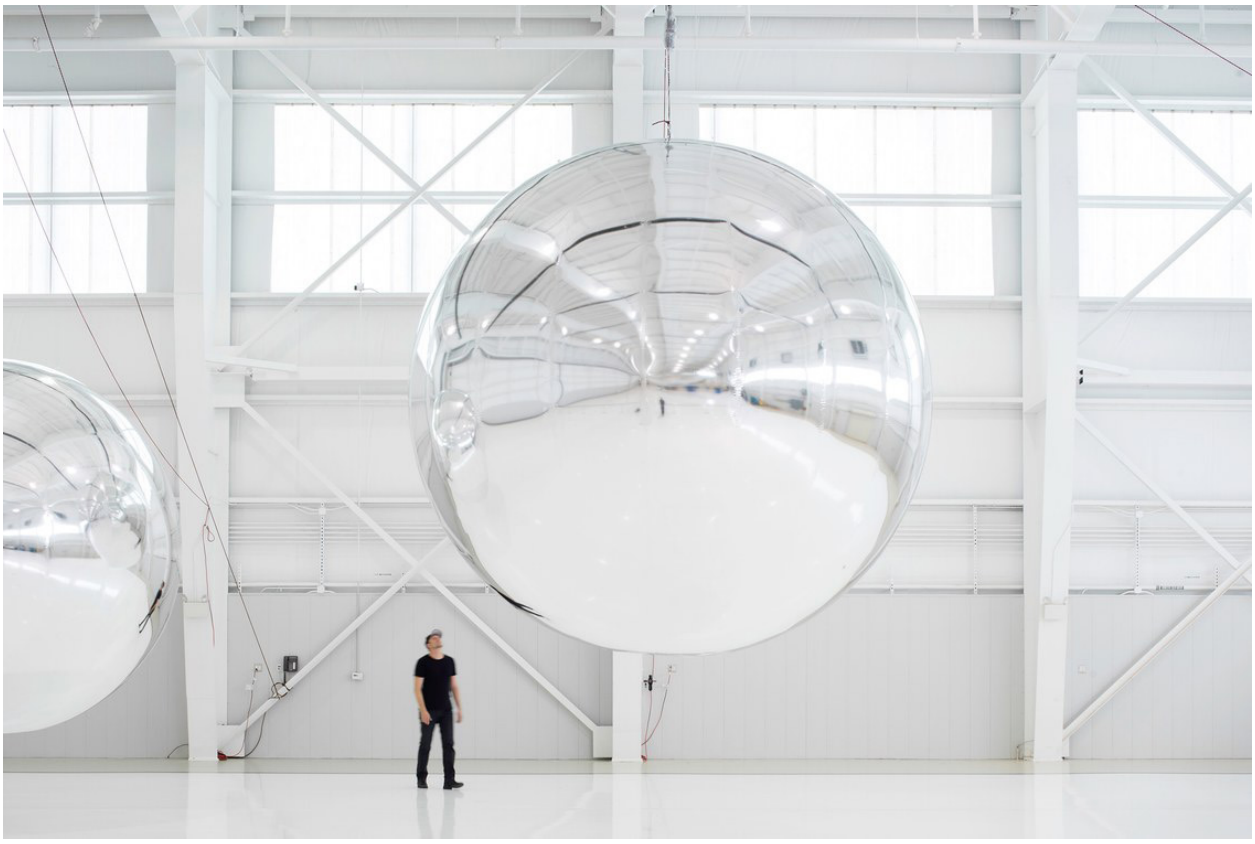
"Geography theory tells us that it really isn't possible to make things disappear, to render things nonexistent," Paglen writes in the book. "Geography tells us that secrecy, in other words, is always bound to fail."

Paglen's method, then as now, was to question everything. He was rigorous verging on relentless, relying on FOIA requests, archival research, interviews with industry sources, and on-the-ground sleuthing. Along with the book, he trekked into deserts and up mountains to produce a series of arresting landscape photos of these dark sites, some taken from as far as 60 miles away. He next turned his lens skyward, learning how to identify, track, and photograph classified spy satellites for a project called *The Other Night Sky*. The results are both surreal and familiar, entirely novel and yet rooted in our visual culture.

