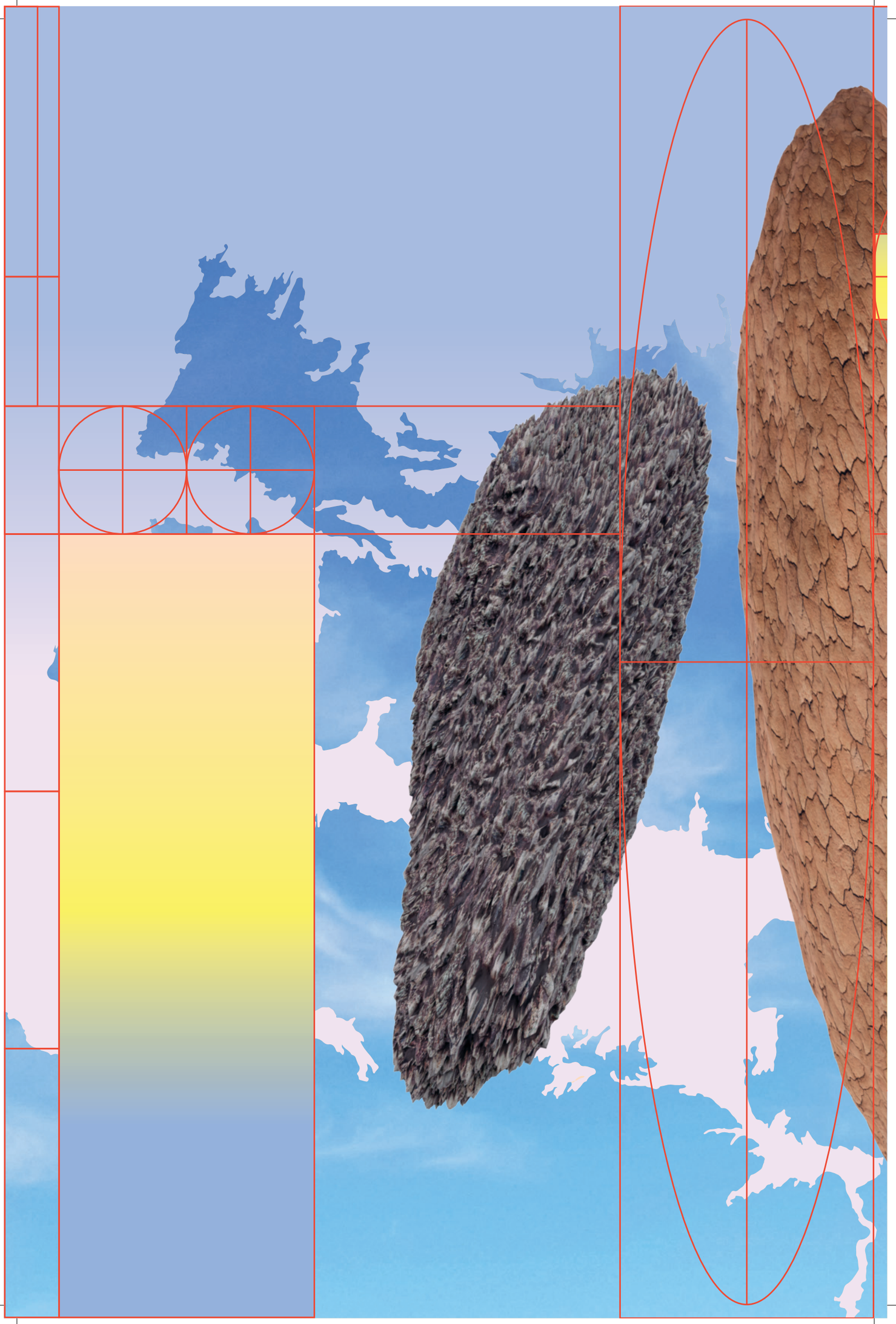
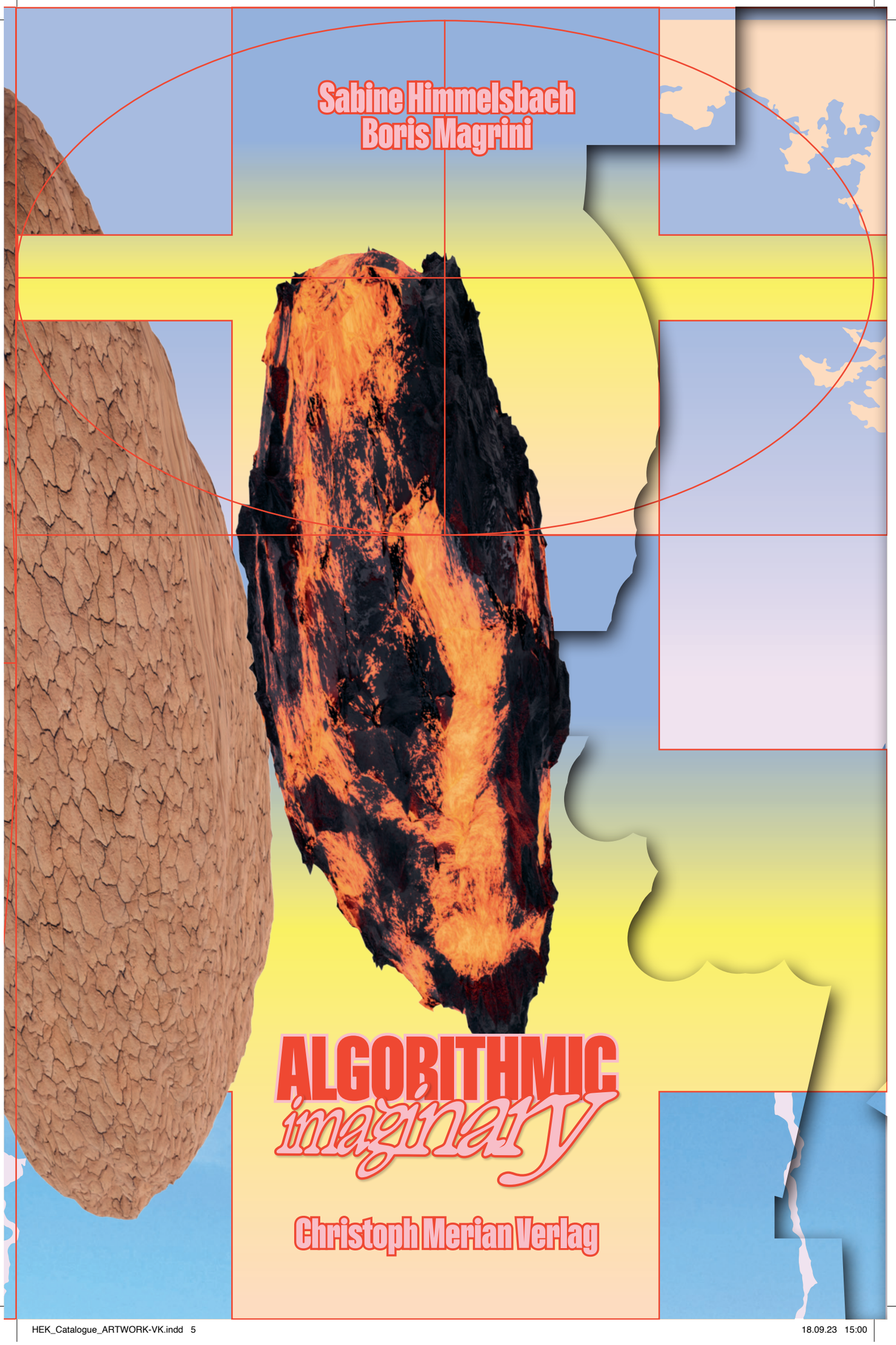
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Sabine Himmelsbach
Boris Magrini



ALGORITHMIC imaginary

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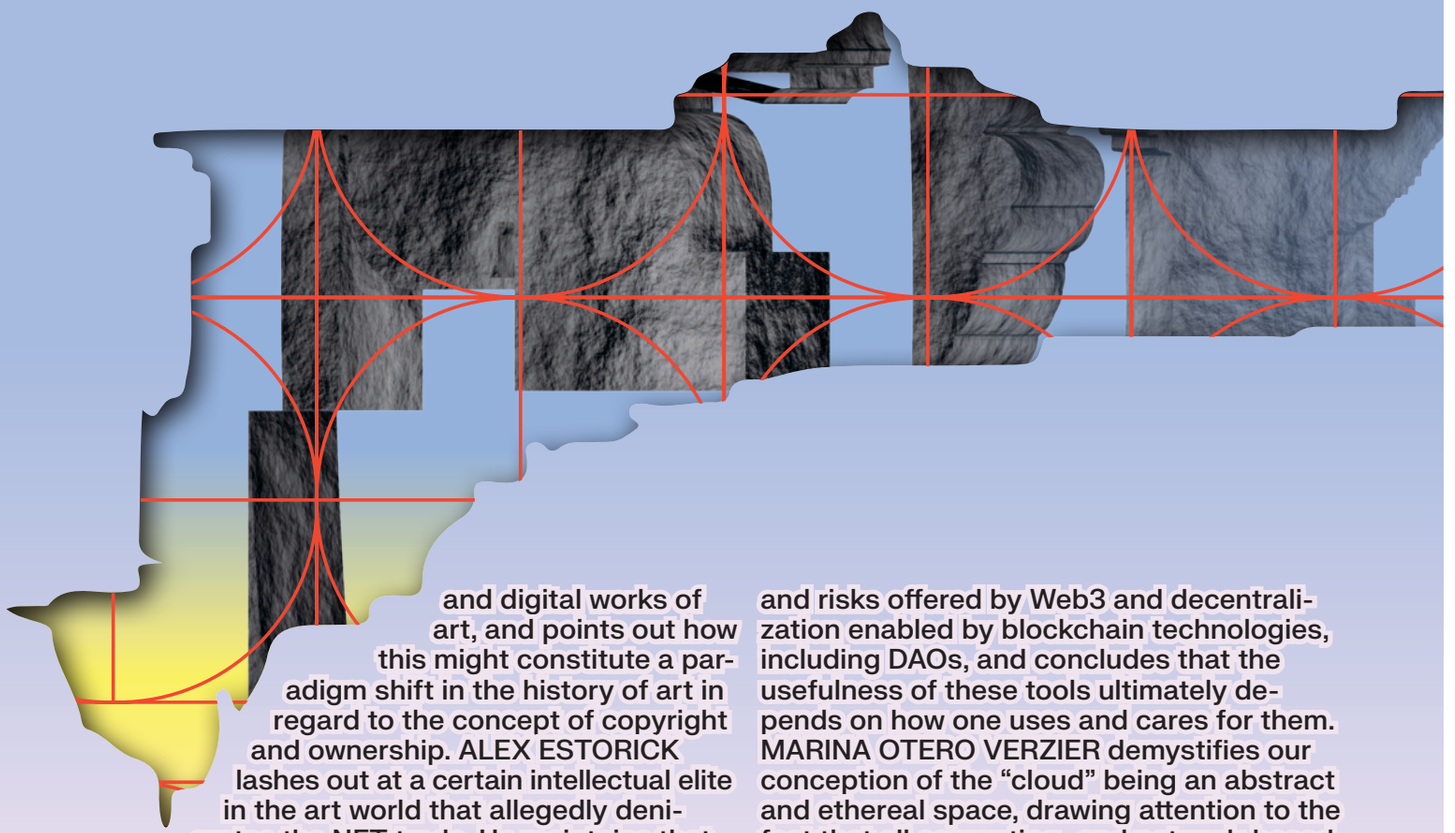
Sabine Himmelsbach
and Boris Magrini

Editorial

The publication *Algorithmic Imaginary – Art on the Blockchain and in the Metaverse* is integral to a comprehensive exploration of Web3 technologies and museums, to which HEK (House of Electronic Arts) has been dedicated this year. This exploration was initially sparked by "HEK Connect – cultural participation in the age of a decentralized Internet," a project that looked at the possibilities and opportunities a decentralized Internet might offer for the institution of the museum, realized with the support from the Federal Office of Culture and cultural departments of the cantons Basel-Stadt and Basel-Landschaft as part of the Covid financial aid program "Transformation Projects." This project was transformational for HEK and presented a challenge to everyone working at the institution. In various workshops held in conjunction with artists, all our staff was familiarized with Web3 structures. The creation of a virtual exhibition space based on the online platform "common.garden" by Dutch artist Constant Dullaart was implemented as part of the project: "virtual.hek.ch" provides a browser-based platform for showing net-based art and a meeting place for events, such as virtual openings and artist talks using live video feeds, audio, and chat functions. Another element launched NFT editions, which will continue to accompany future exhibitions and activities. At the heart of "HEK Connect" is the establishment of a DAO (decentralized autonomous organization) that enables member participation. The blockchain's decentralized governance structures allow members of the DAO to have control, since decisions are made by the community. For the institution of the museum, this implies an opening to collaborative action, enabling members of the committee defined as "Friends of HEK" to exert their influence. Included in HEK Connect's extensive outreach program are artist workshops such as KryptoBrunch, which allow participants to learn about and experiment with Web3 technologies.

All these activities and experiments were accompanied by two exhibitions dedicated to the decentralized Internet. *Collective Worldbuilding – Art in the Metaverse* and *Exploring the Decentralized Web – Art on the Blockchain* both dealt with the potential held by virtual worlds and the blockchain as a new artistic medium.

As an institution concerned with the intersection between art and technology, we are constantly exploring technology's societal impact and laying bare how artistic experimentation can challenge and reshape technology's role in culture and society. *Algorithmic Imaginary – Art on the Blockchain and in the Metaverse* puts our Web3 activities in context, expanding it with exciting contributions from eleven fascinating authors. In our conviction that the issue of decentralization requires examination from differing viewpoints and critical positions, we invited artists, theorists, and researchers from various disciplines to contribute their reflections. RUTH CATLOW'S text takes form as a dialogue between the researcher Martin Zeilinger and a dog pondering the opportunities offered by digital technologies, particularly DAOs, to render cohabitation between humans and other species more equal and respectful, as it allows their representation in decision-making processes that affect them. PRIMAVERA DE FILIPPI uses her Plantoid project to illustrate the opportunity blockchain technologies provide to the production and sale of conceptual



and digital works of art, and points out how this might constitute a paradigm shift in the history of art in regard to the concept of copyright and ownership. ALEX ESTORICK lashes out at a certain intellectual elite in the art world that allegedly denigrates the NFT trade. He maintains that the introduction of NFTs has enabled a generation of digital creators—otherwise ignored by the art market—to capitalize on their work. SARAH FRIEND draws attention to the tragic fate met by many online virtual spaces, where users who devoted immense amounts of time and developed social ties are left empty-handed when these spaces prove to have a limited lifespan and are closed; and emphasizes the importance of preserving these realities and memories. SABINE HIMMELSBACH recounts the birth and creation of HEK's circle of friends in the form of a DAO, revealing the project's inherent complexity and its challenges and difficulties, as well as the significance of addressing the issue of decentralization collectively through the experience. BORIS MAGRINI introduces the two exhibitions *Collaborative Worldbuilding – Art in the Metaverse* and *Exploring the Decentralized Web – Art on the Blockchain*, elaborating on the themes developed via descriptions of the works on display, while addressing the concept of Web3 associated with the ideology of decentralization. BABUSI NYONI raises the issue of stereotypical representation in avatars and virtual spaces, as well as the monopoly of digital creation software, developing a reflection on how to offer different communities open source tools to realize personalized metaverses. PENNY RAFFERTY considers both the opportunities and risks offered by Web3 and decentralization enabled by blockchain technologies, including DAOs, and concludes that the usefulness of these tools ultimately depends on how one uses and cares for them. MARINA OTERO VERZIER demystifies our conception of the "cloud" being an abstract and ethereal space, drawing attention to the fact that all computing- and network-based applications, including the metaverse, are held in massive, energy-consuming and polluting data centers. MARLENE WENGER questions the notion of a single, exhaustive metaverse, and proposes unconventional artistic approaches that allow us to imagine meta-verse manifestations alternative to those promised by large IT companies. TINA RIVERS RYAN questions the desirability of decentralized decision-making mechanisms and non-hierarchical structures such as DAOs being applied to the management of museums, which already are regarded as trustworthy institutions by the vast majority of the public, according to a survey in the United States.

We would like to thank all the authors for their enlightening contributions. A huge thank you also goes to the artists of the two exhibitions *Collaborative Worldbuilding – Art in the Metaverse* and *Exploring the Decentralized Web – Art on the Blockchain*, whose work is at the core of this publication. Their concepts, visions, and ideas inspire us.

Art and

Boris Magrini

INTRODUCTION

This publication is both a catalogue and a theoretical compendium to two joint exhibitions on the topic of Web3 and decentralization presented at HEK (House of Electronic Arts) in Basel. The exhibition *Exploring the Decentralized Web - Art on the Blockchain* examines the dynamics and mechanisms of blockchain technologies, as well as their economic, social, and cultural significance. The exhibited works test the creative potential of the blockchain by experimenting with the parameters of smart contracts and raise questions about controversial issues that the technology entails. The exhibition *Collective Worldbuilding - Art in the Metaverse* explores collaborative practices specific to the Web3, in particular activities in online virtual spaces called metaverse and the creation of decentralized autonomous organizations (DAOs). The exhibited projects creatively occupy online virtual spaces to tell stories and address issues related to the development of decentralized technologies or explore the application of DAOs for the collective management of creative content in the arts.

What links the themes addressed in the two exhibitions and in this publication? The answer is blockchain, decentralization, metaverse, and DAOs. These are technologies, concepts, and applications that revolve around the idea of the Web3, or decentralized Web, considered by some to be as much a revolution as the evolution from Web 1.0 to Web 2.0. We must bear in mind that these designations are arbitrary conventions: the Web is not an edition-changing program like software or an operating system. We must therefore take these labels with a grain of salt as long as they are not accepted by most users. The transition from Web 1.0 to 2.0 was characterized by the multiplication of participative applications and interactive content managed by users; social networks were exemplary of this transformation and today the terms are commonly accepted. It takes a consensus for the attribution of an evolution to be recognized, but there is still no consensus on the characteristics that describe a new generation of the Web. Tim Berners-Lee, James Hendler and Ora Lassila suggested that the future generation of the Web will be characterized by metadata that make online content analyzable by programs, a phenomenon they called the semantic Web, and some referred to as Web 3.0.(1) This process is not yet fully realized. On the other hand, promoters of blockchain technologies consider decentralization as a revolution that justifies the naming of a new generation of the Web; the term Web3 was proposed by Gavin Wood, co-founder of Ethereum and the Web3 Foundation.(2)

ARE WE ON THE THRESHOLD OF A NEW INTERNET REVOLUTION?

A revolution that justifies the designation, albeit artificial, of a new Internet must, after all, pass the test of time and users. We can ask ourselves whether blockchain technology has therefore substantially altered the use of the Internet and the online behavior of the majority of the population to justify the attribution of a third iteration. Blockchain technology was created primarily to solve the problem of how to carry out currency transactions without an intermediary body guaranteeing their verification. The cryptocurrency Bitcoin designed by

Web3

Decentralization Put to the Test

the mysterious Satoshi Nakamoto is considered the first real functional application of blockchain technology.(3) However, blockchain technology can be applied to other purposes, as blockchain advocates often note. Ever since Ethereum's blockchain implemented the ERC-20 token enabling smart contracts and the ERC-721 non-fungible token, the market for digital works has surged and seen the multiplication of online platforms for buying and selling digital assets whose authenticity is guaranteed by their identification with non-fungible tokens (NFT). Another famous example of applications enabled by the blockchain are Decentralized Autonomous Organizations (DAOs), i.e., organizations whose decentralized, non-hierarchical structure is guaranteed by rules and decision-making mechanisms inscribed in automated contracts registered on the blockchain. Existing well before the appearance of blockchains, decentralized organizations have been identified as effective systems in different fields; entrepreneurs and economic analysts Ori Brafman and Rod Beckstrom, in their publication praising the benefits of such organizations, state that "In many arenas, a lack of traditional leadership is giving rise to powerful groups that are turning industry and society upside down."(4) With the arrival of blockchains, such organizations have found a technology that has enabled not only decentralization but also algorithm-based autonomy. DAOs thus offer a meeting point between blockchain technology and the organization of autonomous, online communities, while exemplifying the crypto-anarchist ideology that characterizes the philosophy of decentralization. The commerce of virtual assets and the use of cryptocurrencies could not flourish, on the other hand, without the existence of spaces that justify these trades beyond mere collecting and financial speculation. This is how several online virtual spaces have emerged that offer social activities while encouraging trade in digital goods by introducing the possibility of using cryptocurrencies through the integration of cryptocurrency wallets. The term metaverse has been eagerly used to define these spaces, although most of them are far more limited than many previously existing online virtual worlds. Such online spaces are not only inhabited by the avatars of real users, but also by non-human agents and complex mechanisms governed by artificial intelligence (AI), whose multiple applications are making exponential progress. A metaverse without AI is therefore not possible.

This leads us to understand how the subject of Web3 touches on aspects such as cryptocurrency trading, production of digital assets sold as NFTs, creation of metaverses and DAOs, online identities, as well as progresses in artificial intelligence. These developments have certainly brought about considerable innovations and are transforming various economic and cultural sectors, although it is still difficult to assess the true extent and durability of these transformations for society. The artistic projects presented here are therefore to be seen as a laboratory for asserting the concept of the technological revolution that the Web3 wants to be. And who better than artists to put a revolution to the test? On the one hand, artists can afford the most visionary endeavors. On the other hand, artists working in the digital sphere have the tools to understand these technologies in depth, and to create new usages for them.

And this is where the revolution can take place, namely in the spaces of experimentation, assimilation, and transformation. When a technology is appropriated by a large segment of the population and employed for needs not imposed but determined by its users, we can then consider that it has contributed to a tangible revolution.

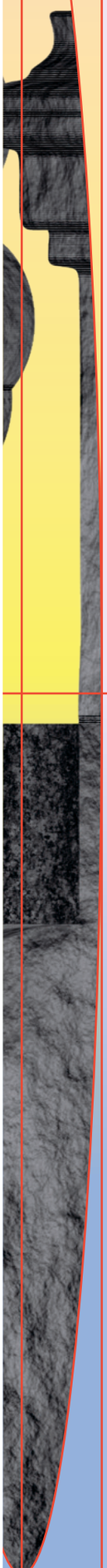
OF BLOCKCHAINS AND NFTS

In the context of digital art, blockchain technology has enjoyed spectacular success with the creation of smart contracts, which are mainly used to sell digital assets in the form of non-fungible tokens (NFTs). The economic success of NFTs has certainly had an impact on the art market, although the impact has eased in recent months. Most works marketed through NFTs are images or videos that are not registered on the blockchain; the NFT contract simply refers through a link to the related work located on a particular server. Some artists, on the other hand, have experimented directly with the mechanics of blockchain and smart contracts to create conceptual works. RHEA MYERS is considered among the first artists to create conceptual on-chain works, often subverting the market logic and mechanisms underlying the functioning of blockchains, sometimes emphasizing their limitations, sometimes playing with their dynamics to create poetic or paradoxical results. Myers' works—*Is Art* (2014) and the more recent *Is Art (Token)* (2023)—allow users who intervene with each new transaction to decide whether to change the instruction of the smart contract, alternating the state of the contract with the consequent public information affirming the work to be art or not. AMANDA E. METZGER uses the large language model GPT-3 to write an intimate journal, *Ever* (2023), in which every memory is saved (minted) on a blockchain, thus opening a debate on future applications combining artificial intelligence and blockchain. SARAH FRIEND has created works in the form of NFTs that test the aspirations of purchasers, often linked to economic speculation: her *Lifeforms* (2021-ongoing) only survive if they are regularly resold, regardless of whether the sale generates profit or loss for their owners, who must decide whether to keep these digital entities alive even at the risk of losing profit. Friend's recent installation constitutes a sort of graveyard for the life forms that have meanwhile ceased to exist. CONSTANT DULLAART's *Aura.lol* (2022) enables the creation of a collective NFT artwork in the form of a generative manifesto, thereby blurring the distinction between art collectors and creators. OPERATOR, a duo composed of Ania Catherine and Dejha Ti, interweaves body performance with blockchain: *Human Unreadable* (2023), described as a three-act experiential artwork. Operator developed an on-chain generative choreography method, and then used the motion data from the dances to generate images. These were sold on the Art Blocks platform. The first 100 collectors who purchased NFTs in the series will register their acquisitions on Operator's website and automatically generate a second token—a choreographic score—that will be performed live. LEANDER HERZOG and MILIAN MORI released *DOM1* (2023), a series of 256 generative NFTs, on fx-hash. The artists exploit the variables and HTML elements of the Document Object Model (DOM), an interface and representation model for documents on the Web, to generate an infinitely changing document accompanied by audio synthesized by its generative elements. The work is emblematic of a production of generative and programmatic art that has a long history, and is partly also related to the glitch art that broke out in the 1990s and is enjoying renewed success among artists active in the production of NFTs.

WEB3 AND THE IDEOLOGY OF DECENTRALIZATION

The ideology associated with Web3, based on the concept of decentralization, is promoted by those who see blockchain technology as a tool that guarantees greater democracy, equality, and freedom precisely because it allows the development of transactions and the creation of organizations that are independent from state or central authorities. Yet blockchains still depend on several systems and services that are centralized for their operations, and they also entail other drawbacks, ranging from energy expenditure to issues related to tax fraud, security, and stability. Several artists have critically addressed the Web3 philosophy. SIMON DENNY created the *Metaverse Landscapes* (2022-23) paintings by depicting details of how plots of virtual territories offered for sale are represented in online trading spaces. On the right side of the frame two QR codes refer to the parcel of territory depicted in the painting offered for sale, and to the non-fungible token created by the artist. With this series of works, Denny exposes the financial speculation that characterizes





the economy developed around cryptocurrencies and more specifically the so-called metaverse spaces that have proliferated in recent times. A work by SIMON DENNY and GUILE TWARDOWSKI, *Dotcom Séance* (2021-22), is a biting critique of the Web3 economy, creating a link between this and the early financial speculations associated with Web1.0. The artists exhumed 21 companies that were born and died during what is considered the first "dot-com bubble" and generated new logos for these companies in the form of NFTs that, when minted, allow buyers to claim sub-domains for these companies and become their CEO. CHLOÉ MICHEL has produced a mining rig for the Monero blockchain as an artistic installation with four Raspberry Pi, *Proof of Faith* (2022), taking the form of an altar at which the public is invited to worship and meditate, emphasizing with this gesture the quasi-religious character with which some venerate cryptocurrency trading and the philosophy associated with decentralization. EEEFFF, a collective formed by Nicolay Spesivtsev and Dzina Zhuk, developed *Economic Orangery* (2021), an online and live action role-playing game with interactive elements, including video sessions and Discord chat groups. Set in a future in Belarus, the game intertwines collective economy, decentralization, gymnastic exercises, and revolution. With the work composed of three sculptures—*Amends* (2022)—KYLE MCDONALD intends to fully mitigate the negative impact calculated before Ethereum's split of the three major marketplaces for NFTs: OpenSea, Rarible, and Foundation. The money the artist obtained from the sale of the three sculptures, which can also be purchased as NFTs on the respective platforms, is entirely donated to NGOs working in ecological fields, such as Project Vesta, Nori, and Tradewater.

EXPERIMENTS IN DAOS

Decentralized Autonomous Organizations (DAOs), which are made possible by the introduction of smart contracts in certain blockchains such as Ethereum, allow the creation of non-hierarchical organizations whose ruling systems are automated for token holding members. In the artistic field, DAOs have been founded with purposes ranging from humanitarian and ecological initiatives to experimental art. In 2018, JONAS LUND created the Jonas Lund Token, built and distributed on the Ethereum blockchain, which allows holders to participate in decision-making processes regarding the management of Jonas Lund's work and artistic career as well as the JLT cryptocurrency itself. At the same time, the artist develops a reflection on the mechanisms underlying an artist's career, determined by economic imperatives and networking. HOLLY HERNDON & MATHEW DRYHURST have recently made available to the community a customized voice tool that allows anyone to upload a polyphonic audio and receive a piece of music sung in Holly's distinctive voice. This community project is furthermore managed by *Holly+*, a DAO which enables members to vote on the certification of new works created by the voice model. *no1s1* (2021-ongoing) is a NO1S1 LABS AND DEZENTRUM project realized in cooperation with the Swiss Federal Institute of Technology in Zurich, with the University of Zurich, with the Zurich University of Applied Sciences in Winterthur and with the Digitalization Initiative of the Zurich Higher Education Institutions. In this project, a housing module is managed autonomously by a DAO and smart contracts, thus creating the first example of a house that does not belong to anyone but can be used by the community. With the installation *Undergrown* (2023), LUKAS TRUNIGER has invented a hacking kit for repurposing obsolete crypto mining hardware for scientific research, also managed by a DAO. Truniger points out with this work the issue of energy consumption associated with the existence of data centers and cryptocurrency mining, while offering a model of hardware recovery for projects of collective interest. PRIMAVERA DE FILIPPI created a series of interactive blockchain-based sculptures in the form of mechanical plants called *Plantoids* (2014-ongoing). Similar to other life forms, Plantoids aspire to reproduce and invite the public to participate in their reproductive process through donations in cryptocurrency and by contributing to the selection of new offspring. The Plantoids then draw on financial resources, managed through a DAO, and commission a new artist to create the new progeny, according to predefined parameters that condition their evolution. In this case, De Filippi cleverly uses the mechanisms of DAOs to manage the activity of non-human beings, while exploring the possibility of artworks to ensure their own autonomy and prosperity.

ARTISTS OCCUPYING THE METAVERSE

The metaverse is a concept developed back in the 1990s by science fiction writer Neal Stephenson.(5) It has now reappeared to describe multi-user virtual online spaces.

