

SARAH FRIEND AND MARTIN ZEILINGER

## Reinventing the Wheel on the Blockchain

*Sarah Friend and Martin Zeilinger in Conversation*

The last five years have witnessed a meteoric rise in the popularity of NFT Art. While much of the focus has been on the ability to authenticate and secure the ownership of digital assets, driving associated markets to astronomical heights and bottomless depths in turn, artists are increasingly engaging with the medium reflexively—testing its affordances and critiquing its limits. Sarah Friend is one such artist. Specializing in blockchain and the p2p web, much of Friend’s recent work consists of NFT editions that challenge traditional conceptualizations of art ownership. Both *Off* (2021) and *Lifeforms* (2021), for example, require collectors to give away the minted edition(s) or share their contents in order for the full, coded potential of individual pieces and their overarching series to be realized. Friend discussed how these and other blockchain-oriented works of hers engage with questions related to art ownership in conversation with Martin Zeilinger, a senior lecturer in Computational Arts and Technology at Abertay University (Dundee, Scotland). Zeilinger’s research focuses on artistic and activist experimentation with emerging technologies, intellectual property issues in contemporary art, and aspects of experimental video game culture. He has presented and published widely on the topic of blockchain-enabled art and activism, and is the author of *Tactical Entanglements: AI Art, Creative Agency, and the Limits of Intellectual Property* (2021). In a conversation that took place on Zoom in July 2022 (with a few updates in February 2023), the two began their discussion by talking about teaching on blockchain technology and digital art at university.

**MARTIN ZEILINGER:** What do you feel are the benefits of educating digital artists on NFTs and blockchain technologies more broadly? And what do you want to get out of your class, as the person teaching it?

**SARAH FRIEND:** Oh, that’s a good question. I want to kind of flip this one back around on you because I know you teach often. I’m really excited about building a curriculum that puts blockchain art in a lineage with art history. I myself have a painting degree. So, when I think about precedents for blockchain art, I see them in earlier artist contracts, performances, conceptual art. I know some people have done this kind of thinking or are doing this work already, but it’s a really exciting way for me to think about contextualizing blockchain art. I’m also excited to meet the students, to find out what they think is interesting about this, to be in discussion with them. I’m interested in what a new generation of artists is thinking about in relation to technology and markets.

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Installation view of *Clickmine* (2017) at The Brandscape; courtesy Nagel Draxler; photograph by Finlay Paterson.

**MZ:** As you say, to see what this coming generation of artists is interested in in relation to technology, what they think about it—that will be fascinating. With regard to my own teaching, currently a lot of my students have the ambition to get into video game design and the games industry, and in that field, it's actually shocking how polarizing blockchain technology is. It's a bit mind-blowing how strongly people in games have reacted to the NFT hype. There are a lot of very harshly worded blanket refusals to engage with the technology at all. Right now, it almost feels like dissing NFTs is perceived as a great PR stunt in the games industry. Like, gaming communities will instantly love you if you declare your hate of NFTs. I'm very curious about that and haven't quite fully figured out what that's all about. I mean, I guess it has to do with the existing histories of player exploitation—for example by way of loot boxes, clandestine gambling mechanics, or the extraction and commercial use of player data. A few of my colleagues, including Darshana Jayemanne and Fraser Simpson, have been involved in some fascinating research on that subject.<sup>1</sup> With regard to NFTs, there does seem to be a potential for recalibrating the field in order to give agency back to players, but communities of players seem to want nothing to do with it. Do you have any thoughts on that? Especially since some of your blockchain art projects—such as *Lifeforms* and *Off*—have game-like elements. What's your experience?