"In *The Other Night Sky*, he responded to the traditions of landscape photography, a temporal axis invoking historical precursors including Timothy O'Sullivan and Ansel Adams," writes John P. Jacob, the McEvoy Family Curator for Photography at the Smithsonian, in an essay in *Sites Unseen*, the monograph that accompanies Paglen's Smithsonian solo show of the same name. The photos look up, rather than out, Jacob writes, so that "they have no earthly perspective. They are wondrously disorienting."

It was around the time of that project, in the mid- to late-2000s, that he began thinking about the project that would become Orbital Reflector. In 2008 he started assembling a team to work on the project, and in 2013 he released four prototypes for nonfunctional satellites.

The one that led most directly to the Orbital Reflector was built around the idea of a mirrored, reflective sphere—an anti-spy satellite, echoing Russian artist Kazimir Malevich's 1920s idea of man-made planets and inverting the normal relationship: We spy on it rather than the reverse. It would record nothing, do nothing, seek no higher purpose than being a short-lived artificial star, destined to eventually flame out.



Paglen with his "Prototype for a Nonfunctional Satellite (Design 4; Build 4)," 2013, Mixed media, 16 x 16 x 16 feet.

According to Paglen, it was the aerospace version of "art for art's sake," an attempt to see "what aerospace engineering would look like if its methods were decoupled from the corporate and military interests underlying the industry." Or as he rephrased it in a 2015 lecture at the Smithsonian: "Could you build a satellite that was not a weapon? Could you build a satellite that had no commercial, scientific, or military function whatsoever? Could you build a satellite just because you wanted to build one, because you thought it would be beautiful?"

It turns out you could, but it's not easy. In 2015, though, Paglen found a partner for the project in the Center for Art + Environment at the Nevada Museum of Art. "The Nevada Museum of Art has been extraordinarily nimble and creative in terms of being able to think about how to do a project like this and develop an interesting program around it," Paglen says. They were, he notes, also brave to take it on at all, given the potential for failure. "It's really a very risky project for an institution to do," he says.

From the museum's perspective, it was a project, and an artist, that fit with their mission. "We are very focused on art and the environment in the West, on where the built and natural world intersect, and we have a huge archive on land art," Horn says during one of our first discussions about the project. "To us, this is basically a piece of land art in the sky."

Horn spearheaded the fund-raising and helped shepherd many of the logistical details, becoming expert at the paperwork that seems to be the true fuel of spaceflight. "I'm not sure any other art museum would have taken this on," she says. "But we like to take risks—managed ones, at least."

Together they assembled the budget and the engineering team, starting with Oboodiyat, and sought to take advantage of the rapid development of the commercial space sector, which has made satellite launches affordable after a fashion, particularly for the two smallest categories: microsatellites and nanosatellites.

In the latter category, characterized as a satellite weighing between 1 and 10 kilograms, the industry has coalesced around the so-called CubeSat standard, a format initially introduced with academic research projects in mind but now deployed for a host of uses. (Earlier this week, two CubeSats played a crucial communications support role for NASA in the InSight lander's successful touchdown on Mars. They accompanied the lander to the red planet, becoming the first CubeSats to go beyond low earth orbit and sending back some remarkable photos.)

The CubeSat format takes a 10-centimeter cube as its basic unit, and the Orbital Reflector is a pretty standard three-cube unit, 10 by 10 by 30 centimeters. This launch, which Spaceflight has dubbed the "SSO-A: SmallSat Express," is itself evidence of the sector's growth, marking the company's first purchase of an entire payload of a Falcon 9 and the largest ride-share mission from a US launch vehicle to date. It's an Uberpool to space, and CubeSats are the primary customer.

The $1.5 million that the museum raised to build the satellite (actually, satellites—there's an identical backup unit) and put it into orbit seems like a lot of money, but spend some time with people who have devoted their lives to building satellites and you'll come away thinking it's a bargain.

"The industry is evolving," Oboodiyat says. "Instead of hundreds of millions of dollars, suddenly you can spend a million or 2 million on a little CubeSat and run experiments and learn the same thing."

SpaceX, founded in 2002 by entrepreneur Elon Musk, has emerged as the leading private space transportation company, and today marks the 64th Falcon 9 launch for the company since the rocket debuted in 2010. But SpaceX is hardly the only player in an industry that has seen huge growth over the past decade in both outside investment and the number of launches, particularly as nongovernmental launches have surged.

It's estimated that 120 venture capital firms invested nearly $4 billion in private space companies last year, and this year has already seen 72 orbital launches. Navigating this marketplace and guiding clients to space is where companies like Spaceflight Industries come in.