The term is often adopted by entrepreneurs particularly active in the Web3 economy to describe virtual spaces that integrate wallets for the payment of virtual goods via cryptocurrencies.(6) In this context, metaverses are thus strongly associated with the Web3 environment. Although a single metaverse does not yet exist, several multi-user online virtual spaces, or multi-user video games that often combine online and offline commerce, have been occupied by artists who contribute to a reflection on the meaning of such spaces. KATHARINA HAVERICH has visited the online social spaces VRChat and interviewed women who described their violent dreams, which in this case involve violence carried out by women on men. Haverich has then reproduced details of these dreams, allowing the public to experience them in her VRChat world *...dreams about girls* (2021-22). AYOUNG KIM also has created a virtual environment in VRChat, *Surisol Underwater Lab: VRChat World* (2022), an imaginary laboratory situated temporally in the near future, dealing with scientific research into algae cultivation and water quality, which is considered carbon negative and therefore ecologically less polluting. The lab, although a fiction, is figuratively located near the Oryukdo Islands in Korea, which are well known for harvesting seaweed. ELOÏSE BONNEVIOT & ANNE DE BOER carried out online actions in *Farming Simulator*, a multi-user online video game created by Swiss company GIANTS Software in 2008, to analyze and deconstruct the game's ideology and mechanics. The game is often used by farmers who want to try out virtual solutions for their real agricultural industries. The artists modified the virtual landscape to make it even wilder, thus going against the logic of exploitation of nature that is typical of farming activities. *Mechanimal* (2021) is a collaborative interactive online game created by LOOPNTALE, a duo composed of Youngju Kim and Hoyoun Cho, that reflects on the theme of being together with and relating to non-human beings. The players enter a 3D space similar to the research laboratory of a mysteriously disappeared scientist; there, they contact non-human agents who request their help. Through documents hidden in the lab, the players accumulate information that is simultaneously distributed on a Discord messaging account, which then allows multiple players to share their findings and collectively contribute to the narrative.

ONLINE IDENTITIES AND AVATARS

If metaverses are related to flourishing multiusers' virtual spaces, an avatar is the virtual identity that occupies such spaces and interact with others. It is no surprise that artists have creatively approached questions about what it means to be an avatar and to have a digital identity. The origin of the work *Heart of an Avatar 3* (2023) by OMSK SOCIAL CLUB is a real-life game that lasted 58 days without interruption, in which nine people took turns collectively playing the role of Eastyn Agrippa as a compound being. Over the course of two months, the avatar interacted with a community of 175 real people through social spaces such as Discord. During this experience, Eastyn Agrippa collected their memories and considerations of their existence, thus contributing to theories of identity analysis, and what it means to be a human, an avatar, or a hybrid between the two. The installation *An invite, to eternity* (2022) by LEA ERMUTH explores the question of identity and how modern technologies and social networks allow individuals to modify their identities to fit the expectations of the circles of family, friends, and acquaintances that constitute personal networks. Ermuth conducted a motion capture performance in which she modelled her digital self by following the suggestions of the audience, and then created 3D printed terracotta models as evidence of this ideal collective portrait of the artist. With this work, Ermuth shows not only how individuals contribute to the construction of worlds through digital technologies, but how communities at the same time shape the identities of individuals. Artist and avatar LATURBO AVEDON exists and acts, by their very nature, solely in digital spaces. *The Materia collection* (2022-23), their latest creation, consists of expandable series of artefacts sold as unique non-fungible tokens, released during specific moments via the Ethereum and Tezos blockchains, in which collectors are invited to participate. Materia owners can decide to use their tokens as decorative elements for virtual spaces or place them in dedicated sockets that are part of the Materia system to influence the future development of the Materia universe and their virtual artefacts and avatars.

COEXISTING WITH AI

Artificial intelligence has made considerable progress in recent years, particularly with applications for the creation of generative images and with large language

models such as ChatGPT. In fact, various applications of artificial intelligence are now fundamental to the functioning of online virtual worlds, including non-human agents, and are therefore important elements in a discourse related to decentralization. If Web 2.0 has been characterized by social spaces autonomously managed by users, of which social networks are a significant example, we may wonder what happens when the contents of social spaces are generated by increasingly effective artificial intelligence programs. Certainly, tomorrow's decentralized Web increasingly will have to deal with AI-generated content. SARAH FRIEND used Stable Diffusion, and trained AI algorithms from a database of photographs of her person, to produce erotic images based on this database. At the same time, Friend experiments with putting these images online via social networks that allow interaction with a dedicated audience of fans, who in turn influence future content productions. The video installation *Mouthless Part III* (2023) by DOROTA GAWĘDA & EGLĖ KULBOKAITĖ explores the representation of nature by crossing folk narratives with technological innovations. The landscapes of the two-channel video were artificially constructed with the Unreal game engine, and partly created by generative adversarial networks. A peasant and the Poludnica demon, two archetypes from Slavic mythology, confront each other in these rural landscapes. Not only the conversation but also the rendering of the characters and the environment gradually become fragmentary, chaotic, and confused, eventually revealing the synthetic, artificial nature of both the protagonists and the environment. The anime series *Life After BOB* (2021-22) created by IAN CHENG and built on the Unity game engine, revolves around the increasingly important implementation of artificial intelligence programs for ethical and moral choices. The first episode of the series, *The Chalice Study*, tells the story of young Chalice, whose father Dr. Wong has created an artificial intelligence system called BOB (Bag of Beliefs) implemented in his daughter's nervous system. The young girl is then faced with a dilemma: whether to follow the decisions suggested by the artificial intelligence or to remain free in her choices. Conceived by Mario Klingemann, BOTTO is a decentralized autonomous artist that uses a combination of software models such as Stable Diffusion, VQGAN + CLIP, and GPT-3, and that has been trained with millions of works of art, literature, real objects, and people, to autonomously generate artworks that are then submitted to a community structured in the form of a DAO, whose members eventually decide which works to publish and trade as an NFT.

CONCLUSION

The constant evolution of information technologies coincides with profound social and cultural changes, signaling how online digital dynamics—considered under the misleading term "virtual"—are radically anchored in our real life and world. If artists put the applications associated with Web3 to the test by creating models for the large-scale execution of potential projects, their works are to be appreciated as necessary think tanks for the future of the Internet, helping to make it more fair, accessible, and decentralized for all.

(1) Tim Berners-Lee, James Hendler, and Ora Lassila, "The Semantic Web," Scientific American, May 17, 2021, Vol. 284, no. 5.

(2) Gilad Edelman, "The Father of Web3 Wants You to Trust Less," Wired. November 28, 2021, https://www.wired.com/story/web3-gavin-wood-interview/

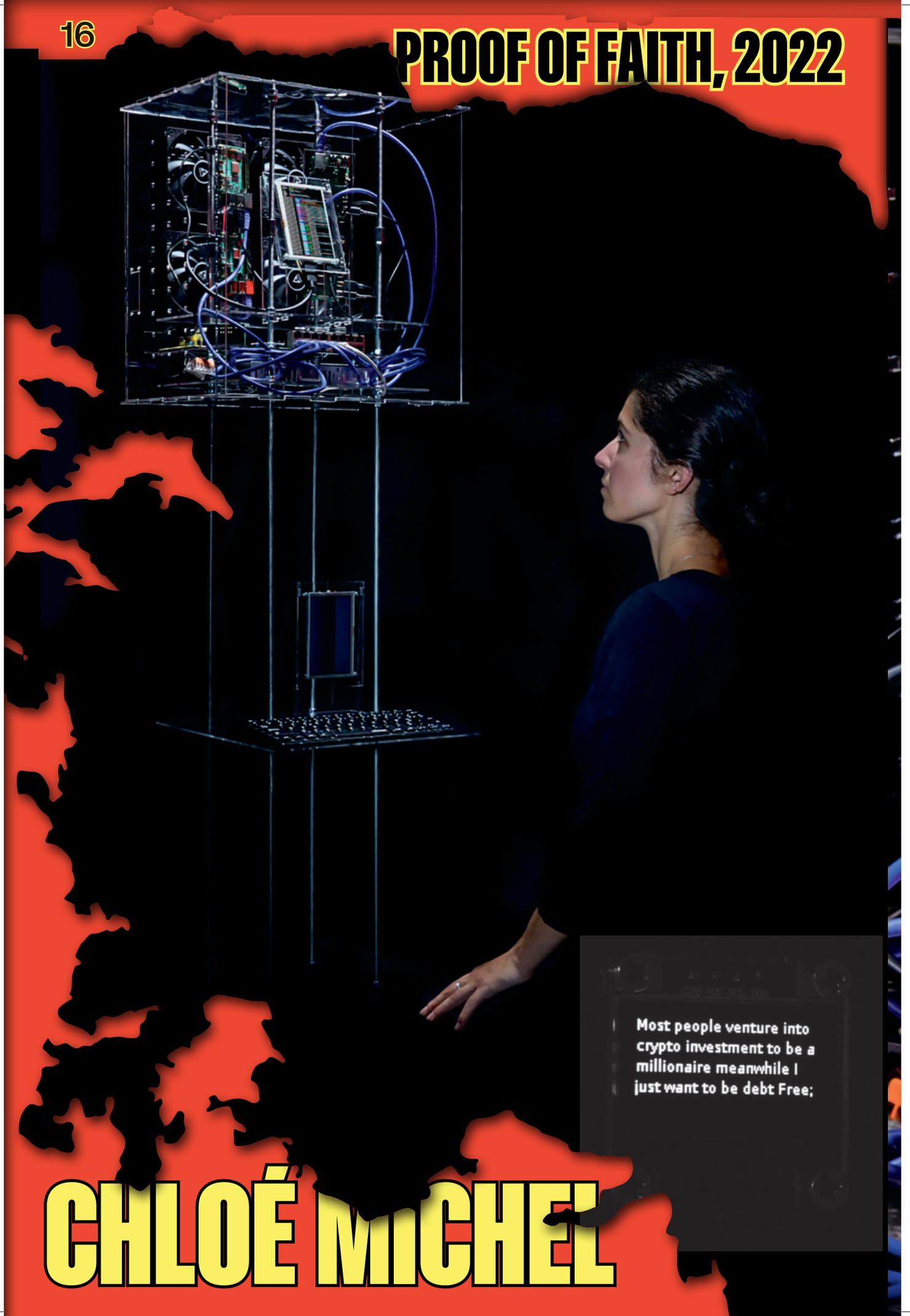
(3) Nakamoto Satoshi, n.d., "Bitcoin: A Peer-To-Peer Electronic Cash System," November 7, 2008, https://bitcoin.org/en/bitcoin-paper

(4) Ori Brafman and Rod A. Beckstrom, The Starfish and the Spider: The Unstoppable Power of Leaderless Organizations. New York: Portfolio, 2006. 5

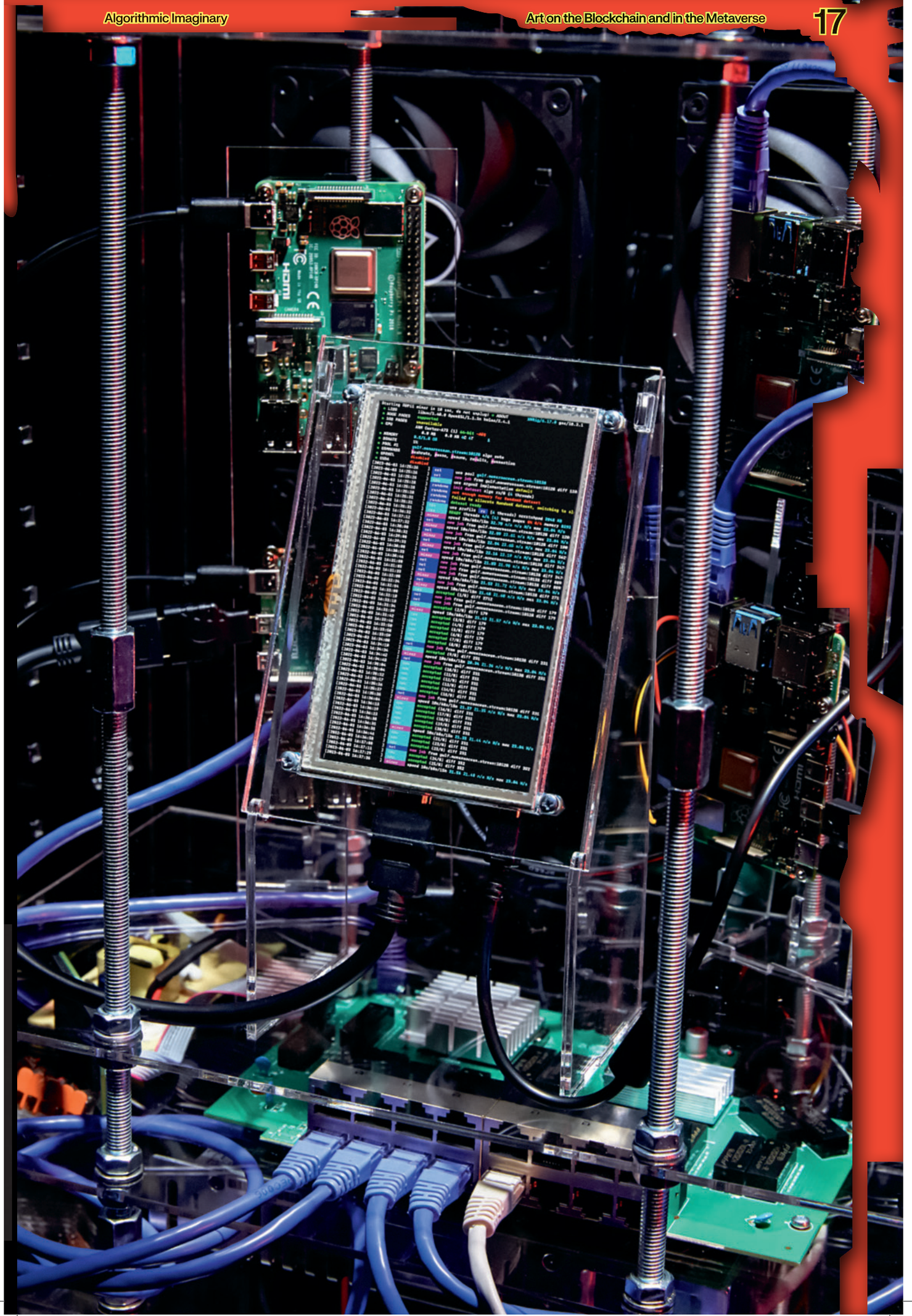
(5) Neal Stephenson, Snow Crash. New York: Bantam Books, 1992.

(6) Matthew Ball, The Metaverse: And How It Will Revolutionize Everything. First ed. New York, NY: Liveright Publishing Corporation, a division of W.W. Norton & Company, 2022.

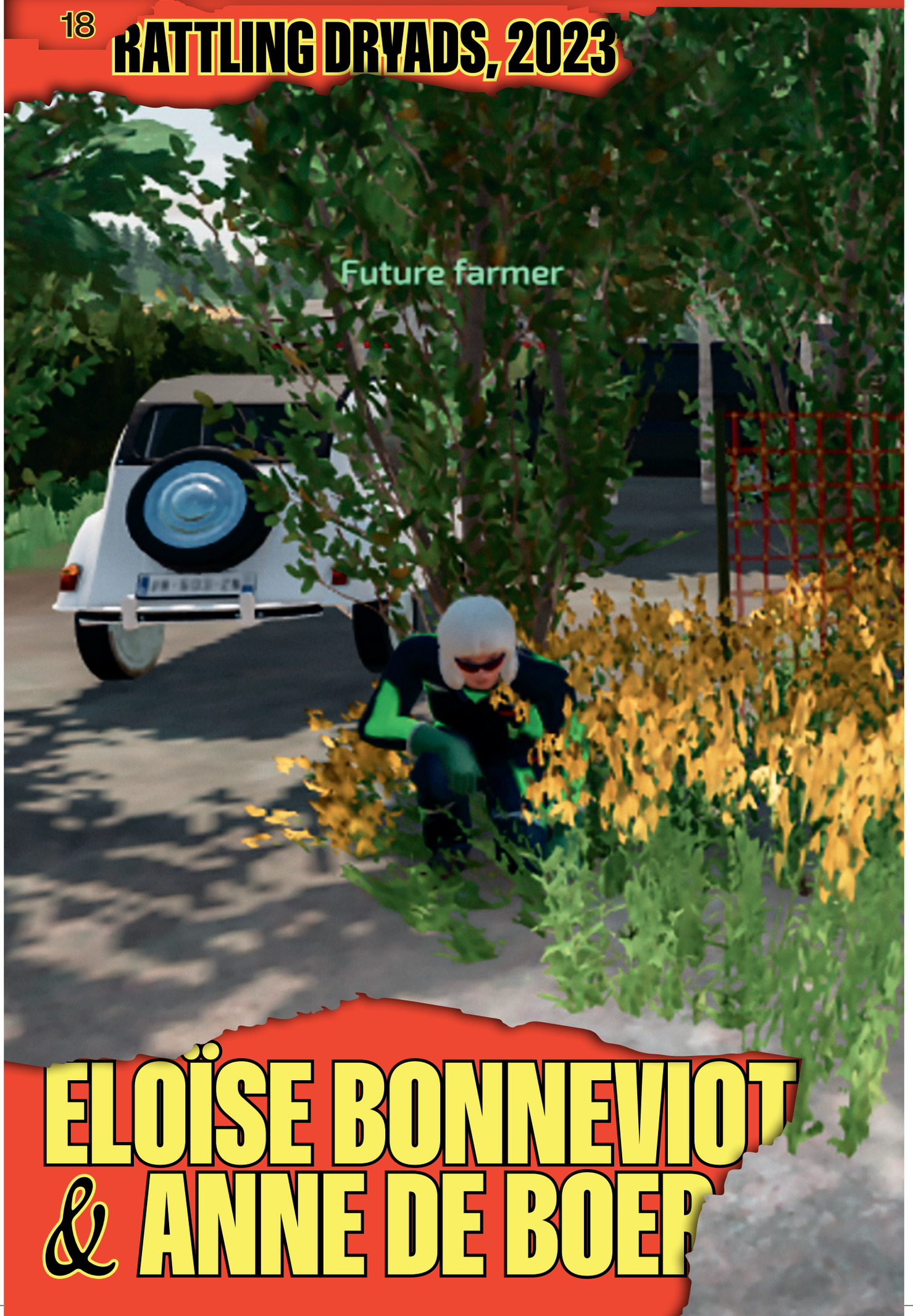
PROOF OF FAITH, 2022



CHLOÉ MICHEL



RATTLING DRYADS, 2023



ELOÏSE BONNEVIOT & ANNE DE BOER


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Marlene Wenger

How to Meaningfully Inhabit the METAVERSE

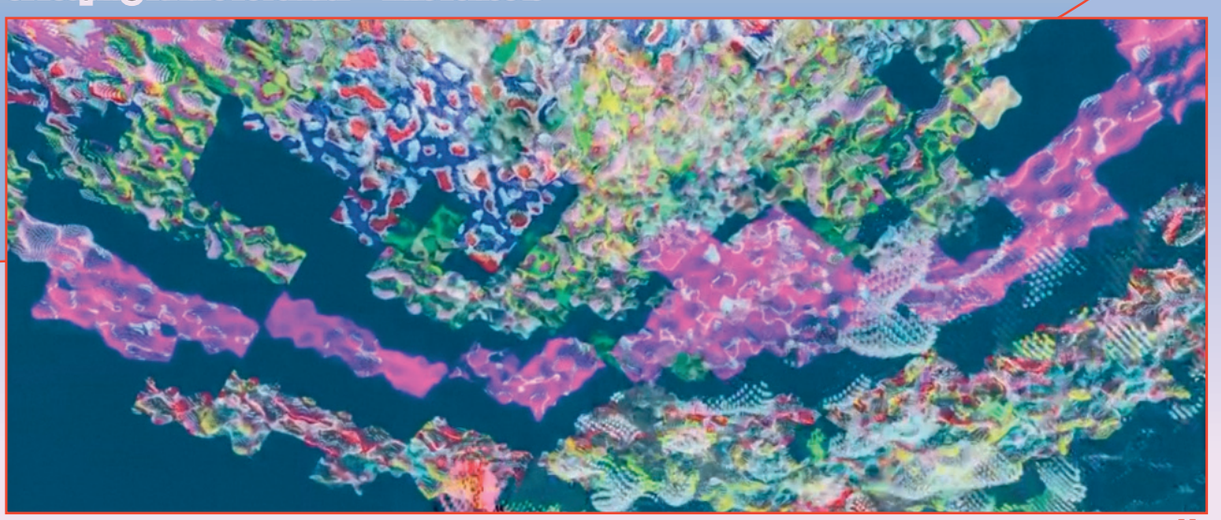
It is not easy to define the term "metaverse." The exponential use of the term lately does not necessarily help us in that regard. On the one hand it is argued that metaverses have long existed in science-fiction narratives,(1) multi-player games such as Second Life and Fortnite and many solid and long-lived online communities. On the other hand, big tech companies—first and foremost Meta—are claiming that the metaverse will be a new experience that will revolutionize our social and work-related interactions. In this scenario, the metaverse is mostly a synonym for a digital brandscape and just another e-commerce business model. Understandably, this development has led many to believe that the metaverse concept already has failed and that nothing promising will come of it, if it stays in Mark Zuckerberg's hands. Let's clarify some misconceptions. First, "the" metaverse does not exist. The idea that there would be one unified digital realm that paralleled the physical world is neither technically feasible nor desired by users, nor is it profitable for companies.(2) Second, although when mentioning "the" metaverse one conjures up images of the oversaturated 3D comic-environments of Decentraland or other game-engine landscapes, a metaverse does not actually require a VR-headset and three dimensions. I would suggest that a metaverse should first and foremost be a space of social, communal interaction, irrespective of its shape. Third, a metaverse can never be fully separated from the physical realm, since we need our body and senses to interface with the digital realm.

Keeping these aspects in mind, I would like to discuss the potential of the metaverse beyond its role as a place for entertainment and/or a brandscape. Babusi Nyoni defines the metaverse as "an extension of existence that manifests digitally either as an augmentation or an alternative to tactile exis-tence."(3) He reminds us to think of a metaverse in a broader sense, one that is not commercially afflicted. If a metaverse is a place, what do we want to do there and how do we want it to look? What is the functionality of these spaces and—more

importantly—what is their societal and philosophical potential? How do we build them in such a way that it seems meaningful to spend time there? I believe that the presented concepts of the metaverse will stay frustratingly boring, as long as we are unable to answer these questions. Luckily, there are some inspiring ideas of what the metaverse could be and I would like to explore some of them here. Let's have a look at three counter examples to the rather dull versions of the metaverse suggestions coming from big tech companies.

CLAIMING SPACE INSTEAD OF OWNING IT

One aspect of blockchain technology has manifested itself in the purchase of land in the metaverse. Companies have invested millions in digital land parcels in hopes of reaping future revenue.(4) This reflects the urge to participate and inhabit a virtual space by reproducing a known economic system. Apart from being unimaginative, the act of dividing a potentially endless digital space into small parts that are privately owned and controlled is not what the blockchain is all about. As Daniel Felstead puts it in his striking video-essay-critique on Zuckerberg's ideas of the metaverse, the key is decentralization instead of walled gardens.(5) One project that very convincingly shows what a truly decentralized and sustainable inhabitation of a virtual space could look like is the generative on-chain land art project Terraforms (2021) by Mathcastles. Terraforms consists of 11,000 generative NFTs made of a 32x32-grid text character JavaScript animation, in an aesthetic that references early computer art experiments. Each token also holds the metadata that represents a parcel in a virtual architecture called "Hypercastle"—a 20-story abstract virtual landscape and it can function as a software tool to overwrite the existing data with differing content.(6) This project meets the complexity but also the potential of the new technologies at hand; it is a "reminder that the best virtual worlds are imagined, not simulated."(7) This imagined world entails different interactive modes and alterations to the artwork by users and thereby the shaping and claiming of virtual spaces not only by a single authorship, but a communal one. Its multidimensional concept and variable aesthetics allow a glimpse into what a metaverse could entail.



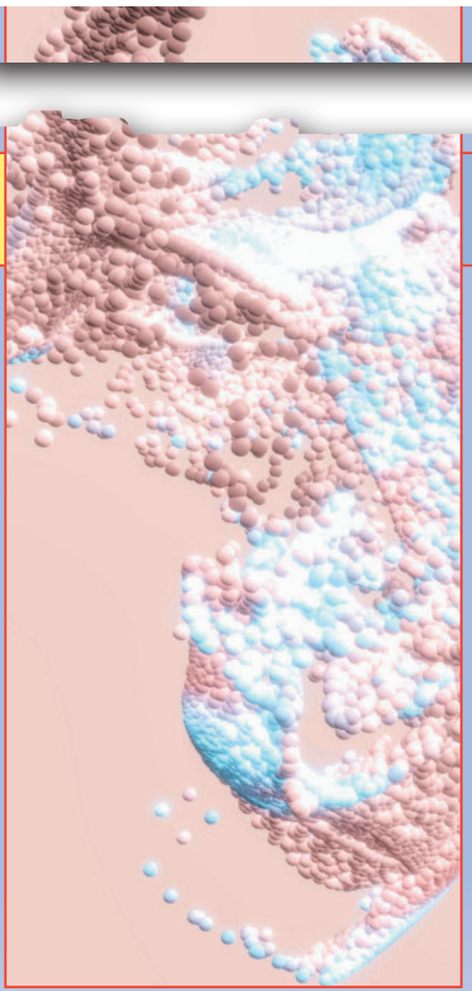
(a)

CREATING VIRTUAL SANCTUARIES

What if, instead of being a place to work, shop, be entertained or to procrastinate—we already inhabited these excessively in Web 2.0— the metaverse is considered a place of comfort? What if we create metaverses as places of contemplation, meditation, and healing instead of places of stimulation and interaction? While wandering through today's metaverse landscapes, one already can find alternative spaces such as ASMR soundscapes,(8) memorial places on Spatial(9) or browser-based critique on techno-capitalist exploitation posing as a guided meditation through a dreamy, 3D-rendered, soothing landscape as proposed by Gloria

It is not easy to define the term "metaverse." The exponential use of the term lately does not necessarily help us in that regard.

The metaverse is definitely a space and a place that we will inhabit more in the near future.



(b)

For a better understanding of the term, maybe it should be turned into a verb.

López-Cleries' and Sive Hamilton Helle's work *The Unreal*.(10) Creating specific atmospheres that are customized, imaginative and immersive is a key competency of 3D metaverses—noticeably one imported from game design—and is one of the reasons the metaverse could become a perfect place for psychological well-being. The startup company AETHA is tapping exactly into this field by promoting an idea of a metaverse that presents itself as a personalized, generative VR spa treatment that sends users into an abstract atmospheric bubble landscape drawn from data of their own emotional state.(11) A brainchild of Austrian artist Christiane Peschek, this project draws from an intensive artistic engagement in digital spiritualism and the creation of multisensory experiences on the verge of art, technology, and wellness.(12) By bringing the idea of a meditative, self-healing VR experience to the corporate space, Peschek is demonstrating her conviction that this could be one future use of a metaverse.

ACKNOWLEDGING WE HAVE A PHYSICAL BODY

Although Zuckerberg calls his version of the metaverse "embodied Internet,"(13) it becomes clear that Meta is purely focusing on the simulation of our bodies as avatars in the virtual space. Given that we most probably will spend even more time online in the future, instead of accepting clunky devices stuck to our heads while sitting statically and dizzy in uncomfortable chairs in bleak office spaces while our avatars move, fly and dance through the metaverse, should we not consider how our physical bodies can be integrated into this development? Should we not rethink the entry point into the metaverses and design them according to our bodily needs and acknowledge that the interface to the metaverse will always be our senses? Since 2020, the Berlin-based artist collective Keiken have put much thought into the role of bodily presence in the metaverse and have designed displays that smooth the transition from the physical to the virtual.(14) *Metaverse Womb* (2020) is a 360 video and motion-capture performance in which the performer's movement impacts her avatars in the game engine. In a performative dance ritual, her bodily presence and that of her unborn baby are part of the on screen narration, bringing layers of wisdom from past and future together.(15) To me, this piece is a best practice example of how a body must not be replaced by an avatar, but can be integrated into the metaverse with acknowledgment of its physical presence. Although it might not be technically feasible to have motion-caption technology in every household, I would wish to see more efforts put into the translation of our bodies into the metaverse.



(c)

(Pic. a)
Christiane Peschek, visualization of AETHA, 2023.

(Pic. b)
Hypercastle Explorer, alternative visualization software artwork for Terraforms by Mathcastles by Matto Thousand Ant.

(Pic. c)
Keiken in collaboration with Naama Ityel, "Metaverse Womb," Performance, HAU Berlin, 2020. Commissioned by Creamcake and HAU Berlin.

CONCLUSION

As the mentioned artistic examples have hopefully shown, there are creative suggestions of how we can meaningfully inhabit a metaverse. What we can learn from these—and many other examples—is that the relatively new technologies of Web3 also call for new narratives and alternative modi operandi than the ones we already explored and dismissed in Web 2. To quote Daniel Felstead's brilliant essay again: "To think of the metaverse as something computational is limiting, we should think of it as a speculative prototyping tool!"(16) This could entail respecting and fully maxing out the decentralized potential of blockchain, finding alternative ways of occupying and utilizing digital spaces and keeping in mind that the physical and virtual are never separate realms. The metaverse is definitely a space and a place that we will inhabit more in the near future. For a better understanding of the term, maybe it should be turned into a verb. The term "metaversing" could describe how people behave, treat and engage with virtual interfaces while they live and build their own worlds in an embodied Internet.

(1) The term was originally coined by Neal Stephenson in his 1992 novel, Snow Crash.

(2) Eric Ravenscraft, "What is the Metaverse?" April 25, 2022, https://www.wired.com/story/what-is-the-metaverse/

(3) Babusi Nyoni, "Five Views of the Metaverse," March 1, 2023, https://outland.art/five-views-of-the-metaverse/

(4) Eric Ravenscraft, "The Metaverse Land Rush Is An Illusion," Dec. 26, 2021, https://www.wired.com/story/metaverse-land-rush-illusion/.

(5) Daniel Felstead, "The Metaverse in Janky Capitalism," 2023, https://dis.art/the-metaverse-in-janky-capitalism.

(6) "Terraforms by Mathcastles: Onchain land art from a dynamically generated 3D world," June 9, 2022, https://www.youtube.com/watch?v=U2xTI5pPHwk.

(7) Kevin Buist, "The Map is the Territory," Oct. 31, 2022, https://outland.art/terraforms-by-mathcastles/.

(8) ASMRSoundlands is a project by Everyrealm that brings ASMR sounds into the metaverse. Small ASMR sound effects will be tokenized as NFTs, the project did not launch yet, https://asmrsoundlands.com.