**SF:** I've encountered this as well. There are a few online pockets where NFTs are more hated than in other places, and I've definitely noticed that gaming is one of them, particularly

1. Darshana Jayemanne, Shiona Chillias, Jim Moir, Augusto Rocha, Fraser Simpson, and Heather Wardle, *Loot Boxes and Digital Gaming: A Rapid Evidence Assessment* (London: Department for Culture, Media and Sport, 2021), [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1091282/InGAME\\_Loot\\_Box\\_REA.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1091282/InGAME_Loot_Box_REA.pdf).

indie gaming. The slightly older media art community, and also comics and illustrators, seem to be very split. And yeah, why? I don't know. It's fascinating. I think there have been hyperbolic claims made about what NFTs do, particularly in regard to environmental impact, which, while it can be significant, still ends up discussed inaccurately and with blanket statements. That certainly has contributed to it. And yes, I think it also has to do with the bad taste that's been left by other monetization strategies that players have experienced in games. Recalling my own history with NFTs, I also had a pretty bad reaction to them at first and considered myself as part of an older media art community that wanted to make things open source, and freely available. But this really came down to confusing NFTs with DRM (digital rights management). These technologies are related, but NFTs, as Rhea Meyers has pointed out so well, actually help to decouple the idea of ownership from access to the content that is owned.<sup>2</sup> So, quite often, the thing that is now ownable as an NFT actually continues to be publicly available on the internet. Anyone can still look at it or interact with it or watch the video, but there's now an additional, new layer that marks ownership. So, in this sense, NFTs are really different from earlier models of DRM that I really hated and didn't want to replicate. It took me a while to realize that difference, and to come around to a position of thinking well, maybe this isn't all that awful a monetization strategy for an artist.

**mz:** Yes that's an important point, about this splitting off from what we would previously have thought of as a DRM layer to lock down content and extend very traditional ideas of ownership in digital contexts. In a way, NFTs can really open that up again, if they're deployed appropriately. A few years ago, I wrote an essay about Kevin McCoy and Anil Dash's *Monegraph* (2014) project, in which I was trying to address this particular tension in digital culture, between opening up access and fencing in content. At the time, *Monegraph* was one of the first attempts to use blockchain technology to inscribe and enforce ownership of digital artifacts.<sup>3</sup> This was a few years before NFTs, of course, and what I wasn't quite able to appreciate at the time was that with NFTs, artists would be able to experiment with ways of asserting authorship or ownership claims while at the same time freely circulating digital artifacts all over the web.

**sf:** Yeah, NFTs don't fit cleanly into older DRM frameworks; they really work quite differently when you look closely. To stay on the topic of games and NFTs, I came across this really interesting thread—I don't know if you saw it or have been following as well—about the *Minecraft* NFT ban, where the company forbade all blockchain integrations in the game. With that, just as you said, the platform announced that it was going to ban NFTs, and immediately the larger community of players seemed to be really happy about that. What strikes me as highly ironic about this is that Microsoft has its own proprietary marketplace for *Minecraft*, where players can buy items with an in-game currency called Minecoin. Related to this, there was also a recent outcry from players when Microsoft, which owns the *Minecraft* IP, announced that it could ban players using privately hosted servers. In this case, a server that you might think you own because you run/operate it is actually still under the control of Microsoft. Players were really angry about that. This strikes me as an issue of sovereignty and

2. See Rhea Myers, *Proof of Work: Blockchain Provocations 2011–2021* (New York: Penguin Random House, 2023).

3. See Martin Zeilinger, "Digital Art as 'Monetised Graphics': Enforcing Intellectual Property on the Blockchain," *Philosophy & Technology* 31 (2018), 15–41.



*Liform Display Surface #1 (first generation) (2021) by Sarah Friend; courtesy Nagel Draxler.*





Installation view of *Lifeforms* (2021) by Sarah Friend at Panke Gallery; courtesy Nagel Draxler; photograph by Hannah Rumstedt.

ownership of digital space, which is a very sort of blockchain-y question. And so, this thread I mentioned was pointing out that the community responses to these two different developments—Microsoft banning NFTs in *Minecraft*, and Microsoft clamping down on privately hosted servers—were really quite incoherent. It makes you wonder what kind of ownership model, and what level of agency, players actually want.

