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A Los Angeles artist keeps upping the ante, whether photographing Arctic glaciers through lenses made of their own ice or using a camera that captures light itself at a trillion frames per second.

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Reporting from Los Angeles

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What's Tristan Duke — polymath, experimental photographer, lavish tinkerer, and winner of the Los Angeles County Museum of Art's prestigious Art and Technology prize — been up to lately?

I mean, besides the body of work featured in the sumptuous, just-released Radius Books monograph on his Glacial Optics project, Duke's continuing act of witness to some of the most wrenching effects of human-made climate change.

This series grew out of his recent practice of fashioning camera lenses out of pure ice, a notion he first got from happening upon the lab notes of a third-century Chinese alchemist who had enjoyed setting fires with polished globes of ice. Duke developed an exacting methodology for molding a series of such ice globes and meticulously calibrated ice lenses as well, through which he, yes, set fires but then also started taking photographs.

He would attach his frozen lenses to the aperture of a portable tent camera obscura which he had also concocted and which he presently took along on a quite eventful Arctic expedition.



Duke hauls pure ice out of the Arctic Ocean and uses his invention to press it into a perfect ice lens with a focal length of 120. Tristan Duke



Damien Maloney for The New York Times

In 2022, sailing north of the 78th parallel and leaning out from the rim of the research vessel on whose expedition he'd been invited, Duke hauled up diamond-pure chunks of ancient glacial ice. He then shaped those into perfectly translucent lenses that he trained back on the glaciers themselves. Allowing the whole calamitous situation, as it were, to photograph itself. Then, he went off to photograph burn scars all over the Southwest through the same sorts of ice lenses, to equally harrowing effect.

“Light, often of a mysterious nature, is the through line of Tristan Duke’s work,” Michael Govan, the director of LACMA, has observed. “Like the miracle it must have been to see light fixed in an image in early photography, his art nurtures that same sense of the wonder attending invention.”



Duke contemplates the maquette of a new project, with one of his glacial ice lens photographs as backdrop in his studio. Damien Maloney for The New York Times

I first began following Duke about 15 years ago, when I encountered him squirreled away in a cubbyhole in the back reaches of the Museum of Jurassic Technology in Los Angeles, where, like some 16th-century magus intently grinding lenses, he was perfecting a method for hand-etching exquisite holograms onto metal platters: polygonal volumes hovering over a sequence of rotating turntables, suspended in midair, ghostlike and yet palpable: Incredible.

Duke grew up around the University of Illinois Urbana-Champaign hub. (His mother worked at the university museum.) Eventually faced with a choice between attending the California Institute of the Arts or Naropa University (the Buddhist-

inspired institution in Boulder, Colo., founded by the likes of Chogyam Trungpa, Allen Ginsberg and John Cage), he chose Naropa because, as he said, he never wanted to be a conventional artist so much as a sort of free-floating investigator. (In which spirit, in one early essay, for example, he examined the acoustics of the Japanese tea ceremony.)

But, what else has he been up to lately, now, at age 44? To find out, I recently visited Duke in his lab/studio in a light industrial district on North Alvarado Street where he was deep into his latest provocations.

For starters there were elaborations on the astonishing Aperture Lucida he had created while artist in residence in San Francisco's Exploratorium back in 2020: a pair of 8-by-8-foot jet-black monoliths, notched together in a vertical perpendicular clench, in front of which, several feet out from the seam where they joined, hovered a grapefruit-size ball of light, seemingly substantial but in fact utterly immaterial, unmoving (yet strangely pulsing).

Drop-jawed visitors moved hesitantly about, some gingerly hazarding to approach so as to stab the thing with their fingers and then maybe enter it with their heads — at which point the entire monolithic construction seemed to disappear as the surrounding world surged through all around it. For he'd in fact pierced the seemingly solid black panels with hundreds of thousands of precisely tunneled wormholes, all converging on the same spot (hence both effects — the hovering ball of light and the seeming disappearance of the surrounding walls).

"Tristan was possessed of one of the most astounding intellects I encountered during my tenure at the Exploratorium," said Kirstin Bach, retired director of the Center for Art & Inquiry at the Exploratorium. "And in my job capacity I was privileged to encounter several, but his was also exceptionally generous. He could envision a truly outlandish outcome and had the self-confidence to bring others along for the journey as he made it so, manifesting some truly magical results. It sounds crazy but I saw it time and again with my own eyes."