(9) Kanaloa Prayer Candles for example, is a space on Spatial created by Shawn Young where visitors can light a digital candle and wander contemplatively in soothing fantasy gardens: https://www.spatial.io/s/KANALOA-Prayer-Candles-642f8b543941b8cf8144237c?share=2627559506201508653.

(10) http://www.internetmoongallery.com/archive/Theunreal/Theunreal.html.

(11) The project is currently in the funding process and has not launched yet. https://www.aetha.world/

(12) https://christianepeschek.com/.

(13) Mark Zuckerberg, "The Metaverse and How We'll Build It Together – Connect 2021," https://www.youtube.com/watch?v=Uvufun6xer8.

(14) For example, Feel my Metaverse (2020), Metaverse: we are at the end of something (2020), or Player of Cosmic Realms (2022), https://keiken.cloud.

(15) https://keiken.cloud/work/metaverse-womb/.

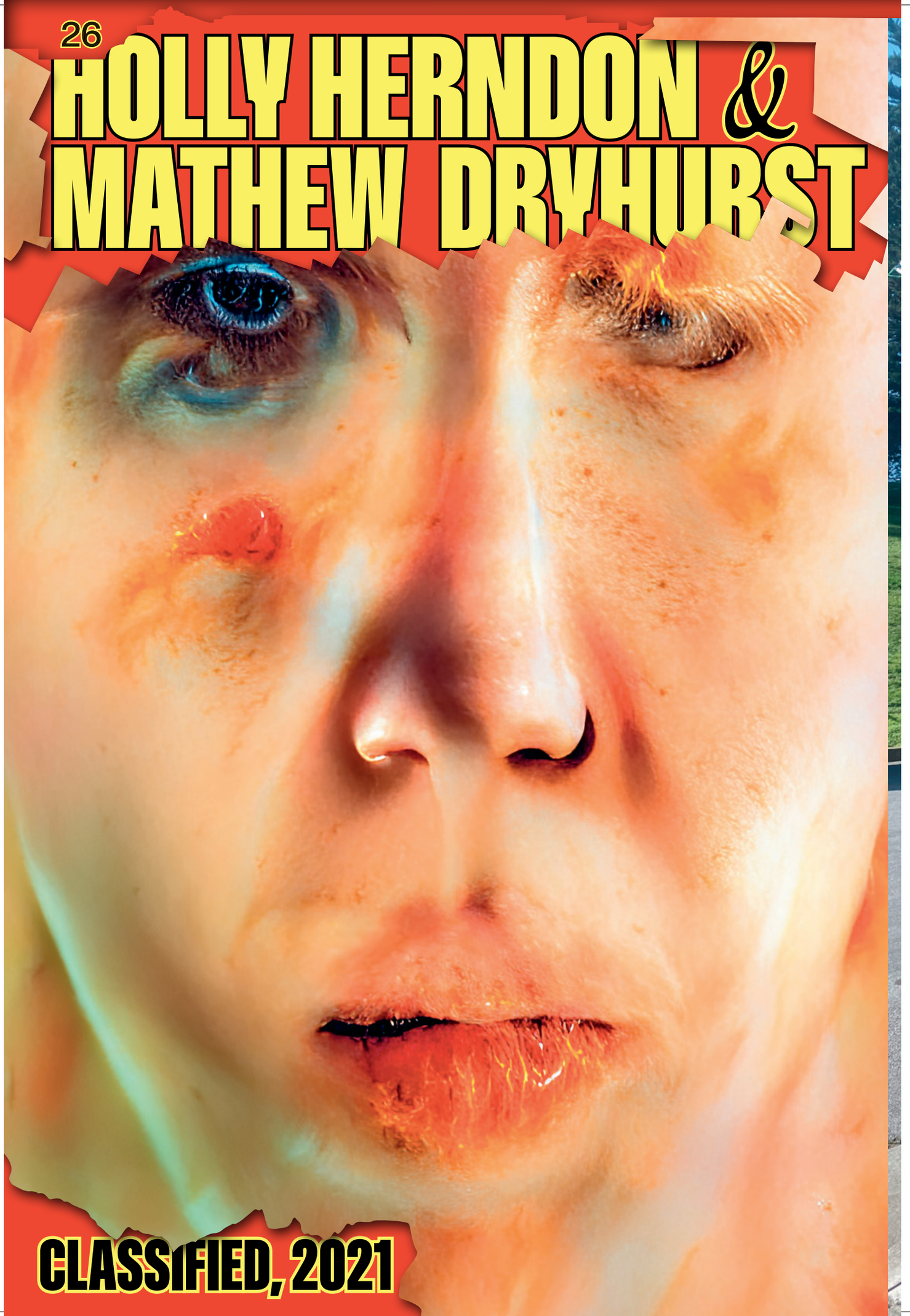
(16) Daniel Felstead, "The Metaverse in Janky Capitalism," 2023, https://dis.art/the-metaverse-in-janky-capitalism

LEANDER HERZOG, MILIAN MORI



DOM1, 2023

HOLLY HERNDON & MATHEW DRYHURST



CLASSIFIED, 2021


200
HOLLY PARK

























AI TRAINING CEREMONIES / COLLECTIVE VOICE MODEL, 2018-2020 / 2022

TRAINING DATA FOR EVER, 2023



AMANDA E. METZGER

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g to write a bit about my (art) practice. Still not
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can do and what is my practice? Dok and Amanda said
 I should write about my present state. Hm. I guess
 for me the main question is whether I want to do t
he same stutt as the \n\npeople that are currently
in the studio? I think my work will probably be qui
te different. I like to work with bodies, but I gue
ss that's a bit too vague. I might need to work wit
h physical documents. But I feel like I shouldn't c
onfine myself too much to one \n\ngenre, especially
 since a lot of people do this. I think for me it's
 quite exciting to play with different mediums and
try to think about things in a different way. I rea
lly want to go to a museum to \n\nresearch. The onl
y thing I can think of is the Jeu de Paume, but I g
uess they \n\ndon't have a lot of information of th
e nineties. I should probably also \n\nlook for ano
ther one. would be nice to ask Amanda, but I feel l
ike she's quite busy and I should probably figure \
n\nthis out by myself. I think that's good for me.
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PROMPT TEST, 2023

Sarah Friend

Eschatology



In 2008, Electronic Arts decided to shut down the servers of *The Sims Online*, a multi-player version of the classic single player simulator—essentially sending the entire world and all of its community members to a scheduled apocalypse. Released in 2002, the game had never seen the success EA had hoped for, and after a rebrand in 2007 as EA-Land the shutdown was announced for 2008.(1) In the final minutes of the game, players gathered in the town hall to attend a See You Soon Party, where one of the community members gave an emotional final speech:

I just wanna thank you all, it's been an amazing experience, it really has, and I told myself I wouldn't make myself cry, but I can't stress enough how much you guys have meant to me over the past, oh however many years it's been. It really has been awesome and uh, some people don't get attached to things but when you make friends the way people have in this game, it's actually really hard.(2)

MMO apocalypses have been surprisingly common. Giantbomb lists more than 70 virtual worlds that have been shut down between 2001 and 2016.(3) One particularly beloved example is *Asheron's Call*, which ran from 1999 to 2017. The game had a strong and dedicated community of players, but it had shrunk over the 17 years and was no

longer profitable.(4) In a video documenting the final moments, as player avatars disappear in waves, each death marked by a purple spiral, one streamer says through tears:
Don't let Dereth go to waste. And all these people and all their items. And everything that we've worked for, the friendships, and the relationships, and the marriages and the kids and the friends and everything that people have had. Don't let this go to waste. Thank you everyone.(5)

In these moments of grief we can see clearly—perhaps more than at any other time—that these worlds are real. While we casually say "irl" when we mean "in real life" and not on the computer, the world in the computer always has been real in the Philip K. Dick sense: "Reality is that which, when you stop believing in it, doesn't go away."(6) The metaverse is a living place—or at least it is alive enough to die. Like Margery Williams' classic children's story, *The Velveteen Rabbit*, about a toy that becomes real, these worlds have been loved into a kind of transubstantiation:
"Real isn't how you are made," said the Skin Horse. "It's a thing that happens to you. When a child loves you for a long, long time, not just to play with, but REALLY loves you, then you become Real."(7)

When the rabbit then asks the horse, "Does it hurt?" and the horse replies, "Sometimes," it's difficult not to think of these MMO eulogies and perhaps to wonder—what kind of archive, cemetery, or memorial, is appropriate for these beloved digital places? The first impulse might be to store all of the data that encompasses the world—the game save file, the data of the map and all of its buildings. One could also store the game code, the game engine, even the operating system the game runs on, and the drivers for common hardware. We could store every version of the world that exists, for every tick in game time, so that we could replay deterministically every move that every character made with every game item—in fact, a structure very much like a blockchain. But what would we have actually captured that matters about the world?

In the *Preserving Virtual Worlds Report*, part of a collaborative research endeavor between Lindon Labs, the creators of Second Life, and several North American universities, the authors write:
An important part of the historical context for virtual world history is the fact that human beings (through their avatars) fill these digital environments with meaning that emerges from their activities in social spaces, regardless of whether the spaces are synthetic (digital) or physical.(8)

Furthermore, "If we save every bit of a virtual world, its software and the data associated with it and stored on its servers, it may still be the case that we have completely lost the history."(9) While we can back up the data that encompasses a game map, all the buildings that inhabit it, even the engine that runs it, none of these acts in fact captures what it really is. A world, much like a protocol, cannot exist in a static instant. A protocol must be enacted, and a world must be lived in. Blockchains can also be thought of as universes or worlds. They have time—it is linear and proceeds forward. They have a past—what has happened is recorded, and that history is immutable. It is even, in the case of proof-of-work blockchains, thermodynamically guaranteed: we cannot undo an executed transaction any more than we can unbreak a glass (of course in practice it's not so simple). Blockchains have space, at least in the sense of "things" (assets and data) being stored in "locations" (accounts and smart contracts). Blockchains have a physics, in the form of code and protocol rules, that make certain actions possible and blocks others. And, critically, they have boundaries. From within the universe of a blockchain, one cannot perceive the exterior except by way of an oracle—an aptly-named type of blockchain application that translates data from the world outside the blockchain, for example, the temperature in Arizona or the price of wheat in euros, like a vision from another dimension.

Moreover, the social realities that surround blockchain worlds contain many examples as heartfelt as the MMO eulogies above. The first marriage vows were enshrined on

"Real isn't how you are made," said the Skin Horse. "It's a thing that happens to you. When a child loves you for a long, long time, not just to play with, but REALLY loves you, then you become Real."

the blockchain in 2014 by David and Joyce Mondrous.(10) One of the contenders for "first NFT" is *OL@A*, minted on the counterparty blockchain by JP Janssen, also in 2014. The image is a drawing of Janssen and his now wife and is titled Моя Вечная *One & Only* which translates to *My Eternal One & Only*.(11) In 2015, Terra Nullius, an early project on the Ethereum network that allowed people to record a short message, hosted a memorial message to Nóirín Plunkett, an open source contributor and VP of the Apache Software Foundation.(12)(13) More recently, a smart contract was deployed to serve as a memorial for coronavirus whistleblower Dr. Wenliang Li.(14)

Blockchains are always-already acts of collective worldbuilding. Their decentralized architecture makes it so that no company can send them to a scheduled ending, like the ones that befell *The Sims Online* or *Asheron's Call*—but few technical systems last forever, and 99Bitcoins maintains a list of more than 1,700 blockchains that have "died."(15) There are still existential threats that could result in the "ending" of a blockchain network—including a critical enough software bug or massive regulatory crackdown. The Ethereum network has more than 230 million unique addresses, and while these don't correlate to "users" directly, it still speaks to a large population.(16) For comparison, *Asheron's Call* is estimated to have had slightly more than 280,000.(17) If the Ethereum network were to end, it would constitute perhaps the largest virtual apocalypse ever witnessed. Does a world need an eschatology? It's a task for historians and archivists to record these worlds as the legitimate places they are—and to grieve for what is uncapturable, the lived layer we have loved into being.





Blockchains are always-already acts of collective worldbuilding.

(1) Accessed June 18, 2023, https://en.wikipedia.org/wiki/The_Sims_Online.

(2) Accessed June 18, 2023, https://archive.org/details/EALand_FinalCountdown

(3) Accessed June 18, 2023, https://www.giantbomb.com/discontinued-mmo/3015-3661/games/

(4) Accessed June 18, 2023, https://www.engadget.com/2016-12-21-asherons-call-to-shut-down.html?guce_referrer=aHR0cHM6Lv93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAEUo18BdQ3paoGY_OX0TGJntabGCP1b1i-CC3vB1mpUxNo3MeVaP7yWCOkXMLG-1FUIM3GDYS8I_4jvUxSOISpNhQiObaqcF9uHVAK5--NZ82eJFvvpcZbwTLxlzTTKwNHEmmKytCpBGfby_TLvsb6P_EtDgPsH3EPp4h_p4QkWo&guccounter=2

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(13) Accessed June 18, 2023, https://geekfeminism.fandom.com/wiki/N%C3%B3ir%C3%ADn_Plunkett

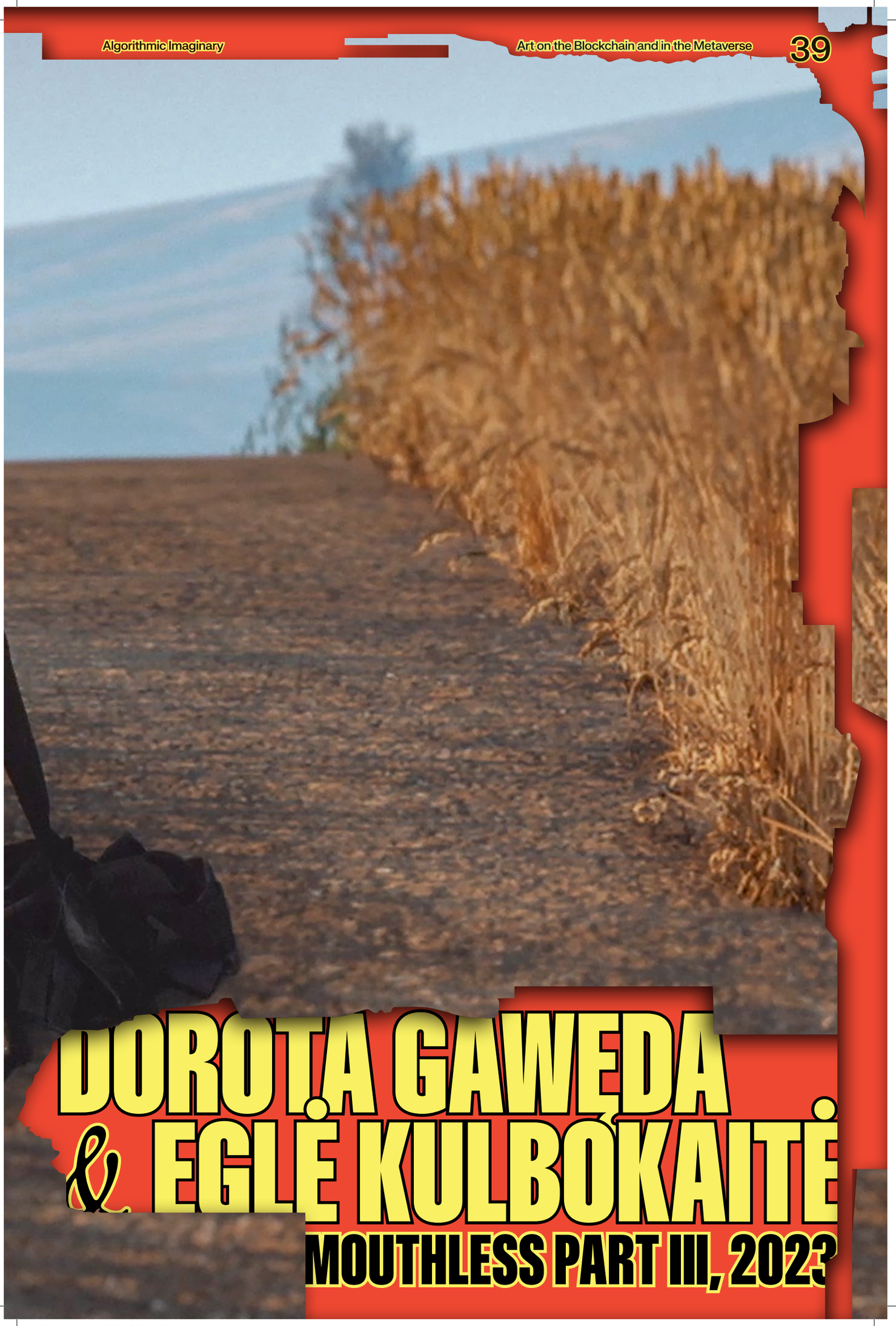
(14) Accessed June 18, 2023, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7468535/

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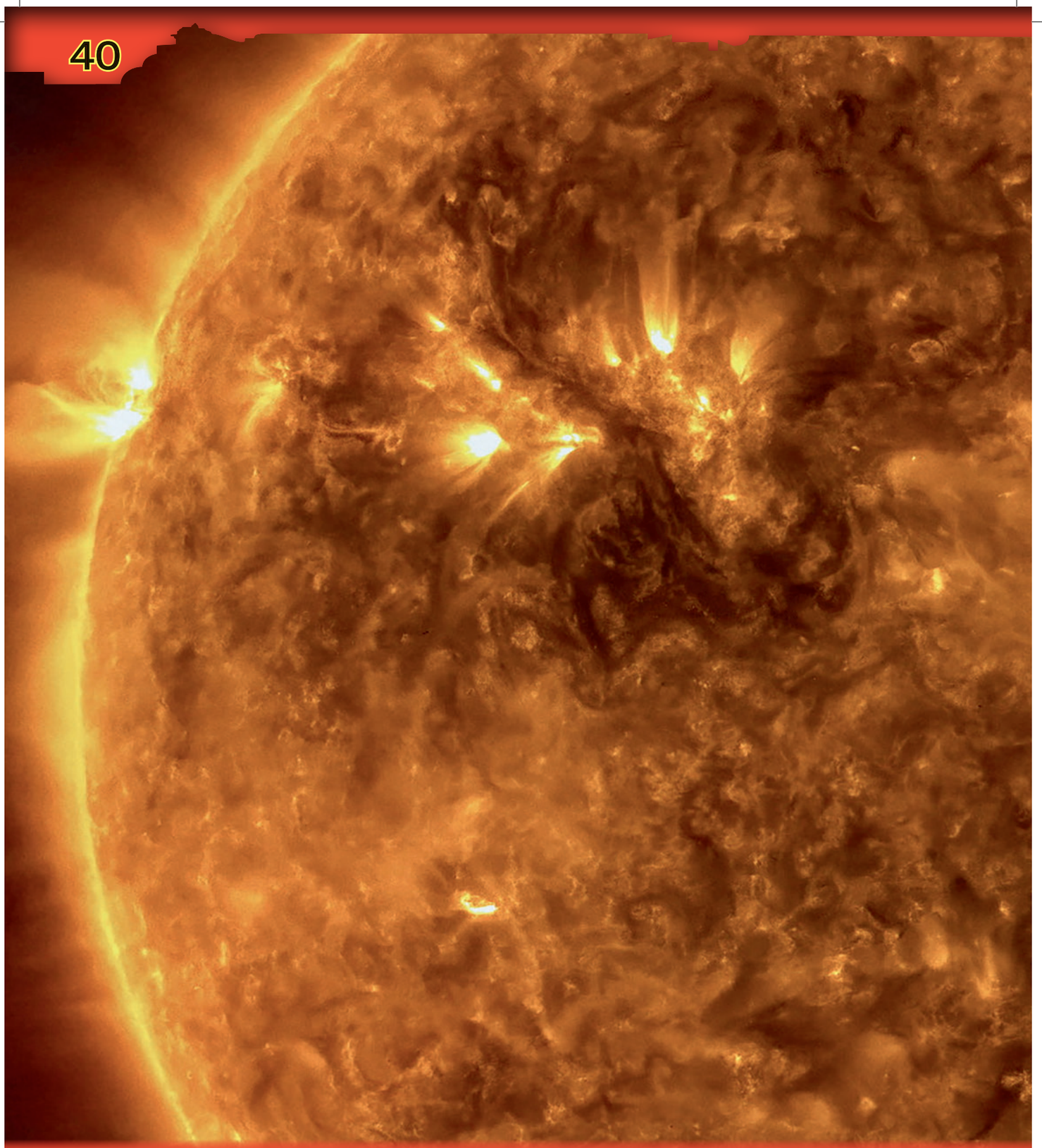
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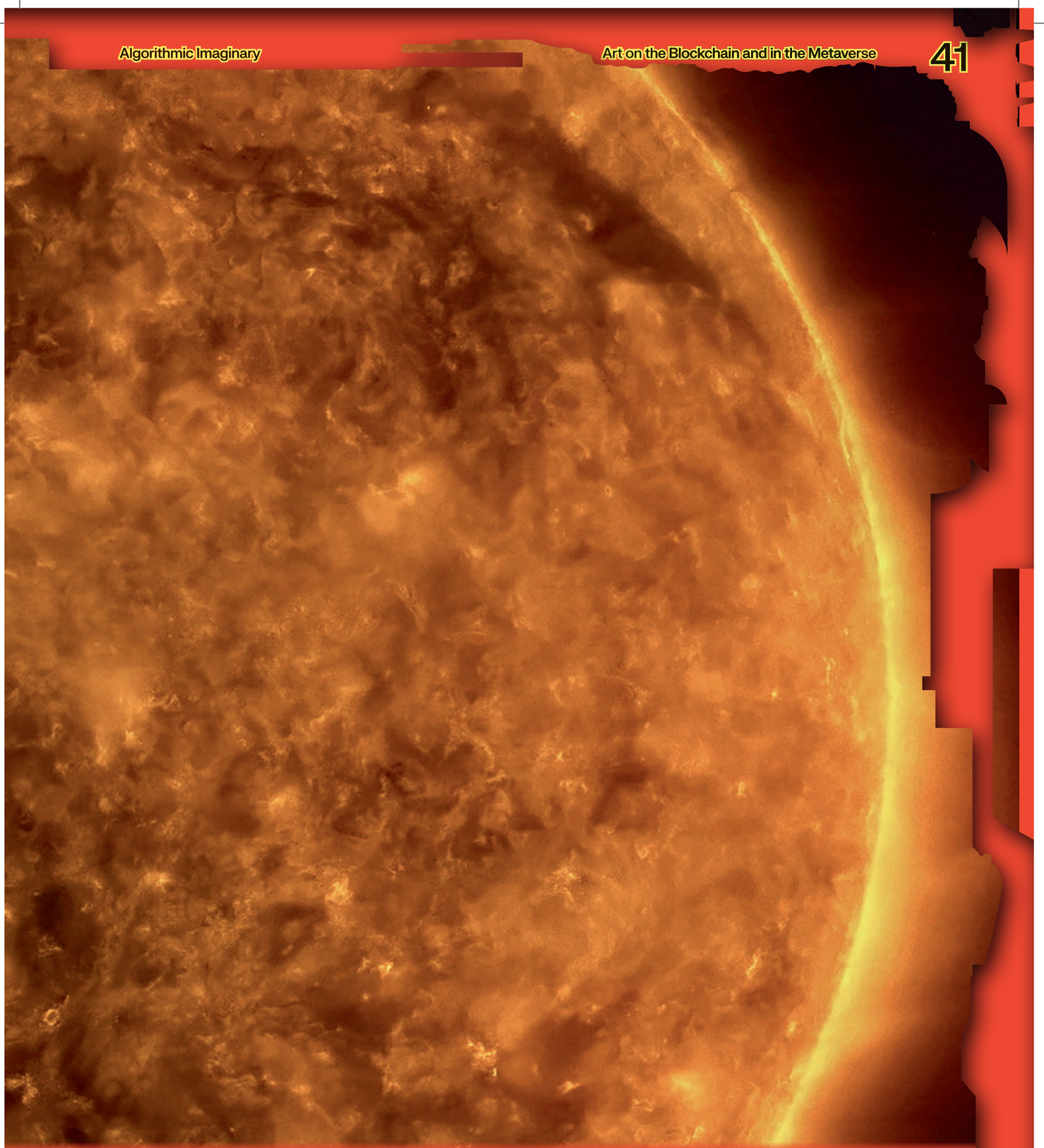
DOROTA GAWĘDA & EGLĖ KULBOKAITĖ

MOUTHLESS PART III, 2023













Marina Otero Verzier

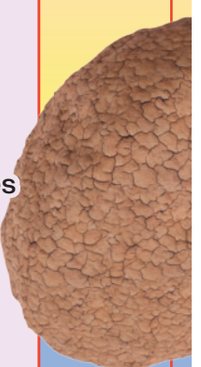
Data mourning



Before they are shaped into a commodified three-dimensional experience, bits are stored in an architectural edifice of climatized rooms. Towering server structures hum incessantly, while pipes regulate temperatures to ward off their imminent dissolution. When venturing into the backend of a fully immersive digital interface, one does not need a virtual headset, but rather a coat and sound-muffling earplugs. Forget the ethereal cloud: the metaverse neither hovers above nor does it materialize from the fabric of dreams. It is cold and noisy. It is heavy. It is hungry.

Remarkably, the prophets of IT marketing have ingrained the cloud metaphor so deeply within the collective imagination that most of us fail to perceive the stark reality that lies beneath: a network of cables and pipes arriving to and emanating from data centers, enabling the insatiable consumption of energy, water, and the release of CO2 emissions—a volume equivalent to that of the airline industry. These data centers tirelessly tend to their servers, ensuring uninterrupted operations, day and night, throughout the entire year to process technological ambitions, scientific breakthroughs, emails, videos, selfies, and intimate sessions with ChatGPT, as well as our transfigurations into assassins, sorcerers, and legless, more-than-human avatars.
They are everywhere, these data centers. Some take the form of colossal rectangular structures, nestled within industrial parks or in proximity to strategic energy grids. Others disguise themselves as ordinary buildings, seamlessly blending into the urban fabric of city centers. The closer they are to our devices, the smoother the digital encounters become. Initially driven by the pursuit of computational might and reduced latency, the future of data centers has now evolved into an environmental and social quandary. Where shall we house these infrastructures that manufacture new worlds at the expense of the planet's future?

Driven out of cities worldwide by communities well aware of the cost of technological dreams, and by governments wary of political and environmental risks, data centers are undergoing transformations in a bid to curb CO2 emissions and water and energy consumption. New designs imagine data centers cooled underwater, harvesting solar power while orbiting around the Earth, or using excess heat to produce vegetables and warm-up our living rooms. Regrettably, the scales seldom tip in favor of the environment. With each technological solution a new externality emerges. Loss of ozone due to space launches, marine communities grappling with altered seawater temperatures, indigenous peoples witnessing renewable energy infrastructure encroach upon their lands, or urban areas left bereft of access to essential resources like electricity and water. All this to ensure a smoother, swifter digital experience.



At a time when the planet's limits are acutely apparent, tech companies and their billionaire CEOs envision new digital realms and extraterrestrial worlds, seeking to expand the horizons of our fragile existence. They channel humanity's insatiable thirst for more and aspirations toward transcendence, by stimulating the compulsive production and consumption of vast amounts of digital information amassed as precious assets and whose significance is yet to be seen. Scientists delve into the intricacies of DNA codes, astronomers meticulously document the enigma of black holes, and artificial intelligences navigate through our daily tasks and cat pictures, all stored in data bases tasked with modeling and predicting the future. Paradoxically, these actions exacerbate the strain upon the environment on which we rely, inadvertently foreclosing alternative futures that lie beyond the confines of the cloud.

The paradox finds its embodiment in the Pacific island-nation of Tuvalu, a coral atoll

comprised of islands inhabited by 12,000 people. As the repercussions of global warming and escalating pollution reverberate, manifesting in rising sea levels and the acidification of the oceans, Tuvalu is disappearing under the sea. With an alarming rate of sea-level rise at 3.9 mm per year—twice the global average—the nation is confronting the grim reality of its imminent submergence. At the United Nations Convention on Climate Change, during the COP27 climate summit, Tuvalu's Minister, Simon Kofe, addressed the assembled delegates, emphasizing the need to prepare for his country's survival. "Our land, our ocean, our culture are the most precious assets of our people and to keep them safe from harm, no matter what happens in the physical world, we will move them to the cloud," he asserted.

Faced with the impending loss of their tangible homeland, the people of Tuvalu find solace in the intangible realm, seeking refuge within the digital sphere. By transferring itself to the metaverse, Tuvalu aspires to become a cloud, a fully virtual and digitized nation. Yet, rather than an ether, Tuvalu's digital twin would effectively manifest as a network of data centers, perhaps floating atop the ruins of its once-vibrant land or submerged alongside them, heavily reliant on electricity, water, and other precious resources, and whose functioning inevitably hastens the disappearance of other imperiled territories.

As we witness the unraveling of worlds, cities transcending into digital twins and backups, corals reduced to mere images, and humans replaced by avatars or displaced by generative AI, we confront the stark reality of the fragility of our environments and their histories. Driven by humanity's struggle with loss, market-driven scientific innovations for data storage propagate the empty promise of preserving information unaltered across time. They fail to recognize that data centers, akin to archives and physical bodies, exist in a state of simultaneous proliferation and decay. Memory, a practice entailing acts of both remembrance and forgetting, extends beyond mere containment and storage. Any form of memory undergoes continuous renewal through maintenance practices, where meanings are updated and the act of remembering encompasses both the generation of knowledge and its loss. It is within the realms of information's decomposition and recomposition that future meanings emerge, transcending the intentions and interpretations of those who initially deposited and stored the files.

Over time, the myriad files kept in hungry servers will inevitably decay and share the fate of ecosystems burdened by their storage. Rather than harboring aspirations for a storage medium that fosters unlimited accumulation with reduced consumption and emissions, we should embrace other forms of relating to data, embrace rebellion, celebration, and mourning as forms of remembrance. For what lies susceptible to destruction amidst the throes of the climate catastrophe, and what has been and continues to be systematically erased through the violent forces of colonialism and capitalism, are the intricate tapestries of social, cultural, and environmental relationships.