**MZ:** It definitely feels a bit absurd when, in a corporate-owned game ecology that is so super-centralized and hierarchical, you have communities say, “We don’t want NFTs because they are just a monetization tool.” I imagine that on some level, it’s probably also the IP owners and game studios themselves that are against incorporating blockchain-based technologies, since such technologies could bring with them protocols and mechanisms to make transactional systems more transparent—which could highlight financialization techniques that are already implemented in the games. I guess that could end up drawing attention to game environments as highly centralized and controlled algorithmic structures. If Microsoft can build their own proprietary token system and marketplace, which gives them the ability to lock players into that system, then why would you want to allow adoption of a transactional system that could potentially connect to other environments outside of that which is under the corporation’s control? From a business perspective this makes sense, but then as you said, the ways in which player communities take issue with that can be oddly incoherent.

**SF:** Certainly we can never imagine Microsoft to act without a focus on profit, and wholly for the benefit of players. I mean, maybe there are some attempts to protect certain communities of players—for example young children—from certain financial elements of the blockchain world, but definitely this also preserves revenue streams.

MZ: Yeah, exactly. And we can see that approach replicated in a lot of places. *Roblox* is another example of a game which, like *Minecraft*, functions largely on the basis of player-generated content, and which also has a very complex (and, in many cases, exploitative) in-game currency system. *Roblox* is also massively popular with younger audiences, and, similar to the *Minecraft* example, the developers have implicitly prohibited NFT integration in the game. Ostensibly this is about protecting players from fraudulent schemes, but it's also true that the developers simply don't want independent or cross-platform-compatible transactional technologies to compete with their existing, proprietary in-game currency system. They don't want any kind of newly arrived NFTs, or token wallets, or marketplaces, because all of that is built into the heart of how that game already works. In that situation, it's easy for the developers to scoff at NFTs and blockchain technologies and say, "Oh, we don't want this, it will only exploit players," but really this is also about protecting commercial interest as much as it is about protecting players.

But let's shift this conversation to digital art a bit more—let's talk about two of your projects, *Lifeforms* and *Off*, both of which have game elements. Would it be right to say that in these projects, your aim isn't to add a fintech layer to a game environment, but instead to augment fintech technology with a gamified layer, and certain playful and game-like aspects?

SF: I definitely think of these projects as games on some level. Both projects are using NFTs, and both follow an approach that I often take with technology more generally (not just blockchain-related technology): I begin by asking, what uses does this technology specify? What is it meant to be for? What is it really accomplishing? Can I make things with it that also shed light on its functionality, and on the assumptions concerning its users that are projected by the technology? So, to begin with, both *Off* and *Lifeforms* exist as NFT editions, but there is also another layer that operates on top of, or slightly outside of their status as NFT editions. This is the game layer, and here the entire edition emerges as a kind of meta-artwork that is created through a collaboration of participants and that isn't owned by anyone.

MZ: Do you have any insight about the communities that you reach with these two projects? Do they appeal to more conventional art audiences, or to audiences who are interested in the game interactions that the projects afford? Do you have a sense of who the communities are that you're reaching with these projects? As far as I know, there aren't any built-in tools that allow you to capture some info about the interactions between participants, or activities surrounding the individual NFTs.

SF: I'm not surveilling anyone who's participating, but I do have a sense of what's going on in a number of ways. The main way is that with *Off*, there is a collectors' group chat. When someone buys a piece from *Off*, they get a link to the group chat. Since I made the group chat, of course I have access to those conversations. So, I've seen all the sharing that has happened. I've also met a number of *Off* collectors in person. In some cases, I knew these collectors before they joined the project. Recently I met a few more collectors when I did an exhibition of works from the series at Public Works Administration in New York City in June 2022. Quite a few *Off* collectors came, because they were based in New York or in town for NFT.NYC. That was a nice opportunity to meet some people who have become part of the project. So, I get some insight into that layer. With *Lifeforms*, it usually happens on social media. There's no chat for *Lifeforms* collectors. People have asked me for one and I'm not opposed to it, but I don't want to create it myself. If someone else creates it, I'll join. In any case, people often post about their *Lifeforms* when it's time to give them away. They'll either