And these days Duke wants to expand the magic by capping the two monoliths with a third, leaning the entire structure onto the ground like a pyramidal tent and then expanding that structure to monumental scale.

The miniature maquette for Duke's proposal for a grand pyramid nesting a free-floating ball of light.

Damien Maloney for The New York Times

Visitors walking around the structure in, say, an urban park, would be able to see a luminous globe hovering inside, and then, entering the tentlike structure by way of its raised sides, they could, if they dared, pierce the floating globe of light with their heads, whereupon the entire surrounding structure would seem to melt away as the sky and skyscrapers all around suddenly poured in. Now he just needs to find the right place to sponsor its construction. (There's been some incipient interest.)

Duke had also been experimenting with flat foam-board panels riddled with such piercings. In perhaps the most mysterious of these, completely unaccountably, the holographic effect beyond the flat black plane was of a universe of densely stacked solid billiard-like spheres, receding into the 3-D distance, bobbing smoothly with the viewer's own shifting vantage. "Imagine," Duke said, "a darkened room with exterior-facing windows through which you could just barely make out the outside world mediated through all that!"

And then, over on a table to the side, there were Duke's recent attempts at reverse engineering Lippmann plate photography, a long-lost late-19th-century method for producing utterly convincing color photographs — without recourse to pigment of any sort! "The effect is based," Duke explained, "on the same physics that causes rainbows to appear on the surface of a translucent soap bubble." All right, but still!

On a computer monitor in a back room, Duke showed me the results of a recent series of experiments he'd been pursuing with a camera that takes a trillion frames a second. Wait, come again? "Yeah, *a trillion frames per second*, sort of like those extremely fast cameras with which Harold Edgerton was able to capture the course of a bullet through an apple back in the day," Duke said. "Only with this device — it's called a Femto camera, it was first developed back in 2010 by, among others, a researcher at M.I.T. named Andreas Velten — the frame rate is so fast that Edgerton's bullet would have taken several months just to reach the apple!"

Duke spent a week back in 2024 with Velten in his current lab at the University of Wisconsin-Madison, working with his students as they built a new Femto camera system from scratch. "With a camera this fast you can actually freeze a pulse of light the way Edgerton froze that bullet going through the apple," Duke said. "Or even better, you can record an ultra-slow-motion video showing that pulse as it moves through a scene, say the kind of spiraling light guide we set up, in what gets called 'light-in-flight imaging.'" Duke proceeded to show me a video of the real-time slowed-way-down transit of a pulse of laser light as it spiraled around that light guide and then onto the wall beyond.

And it was gobsmackingly astonishing.

“Still,” Duke said, “that’s not what I was really there for. What I really wanted to capture is light coursing through some of the thousands-of-years-old Arctic glacial ice cores I carry around with me in their dedicated iceboxes. Again, as with so many of my experiments, I just wanted to see what would happen if one had the quintessentially slowest thing on earth intersecting with the speed limit of the universe. I just like the poetry of that happenstance.”

The freezer where Duke’s frozen ice cores are stored. Damien Maloney for The New York Times

Now, one can only take so much of this sort of thing on any given visit, and I’d just about had my fill. So I got up to excuse myself, but just as I was leaving, I noticed one of those typical mid-20th-century laboratory microscopes off to the side and asked Duke whether it featured anything else worth looking at.

Just an ordinary midcentury telescope, through the eyepiece of which the viewer suddenly makes out ... Damien Maloney for The New York Times

He just smiled, gnomically. I went over, noticed a blank glass slide notched under the scope's barrel, but leaned in just the same, as an image of the thermonuclear explosion over the Bikini Atoll swam into focus.

... one of Duke's Microminiature Apocalypses. Damien Maloney for The New York Times

I jumped back, to Duke's evident delight. What the...!? "Yeah," he said, "I've been experimenting with microminiature photography," which as he went on to describe required that he develop both new techniques for hyper-reducing imagery but also new coating emulsions with grains even tinier than the wavelength of light capable of capturing such images.

Once he'd done so, though, he had to figure out what sort of imagery to deploy the technique upon. "And that's when I came up with this idea of Microminiature Apocalypses."

He went on to offer a detailed rationale for why he had chosen that particular image, all of which, of course, is worthy of consideration. But what I couldn't stop thinking about at that moment was how time and time again, somehow, this latter-day magus Tristan Duke just keeps blowing all our minds.

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