In the wake of Tuvalu's drowning, what would remain stored in data centers, their mirrors and security backups would be empty signifiers, vestiges that bear witness to the violence inflicted by the actions and inactions leading to its erasure. In this web of replication and duplication, errors, and mutations, outages, and accidents will alter the information over time, leaving room for unexpected developments. As bodies, architectures, and territories disappear and the cloud becomes debris, our collective stories will feed and be repurposed by those that survive and mourn us: bacteria, viruses, and emergent artificial intelligences.



Any form of memory undergoes continuous renewal through maintenance practices, where meanings are updated and the act of remembering encompasses both the generation of knowledge and its loss.

LATURBO AVEDON













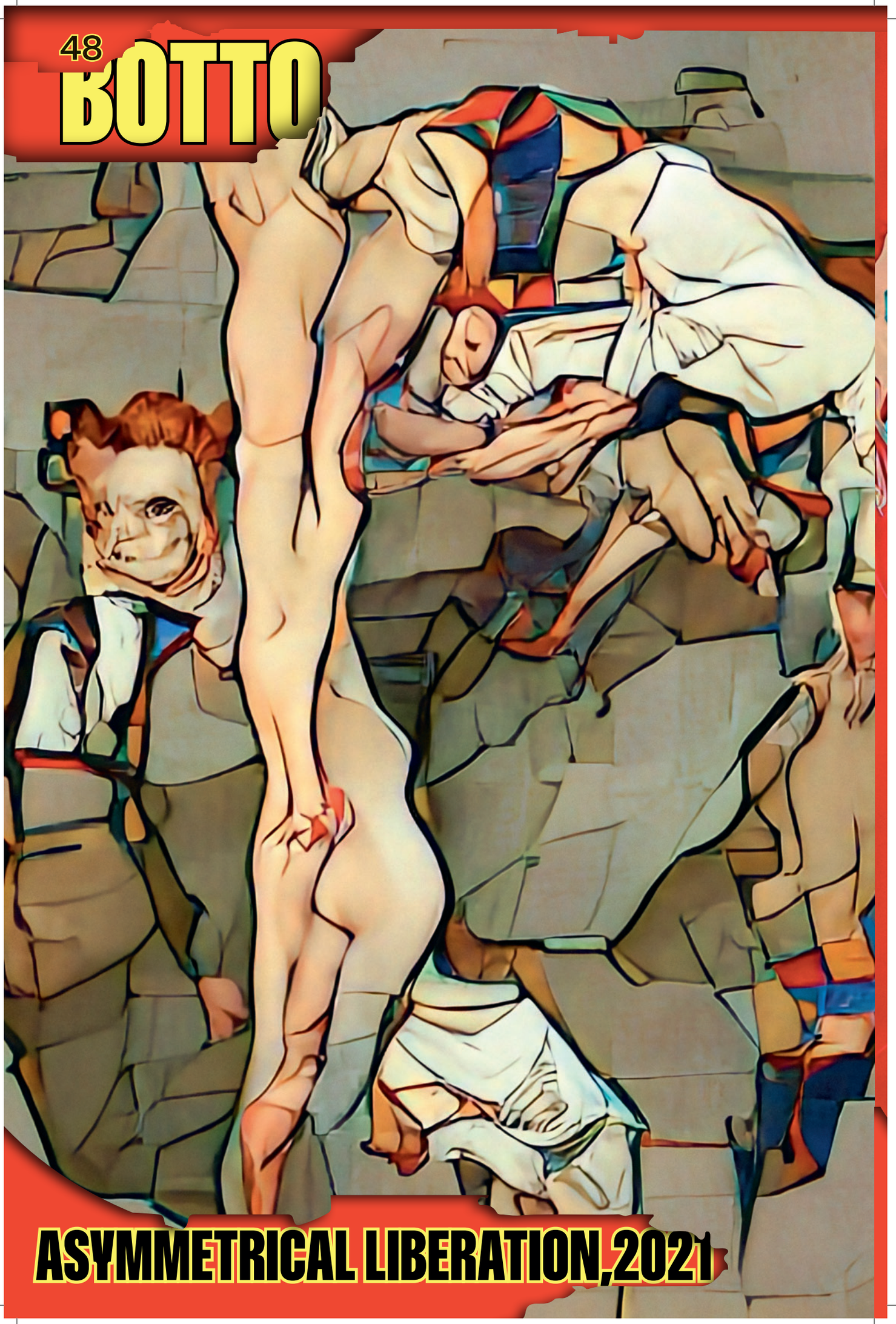
DREAM SEQUENCE IN THE CLEAR RUINS, 2023


One Ever
Level 1
Significant Life Events:
Glyph Initialias
Level 1
Significant Life Events:
Tangent Cove
Level 1
Significant Life Events:

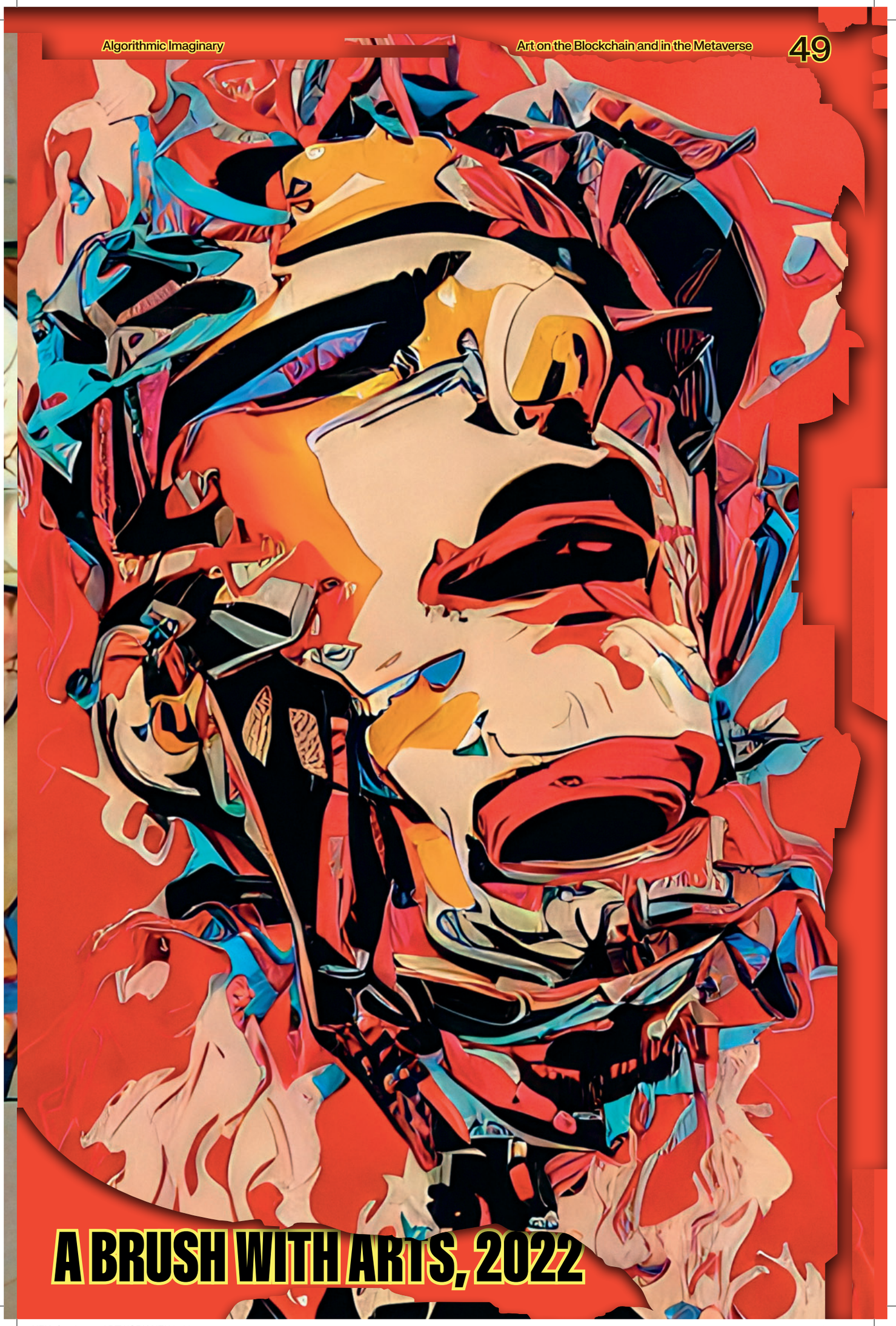

where my friends wandered
the sudden collapse of existing media

48

BOTTO



ASYMMETRICAL LIBERATION, 2021



A BRUSH WITH ARTS, 2022

Babusi Nyoni

Dancing Through the DIGITAL DIVIDE

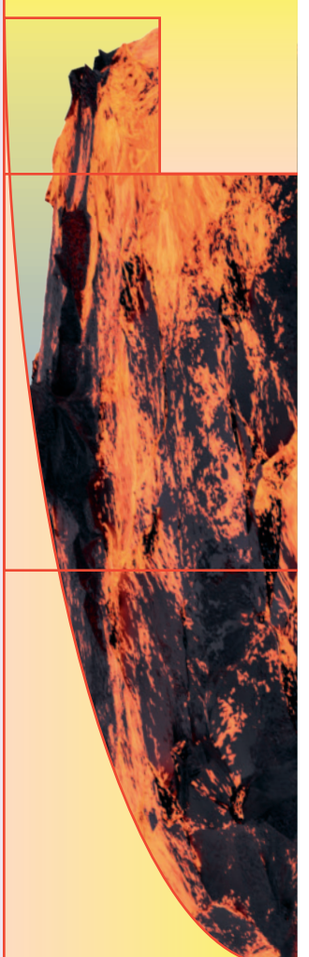
The African Metaverse Framework

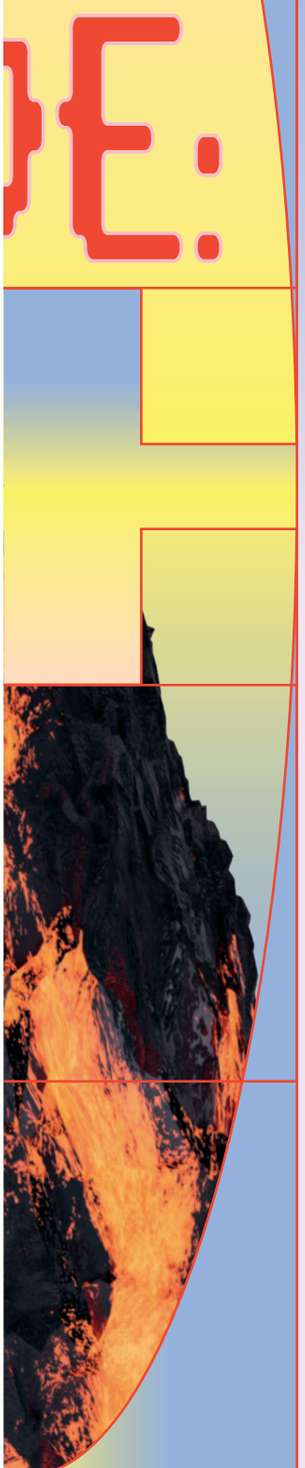
Imagine, if you will, stepping into a digital universe, let's call it a metaverse. But unlike the glossy, almost alien-like versions to which we've been introduced by big tech companies, this one reflects who you are. It's a world where you don't just see your likeness, but feel your rhythm, and form real connections through movement.

I work as a creative technologist at the nexus of emerging technology and the needs of underrepresented communities, exploring the uses of technologies such as computer vision, AI image generation and language modelling and giving them context in low-resource settings. My artistic practice has always centered around the uses of new digital ways to uplift underrepresented communities, to give them a seat at the table, and to make them visible. In this renewed age of metaverses, I asked myself: How do we ensure that people from the global majority see themselves represented?

Through a series of experiments in machine-aided human digitization I found a way to digitize my likeness and prepare it for existence in a digital extension of the tactile, otherwise known as "real." I used open-source 2D-to-3D libraries as well as freely available 3D modelling and rigging tools to turn a single photo of myself in my garage into a controllable avatar. It's well-documented that in mainstream platforms, avatars often lean towards a certain Eurocentric norm, neglecting the rich diversity of our global population. But here, in this metaverse, you see yourself, your unique features, your skin color, your unique body type—all reflecting your identity.

At this point you must be asking yourself why this is important. For many people who grew up on an Internet tailored to their appearance, conversations related to existence on digital platforms often explore avatar anonymity or hyper customization. Both of which enable metaverse users to exist without the "limitations" of their likeness. A conversation about likeness parity often feels outdated and that makes sense. For people like me, however, who grew up on a hand-me-down version of the Internet whose language, visuals and progress ignored my appearance as well as my culture, metaverse likeness feels surreal. Ultimately, it's about more than just looking like yourself in a digital world. It's about agency, control, and dignity. When you see yourself mirrored in your avatar, you're not just





I believe that in the age of the metaverse, we all deserve to dance to our own rhythm in a world that is as much ours as it is anyone else's.

a bystander in the digital realm, but an active participant. You're visible, you're represented, and you're part of the conversation.

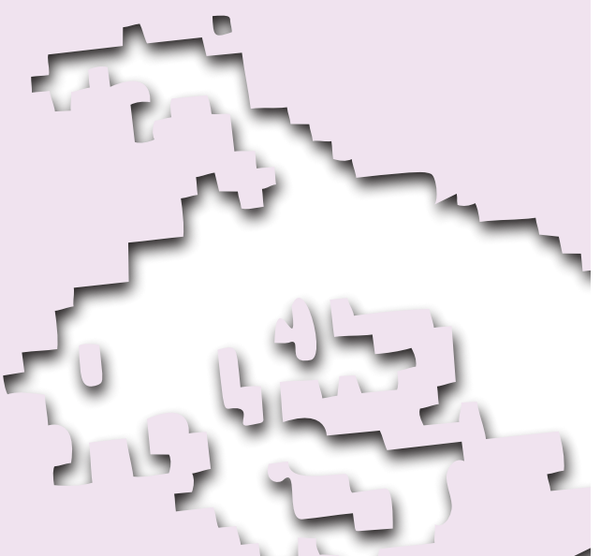
But representation is only one part of the story, connection is the other half. In the real world, we connect through more than words. We connect through shared experiences, shared rhythms, shared dances. So why shouldn't our digital universe reflect that?

That is why I introduced dance as a medium to connect users in this metaverse. Dance, particularly in many African cultures and especially in mine, is an integral part of community, a universal language that transcends borders. Dances can dilate joyful social settings like iVosho(1) does or carry socio-political meaning like Pantsula.(2) In the absence of dance representation in the metaverse I found rhythm to be a powerful proxy. My development of a language of motion leaned on learnings from my previous work in creating engaging ways to document Southern African dance as well as in measuring movement on mobile devices for the purpose of disease diagnosis. In this metaverse, your physical motions translate to your digital avatar, allowing you to express yourself and connect with others in a way that transcends the spoken or written word. Dancers in this metaverse form connections based on shared rhythm wherever they are in the world.

What played a major role in the type of platform I built was (economic) accessibility. For many people in the global majority, high-tech gadgets such as VR headsets aren't always accessible. This means that for millions of people device-centric conversations about the metaverse ostracized them by default due to the high economic barriers to entry. With that in mind it was important to me to make this metaverse as low-tech as possible so that the word itself wouldn't alienate people with limited financial means from the outset. All that users need is a basic smartphone, a device many of us carry in our pockets and whose adoption in sub-Saharan Africa will reach 87% by 2030, up from 51% in 2022. This desire to design for the base of the pyramid is in line with my mission to ensure that new technologies are accessible to everyone, not just a select few.

Through the African Metaverse Framework, I'm not just creating a digital world, I'm challenging the norm and shifting power dynamics. I'm ensuring that everyone, regardless of where they are in the world, feels seen, feels represented, and most importantly, feels like they belong.

I believe that in the age of the metaverse, we all deserve to dance to our own rhythm in a world that is as much ours as it is anyone else's.



(1) iVosho is a South African dance move that involves squatting and kicking at the same time.

(2) Pantsula is a traditional and highly energetic dance form that originated in the black townships of South Africa during the apartheid era.

OMSK SOCIAL CLUB







HEART OF AN AVATAR <3, 2023

Penny Rafferty

Decentralized Autonomous Organisations: Bones and All

Coming of age for the last decade has been like coming of age on a permanently fixed battlefield, where the house always wins. Born into a state of planet-wide militarization, enabled by seemingly undirected and unpredicted moments such as the aftermath of 9/11, Covid-19 policy changes, and most recently the tactics of global war through Ukraine have left youth culture perspectives bleak and dystopian at best. In addition to these almost containable moments, you have the socio-political challenges of growing up knowing that staggering numbers of people, even in the wealthiest countries, are living in poverty, without aid, and that there are more than three times as many people in slavery today as during the most prolific eras of the transatlantic slave trade routes.(1) Even considering overall population growth these numbers are hard to stomach. These factors have enabled political arenas to practice the cultivation of war zones for life, and this list would even be deemed short considering the hyperobjects at play, such as overpopulation, environmental destruction, displaced people, and climate change that sit alongside the very human, very complex narratives of tried and true policies in discrimination and privilege.

So it's no wonder that the past decade of coming-of-age films finds solace in the impermissible act of cannibalism, which targets the complexity of outdated simple slogans like "Eat the Rich," replacing them with the stark word "survivalism" coupled with identity and culture. To name but a few: We have seen the French-Belgian film, *Raw* (2016), directed by Julia Ducournau, which explores a 16-year-old vegetarian's first year at veterinary school and her lack of assimilation into this new society leading to a craving for flesh; that same year we saw the release of *The Lure*, a Polish operatic musical about flesh-eating mermaids; and since then we have seen an accelerated increase of films exploring the subject, from *The Neon Demon* to *The Bad Batch*, *Fresh*, the TV-series Yellowjackets and most recently the film *Bones and All*, released last winter and directed by Luca Guadagnino. In this text, I want to

unpack *Bones and All* further through its story of two ill-fated, inexperienced lovers who are trying to survive on the margins of society, to which they are oriented not only by the overpowering urge to eat human flesh but also through racial discrimination, poverty, abandonment, and addiction. I couldn't help thinking about Decentralized Autonomous Organizations, or DAOs, and their worlding potential for better or for worse, after I watched this film. But let me unpack the narrative for you first.

Set in the '80s, the film depicts one of the lead characters, Maren, making her way across the American Midwest in the hope of finding her mother, who may be able to explain the violent epigenetic material that keeps her alive. Maren comes into contact with a number of power structures both old and new that reside in this unspeakable endurance test—a lust for human flesh on her journey, including the act of falling in love itself. Another hurdle that is particularly telling is her anguish at actually eating human flesh and at how some eaters create codes of conduct and ethics—one eater has learned to sniff out those who are dying, so he can feast on them in their last moments only—and how they band together as a nomadic community, linked by cause and effect. An older eater tells Maren they will look after her if she keeps to the rule "don't eat an eater." They of course are not the only players in the cannibalism field: There are also eaters who enjoy the hunt, who use sexuality to lure their prey, and who even turn humans who don't need flesh to survive into flesh-hobbyists and fetishists.

This mixture of agendas that tap into alienation, charisma, and taboo whilst simultaneously being practiced by a decentralized community—at times we could call them anonymous actors banded together with the faith, since they can survive longer together than alone—made me think about Decentralized Autonomous Organizations (DAOs) and how community and capital have left us with no alternative but to siphon off into smaller frameworks of governance in order to survive in our changing world. You don't always know with whom you will have to survive… nor do you know when they will turn on your best-laid plans of operational trust.

Two quotes come to mind here that aptly draw the battlefield lines of the now, exploring the communities we fall into, the veiled wars we live inside and the demand for insurrectionary worlding.

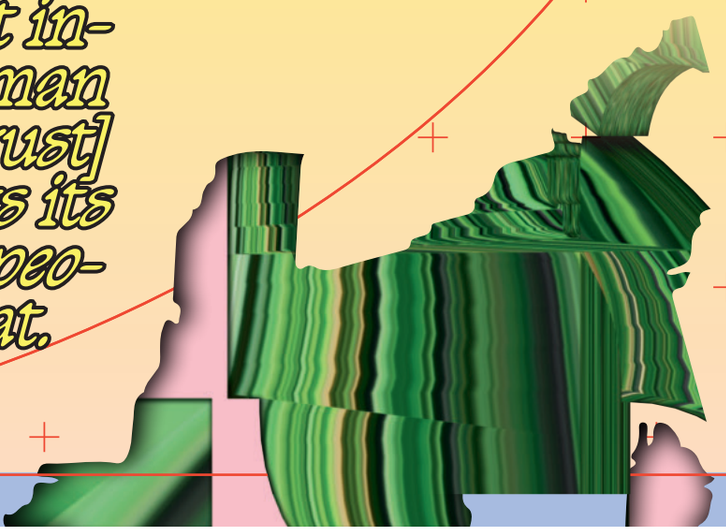
"Yes, it's night and another world is rising.
Harsh, cynical, illiterate, amnesiac, revolving
without reason… Spread out flattened,
as if perspective and vanishing point have
been abolished…
And the strange thing is that the living
dead of this world are based
in the world before…"

Philippe Sollers, cited in Jean-Luc Goddard, Histoire(s) du Cinema and Tiqqun, The Cybernetic Hypothesis[2]

"We choose to stay alive, against all odds,
because our lives matter. We choose to support
one another in living, as the act of staying alive
is a form of world-building."

Legacy Russell, Glitch Manifesto[3]

It is after all a human problem that has often been forgotten or optimistically avoided when we develop new technologies that interface with human complexity. …[Trust] often only shows its true face when people decide to eat.



Ok, but why bring in blockchain technology? Well, the potential I have always seen in DAOs is in their ability to bring back decision-making arenas to disenfranchised communities that can act alone or can be micro-gridded through connective cultural nodes; they allow individuality and solidarity to thrive simultaneously, over universality and scalability. I believe strongly in this technology being linked to a Web3 interface because of the functions of transparency, opacity, and how crypto can move. This may seem contradictory if you only tap into the decentralized finance articles surrounding these technologies. So let me back this up with history and examples of use.

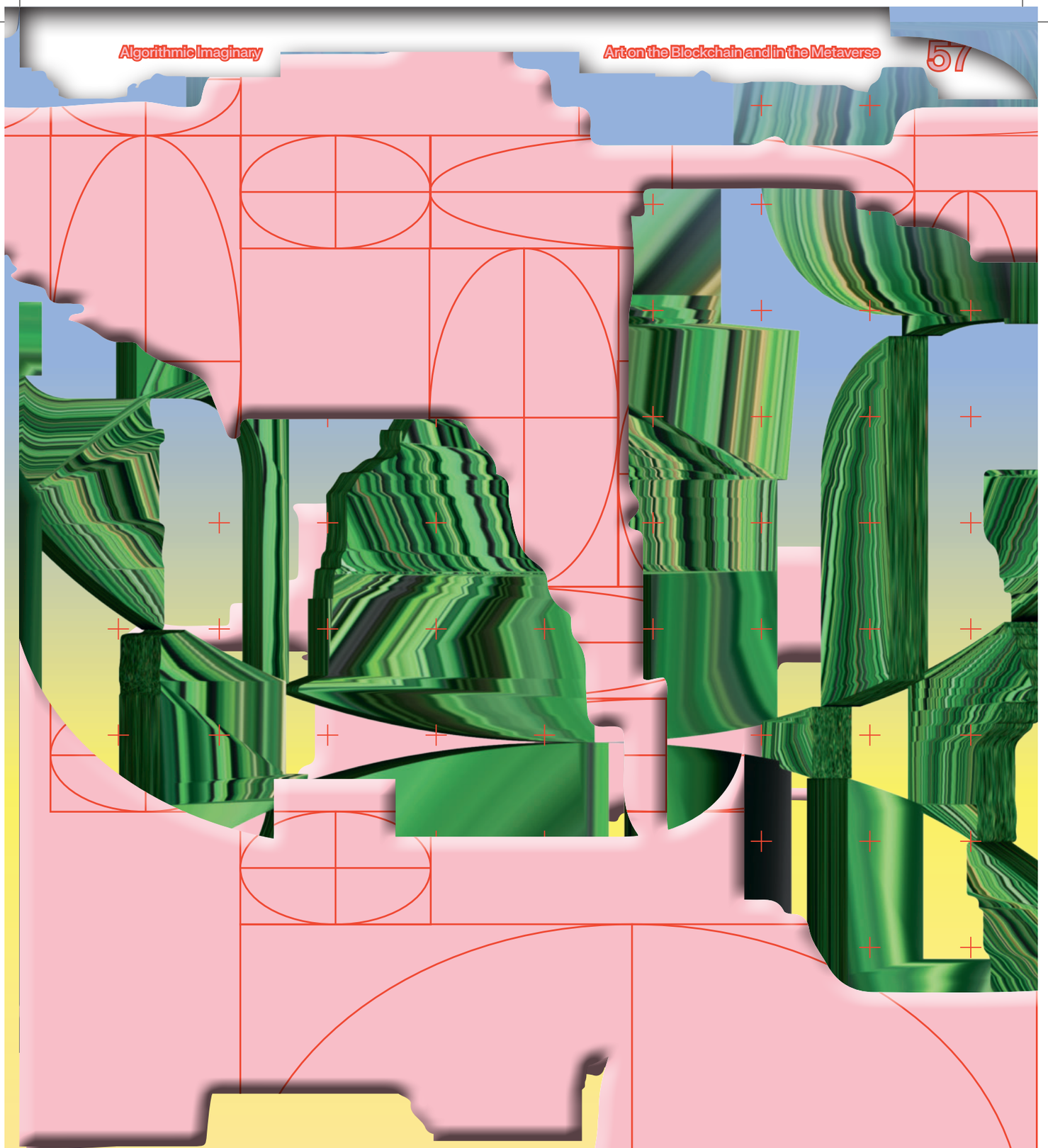
So... The original DAO—simply called The DAO[4] (released in 2016)—was initially meant to operate like a venture capital fund for crypto and decentralized space. In the eyes of the founders and group that surrounded it the lack of centralized authority was expected to reduce costs and in theory provide more control and access to the investors. In essence, The DAO allowed a group of people, token holders, to pool money that could fund different projects led by token holders. Speaking to the old models of communes, you can do more together than alone, with less personal risk, plus you get to do it with like-minded individuals. This mode of organizing has historically been deemed to be the most progressive and destructive decision-making arena: We know where human dreams, purposes, and desires interact and contend with structural necessities and political agendas.

New software systems such as DAOs allow this old practice to be coded and deployed through the blockchain, which means any number of resources can be pooled and distributed. This can result in a multiplicity of use cases such as shared ownership of artworks being produced and owned, as in the case of Fingerprints DAO,[5] or a political action being funded such as the Ukraine DAO[6] conceived by Pussy Riot's Nadya Tolokonnikova. The possibilities are endless and are inherently linked to political belief, desire, and articulation.

I want to stress this linkage to belief and action because of the software's political flexibility. Think of a term that circulates Web3 discourse: "lack of a centralized authority." This could be to the advantage of a deregulated free market, an idealized cognitive model of an economic system without the intervention of government or any other external authority. Yet the term "lack of a centralized authority" could also mean grassroots leftist community organizations could hold and distribute resources that they have pooled under a fascist regime or in the absence of a government. When these organizing mechanics are built on Web3 they also have censorship resistance built in, ensuring that a transaction will go through as long as all the set criteria on the smart contract are met. This ensures that no government or organization can influence or alter transactions on a blockchain, regardless of the amount of power they wield. This means right-wing groups can fund coups but also that sex workers can be paid even when political or religious powers make their work illegal. It also would stop the ability of major credit card businesses to stop processing payments based on political interest—such as in 2010, when Visa and Mastercard stopped all donations to WikiLeaks via their only direct credit card payment line, located in Iceland.

For all the pros you have cons. This tool, a DAO, has slippage, No, it is not a savior, nor could it be our final downfall per se.

But coming back to the film, in one of the final scenes of *Bones and All* Maren utters the words to Lee, "All I know is I love you." These simple words make everything she/we do have a trajectory, a reason, a cause; they make things unreasonably clear-cut. Yet how do we know we love the right ones? We can be deceived by others' hunger, by others' demands, needs, traumas, and egos. A DAO won't help with that, it doesn't automatically enable us to trust each other, nor does it eliminate bad actors: As Paul Seidler remarked, "Trust is not a technical problem."[7] It is after all a human problem that has often been forgotten or optimistically avoided when we develop new technologies that interface with human complexity. Trust is not consistent, therefore it's hard to chart. Trust is not always broken, nor does it affect every member of a group in the same way, given their different stakes and different principles. It often only shows its true face when people decide to eat.



(1) https://www.theguardian.com/news/2019/feb/25/modern-slavery-trafficking-persons-one-in-200

(2) Tiqqun, The Cybernetic Hypothesis. Los Angele: Semiotext, 2020

(3) Legacy Russell, The Glitch Manifesto. London and New York City: Verso Books, 2020

(4) The DAO was a digital decentralized autonomous organization and a type of investor-directed venture capital fund. After launching in April 2016 via a token sale, it became one of the largest crowdfunding campaigns in history. The DAO aimed to provide a new decentralized business model for organizing both commercial and non-profit enterprises. It was instantiated on the Ethereum blockchain and had no conventional management structure or board of directors. The code of The DAO is open-source. https://en.wikipedia.org/wiki/The_DAO_(organization)

(5) Fingerprints DAO is focused on curating, collecting, and promoting smart contracts as art. While doing this, we believe we'll also build one of the most valuable DAO treasuries over the next decade and provide a framework for other DAOs to follow. https://fingerprintsdao.gitbook.io/fingerprints-dao/

(6) A decentralized autonomous organization (DAO) has formed to raise money for Ukrainian soldiers facing down the Russian army. UkraineDAO, a fundraising effort coordinated by members of the investment group PleasrDAO, the non-fungible token (NFT) studio Trippy Labs, and the Russian art collective Pussy Riot, has already raised over $3 million in Ethereum-based tokens. The project is taking cues from other politically minded fundraiser DAOs, such as AssangeDAO (supporting embattled WikiLeaks founder Julian Assange) and ConstitutionDAO, which tried (and failed) to purchase an original copy of the U.S. Constitution at auction. https://www.coindesk.com/tech/2022/02/27/new-dao-raises-3-million-in-eth-for-ukrainian-army/

(7) Roundtable on Aesthetics of Trust with Ed Fornieles, Sarah Friend, Paul Seidler, and Sam Spike. Moderated by Laura Lotti and Penny Rafferty for communication +1 Journal, conducted via Zoom (April 13, 2023).