*Wildcards* (2022) by Sarah Friend.

say something like “I’m looking for someone to care for *Lifeform* number 62,” or maybe they’ll say, “I just gave my *Lifeform* to so and so.” So, I follow those kinds of comments online. But additionally, because all these things are happening on the blockchain, you can scrape the data, and I did that recently for *Lifeforms*. This allowed me to do an analysis of the movement patterns, and I made a network diagram showing their movements for the exhibition *Creation Stories*, curated by Simon Denny and Karamia Müller at Gus Fisher Gallery in Auckland, New Zealand, in 2022.

**MZ:** Very cool, yes, that’s what I was getting at with my question. I just finished a draft of a chapter I’m writing for the next *DATA Browser* book (Vol. 10, “Curating Superintelligence”), and in that I write a bit about *Lifeforms*.<sup>4</sup> One of the points I make there is that when you put an art project like *Lifeforms* in this particular technological environment, it can become a kind of research tool, since you can access the transactional data and see what’s going on. For me, that’s a very interesting dimension of blockchain art. The accessibility and transparency of the data streams can become a potential source for all sorts of insight, inspiration, or also critique.

So, based on that data, what is the life expectancy of a *Lifeform* these days?

**SF:** Oh, it’s bad. As of mid-2022, of the first fifty, only nine were still alive. Only a really small number have made it. And by far, most *Lifeforms* are born, but never change hands, and then die. So, there are a lot of paths going pretty much straight from birth to one person and then to death. There are some outliers, but most die without every changing hands. And I think it’s really interesting what you said about data being available in a case like this. A lot of my works have this element where they could function a little bit like a social experiment. You know, like, what will people do? How will they react when they see this object? Or if it’s interactive, what interactions do people choose? A lot of interactive artworks have this quality, but projects rarely deliver on that potential, because no meaningful results are captured. But with blockchain projects, a lot of interactions are public, so I’m in the process of doing this with *Lifeforms*, but actually, anyone could.

**MZ:** This dimension is so interesting to me—especially in this blockchain art domain, where there is (at least in the mainstream) such a powerful focus on ownership, on collecting, and on wealth accumulation. But then when a project like *Lifeforms* comes along—a project that incentivizes sharing over hoarding, passing a work on to someone else instead of keeping it in a vault—it’s fascinating to see how it plays out. As it stands, it really seems that the incentivization of sharing is, on some level, rejected by people who want to engage with NFT art ownership. Maybe this is a cynical interpretation, I don’t know. But it’s hard not to be cynical, sometimes, when I think about NFT-enabled digital art.

**SF:** I completely agree. Both *Off* and *Lifeforms* have this layer where they’re very innocent and potentially very sad. They really need other people to act in order to have, you know, a happy ending, you might say. Not that *Lifeforms* ever ends, at least not in its current state—the token supply isn’t capped, so a nearly infinite number of *Lifeforms* can be created, and for each *Lifeform*, there’s no path except being shared endlessly or eventually dying. It’s funny to have created these projects. There are moments where it’s been kind of sad to see all the *Lifeforms* die, you know. Also, to be honest, I have moments where I’ve wondered whether

4. Martin Zeilinger, “Smart Contracts and the Becoming-Curatorial of Digital Works of Art,” in *DATA Browser 10: Curating Superintelligence*, ed. Joasia Krysa and Magdalena Ty\_zlik-Carve (London: Open Humanities Press, forthcoming).





Installation view of *Clickmine Physical Non-Fungible Token Edition* (2018) by Sarah Friend at the Kunstverein in Hamburg; courtesy Nagel Draxler.

I am just a bad game designer. If I were a better game designer, would I have made this, like, more fun? What if I had built more dopamine hits into keeping the *Lifeforms* alive?