"We're really a facilitator to get people on orbit," says Curt Blake, CEO of Spaceflight. And as the barrier to entry has gotten lower, he says, they've seen "a whole bunch of satellites with different ambitions where you say, 'That's pretty amazing that people even thought of that.'" This launch will include a satellite that will study the clarity of ocean water as a measure of ocean health, and another testing the effects of different levels of gravity on algae.

Building and launching a satellite may be more achievable than it used to be, but this project represented a unique set of both technical and aesthetic challenges, starting with its scale. Most CubeSats start small and stay relatively small. This one needed to sprout a 100-foot tail.

The balloon was partly what led them to Global Western, as the firm had prior experience with balloons through a project they did for a French high-altitude parachutist. Paglen's initial sphere conception got tossed early on. "That's a really efficient shape for maximizing your surface area," he says, "but that also means it's very susceptible to drag. So it's not a very efficient shape in terms of wanting to stay up for very long."

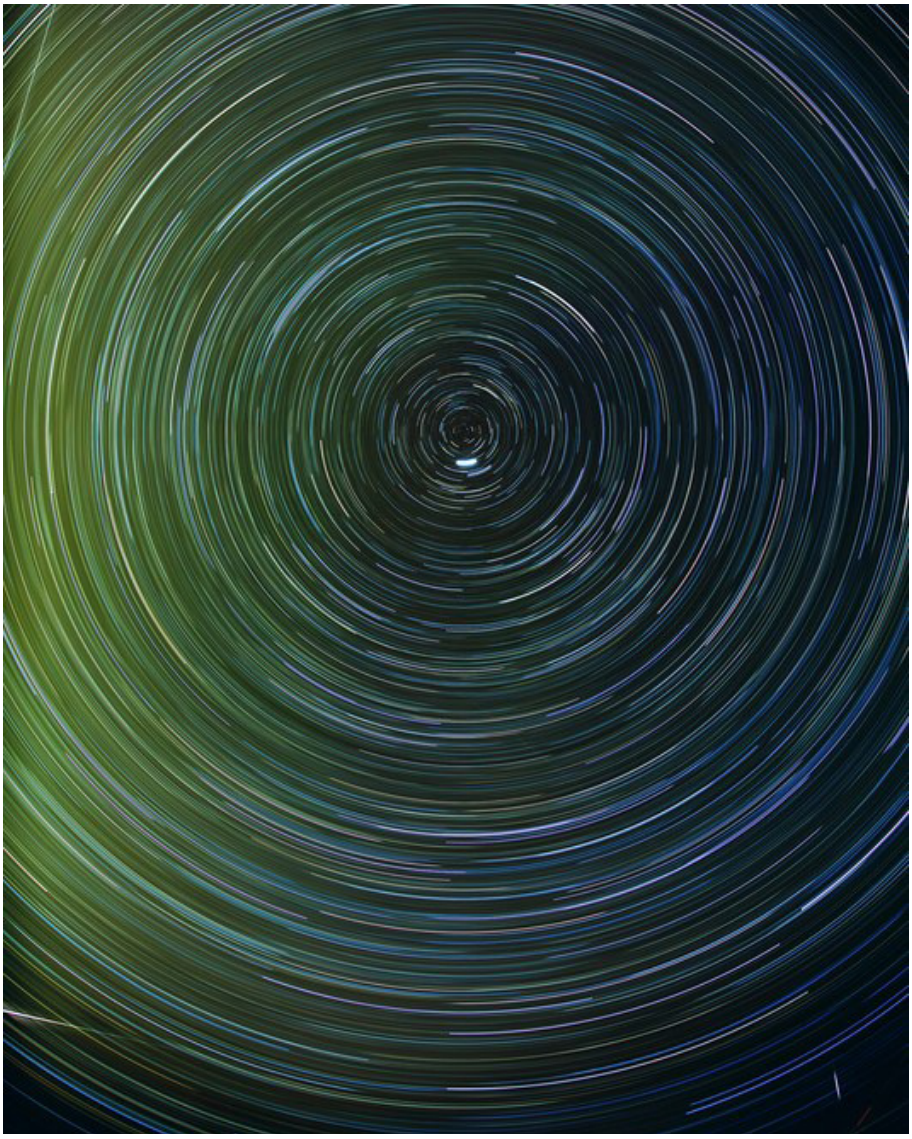
Paglen's art project will be one of dozens of so-called CubeSats launched on a Falcon 9 rocket—an Uberpool to space.