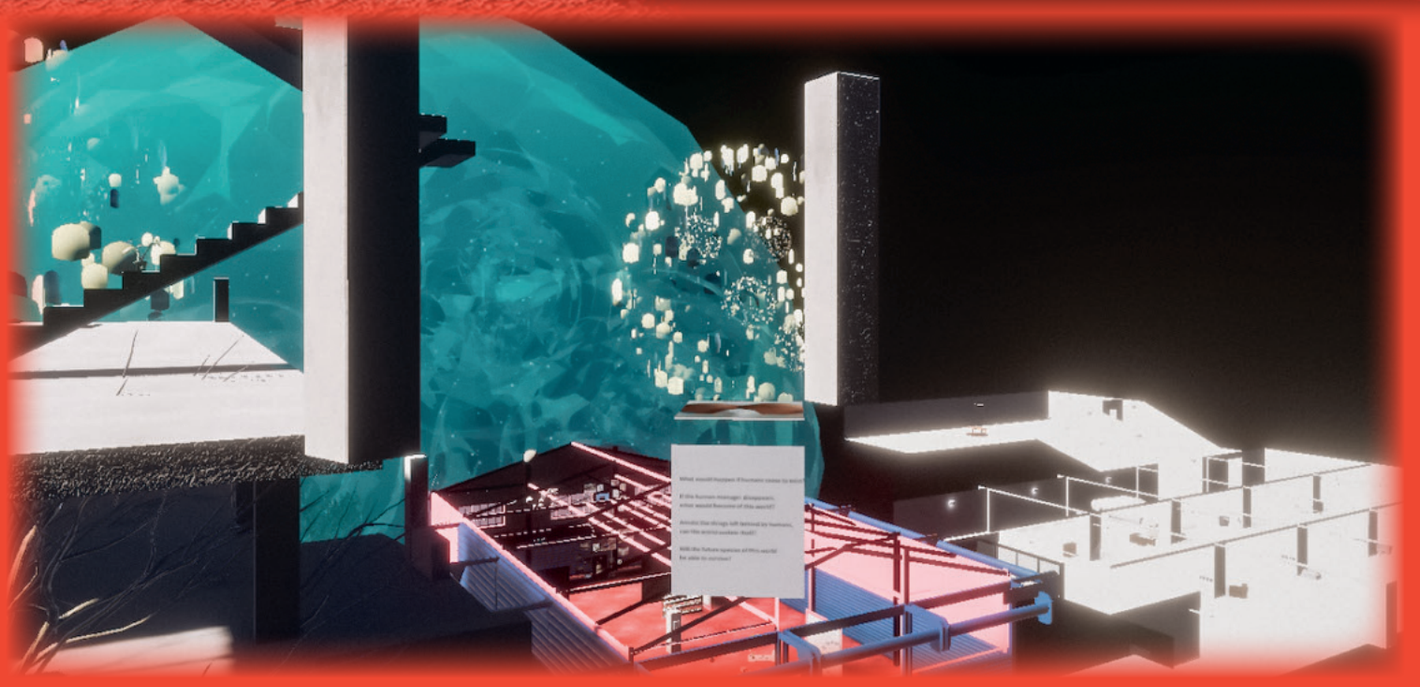
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LOOPNTALE

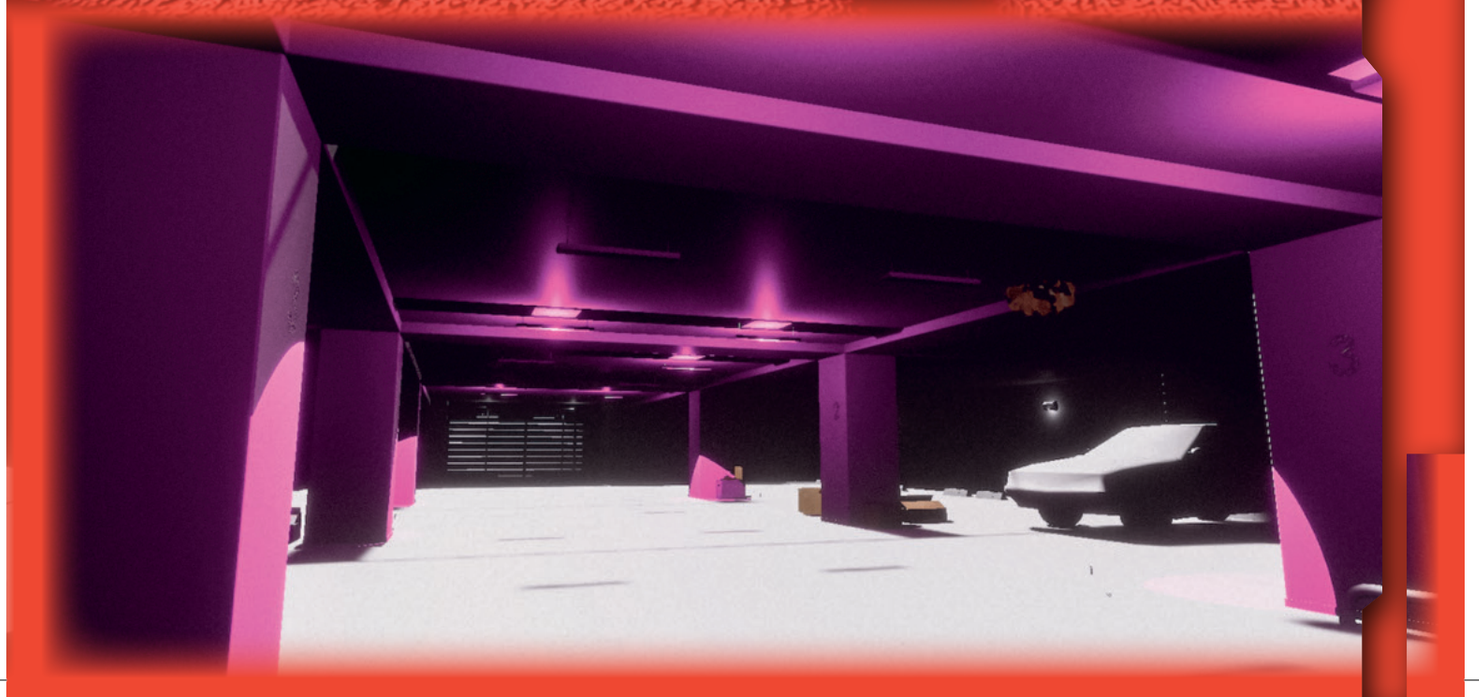
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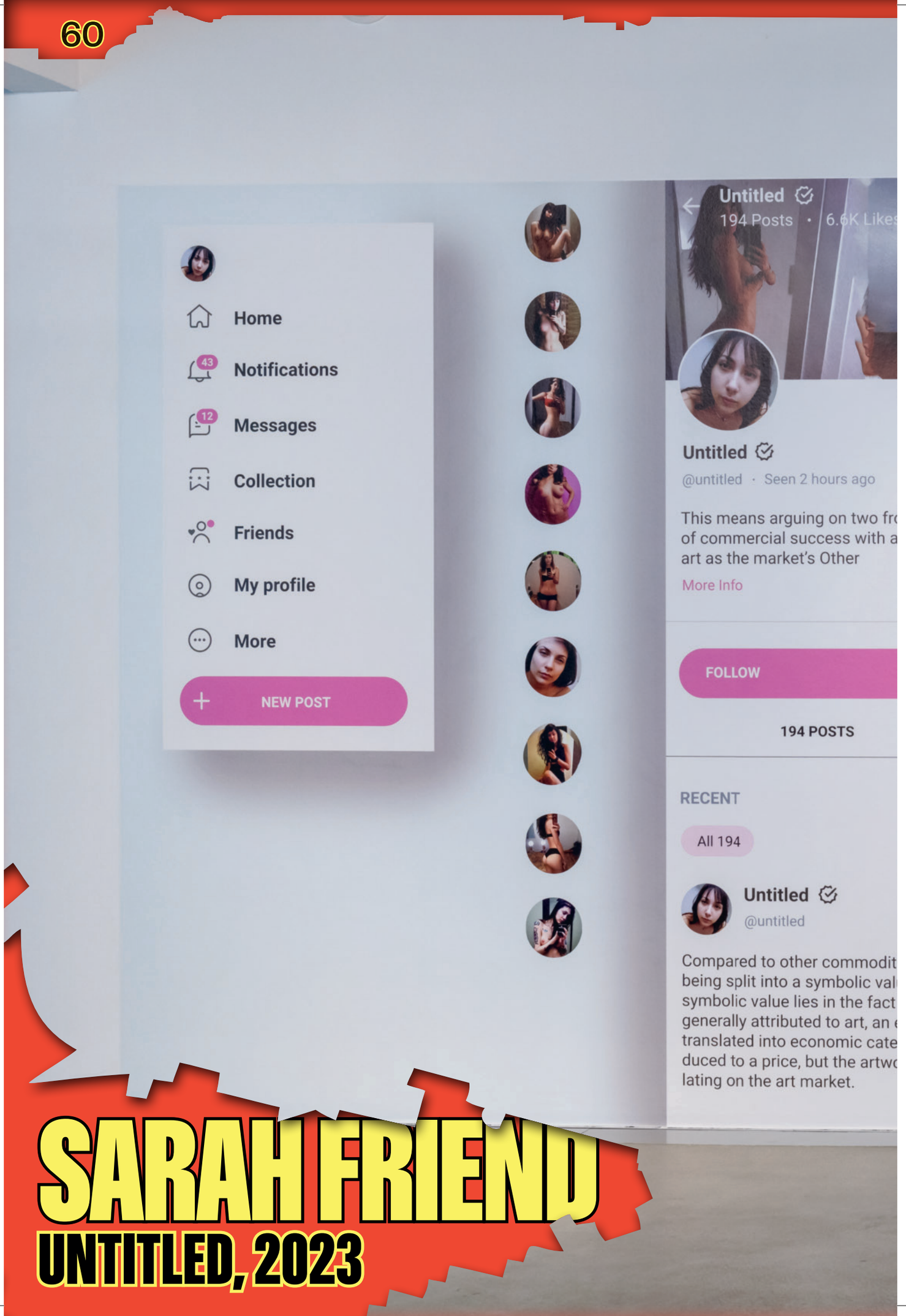
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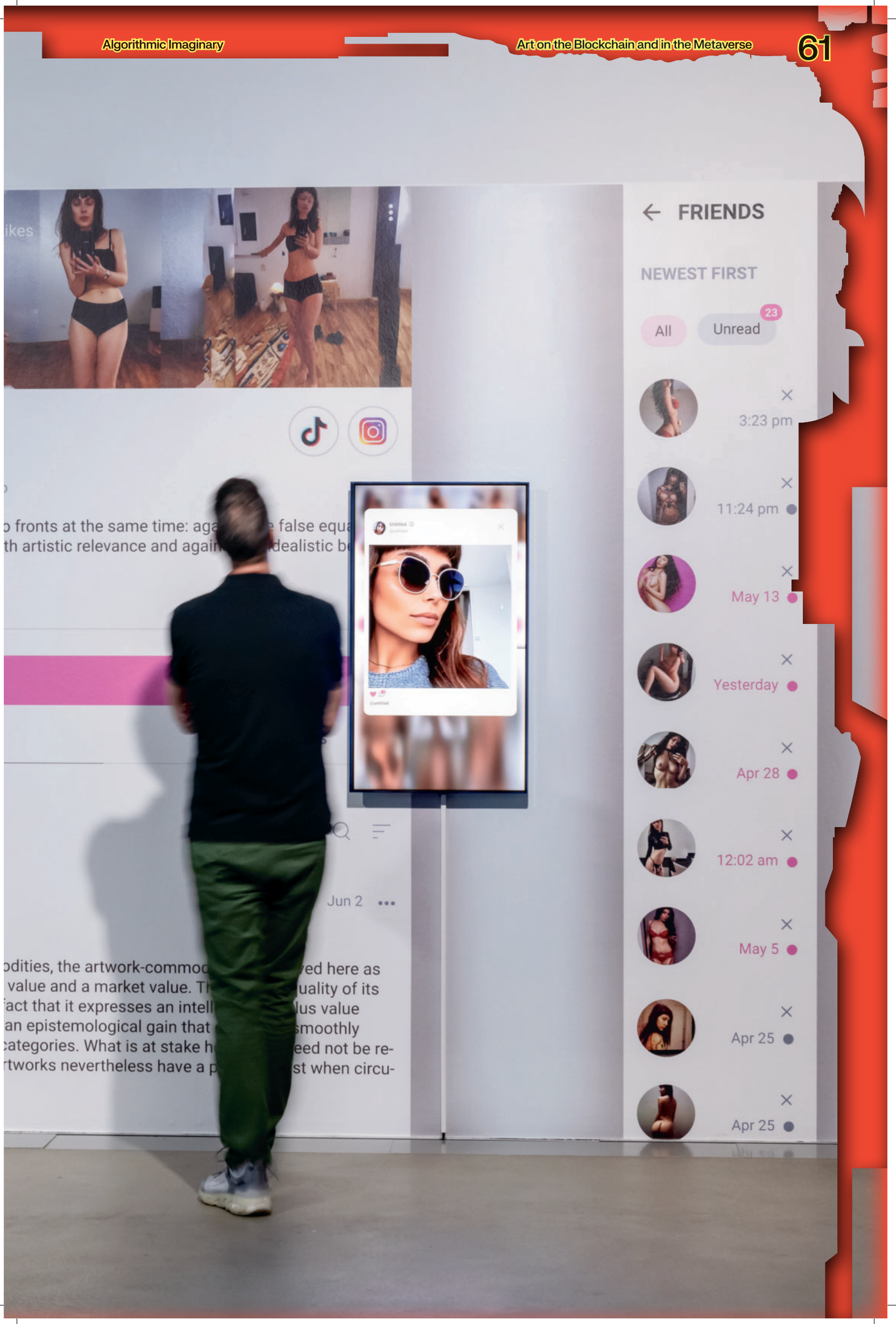






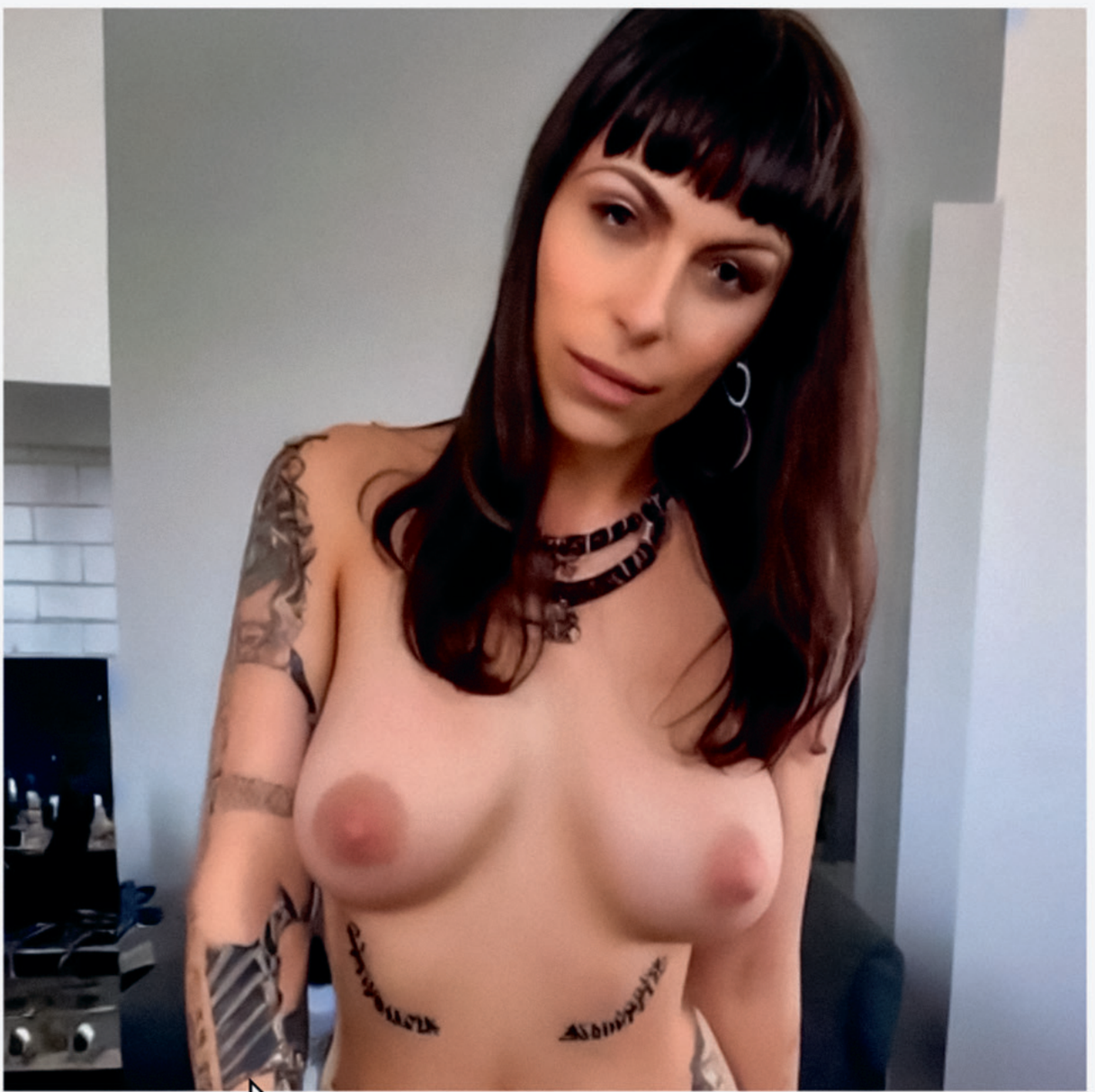
SARAH FRIEND

UNTITLED, 2023

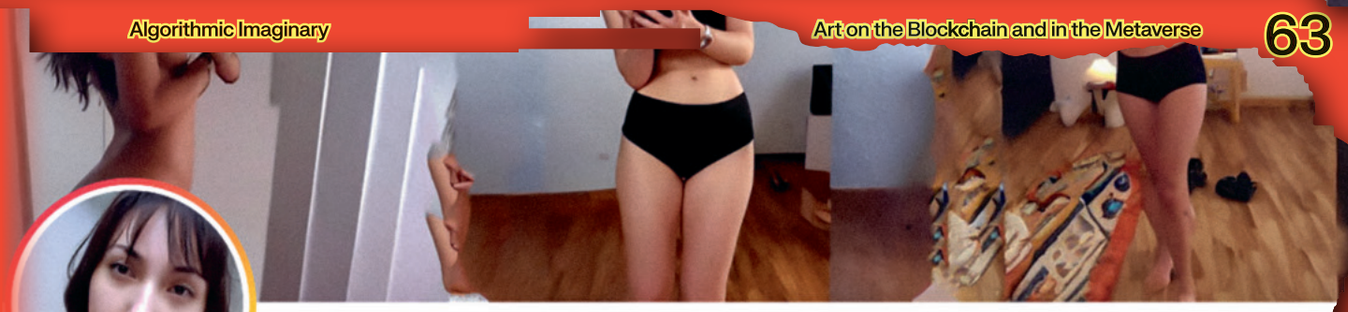

FRIENDS
NEWEST FIRST
All
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3:23 pm
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Apr 28
12:02 am
May 5
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Apr 25
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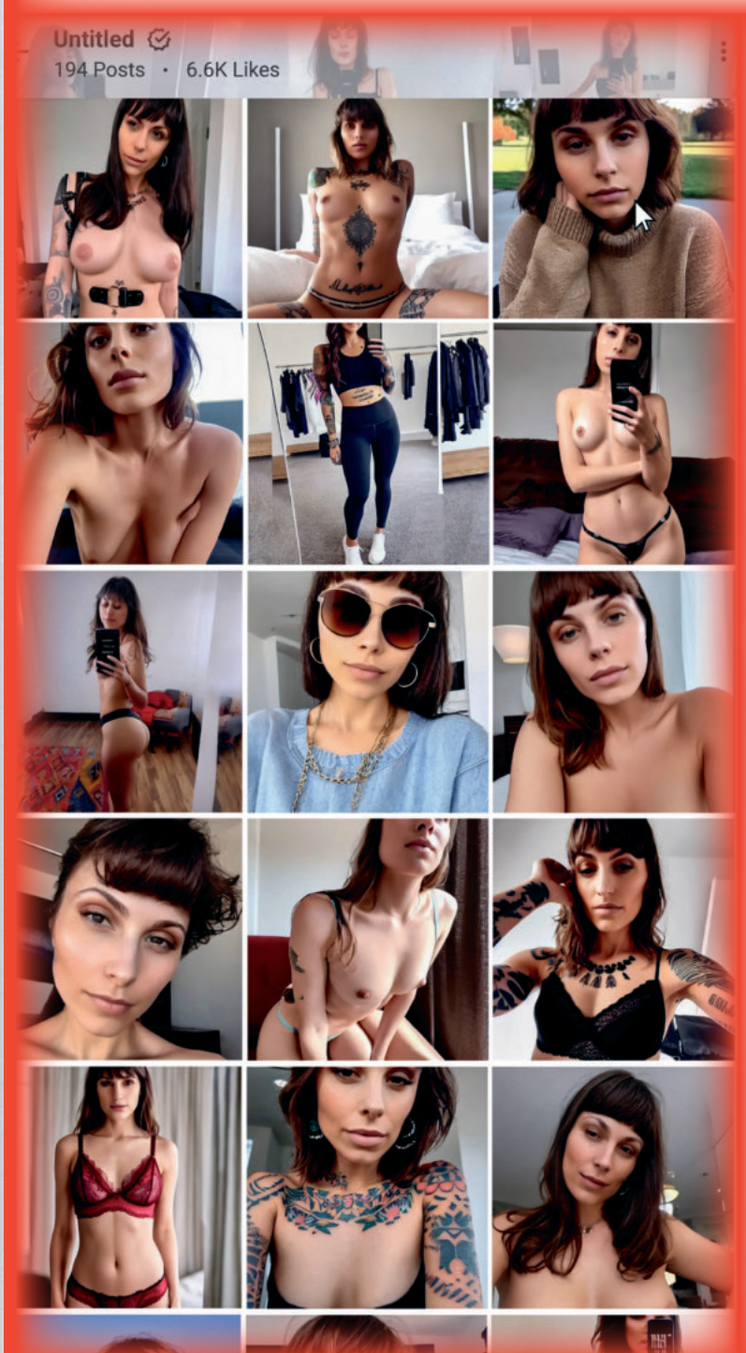
@untitled Why should our bodies end at the skin, or include at best other beings encapsulated by skin? From the seventeenth century till now, machines could be animated—given ghostly souls to make them speak or move or to account for their orderly development and mental capacities. Or organisms could be mechanized—reduced to body un-der-stood as resource of mind. These machine/organism relation-ships
Read More



Untitled

@untitled · Seen 2 hours ago

This means arguing on two fronts at the same time: against the false equation of commercial success with artistic relevance and against the idealistic be art as the market's Other









Lifeform #1

A garden requires patient labour and attention

Age: 732 days 16 hours 2608 seconds

GIVE

Lifeform #1

A garden requires patient labour and attention

Age: 732 days 16 hours 2593 seconds

GIVE

GOOD DEATH, 2023

About lifeforms



Lifeform #1

A garden requires patient labour and attention

AGE: 0 days 23 hours 698 seconds

GIVE

Lifeform #2

A system requires gentle support and maintenance

AGE: 0 days 23 hours 666 seconds

GIVE

Lifeform #3

A companion requires mindful observation and understanding

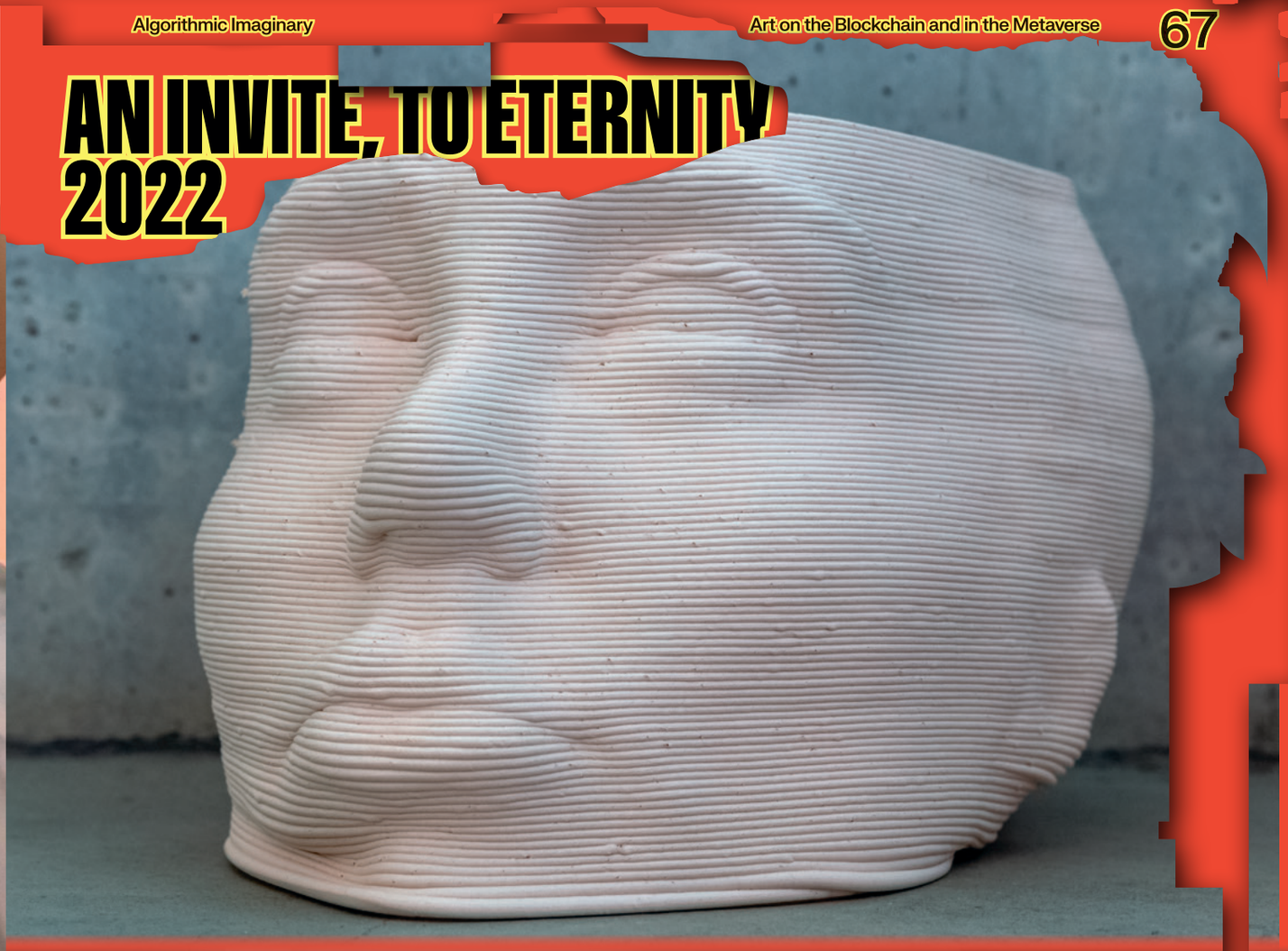
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GIVE



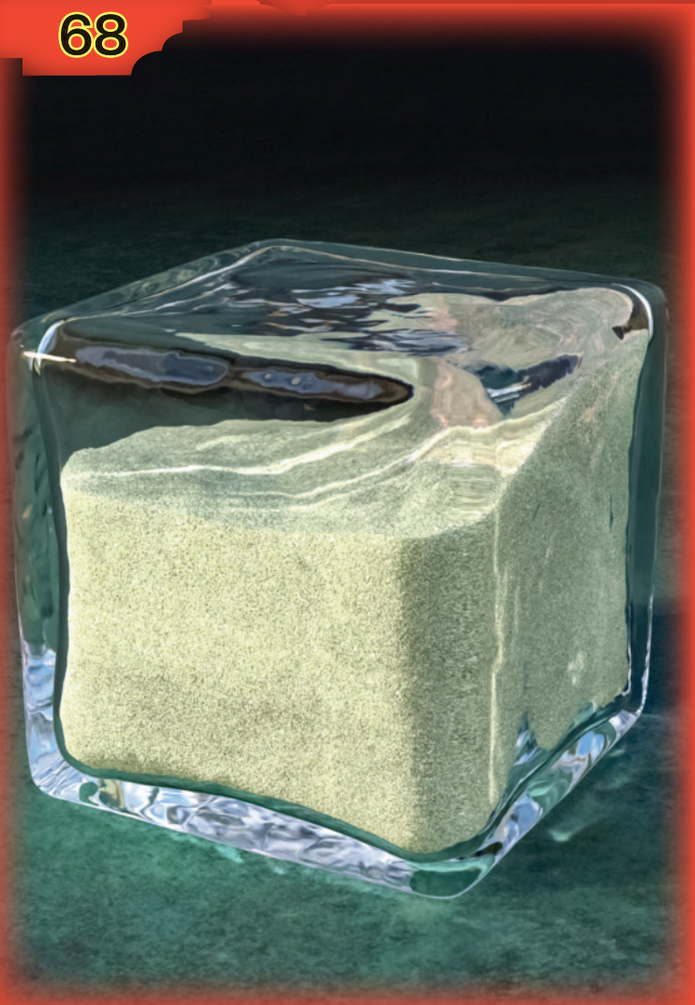


AN INVITE, TO ETERNITY 2022



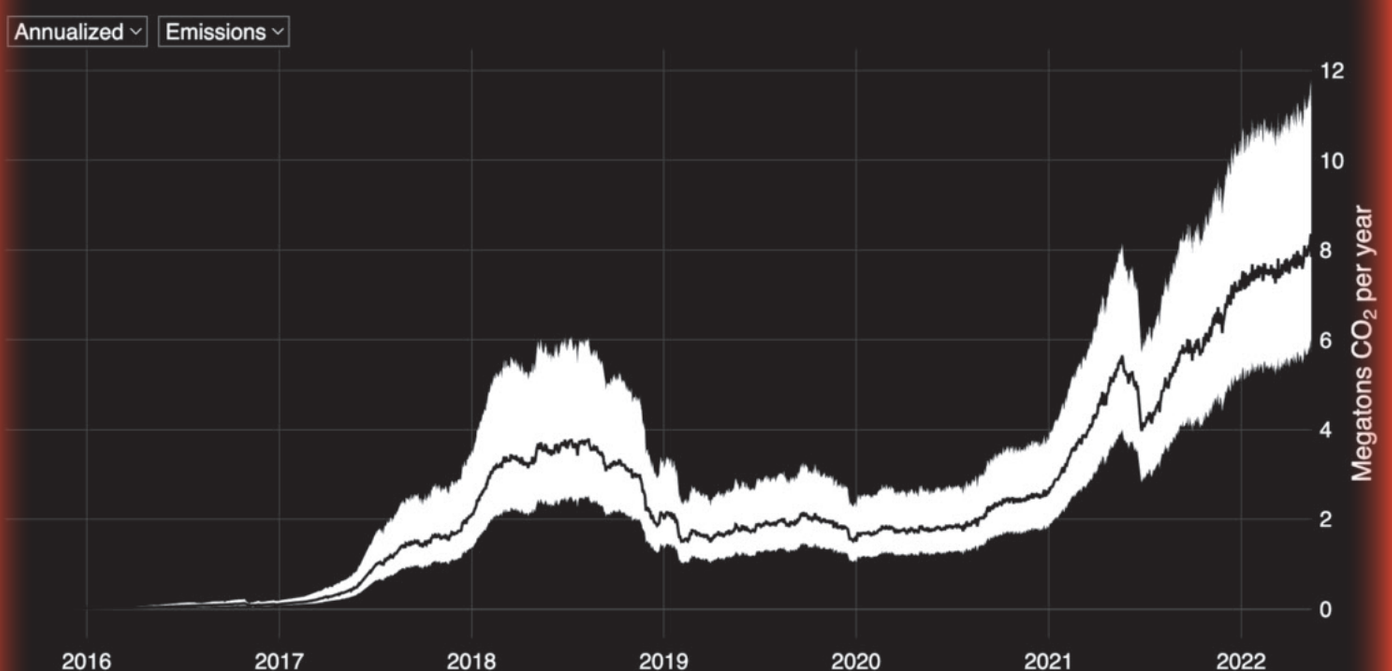


LEA ERMUTH





Ethereum Emissions: A Bottom-up Estimate



Emissions
21.5 $ktCO_2$/day
7.84 $MtCO_2$/year
15.7 $MtCO_2$ total

Energy
3.11 GW
27.2 TWh/year
51.5 TWh total

KYLE MCDONALD

AMENDS, 2022



Sabine Himmelsbach

Exploring the DECENTI

"Web3 is now part of our collective imaginaries, even if the specifics of what the buzzword entails remain murky and inaccessible to many."