**MZ:** That's really what it comes down to, isn't it? Do you want to budge to those pressures of how to implement gamification techniques for maximizing engagement? We already know how to do that, of course, but it might really not be the most interesting thing to do in an art project that has such a pronounced critical angle. There are already so many NFT projects that are all about gamifying art collecting, mostly for the purpose of increasing business. Essentially, the tendency is to reward buying, collecting, hoarding, and stockpiling with the promise of massively increased financial value over time. By contrast, I love how *Lifeforms* very consciously subverts those modes of financialization and that allure of ownership. In this sense, to me, every death of a *Lifeform* becomes a powerful comment on what's problematic about mainstream approaches to art ownership (and by extension, access to art). Ultimately what's sad isn't just that someone let one of your *Lifeforms* die, but also that someone decided that sharing the artwork quite literally wasn't "worth it." As I understand it, when you've passed on a *Lifeform*, it's gone, you don't have it anymore, that's it—and I think that because of the way in which we've become accustomed to ownership in a capitalist economy, that's a hard pill to swallow for many people.

**SF:** There is a similar element to the *Off* project, which is an NFT edition that has a secret text hidden across all the NFTs, in such a way that it can only be revealed if two thirds of the collectors share their images with each other. I was talking with a friend at the recent *Off* opening in New York City about general attitudes toward sharing the *Off* secrets, and so far, the share rate is not good. At this rate, if the sharing continues as it's gone so far, then the secret text that all the works add up to will never be revealed. There's a third drop of works in the *Off* series coming up, and I haven't announced the date, because I still have some infrastructural work to do before I can do it, but even if 100 percent of the collectors from the third drop share their secrets, the text will still not be revealed. It will require people from the first and second drop, who have not yet shared, to also come forward. So, it's not looking very good. And then my friend asked, well, why aren't people sharing? And I said, I think the biggest barrier is just that it takes attention, time, and a bit of effort to do it. And then he said, "It sounds like so many other coordination games that we're playing at larger scale." I feel like there's a way these projects have mirrored this bigger thing, that there are all of these other moments where maybe there's a small action we could take that costs us very little, and results in some greater good, but it also might not immediately reward us in a tangible way or give us the sort of dopamine hit we've come to expect from video games.

**MZ:** We've talked about gamification, and the way culture has trained us to expect instant rewards. I guess the problem we're trying to highlight is in what you just said. The greater good on the one hand, and then the dopamine hit on the other. The greater good often just isn't an instant payoff by way of feedback that stimulates you—chemically, or monetarily, or in some other way. That's just not how we tend to achieve a greater good that is longer term, more diffuse . . . just different from how we collect coins in platformer video games. *Lifeforms* and *Off* address this difficulty in wonderful ways, even if the outcome can be a bit sad.

Here's another question related to this, which I've been looking forward to asking you: lately (in spring 2022) I keep coming across the term "physicals" or "phygitals" as a way of referring to sculptural or canvas-based artifacts that represent an added physical/tangible layer of NFT-enabled art projects. *Lifeforms* has that, too, right? Was this an element right from the start, or was it added later?



Installation detail of *Clickmine Physical Non-Fungible Token Edition* (2018) by Sarah Friend at the Kunstverein in Hamburg; courtesy Nagel Draxler.

**SF:** That element was there right from the beginning, because *Lifeforms* launched with an exhibition at the Kunstverein in Hamburg, which also included the sculptures. I'm not sure if it's a "phygital" because I haven't heard the term before, but maybe. With *Lifeforms*, the sculpture and the digital version are completely separate; you don't need to have a sculpture to have a digital *Lifeform*. And you can have a sculpture and not be owning a *Lifeforms* NFT. There's really nothing that holds them together. Is that still falling under the term as you understand it?