Efficiency-wise, a cylindrical balloon trailing behind the satellite body was deemed the best bet, but the setup looked, to Paglen's eye, a little too phallic. He sketched out a faceted, more diamond-shaped version that looks almost like the blade of a sword.

The optimal shape of the reflector was just the start of a list of problems to be solved and questions to be answered, issues that seemed to multiply by the day. What would the balloon be made of? How would it inflate? What would the communication link be? How much battery life and solar charging capacity could you pack into such a small unit? How would you fit in all the other components and still have room for the balloon? What would the mechanism be for opening the door to release the balloon? Where would the hinge be located? How would you avoid hitting other satellites with the balloon? How would the balloon react to solar radiation? How much drag would the balloon create, and how rapidly would the drag cause it to fall out of orbit?

But engineers love solving problems, and in every case, they sought the simplest, most fail-proof solutions, building in redundant backup systems where possible. The communications link is via ham radio, the unit is held shut by spectra cord, and the entire balloon—thanks to the atmosphere of space, with external air pressure near zero—will inflate via a simple, small CO2 cartridge. The resulting satellite is a tiny exercise in elegant simplicity, built of perhaps a hundred different components, many of them available off the rack.

It was Global Western's first CubeSat project, but they seem to have enjoyed the challenge. "When Mark called me up with this project, I didn't answer right away," Snyder says. "I wanted to make sure it was something I could do." He was pleased with the result, and the relative simplicity of the process. "I built this satellite," he says, tapping the box. "It has solar power and lithium batteries and computers." It could, he says, herald a new era for spaceflight.



"Singleton/SBW ASS-R1 and Three Unidentified Spacecraft (Space Based Wide Area Surveillance System; USA 32)," 2012, C-print.

"Not everyone builds satellites in their garages," Oboodiyat says.

"Everyone should!" Snyder says.

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Paglen once spent a week holed up in a Las Vegas hotel room with an airport view, tracking the comings and goings of planes headed to classified sites in the desert. So the revelation that he likes to get to the airport early for a domestic flight—really early, like two and a half hours—makes me think perhaps he has some secret agenda there. No, he says. "I just don't like the stress of it."

And so with the tests still underway, Paglen departs, the documentary crew trailing behind him. Truth be told, there isn't much for any of us to do there. The machine keeps vibrating, the plotter keeps plotting, the engineers keep watching, and, eventually, Larry gives a thumbs-up. The machine ceases its roar, and the team gathers around to look at the results.

"This is good news," Caviezel says. "No big spikes or variances. Very stable."

Snyder and Oboodiyat agree. Larry nods and then swaps out one 8-inch floppy for another one.

During breaks in the testing, I spend a good deal of time with my face 6 inches from the aluminum box, trying to peer inside to make the satellite give up some of its secrets. I can see its handmade provenance in the screws and the hinge where it would open and the solar panels attached to the outside. The project is simultaneously complex beyond civilian understanding and alarmingly simple: a tiny box with a balloon and a remote-controlled whippet cartridge to inflate it.

But though physically small, the scope of potential impact and the size of the canvas are grand. "Orbital Reflector … places Paglen in the tradition of earth artists such as Christo and Michael Heizer," writes Jacob, the Smithsonian curator. Instead of massive-scale land art on the planet, it is nearly its own planet. "A satellite that has no intelligence-gathering function becomes an artificial star, a reflective object of pure delight and wonder."

The Orbital Reflector passed all of its tests that day, taking an important step on its path to launch and gratifying the men who made it. By the end of the day, the team's discussions had turned wistful.

"It's like you have a child, you invest all this time into it, and then just give him away," Oboodiyat says. "Every time I build a satellite I feel that way, that void. And then you find the next project, and you start all over again." This project, however, was a little different, and he'd connected with its sense of higher purpose. "It's just pure art," he says. "It doesn't discriminate. You can see it no matter who you are, and it's a light of hope. It's helping people become a little more inquisitive."

In the months following the tests, other minor problems cropped up and were solved, and all the other necessary tests were passed. Since late summer, the team and the satellite have been ready for launch. The blastoff, initially scheduled for July, was postponed by SpaceX and then postponed again. Just last week, as Paglen and his team were en route to Vandenberg for the scheduled November 19 takeoff, they got word that it would be postponed yet again. A week later, reports of bad weather led to another postponement.