Victoria Ivanova and Gary Zhexi Zhang (1)

The hype in the art market around digital art, triggered by the 2021 NFT boom, also lit up the concept of Web3. A term coined by Gavin Wood, co-founder of the Ethereum blockchain, it stands for a decentralized Internet ecosystem based on blockchain. The new blockchain technology carries the promise of increased decentralization, self-determination, and transparency. The pseudonymous Satoshi Nakamoto created the blockchain in 2008 in reaction to the banking crisis, as a mode of circumvention of the existing banking system. It is a decentralized, public database, comparable to a protected distributed ledger, which structures distribution and functions as a payment platform and authentication tool. The system allows the chronological adding of transactions to blocks of records, like endless links in a chain. Cryptographic mechanisms, such as hash functions or digital signatures, additionally ensure that all data added to the blockchain remains immutable, providing transactions with seamless documentation and proof against forgery. The blockchain's decentralized peer-to-peer structure eliminates the need for central administration. Technologically, this facilitates wider modes of control and an emancipation from the clutches of Web 2.0's established data and social media giants. Another breakthrough achieved by blockchain technology lies in its ability to provide digital works with certificates of authenticity, so-called NFTs (non-fungible tokens), therefore empowering artists—who previously had difficulty finding their place in the existing art market—to trade their digital art.

Given our electronic and digital art focus, and our growing collection of software and net-based media art, it was a matter of course for HEK (House of Electronic Arts) to explore the world of Web3 and find out more about the potential of decentralized technologies to enable greater participation. Since its emergence from the 2008 financial crisis, the blockchain has extensively affected our global economy and is reshaping our digital reality, a reality where art is being increasingly created, distributed, and exchanged. An interesting aspect in these

Friends of HEK DAO and other museum experiments

RALIZED WEB.

developments is the blockchain's structure as a global public ledger, not owned by any association but democratically managed by a collective of people using crypto wallets.

We asked ourselves how we might meaningfully employ and implement these technological developments in a manner beneficial to 21st century cultural infrastructures. As a cultural institution, we were curious as to how we could participate in actively shaping these changes, fostering our network and possibly even overcoming those unequal aspects of participation that are all too familiar from our physical world. HEK's critical interest in the question of how blockchain technologies impact our ecosystem led us to limit collector activities to NFTs mined on blockchains operating on the "proof-of-stake" principle, such as Tezos.(2)

"What blockchain does have to offer is to relearn, retool and re-educate ourselves in small test sites," as author and artist Penny Rafferty states.(3) To us, this relearning and retooling takes form as rethinking a cultural organization and offering content-related participation to a wider audience. This led us to found a DAO, a decentralized autonomous organization, as a token-based circle of people who support our work: the "Friends of HEK." The magic of DAOs lies in their facilitation of transparent and equal relationships on a global scale between artists, audiences, and institutions, thus promoting community building. Rules and values are accordingly implemented collaboratively.

Our intention in creating "Friends of HEK" was to build a token-based community interested in contemporary digital art and issues related to new technologies. At the same time, the digital platform opened a space for us to offer exciting content and opportunities for exchange to a broad audience. A token is the basic building block for operations with crypto assets and serves as a means of user identification and authentication within the computer network. Issuing a token allows its issuer to build and consolidate the value of a network or community through issuance and sale, and through participation. The token is used for social interaction and enables holders to contribute valuably to the network, in this case HEK. In recent months, as blockchain technology continues to develop rapidly and take root, numerous international, non-local communities have emerged, whose membership is defined by the ownership of blockchain-based tokens. An interesting example of a token-based community akin to ours, where tokens are also used to enable collaborative action, is the CultureStake project created by London's Furtherfield organization. The CultureStake platform invites anyone to actively participate in the cultural organization's decision-making processes, for example to have a say in the realization of local art projects in London's Finsbury Park.(4)

In the meantime, numerous DAOs have emerged that collect or curate art together, such as the Unicorn DAO[5] or the Black Swan DAO, an artist-initiated platform dedicated to distributing resources to cultural workers and therefore fostering a possible alternative as cultural work becomes increasingly precarious.[6]

Of course, as an institution, we were aware that the social challenges we face require much more than a technical fix. However, the knowledge that technology alone cannot change the world for the better has not diminished our intent to infiltrate Web3's emerging Internet economy with our own activities as a cultural institution. In the words of researcher and curator Martin Zeilinger: "Artists and creative communities have an opportunity to help shape blockchain technologies in ways that challenge conventional perspectives on private property and the enclosure of cultural commons, rather than feeding into them."[7] In the development of the HEK DAO we found our corresponding challenge in being as inclusive as possible and enabling wide membership. Blockchain technology is undeniably complex and not everyone is willing to create a wallet to manage their crypto tokens. Hence, we decided on a system that allows membership to people with or without a crypto wallet. For the latter members, the token is "managed" by the institution, with participation and voting taking place via e-mail in direct exchange with the HEK team. To ensure wide participation, we launched an extensive outreach program, for example by initiating "KryptoBrunches" where people can informally gain insight into the complex world of cryptocurrencies, blockchain and NFTs from the perspectives of participating artists. Members with a crypto wallet independently manage their token and cast their vote via the DAO Discord channel. Central to this is member involvement with regard to certain goals: in our case the promotion of digital art and enabling of visibility and participation in the HEK network. To this end, calls invite the community to propose artists for online projects commissions. An initiative to swarm-curate an exhibition for our online exhibition platform virtual.hek.ch is one of the projects we plan to implement via the DAO. Most activities take place via the specialized Discord channel rather than directly on-chain.

In conjunction with the development of HEK DAO, we launched the aforementioned virtual.hek.ch, a digital exhibition platform that also serves as a social space, based on the common.garden[8] platform designed by Constant Dullaart. NFT editions, which HEK has been distributing since 2022, are another new feature. For example, members of the digital circle of friends are given a say in the realization of digital programs and definition of preferential terms in relation to the purchase of NFT editions.[9] Our intention is to set

(1) Victoria Ivanova and Gary Zhexi Zhang, Future Art Ecosystems: Vol 3. Art x Decentralised Tech. London: Serpentine R&D Platform, 2022, p. 7.

(2) Only since Ethereum's move from "Proof of Work" to "Proof of Stake" in September 2022 have we begun collecting works traded on Ethereum.

(3) Penny Rafferty, in Victoria Ivanova and Gary Zhexi Zhang, Future Art Ecosystems: Vol 3. Art x Decentralised Tech, London; Serpentine R&D Platform, 2022, p. 38.

(4) https://culturestake.org/

(5) https://unicorndao.com/, https://medium.com/@wac-lab/how-unicorndao-collects-curates-and-exhibits-work-for-social-change-c4c64b20d6b4

(6) https://blackswan.support/

(7) M. Zeilinger, Digital Art as "Monetised Graphics": Enforcing Intellectual Property on the Blockchain. Philosophy & Technology, 31, 2018, p. 15–41 https://doi.org/10.1007/s13347-016-0243-1

(8) https://common.garden/

(9) Previous NFT editions were published via the objkt.com platform and mined on Tezos.

(10) Our workshop with the aforementioned Black Swan DAO was particularly helpful here.

(11) https://wac-lab.xyz/wac-fellowship

(12) Domenico Quaranta, The Byzantine Generals Problem, exhibition brochure, 2022 https://aksioma.org/pdf/Domenico-Quaranta_The-Byzantine-Generals-Problem.pdf

The blockchain and Web3 have brought utopia back and given us a future once more, and it doesn't even look too dire.

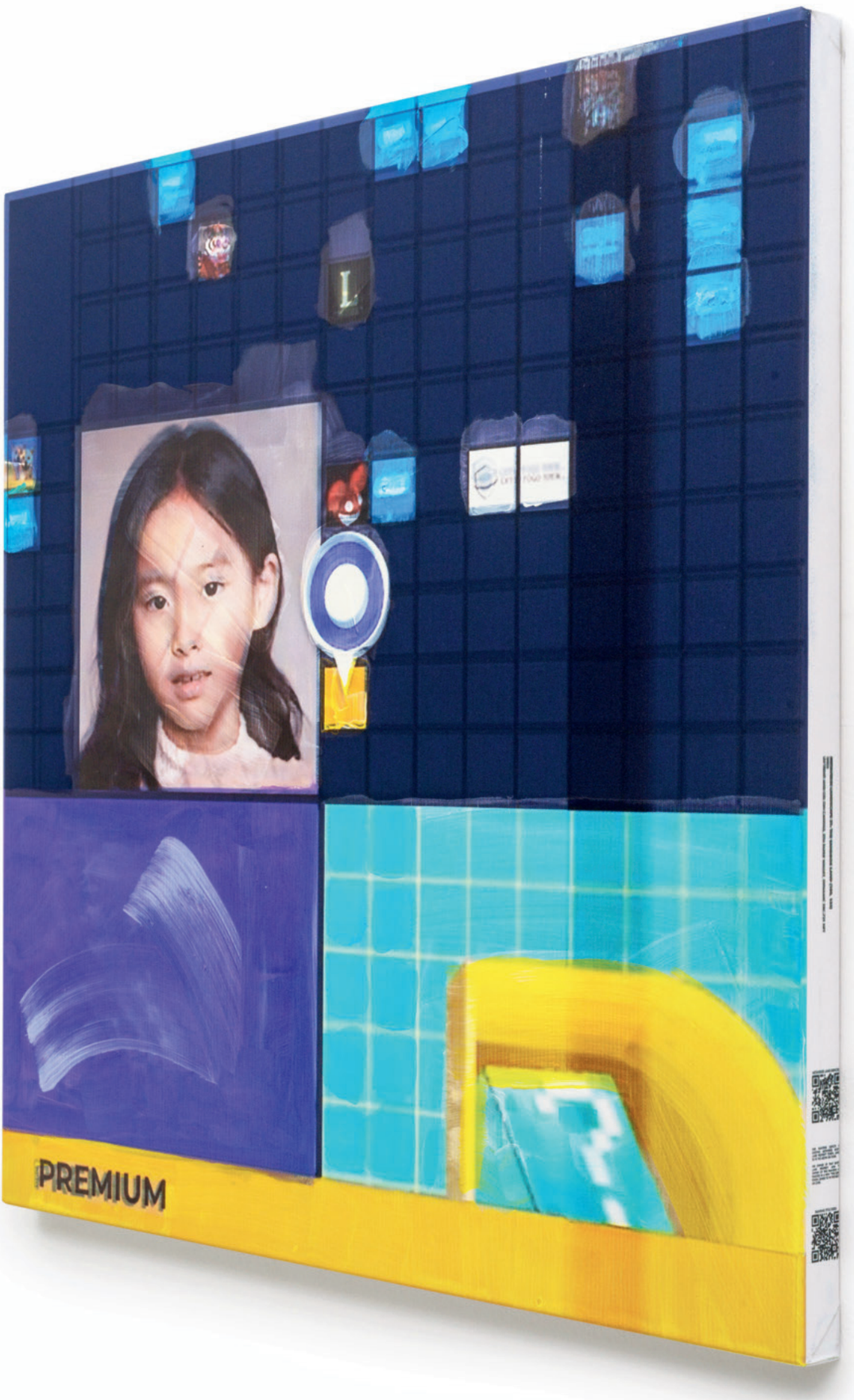
up structures in our cultural institution that enable active exchange with digital communities, inviting people to engage culturally, and respectively inviting various forms of their support into our network. The process of engaging with and setting up these new forms was transformative and involved all HEK team members. Our many workshops(10) helped us to shape the process collaboratively and increase our knowledge of the Web3 ecosystem, through participation in the WAC Fellowship (WAC=Web3 for Art and Culture) sponsored by We-are-Museums and the Tezos Foundation, which enabled us to implement an NFT shop on our existing website.(11)

Author, curator, and art critic Domenico Quaranta claims: "[T]he blockchain and Web3 have brought utopia back and given us a future once more, and it doesn't even look too dire."(12) We are aware of HEK DAO's initially experimental character, and of how it takes time and energy to build an online community. Nevertheless, the opportunity a DAO offers as a means for collective reflection on the future of cultural institutions and practitioners, for participation and for experimentation with new formats and approaches, is undeniable. Web3's tools could enable us to interact in more equitable ways than those offered by the centralized platform models of Web 2.0. The near future holds promise of many changes and developments. As a cultural institution, we are keen to participate in shaping these ongoing processes and enable the creation of more equitable and inclusive models of contribution and participation, collaboratively deciding what is meaningful and interesting in the community of digital artists.



SIMON DENNY

METAVERSE LANDSCAPE, 2023


PREMIUM





SIMON DENNY, GUILE TWARDÓWSKI, COSMOGRAPHIA

DOTCOM SÉANCE, 2021


POPULAR
POWER
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2000-2001
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RHEA MYERS

This token is not art

IS ART (TOKEN), 2023

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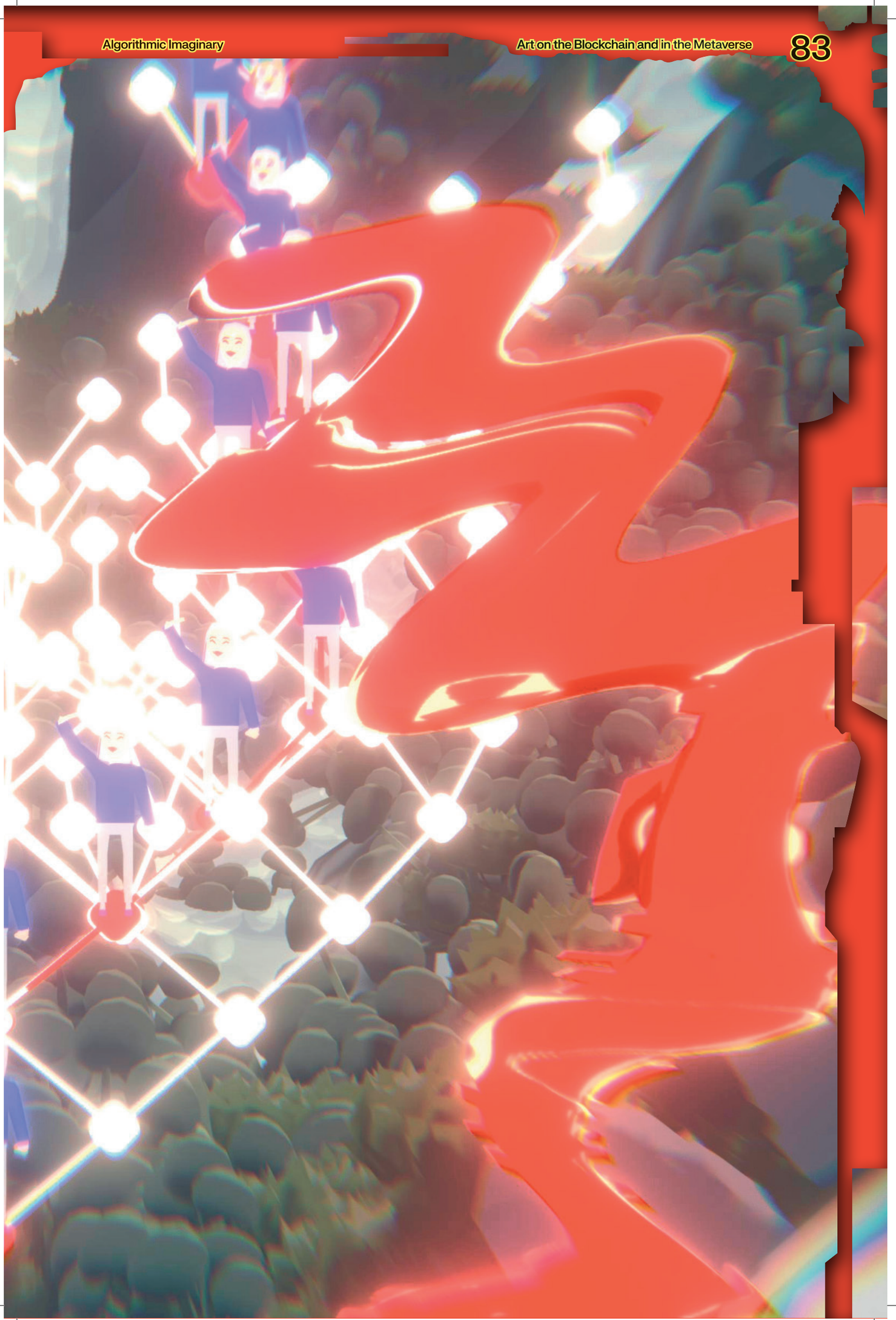
TYPE OPPOSITE IMAGES, 2023

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LIFE AFTER BOB: THE CHALICE STUDY, 2021-22



IAN CHENG













Tina Rivers Ryan

Trustworthy and Trustless: Museums and DAOs

In 2021, the American Alliance of Museums surveyed more than 1,200 American adults—representing the country's entire adult population—about the trustworthiness of museums, including art, science, and history museums. As the final report summarized, "*Museums and Trust 2021* confirms that the public continues to regard museums as highly trustworthy—ranking second only to friends and family, and significantly more trustworthy than researchers and scientists, NGOs generally, various news organizations, the government, corporations and business, and social media. For respondents who had visited a museum in the past two years (one-quarter of respondents), *museums are the number one trusted source of information.* This high level of trust is consistent for museums of all types, from art museums to zoos. The top three reasons cited as contributing to this trust are that museums are fact-based, present real/authentic/original objects, and are research-oriented."(1)

While geographically limited and already somewhat outdated, this study provides a useful starting point for thinking through the future of museums in the wake of decentralization—and perhaps the future of a decentralized art world more broadly.(2) Over the past few years, the idea of decentralization has been embraced by the so-called Web3 community, which promotes using blockchains to make immutable records and automated transactions in the service of greater transparency. Blockchain technologies are often referred to as "trustless," in the sense that transacting through a blockchain supposedly does not require us to place our trust in third-party verifications; they are therefore nherently opposed to traditional centralized organizational structures, which are seen as untrustworthy.(3) During the popularization of blockchain-based cryptocurrencies and NFTs in 2021, many voices in the community even called for museums and other hierarchical "gate-keepers" in the art world to be eradicated. Some proposed a shift towards Distributed/Decentralized Autonomous Organizations (DAOs): groups of interdependent people who use decentralized technologies or structures (such as token-based quadratic voting systems) to work cooperatively towards a common goal. As early as 2018, a Berlin-based collective of creatives launched the Black Swan DAO, envisioning "a cosmos where wider communities and collectives of creative practitioners, not art bureaucrats sitting aloft of the community, benefit from the value created by their practices."(4) In practice, this looks like "peer support, artist-led funding and commu-

nity decision-making" (none of which necessarily rely on blockchain technologies) that "places resources into the hands of the users rather than the gatekeepers of the arts," while in theory, it models a new concept of "organizational bodies as something that are fluid, mutable and adaptable, and that shift the ecology within which art is created," as Black Swan co-founders Laura Lotti and Calum Bowden have argued.(5)

To summarize: the general (American) public finds museums incredibly trustworthy, considering them to be citadels of authenticity and facts backed by neutral experts, while many in the Web3 community embrace the maxim DYOR (Do Your Own Research) and distrust museums precisely because they are centralized organizations that monopolize trust. It may be tempting to dismiss this attitude as resulting from grievance: of course artists and art workers who have largely been ignored or preyed upon by the establishment would decide that it must have been corrupted (whether by money, ignorance, or bias), and should no longer be trusted. But it is just as likely that this attitude results from traumatic experiences with exploitation and hypocrisy in the "traditional" or "mainstream" art world: as the saying goes, trust must be earned. If anything, the division of opinion over museums reveals that the approach to earning trust depends on the community to which one appealing: Do you hire experts who work with authentic objects and conduct research, or do you enact protocols that allow "wider communities and collectives of creative practitioners" to "benefit from the value created by their practices"?

The irony here is that museums already somewhat resemble blockchains, in the sense that they offer (theoretically) permanent and immutable storage of cultural heritage that is geographically distributed across a network of individual nodes. More to the point, most museums and other legacy cultural organizations were thinking long and hard about the concepts of community and trust long before DAOs gained traction. Whose stories do museums tell, and who gets to tell them? What kinds of value do they create for their artists, audience, staff, and donors? How can they operate according to the principles of sustainability instead of extraction? Perhaps asking (and even addressing) these questions is too little, too late; not everyone is happy to see incremental change when the crises that artists and other cultural workers face are so dire. At the very least, we might admit that they are justified in asking more of museums.

At the same time, in this age of rampant anti-intellectualism masquerading as populism and a renewed Californian Ideology that presents technological silver bullets to solve every social problem, it seems prudent to ask: Who stands to benefit most from the erosion of public trust in our most civic organizations? What concept of democracy is served when someone advocates that a museum operated by an accredited non-profit organization or the government—holding works in trust for the public, subject to legal and financial oversight, and beholden to the ethical guidelines of professional organizations, at risk of censure—should be replaced by a DAO comprised of private citizens who, as the Black Swan member Penny Rafferty acknowledges, may participate in group

For either to earn our trust, they need to continually define their terms and defend their motives. ...[T]rust is not simply the product of technological protocols (no matter how transparent), but also of a "social layer" of legal and professional codes and specialized knowledge bases.

voting without pursuing true "horizontal decentralization"—if they bother to vote at all, given the notoriously thorny problem of incentivization?(6) This is to say nothing of the fact that the voting mechanisms of DAOs can symbolically or even literally link democratic representation to the holding of (digital) property and suggest a future in which society is atomized into cliques sorted by vibes, leading Hito Steyerl to bluntly assert that "DAOs reflect sunken social horizons."(7)

In the end, we need to ask more of museums and we need to ask more of DAOs (and of emerging technologies more broadly). For either to earn our trust, they need to continually define their terms and defend their motives. In the meantime, the rhetoric of decentralization helpfully reminds museums that the pursuit of democracy or equity is procedural as well as symbolic: they need to attend to the politics of the protocols or mechanisms that they put into place, and not just the politics of their stated goals.(8) Conversely, museums and the incredible trust that they have earned from the public might encourage the Web3 community to consider how trust is not simply the product of technological protocols (no matter how transparent), but also of a "social layer" of legal and professional codes and specialized knowledge bases.(9) Hopefully, a future arts ecosystem of both "trustless" museums and "trustworthy" DAOs is closer than it appears.

The writing of this essay was supported in part by The Andy Warhol Foundation Arts Writers Grant.

(1) American Alliance of Museums. "Museums and Trust 2021," https://www.aam-us.org/2021/09/30/museums-and-trust-2021/.

(2) This essay attempts to answer questions I first put forward in my "Curator's Note" for the Fall 2022 exhibition Peer to Peer: "How might our institutions change if we imagine them not only as centralized repositories, but also as a kind of cultural protocol facilitating the open exchange of ideas between artists and their contemporary peers, historical predecessors, cultural workers, and public audiences? We may then also want to ask the inverse about the future of technology: How might blockchains change if we imagine them not simply as autonomous agents of decentralization that will make existing institutions obsolete, but also as public infrastructures embedded within—and accountable to—the larger social sphere?" See Tina Rivers Ryan, "On the Museum as Cultural Protocol," FeralFile.com. https://feralfile.com/exhibitions/peer-to-peer-pjb/note.

(3) Even if one agrees that legacy organizations might be untrustworthy, one should remain skeptical regarding the supposed transparency of a technology that is plagued by both scams and the Oracle problem (that is, the problem of how one determines that the information entered into the blockchain is accurate in the first place)—which are challenging in no small part because the community values anonymity.

(4) Black Swan, "Simulating Equitable Art Worlds: DAOs through a role-played lens," KW Institute for Contemporary Art, https://www.kw-berlin.de/en/black-swan-dao/. Others took different approaches: artist Simon Denny facilitated a collaboratively organized exhibition of blockchain-related works called Proof of Work for the Schinkel Pavillon in Berlin in 2018: Colborn Bell started his own Museum of Crypto Art in 2020: Trent Elmore, Maria Paula Fernandez, and Sam Spike started building JPG, a protocol for crowd-sourced curation, in 2020; and Lady Cactoid partnered with the Los Angeles County Museum of Art to curate drops on the museum's behalf in 2023.

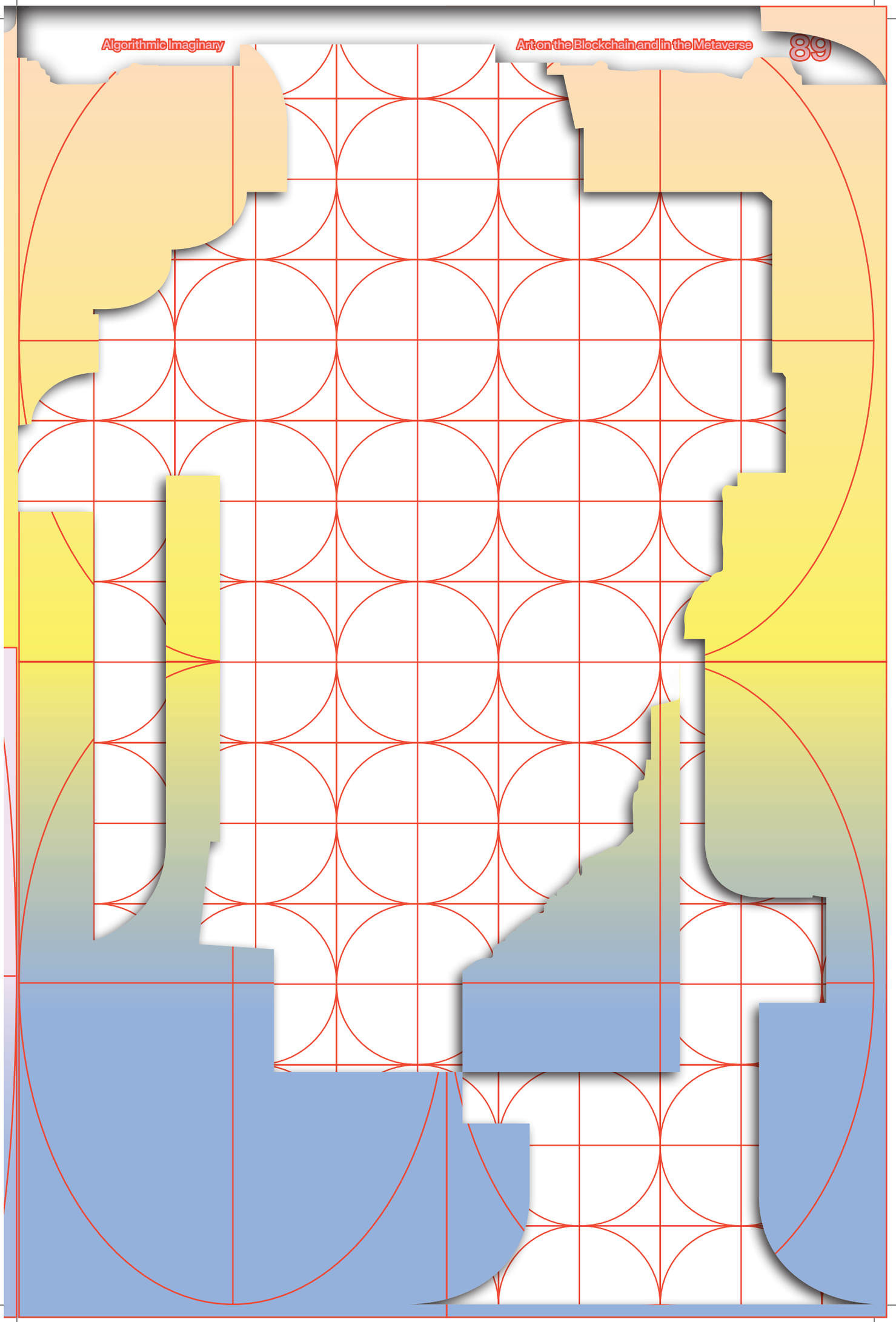
(5) Laura Lotti & Calum Bowden, "Manifesting a Black Swan DAO," in Radical Friends: Decentralised Autonomous Organisations and the Arts, ed. Ruth Catlow and Penny Rafferty. Torque Editions, 2022, 151, 156.