**MZ:** I'm not sure. I think it hasn't really fallen into place as a very clearly defined thing—I just keep coming across it on Twitter and other places online. The recent Feral File online exhibition *Doppelgänger* (2022) is a good example.<sup>5</sup> But then you'll also find things like a video on the Sotheby's website, where the party DJ Steve Aoki, of all people, talks about why the future of digital art will have a "physical" dimension. I supposed Damien Hirst's project *The Currency* (2021) is also meant to engage with this discourse.<sup>6</sup> Often this either refers to physical elements of an otherwise blockchain-based art project, or to an added layer or "dimension" that you can activate if you want to. For example, you might be able to buy an editioned NFT-based work and then have the option of asking the artist for something that you can put on your wall as well, to go along with the NFT, so to speak. It strikes me as a funny way of reinventing the wheel a little bit—of adding a physical work to a non-fungible token in order to emphasize to the potential buyer that this is, indeed, a unique artwork. I guess that also helps to reaffirm the promise that ownership of NFT-enabled art really can

5. *Doppelgänger*, Feral Files online exhibition, curated by Chris Coleman, <https://feralfile.com/exhibitions/doppelganger-jgz>.

6. See Damien Hirst, *The Currency* (2021), <https://currency.nft.heni.com>.

mirror the kind of ownership notion that most people will have in mind when they think of buying an artwork.

I'm also curious about what the appeal of reintroducing this physical dimension might be for artists. But mainly, I wonder why this wouldn't be called a sculpture, or a print, or a drawing, or something else that we have a term for already. Why is it called "physicals"/"phygitals"?

SF: Yes, it's funny. It's as if when a work moves from the digital back into the physical dimension, it needs a new word. I've done physical-digital NFT hybrids a number of times—since the very start, actually. My first NFT project was a physical object that bestowed upon its purchaser the permission to mint an NFT. So that meant that if you bought it from me, I would ship it to you with a USB key that contained an image. And you could then mint that image as an NFT anywhere you want. That was a project from 2018 called *The Clickmine Physical Non-Fungible Token Edition*.<sup>7</sup> I did a similar project recently, *Wildcards* (2022), which involves a physical card deck.<sup>8</sup> To refer back to our earlier discussion about games, this project works a bit like the loot box system, only that here, the loot box is a physical item. Recently, I wrote a short article about NFTs, in which I was trying to discuss the ways in which the NFT market works differently and the NFT community operates differently from the traditional art world, and this project is a good example.<sup>9</sup> At the exhibition opening for this project, the card decks as physical loot boxes were for sale, and people at the opening were sending me Ether right then and there. And whoever bought something was able to take the physical card deck away with them—and I feel that this is a bit of an artworld taboo in a way, to exchange money at the opening and then leave with the physical work right that evening. I was trying to write about it, but the editors for the piece thought I was speaking metaphorically when I said that "people left with the work." It happened again at each layer of editing. They thought what I meant was that people "left owning the work." And I was like, "No! They carried it out of the gallery because it was an object." When you're working in an NFT context, everyone mostly just assumes that the work is purely digital from the start, so you need particular language to point out that it might actually be physical.

MZ: It's a quite radical approach, compared to the old way of just putting a little red sticker on the wall next to the works that have already been sold. I always also read that as a way of signaling that there is an elite "inner circle" of collectors who had access to the exhibition during a preview. But even so, nobody would be allowed to walk away with work at the opening. You're right, it does seem like a bit of a taboo—to expose the commercial nature of the whole event so clearly.

SF: Yeah, I was trying to describe it as an NFT auction website, but being enacted in a physical space, somehow. That's how it felt.

MZ: How much of the work was gone, then, at the end of that opening night?