In October, the satellite traveled to Spaceflight's headquarters in Auburn, Washington, for the "integration" process, wherein it was packed into its slot on the launch unit that will sit atop the rocket. From that point, it was out of the Orbital Reflector team's hands.

(In an unforeseen plot twist just announced in mid-November, there will be another CubeSat-as-art project on the same launch. Artist Tavares Strachan partnered with LACMA's Art + Technology lab, which is sponsored by SpaceX, to produce *Enoch*, a work meant to honor the memory of Robert Henry Lawrence Jr., the first African American astronaut, who died in training in 1967, by releasing a CubeSat-size gold sculpture featuring a bust of his likeness.)

The only other hiccup occurred late this past summer, when a few astronomers and bloggers stirred up a controversy by complaining that the project amounted to an exercise in pollution, just sending more junk into space. In one typical complaint, Mark McCaughrean, senior adviser for science and exploration at the European Space Agency, tweeted that "adding another satellite like this brings nothing beyond what the many purposeful ones in orbit look like already. Or the many natural phenomena already there to enthrall. It's a completely empty artistic statement."

For Paglen, the objections only proved that, even pre-launch, Orbital Reflector was succeeding in provoking dialog. He took the opportunity to respond forcefully with an article of his own. On the critique of putting "useless" things into space, he wrote, "I plead guilty. I think public art is a good thing. The 'uselessness' of public art doesn't bother me at all. In fact, it's one of the things that makes it worthwhile."

What's more, it takes a tremendous amount of willful blindness to be more bothered by one tiny satellite that will last two months than the estimated 2,000 satellites and half a million pieces of space junk already floating in orbit, and the ongoing and ever-escalating militarization of space. The project, he writes, aims to "bring some awareness about how profoundly compromised space has become by the world's militaries and corporations."

His argument reminds me of a part of our conversation in West Covina. "I've said this over and over, but there is no such thing as a civilian space program and never will be," Paglen told me. "The history of spaceflight is a history of nuclear war. ICBMs were not developed to put people on the moon. They were developed to blow up the planet."

That Paglen's satellite is likely hitching a ride to space alongside actual military and spy satellites is an unavoidable reality, as is the fact that Vandenberg has long been the preferred launch site for spy satellites. In fact, Paglen visited Vandenberg for *Blank Spots on the Map*, writing that he wanted to see up close the intelligence world's "gateway to the heavens," the dark counterpart to the sunny launches from Cape Canaveral, "a military base almost entirely dedicated to black projects."

Such overlaps only sharpen the project's implicit critique: The only way to get to space, even within the framework of the newly commercialized space industry, is with a little help from the military.

And so on Saturday, if all goes to plan, the Falcon 9 will fire up on the launch pad at Vandenberg and head skyward on a southerly course, traversing open ocean toward Antarctica on its way to orbit. Paglen and the engineers will be there, and the museum has sponsored a watch party at a nearby park with a clear view of the launch.

About an hour and a half after launch, the Spaceflight launch vehicle will detach from the rocket and, over the next five to six hours, will deploy its payload, starting with the 15 larger microsats, followed by its 49 CubeSats, Orbital Reflector among them.

The door holding Orbital Reflector in its pod will open, and a spring at the bottom will eject it into space. Roughly 10 hours later, a ham-radio signal will trigger the melting of the spectra cord holding the unit closed. The box will hinge open, another radio signal will trigger the compressed CO2 cartridge, and the diamond-shaped balloon will trail out behind the satellite body and inflate to its full 100-foot length.

Within 24 hours, the team will have tracking information from Norad, and within another day or two we will all be able to look at the project website or the Starwalk 2 app on our phones, then up at the sky, and see Paglen's latest provocation tracing its course across the firmament for all the world to see.

And then, perhaps two months from now, it will be gone. A normal CubeSat deployed in similar orbit might stay aloft for 20 years, but the rapid orbital decay caused by the added drag of the balloon means that the Orbital Reflector will lose altitude with each successive orbit—it'll circle the globe every 90 minutes or so—eventually burning up when it re-enters the atmosphere.

Of course, even the two months estimate is more of an educated guess; even assuming a perfect launch, there are a lot of variables that could still impact things, from solar radiation to balloon inflation direction to unforeseen drag to communication issues.

"It's essentially a chaotic system," Paglen tells me. "You can't exactly predict what it's going to do." But that's space. It's also art.