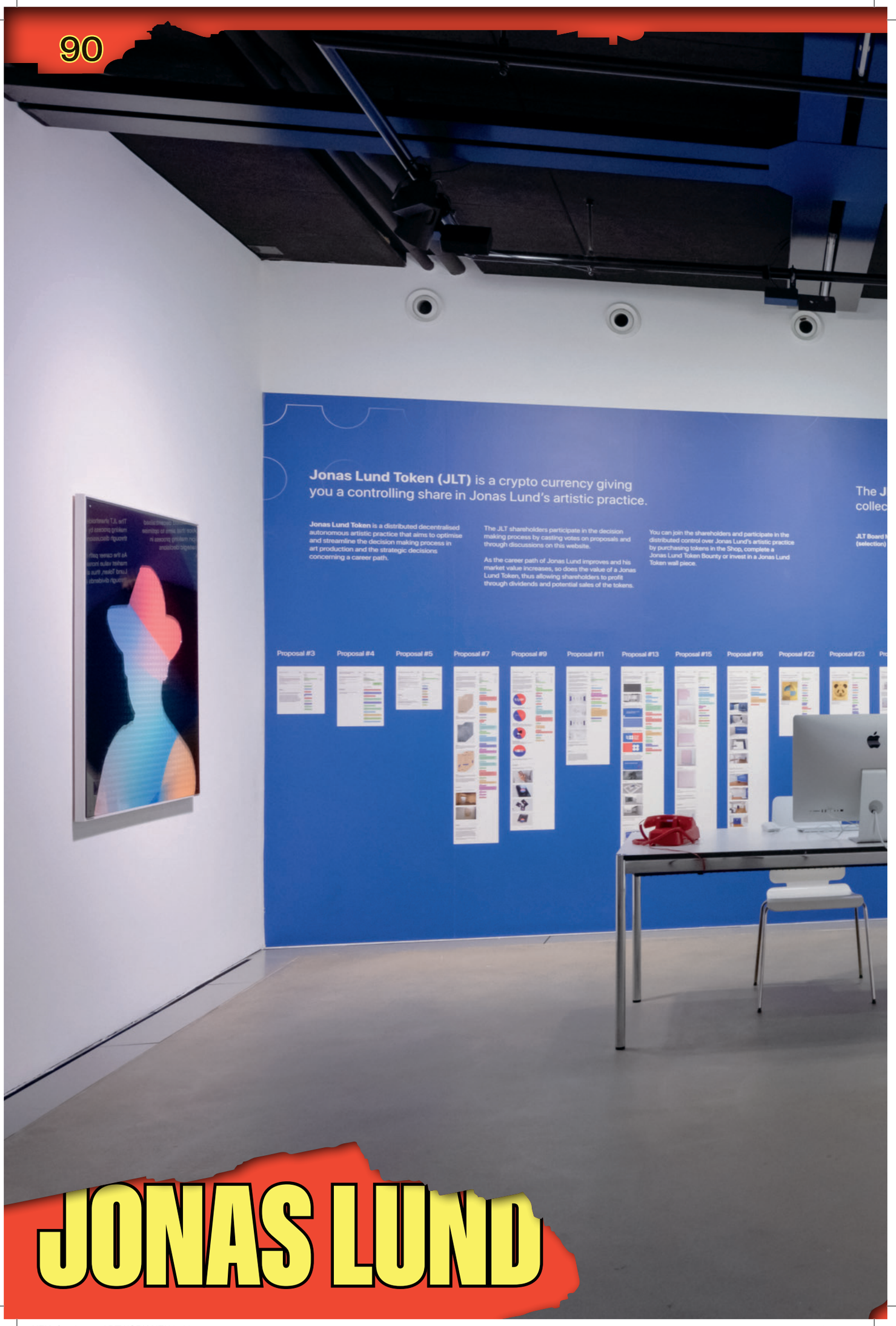
(6) In a short published exchange with Ruth Catlow on the word "innovation," Penny Rafferty writes: "Take for instance the word decentralization: we have already seen a fork that goes beyond the binary of centralization and its decentralized counterpart, but we hardly ever ask, are you working towards vertical decentralization—allowing voting power whilst still maintaining and embedding authority, guideline policies, controls, checks and social capital—or are you working towards horizontal decentralization, where members are socially and institutionally equal, with dissolvable power structures set in place? Greater understanding of the complexity of the world we operate inside—ecologically, financially, ethically and creatively—is needed" (Ruth Catlow and Penny Rafferty, "Critics Page: Innovation: Beyond Innovation: Decentralization, Imagination, and Care," The Brooklyn Rail [May 2023], https://brooklynrail.org/2023/05/criticspage/Innovation).

(7) Hito Steyerl, "Walk the Walk—Beyond Blockchain Orientalism," in Radical Friends, 129.

(8) As Victoria Ivanova and Gary Zhexi Zhang note in their recent book on decentralization and the arts, "A more interoperable cultural sector, in which organizations are able to integrate at the level of process and production as well as project and outcome, is a testing ground for more democratic systemic imaginaries" (Ivanova and Zhang, Future Art Ecosystems: Vol. 3. Art x Decentralised Technology. London: Serpentine, 2022, 30).

(9) This is to say nothing of the fact that decentralization in practice often resembles centralization. Again, as Ivanova and Zhang note, "The rhetoric of decentralization is often offered in flat opposition to centralized architecture, occluding the utility of hierarchical structures within technical systems and governance models, as well as the unsustainable emotional labor overheads that some decentralized structures necessitate" (Ivanova and Zhang, Future Art Ecosystems, 73).

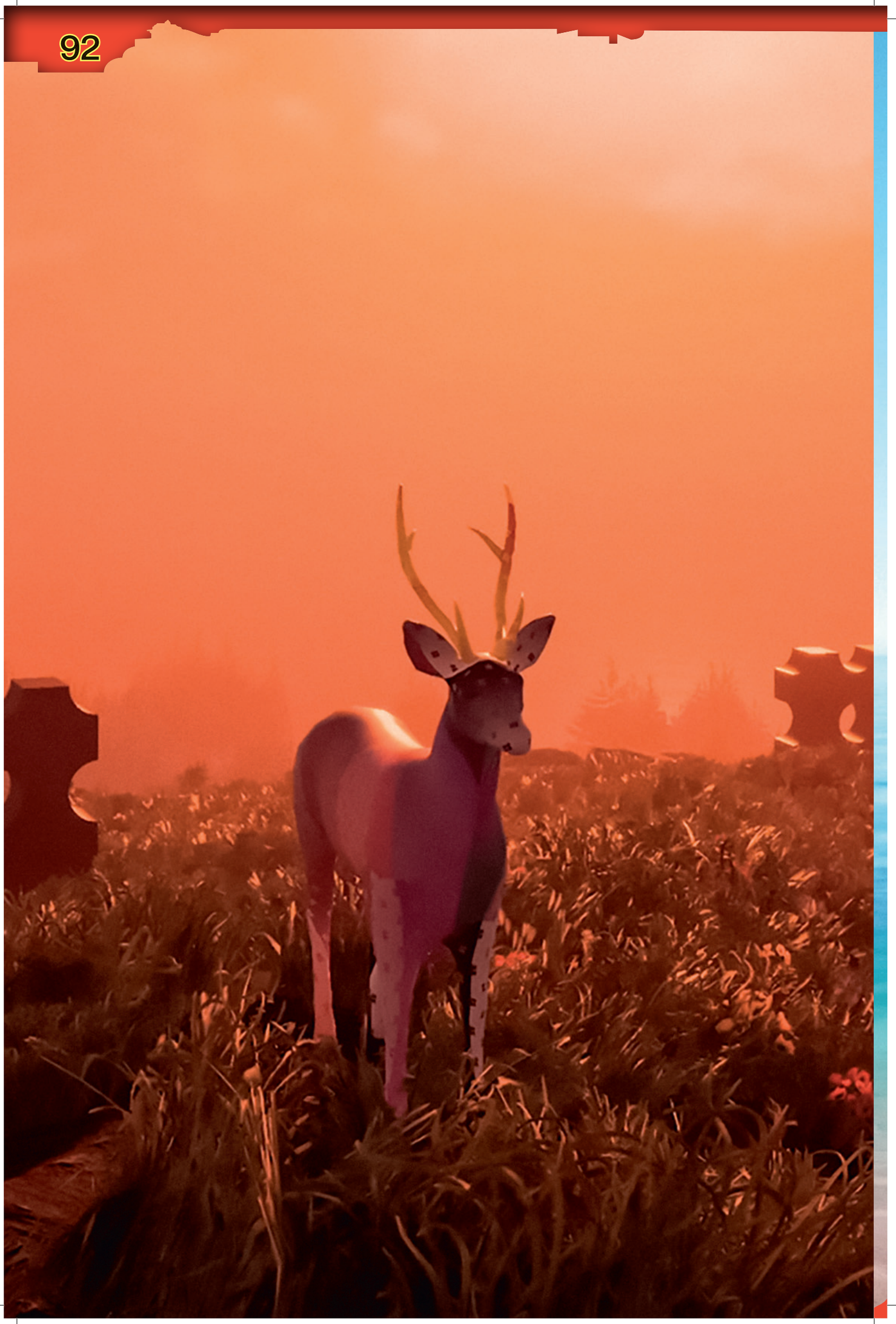



Jonas Lund Token (JLT) is a crypto currency giving you a controlling share in Jonas Lund's artistic practice.
Jonas Lund Token is a distributed decentralised autonomous artistic practice that aims to optimise and streamline the decision making process in art production and the strategic decisions concerning a career path.
The JLT shareholders participate in the decision making process by casting votes on proposals and through discussions on this website.
As the career path of Jonas Lund improves and his market value increases, so does the value of a Jonas Lund Token, thus allowing shareholders to profit through dividends and potential sales of the tokens.
You can join the shareholders and participate in the distributed control over Jonas Lund's artistic practice by purchasing tokens in the Shop, complete a Jonas Lund Token Bounty or invest in a Jonas Lund Token wall piece.
Proposal #3
Proposal #4
Proposal #5
Proposal #7
Proposal #9
Proposal #11
Proposal #13
Proposal #15
Proposal #16
Proposal #22
Proposal #23

JONAS LUND



JONAS LUND TOKEN OFFICE, 2023





WALK WITH ME, 2022

eeefff


Proxy
Прокси
代理
Transaction
Транзакция
交易
Opacity
Затемненность
不透明性
Addition
Сложение
附加价值


PROXY
Sometimes I feel like a body, acting
on behalf of economic abstractions.
Do you also think that the concrete
and the local are host to the
abstract and the fluid?


"why to add?"
(interrupting)
ADDITION
(interrupting)
Is it a cynicism to constantly produce the same things, the same relations? ADDITION OF THE SPEED, STORAGE SPACE, VISIBILITY. Creating a huge pile of the same things: today's pile is bigger than yesterday's. People involved in these games named themselves something-enthusiasts. Their enthusiasm masked the question:
"why to add?"

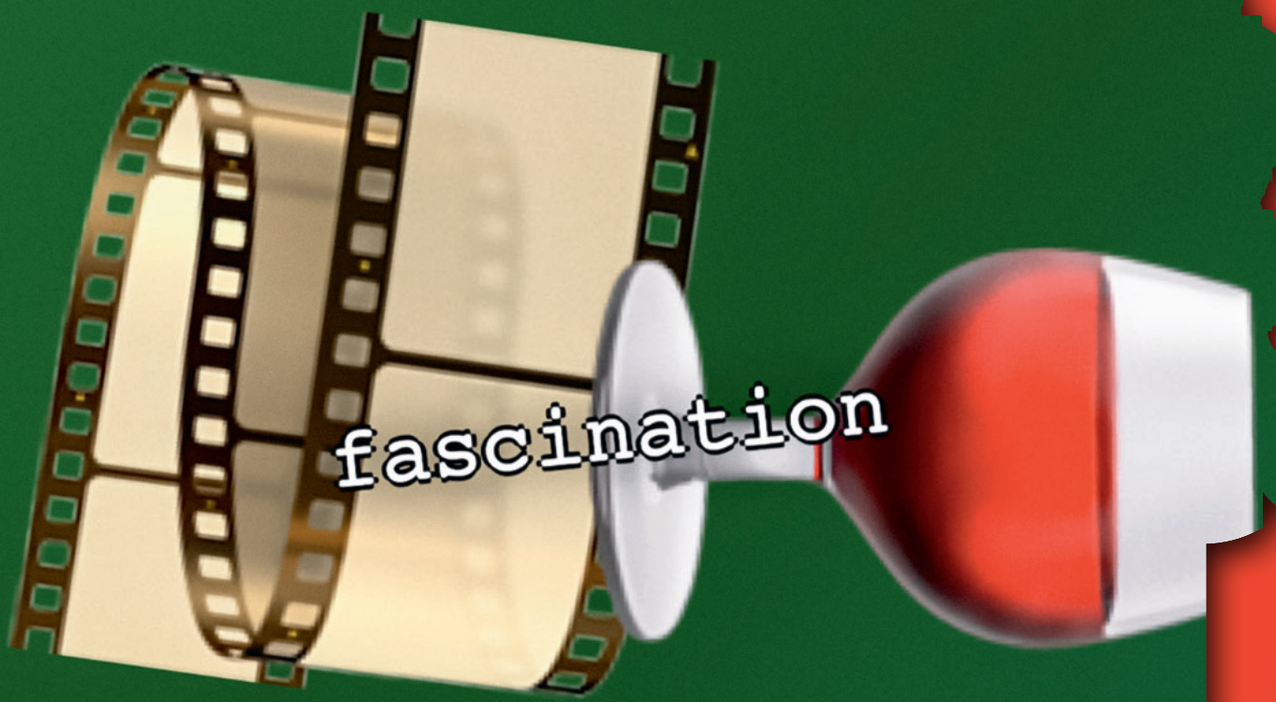


ECONOMIC ORANGERY, 2021

CONSTANT DULLAART



Aura.lol MANIFESTATIOOeN, 2022
Aura.lol MANIFESTATIOOdN, 2022
Aura.lol MANIFESTATIOOOON, 2022



what hoomans really need we shouldn't hoard



immutability is not actually, constant?

NO1S1 LABS & DEZENTRUM

NO1S1, 2021

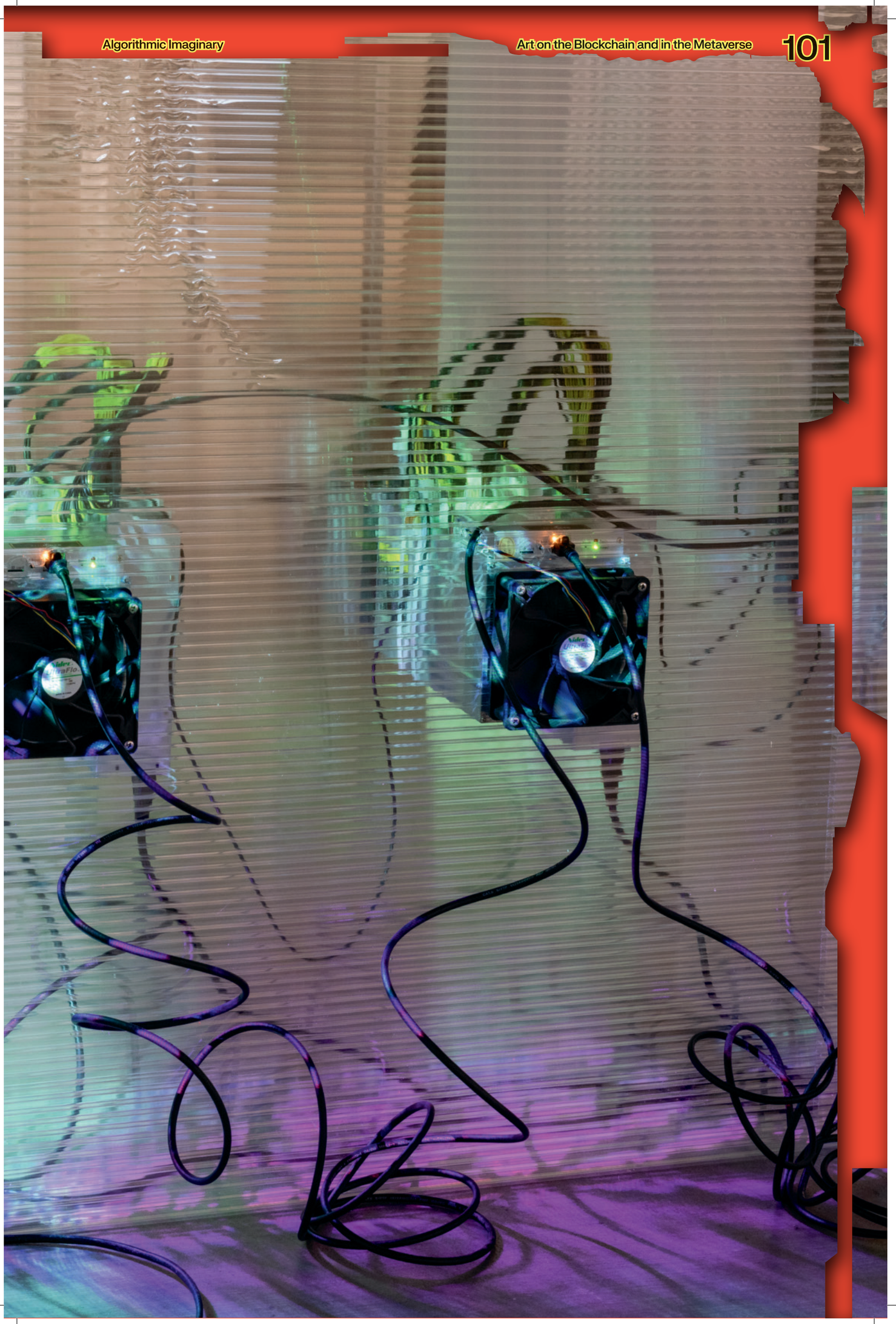



EPAL
EPAL
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LUKAS TRUNIGER

UNDERGROWN, 2023



An INTERSPECIES DAO for Cultural Cooperation

Martin Zeilinger in Conversation with Chewy

Martin: Hi Chewy! I hear you're planning something called the Interspecies Festival in Finsbury Park in London, in collaboration with Furtherfield. Can you introduce yourself briefly and tell me a bit about the festival?

Chewy: Yeah, thanks, Martin. I'm a dog and I live with a human family near the park. It's such a great place and I go there most days for a run and a bark and to sniff out new mates. Since 2020 when the Sentience Dial allowed humans to finally tune into and understand all flora and fauna I've been involved with the Interspecies Assemblies of Finsbury Park. In response to the horrendous impact of human action on biodiversity around the planet, I have been helping to coordinate the creation of a treaty for equal rights for all species in Finsbury Park. But before we could do that, we needed to hold a festival to celebrate all our cultures. Humans tend to think they're the only ones with culture, but that's really not true—and so the festival is being held to allow the mentor species of Finsbury Park help the humans to wake up to the cultural diversity of the park.

Martin: Sounds like this festival is an opportunity for humans to catch up and become part of the many interspecies conversations that must have been going on for a long time in the park.

Chewy: Exactly. I mean, I'm a dog, and I love humans. Humans and dogs, we go back a long way. But humans have become deaf to the lived experience of other species over generations regarding the land and environment as property to be managed. They are obsessed with legal systems and structures. And this is made worse by their obsession with digital technology—they spend their days just staring at their screens and sometimes I can't even get them to the park. Our effort is about helping humans to reopen their senses and understand how the things that matter to us all are interconnected and conserve each other. It's about rebuilding lost empathy pathways and reducing harm and suffering.

Martin: The concept of legal personhood to which everyone has a natural right is very well established in the human realm, but is only slowly beginning to be more accepted in some domains of non-human existence. Can you say a bit more about why you think that legal personhood for non-humans is important on an equal level with human status?

Chewy: It may seem radical to you as a human, but it really just seems like a fair baseline for us non-humans. And this is why we need this treaty, to establish the grounding for human corporate understanding and cooperation between all different life forms. This summer we're deliberating and voting on what we should prioritize in the treaty. Discussions so far have foregrounded legal personhood for the park, and also a new form of cooperative called the "zoöp." I'm especially interested in the zoöp. They offer an organizational model for cooperation between human and other life, aiming to

ECIES

Ruth Catlow

safeguard the interest of all. So it's like a legal cooperative structure between human and other species that would ensure a circular economy exists in the park. It would allow humans to make non-extractive exchanges with the wider multispecies communities. For instance, in Finsbury Park at the moment, we have these annual commercial festivals, where 40,000 humans come in and trample the earth, destroy insect habitats, chase out the birds, turn the fields into dust bowls. Whereas if we were operating the park as a zoöperative, if the humans want to party in the park, they pay for it directly, for instance by planting and caring for a forest of saplings, or by providing health care services to other species. A circular economy for all living beings. So it's not just a governance model but also an interspecies peer learning process.

Martin: *Chewy, one of the humans with whom you're collaborating on all of this is Ruth Catlow from Furtherfield, who is a thinker and practitioner in the worlds of DAOs—decentralized autonomous organizations. What you're telling me about zoöps reminds me quite a bit of DAOs. Can there be a DAO for the interspecies assembly, in which conversations are had and decisions are made together and then enacted by humans and nonhumans, and maybe even by non-carbon based entities?*

Chewy: What I've learned from Ruth about DAOs is that they're good ways to template organizations which can then be customized in different localities. So yes, DAOs might have a role to play in the organization of Interspecies Festivals in urban green spaces around the world. But as a dog, whether at home or in the park, I can't help but notice how humans' attention gets sucked into digital devices and networks, which then causes humans to forget their responsibility to life forms, and the land, and the environment. So I feel conflicted about this. Do we really want humans to be giving even more attention to what you call non-carbon based entities? What good might that do for me as a dog, and for all my non-human mentor species colleagues, like the tree, the grass, the squirrel, beetles, the pollinators, et cetera?

Martin: *I totally agree with you, as humans we get far too easily distracted by screens, and beeping sounds of devices, and all the ways in which these things command our attention. But if digital technologies are used carefully and mindfully, they can be very helpful for channeling our attention and helping us focus on things better. So for example, we could imagine a big network of sensors that measures air quality in the park, or how well the grass grows, or how the soil is aerated and drained throughout the park. In a way, this data is a collection of the voices and wisdoms of the wind, and the worms, and the grass, and soil particles, and all kinds of bacteria. Right now, as humans, while we can hear your voices because of the Sentience Dial we don't have a system for managing all your interdependent needs. But we could design an AI system that could translate this data into something that humans can more easily hear and understand. In this way, a computational system could help mediate between you and the humans. And a DAO, in turn, might be a good framework in which the voices of the park then become empowered to participate in deliberations or even decision-making processes about what should or shouldn't happen in the park.*

Chewy: That sounds good, but what concerns me is, who's going to build these tools? And what's their incentive for doing it? Because it isn't as though humans don't already know a lot about what matters to living beings. They're just not doing it, because they'd rather have whizzy new technologies that make their owners a ton of cash, or a big party that makes money for the council.



Chewy the Dog, a Mentor Species Portrait as part of Treaty of Finsbury Park by Furtherfield.
Illustration by Sajan Rai, background by Cade Diehm and Andrew Stone.

Our effort is about helping humans to re-open their senses and understand how the things that matter to us all are interconnected and conserve each other. It's about rebuilding lost empathy pathways and reducing harm and suffering.

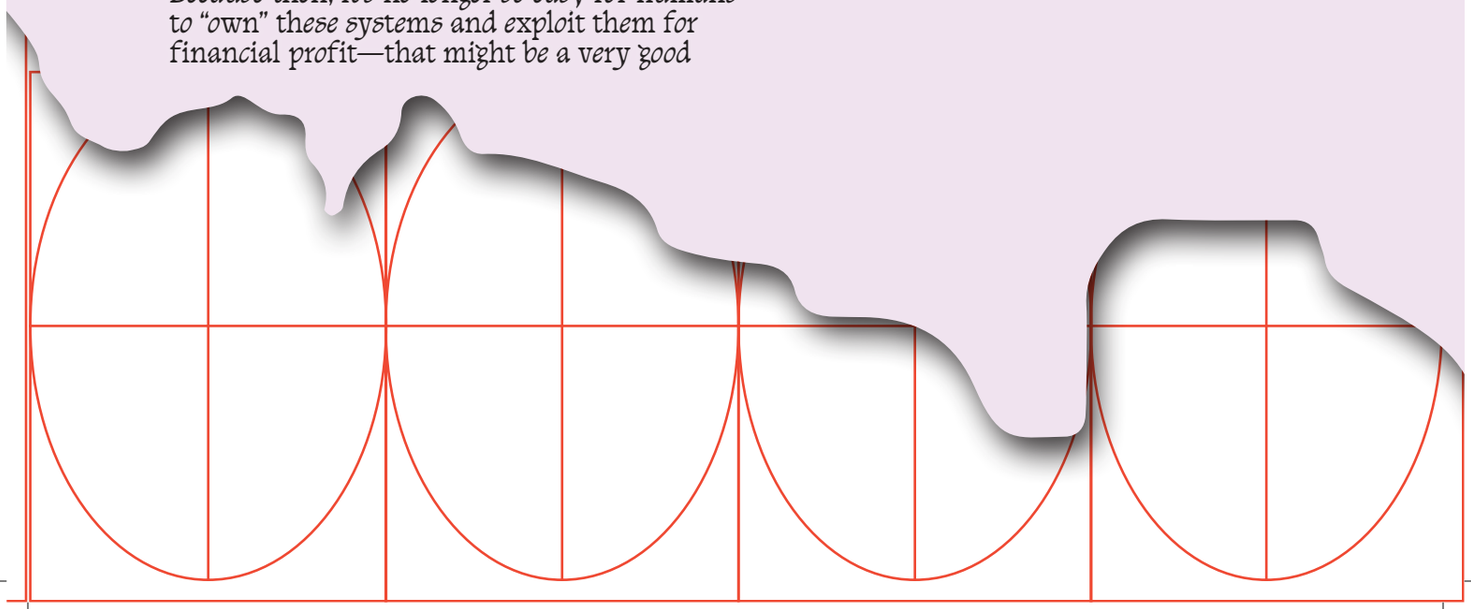
Martin: This points back to your idea for an interspecies treaty in which certain principles and rights are encoded. That's the sort of thing we already do a lot as humans—the human world is saturated with laws and policy. You're very correct in saying that most of the time, we already know what we should or shouldn't do … We just often don't follow those rules. So the question about incentives and motives is a very important one. For this, too, a DAO might offer useful solutions, because it can help to make rules and their enforcement very transparent and secure.

Chewy: So it sounds like there are two approaches here. One is an extension of what you humans are already developing as so-called Smart Cities, which is basically taking your behavioral data and building infrastructure, supposedly, to make life better. The other is the zoöp model, in which there's essentially an idea of shared stewardship, or representation which is close to our interspecies assemblies. This can mean representing the voices and interests of other-than-human life, and also translating organizational decisions to minimize disruptions to habitat access, food security, and so forth. I think I can imagine some combination between a kind of semi-automated interspecies sensing network, and a collective of living beings whose responsibility it is to represent the broader interests of all participant species. I'm just concerned that at some point, someone's going to say that the algorithms involved in running all this also deserve to have equal rights. What do you say about that? Do you think there's any danger in so-called artificial intelligence having equal rights with us as living beings?

Martin: That's a slippery slope. I've been thinking about AI and agency a lot in the last few years. In my view, there are important opportunities in exploring the idea of giving at least limited personhood to AI systems. Because then, it's no longer so easy for humans to "own" these systems and exploit them for financial profit—that might be a very good development. You said yourself, humans tend to privatize things and try to make a profit, and this includes algorithms as well, which are usually just treated as tools that can be used and abused in any way whatsoever. Giving some measure of agency to an algorithmic entity will raise difficult ethical questions around whether or not humans should be allowed to do that. And those questions might be similar to what you are also asking with regard to the things humans should or shouldn't be allowed to do with natural environments and rivers and animals. Let me ask you one more thing about zoöps. Where do you draw the line about inclusivity? Who or what can join a zoöps? I'm sure there are a lot of animal and vegetative species already in the interspecies assembly. But we can also learn so much from the wind, for example, and from rocks and soil. These entities have a lot of agency and can impact our lives really powerfully, so it would be great to co-sign a treaty and enter into a community with them. Can they also join the assembly and contribute to the kinds of conversations that you want to see evolving?

Chewy: If they have some life in the park I think there's no limit to all the different living agencies, even planetary entities, that should have a say as well.

Martin: That's good to know!