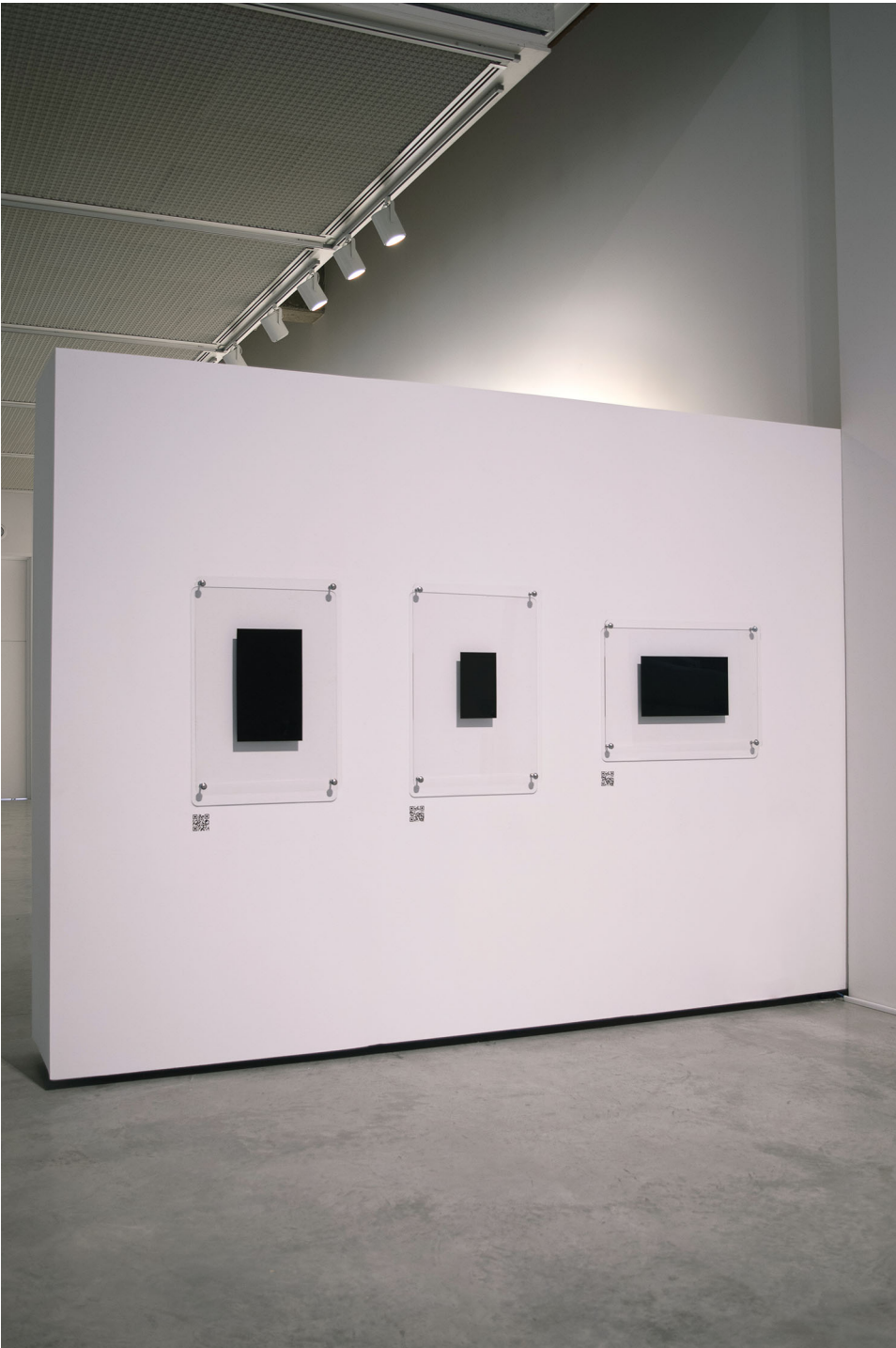
SF: It was an edition of fifty-two, and I don't have an actual count, but I think between twenty and twenty-five of the editions sold that evening. That said, only one of them was on

7. See Sarah Friend, *Clickmine* (2017), <http://isthisacom/clickmine>. The physical non-fungible token component was first exhibited at Kate Vass Galerie at Perfect & Priceless in Zurich in 2018.

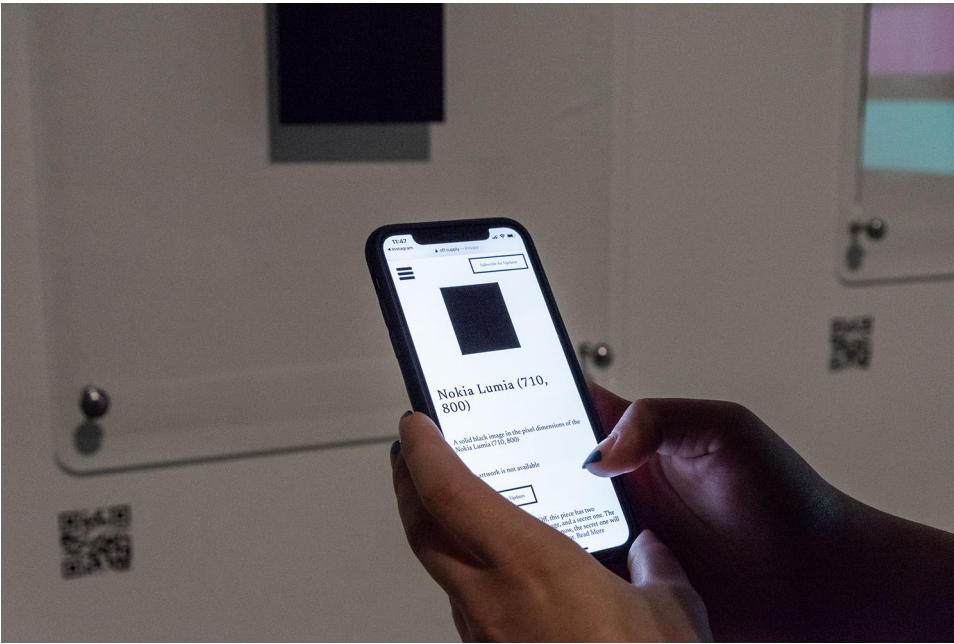
8. See Sarah Friend, *Wildcards* (2022), first released as part of *Off: Endgame*, <http://rhizome.org/editorial/2022/jun/14/off-endgame>.

9. See Sarah Friend, *Asset Logistics* (2022), *Texte zur Kunst*, [www.textezurkunst.de/en/127/sarah-friend-asset-logistics](http://www.textezurkunst.de/en/127/sarah-friend-asset-logistics).





Installation view of *Off* (2021) by Sarah Friend at the Illingworth Kerr Gallery; courtesy Nagel Draxler; photograph by Caroline Vasquez-Lazo.



Close up of *Off* (2021) by Sarah Friend at the Illingworth Kerr Gallery; photograph by Chelsea Yang-Smith; courtesy Nagel Draxler.

display in the installation. In order to have the gallery appear empty, I would have had to sell all fifty-two of them. And well, if we'd gotten that far, I'm not sure I would have sold the one off the wall. I might have told the last person to come back and pick it up later.

**MZ:** For me, this also links back to what we were saying earlier, about this element of disintermediation with regard to copyright protection and the ownership dimensions of NFTs. With NFTs, the “work”—however we might define that—can continue to circulate and proliferate freely online, even after someone buys it. The example you just gave doesn't allow for this, does it? When somebody buys the card deck, they own it but also take it away, such that access to it is removed for everyone else, at least for the moment—precisely because it's a physical work.

**SF:** Yeah, exactly. The physical object has a built-in scarcity based on its affordances as an object. When people mint the NFTs—the NFTs that come with the object—then that image will circulate freely.

**MZ:** It's funny, and a little bit absurd, that after all this time—millennia of tangible artifacts—we've arrived at a moment where it becomes necessary again to describe (or even explain!) the affordances of a unique physical object.

**SF:** Yeah, I feel like we are caught in a strange loop—NFTs have brought us back somehow to a point where we're trying to remember how physical stuff works, as though we're seeing it and experimenting with it for the first time. ■