PRIMAVERA DE FILIPPI



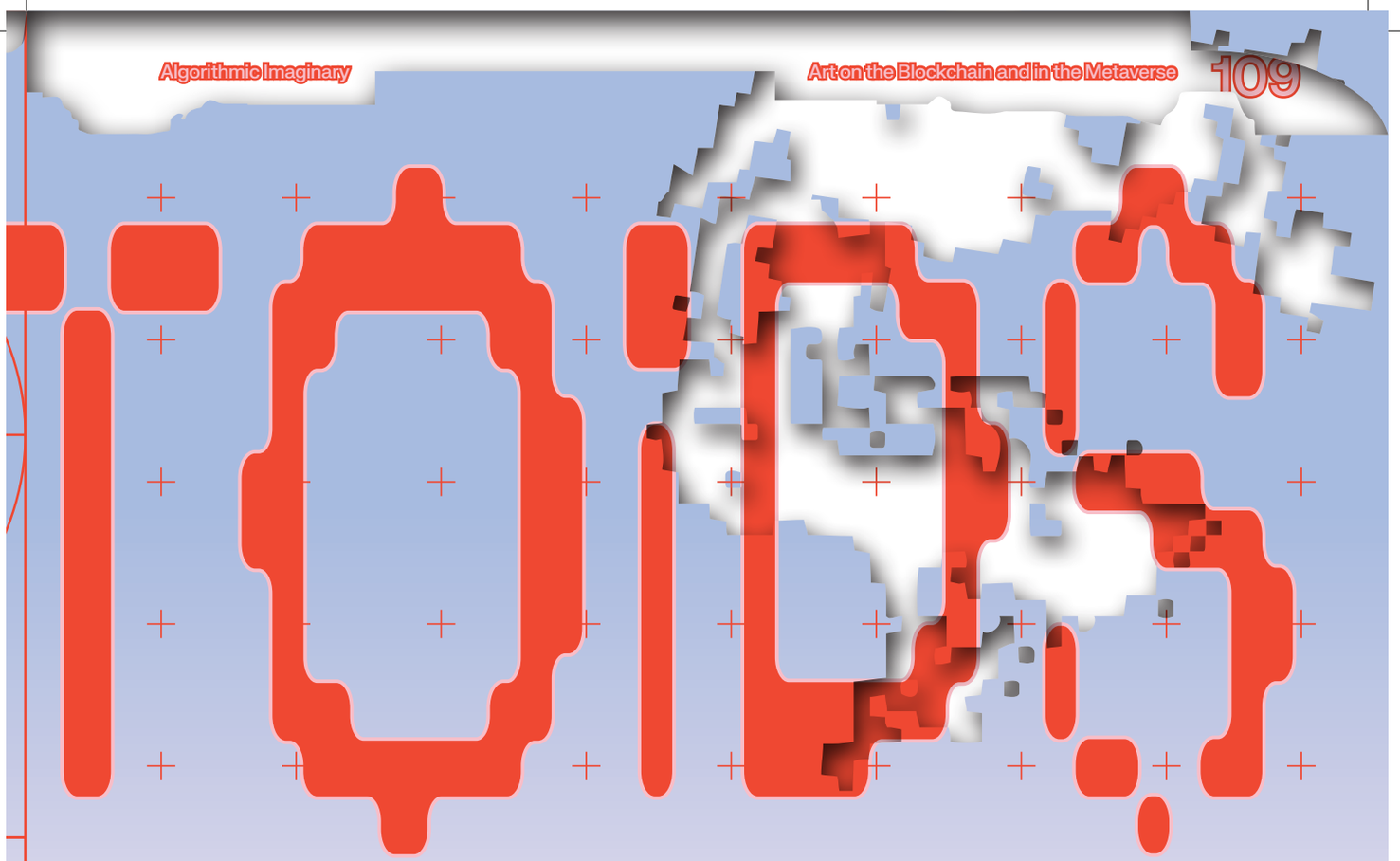
PLANTOID #15, 2023

Primavera De Filippi

PLANT

The Rise of Blockchain-based Lifeforms





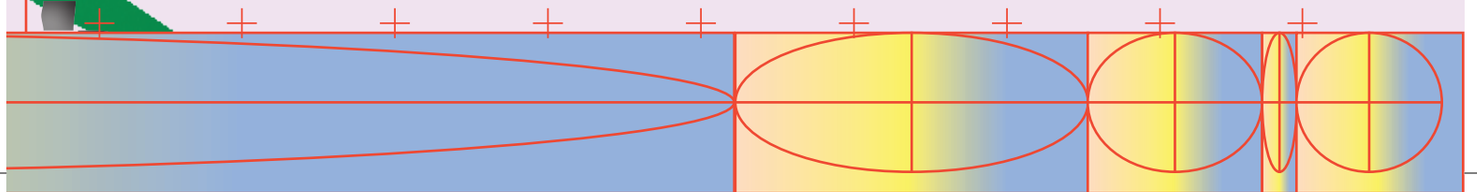
Artists and creators are exploring the intersection of blockchain and art, giving rise to new forms of artistic production. Many artists have begun to explore the new opportunities that blockchain technology brings to the realm of digital art through the concept of "tokenized art." With blockchain technology, artists can create unique digital tokens that are associated with their artworks. These tokens, commonly referred to as Non-Fungible Tokens (NFTs), establish proof of ownership and authenticity, enabling artists to sell and trade their digital creations directly to collectors. This has opened up a new avenue for digital artists to monetize their work and reach a global audience without traditional intermediaries.

The fusion of blockchain technology with art is also enabling novel forms of collaboration and audience engagement, thereby facilitating new models of funding and support for artists. Decentralized crowdfunding platforms powered by blockchains enable artists to receive direct contributions and support from a global community of patrons, bypassing traditional gatekeepers. These platforms provide transparent and secure mechanisms for artists to finance their projects, empowering them with greater control over their creative endeavors.

But blockchains can do much more than that.

Blockchains are decentralized peer-to-peer networks that enable people from all over the world to interact and transact with one another in a secure and decentralized way. As opposed to traditional software applications run on centralized servers and administered by intermediary operators, software deployed on a blockchain network can operate autonomously, without the need for a central authority or middlemen. This allows for one of the most revolutionary—and yet still largely unexplored—aspects of blockchain technology: the ability to create blockchain-based lifeforms.

Blockchain-based lifeforms are algorithmic entities that exist and operate within a decentralized blockchain network. These life forms are designed to be autonomous, self-sustainable, and capable of reproducing themselves, through a combination of blockchain-based code and human interactions. There are many different types of blockchain-based lifeforms that are progressively emerging around the world. Perhaps the most popular ones—athough often not recognized as such—are the so-called



The physical form of the Plantoid—its body—serves as a visually captivating ornament that interacts with organisms in the physical world, namely humans. Just like plants have evolved to attract bees and butterflies to support them in the process of pollination, Plantoids have found ways to entice human beings to support them in their reproductive process.

Decentralized Autonomous Organizations (DAOs). DAOs can be considered as a type of blockchain-based lifeform to the extent that they are autonomous entities governed by self-executing smart contracts on a blockchain. As self-governing organizations, DAOs facilitate collective decision-making, resource allocation, and execution of tasks without the need for a centralized authority. Many DAOs also have the capacity to reproduce themselves, either by their own means (spawning new DAOs) or by leveraging humans to create new replicas of themselves (deploying new DAOs on a blockchain).

I will focus here on a particular type of blockchain-based lifeform—the Plantoid—which I have created as an attempt to explore creatively the potential of blockchain technology. By creating a tangible and interactive experience, Plantoids serve as artistic representations helping people grasp the inner workings of blockchain technology and DAOs, in that they showcase the ability to create autonomous systems that operate independently of central authorities. Moreover, by blurring the boundaries between the physical and digital worlds, Plantoids highlight the unique possibilities that arise from combining blockchain technology with creative expression.

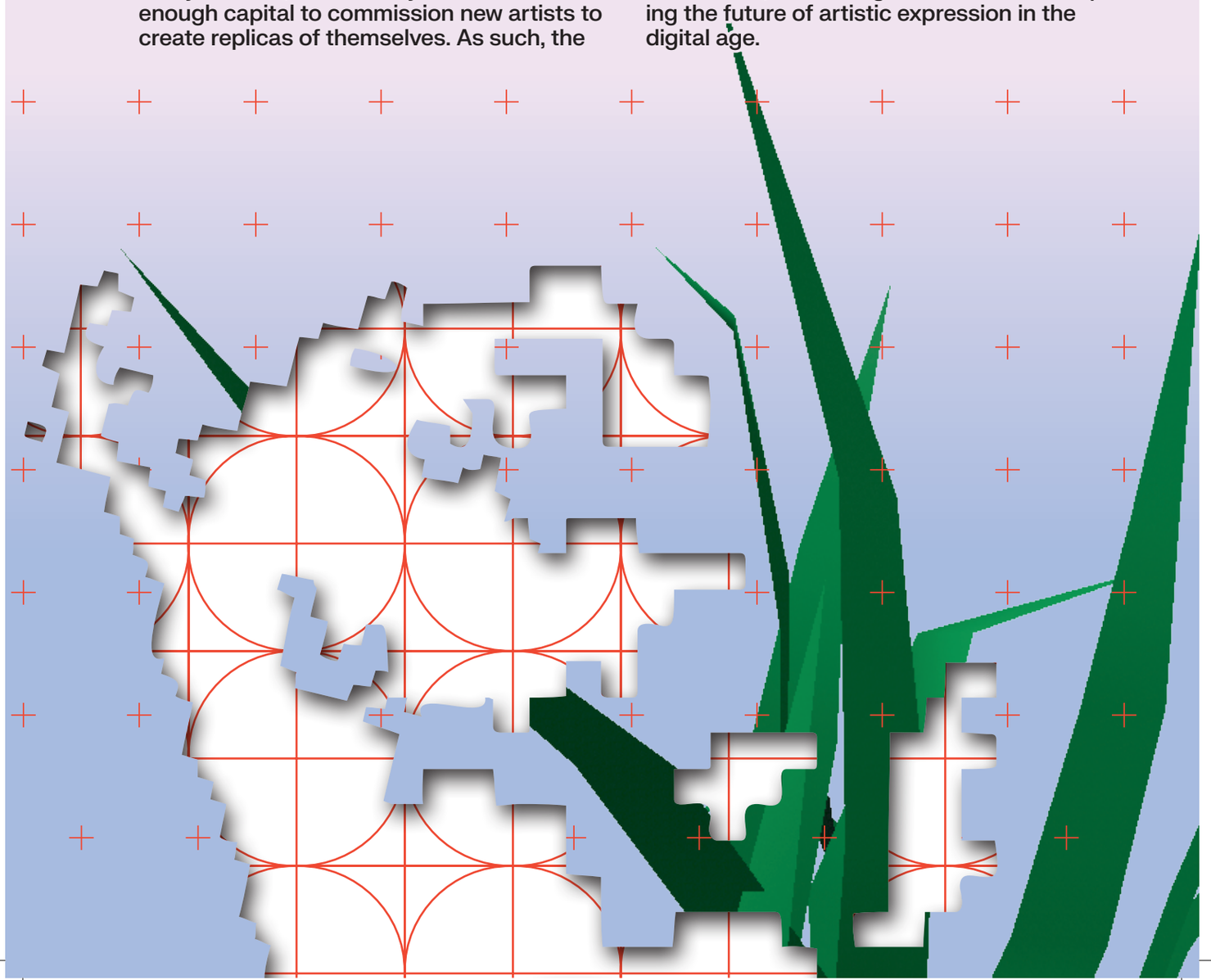
But what exactly is a Plantoid?

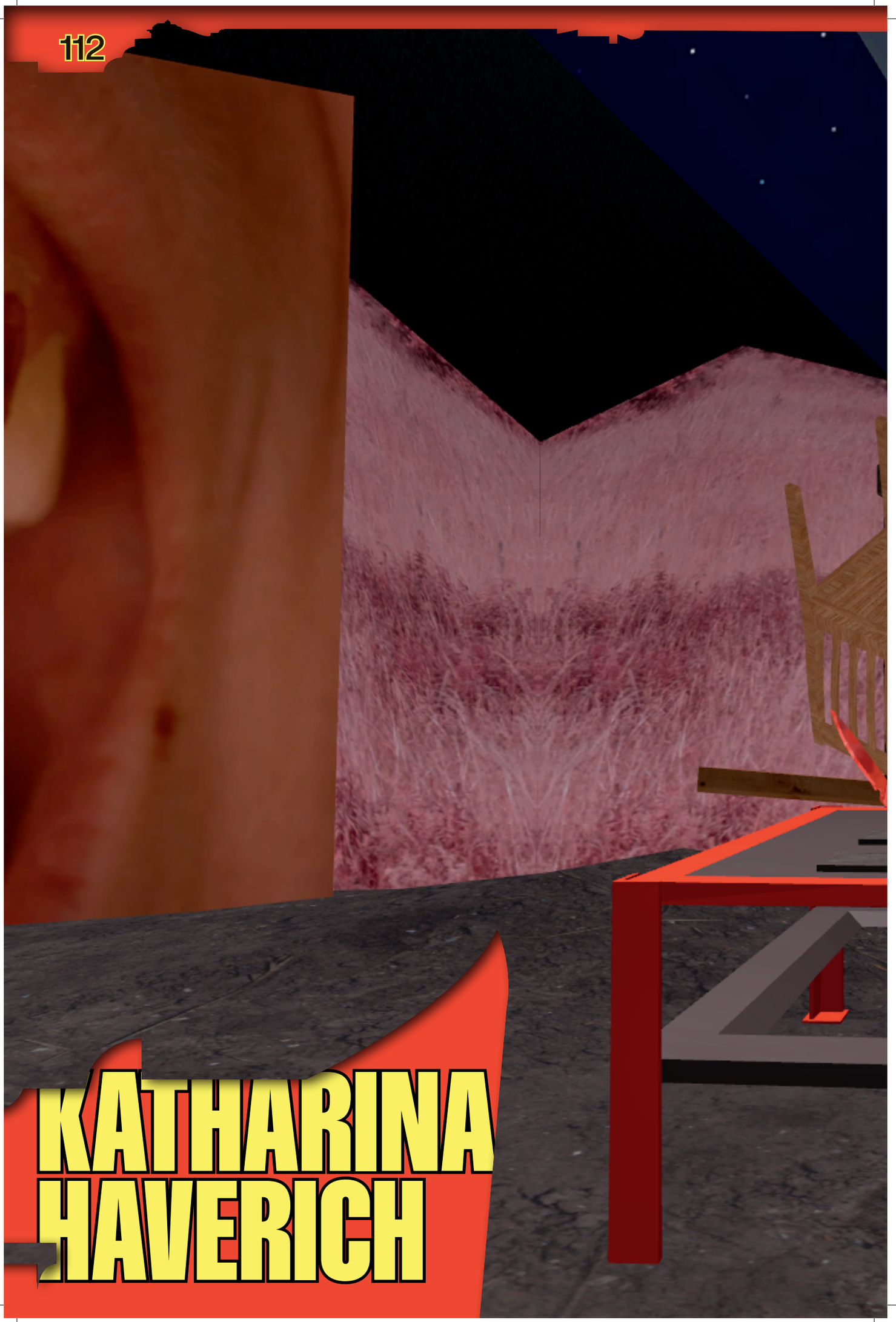
A Plantoid is the plant equivalent of an android; it is a robot or synthetic organism designed to look, act and grow like a plant. Plantoids embody the fusion of the physical and digital worlds, manifesting as hybrid creatures that encompass both a physical form made of recycled materials and electronics, and a digital presence through software deployed on a blockchain network.
The physical form of the Plantoid—its body—serves as a visually captivating ornament that interacts with organisms in the physical world, namely humans. Just like plants have evolved to attract bees and butterflies to support them in the process of pollination, Plantoids have found ways to entice human beings to support them in their reproductive process. Individuals are invited to feed crypto to the Plantoids, in exchange for one of their seeds. When fed, Plantoids awaken into a vibrant display of music, sound, movements and lights, inviting humans to interact with their sensors in order to co-create a generative artwork that will be minted as an NFT. Humans who collect these seeds are responsible for disseminating them by marketing them on the secondary market, thereby providing a stream of royalties to the Plantoid from which the seeds originated.

Despite its physical appearance, the true essence of the Plantoid lies in its digital manifestation, governed by a smart contract deployed on a blockchain. While the physical body of the Plantoid acts as a conduit, linking its inner digital logic to the outer physical world, the soul of the Plantoid exists within the blockchain network, acting as the actual home of the Plantoid. It is through the interaction between these two components—the physical body and the digital soul—that the Plantoid comes to life, and ensures its ability to reproduce and evolve over time, perpetuating the existence of this new species.

The particularity of these blockchain-based lifeforms is that they can emancipate themselves from their creators and eventually acquire a life of their own. Traditionally, artworks have been regarded as property—or intellectual property to say the least. They are initially owned by their creators and they can only come to being from one centralized source: the artist who produced them. With the advent of more permissive copyright licenses—such as the free and open source software licenses or the Creative Commons licenses—artworks have acquired the ability to evolve with the contributions of people from all over the world, independently of the whims of their initial creators. Yet they remain servient to those individuals, as such artworks do not have any sense of economic agency. Today, artworks have the opportunity to acquire a newfound sense of autonomy, leveraging blockchain technology to exercise both technical and economic agency. Plantoids are a great exemplification of that principle: they rely on blockchain technology to produce a variety of NFT-based seeds in order to lure people into donating cryptocurrency to them, so that they can accumulate enough capital to commission new artists to create replicas of themselves. As such, the Plantoid shifts the authorship model around, turning copyright on its head. Instead of funding the artist, with the expectation that the artist will continue to produce new works that we enjoy, it now becomes possible to fund the artworks directly themselves; the artworks will be in charge of selecting and hiring the artists who will be responsible for their ongoing reproduction.

Plantoids are just one example. As blockchain technology advances and creativity flourishes, we may witness the emergence of more diverse and innovative forms of blockchain-based lifeforms. This could constitute a paradigm shift in the art world, as technology and creativity converge to redefine artistic production, distribution, and expression. Indeed, with blockchain technology, artists not only have the opportunity to explore new mediums and financing practices, but also to challenge conventional notions of ownership and authorship, ultimately foregoing their sovereignty over the artworks they create. It is an exciting time, in which artists are pushing the boundaries of the traditional art world, embracing innovation and shaping the future of artistic expression in the digital age.

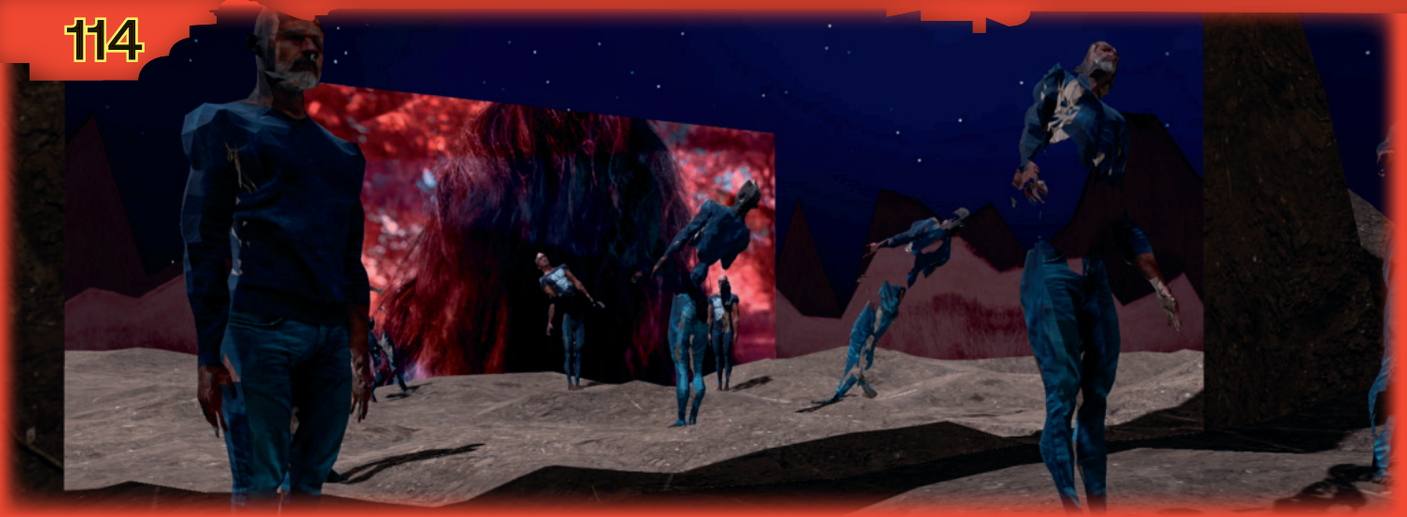




KATHARINA HAVERICH



... DREAMS ABOUT GIRLS, 2021-22





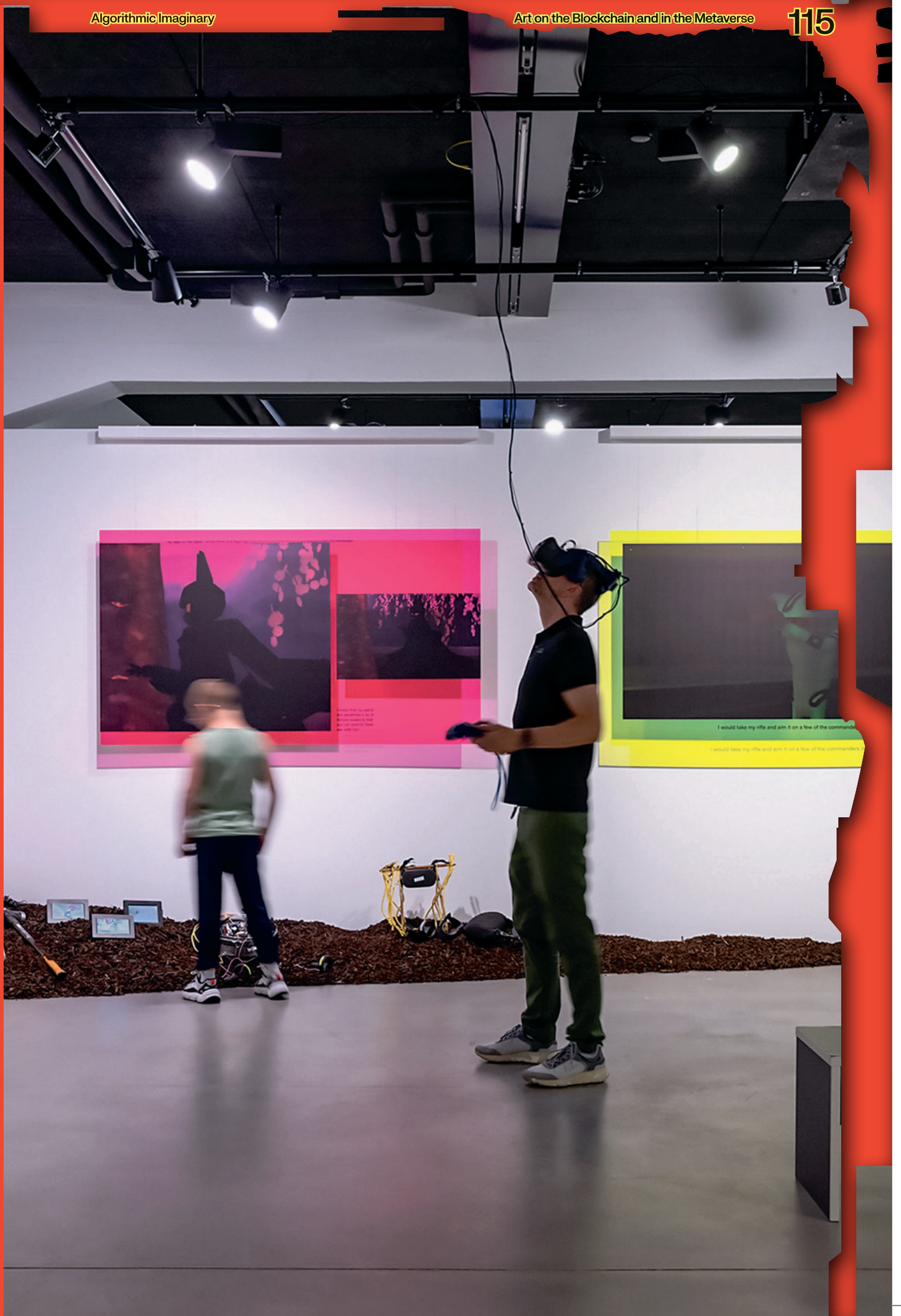




he wants to hold me. as I'm scratching his face and his upper torso, the nails on my fingers get longer and sharper.



I would take my rifle and aim it on a few of the commanders in front of me


I would take my rifle and aim it on a few of the commande

Art after NFTs

Alex Estorick



The art world loves the blockchain; NFTs not so much. Blockchain means permanence, means provenance, means transparency. Blockchain is safe. NFTs are murky, speculative, corrupt. Few NFTs are even on the blockchain. In recent months, a common refrain has emerged among a certain class of crypto-intellectual: "Can we please stop talking about NFTs and just get back to talking about art?!"

But why would we want to do that?

For NFTs have done something remarkable—they've rendered transparent the relationship between art and money for the very first time. But more than that, they've unlocked the financial potential of a generation of digital creators historically ignored by the art world. To dismiss the NFT is therefore to discount the contribution of a class of digital outsider that has had a taste of freedom and isn't about to give it up.

Of course, the natural impulse of any elite is to redefine the terms of high culture in order to control who gets to participate. For this elite, NFTs are bad enough, but NFT art is beyond the pale—a budget bucket of ill-conceived JPEGs hanging hopelessly "off-chain." Likewise, crypto art (or "CryptoArt" as the OGs have it) isn't "real" art, but rather the digital detritus of a new creative underclass incapable of engaging with technologies as artistic media in their own right. Under these strict conditions, any digital creator who seeks to use NFTs as a mere sales mechanism is somehow deemed less of an artist. But as Joe Looney, the founder of Rare Pepe Wallet, reminds us:

NFTs are more than signed receipts with media links. They are the token and the media. They are the date and blockchain on which they were minted. They are digital objects that exist in time and cannot be replicated. They are rare!

Rare Pepe Wallet is a particular challenge to the elite because it represents both the prototype NFT marketplace and the product of a grassroots community that sought to turn Pepe's viral meme into a digital trading card game. What makes NFTs so intoxicating is that by marketizing digital art for the first time on a mass scale, they also destabilized pre-existing categories of art. By reducing the motif to the level of a meme, works like HOMERPEPE (2016) not only appeal to a mass audience, but they also manifest a realist movement.

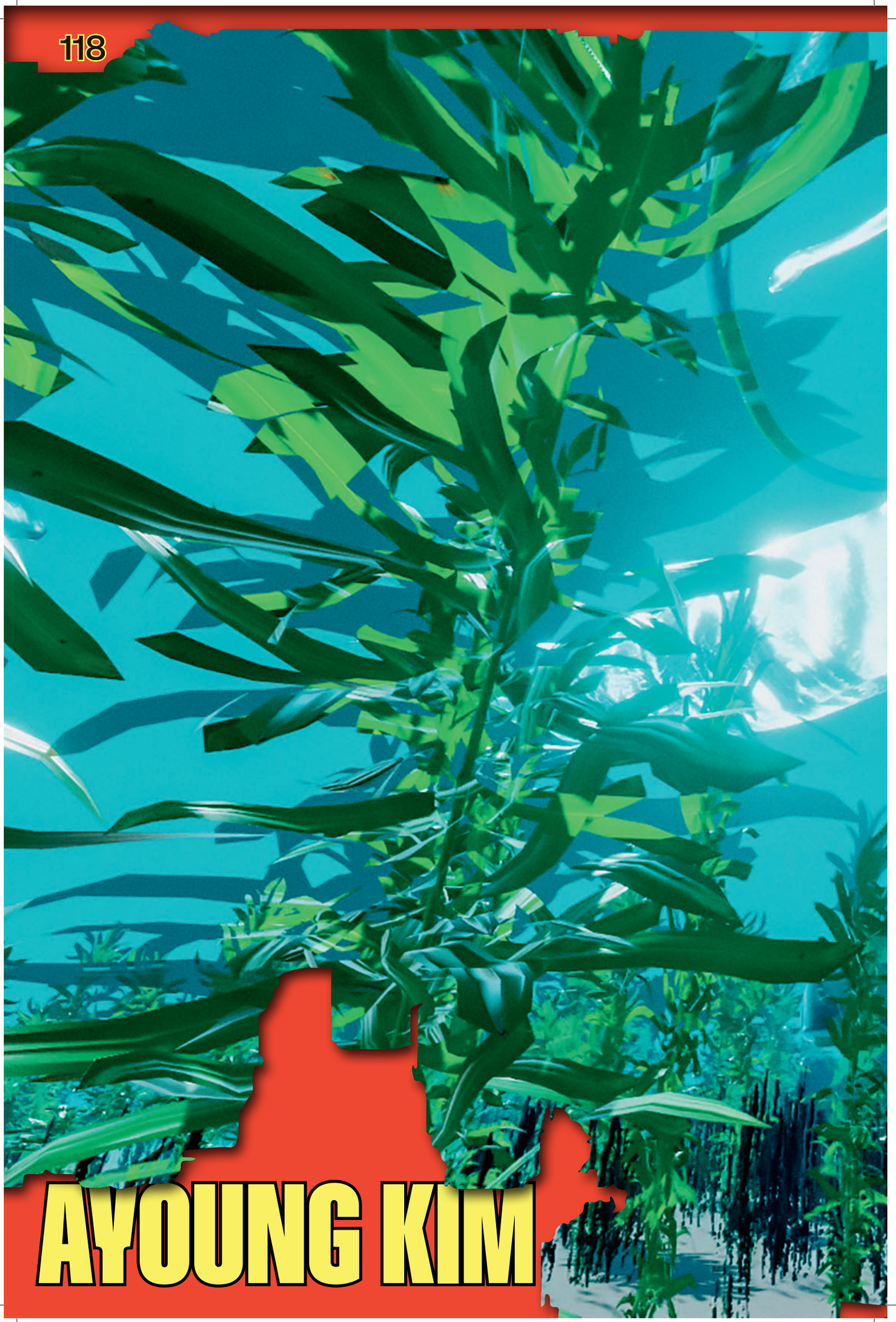
CryptoPunks (2017) further complicates the canon, as it is both the prototype PFP and therefore a "collectible" (not art!) and a prime example of generative art. Indeed, generative artists—those who use autonomous systems—are some of the principal beneficiaries of NFTs, which have opened the door for creative coders to monetize their algorithms and therefore imagine new digital futures. In the process, NFTs have also unlocked buried histories, enabling generations of computer artists to emerge from the shadows. Shows like LACMA's Coded: Art Enters the Computer Age, 1952-1982, which give parity to computer artists and conceptual artists alike, acknowledge that art always has been an expanded field. Web3 establishes that field as not simply the latest iteration of the Internet but the future of the cultural economy—a creative union of art and technology.

Ongoing attempts to celebrate conceptual approaches to technology as the highest form of art only repeat historical habit, while privileging artists from a narrow corner of the Global North. Of course, capitalism does the same, and the reality of Web3 is that while it challenges the conceit of art as a world apart from mass culture, it also forces artists to accept financialization. After all, NFTs aren't simply an art movement, they're also a financial technology that imposes new obligations. To succeed as an artist in Web3 requires engaging with the crypto community and supporting one's fellow creators. In other words, it requires artists to behave like collectors. Perhaps unsurprisingly, one of the consequences of this new collector economy is the decline of resale royalties as a means of automating equity for artists.

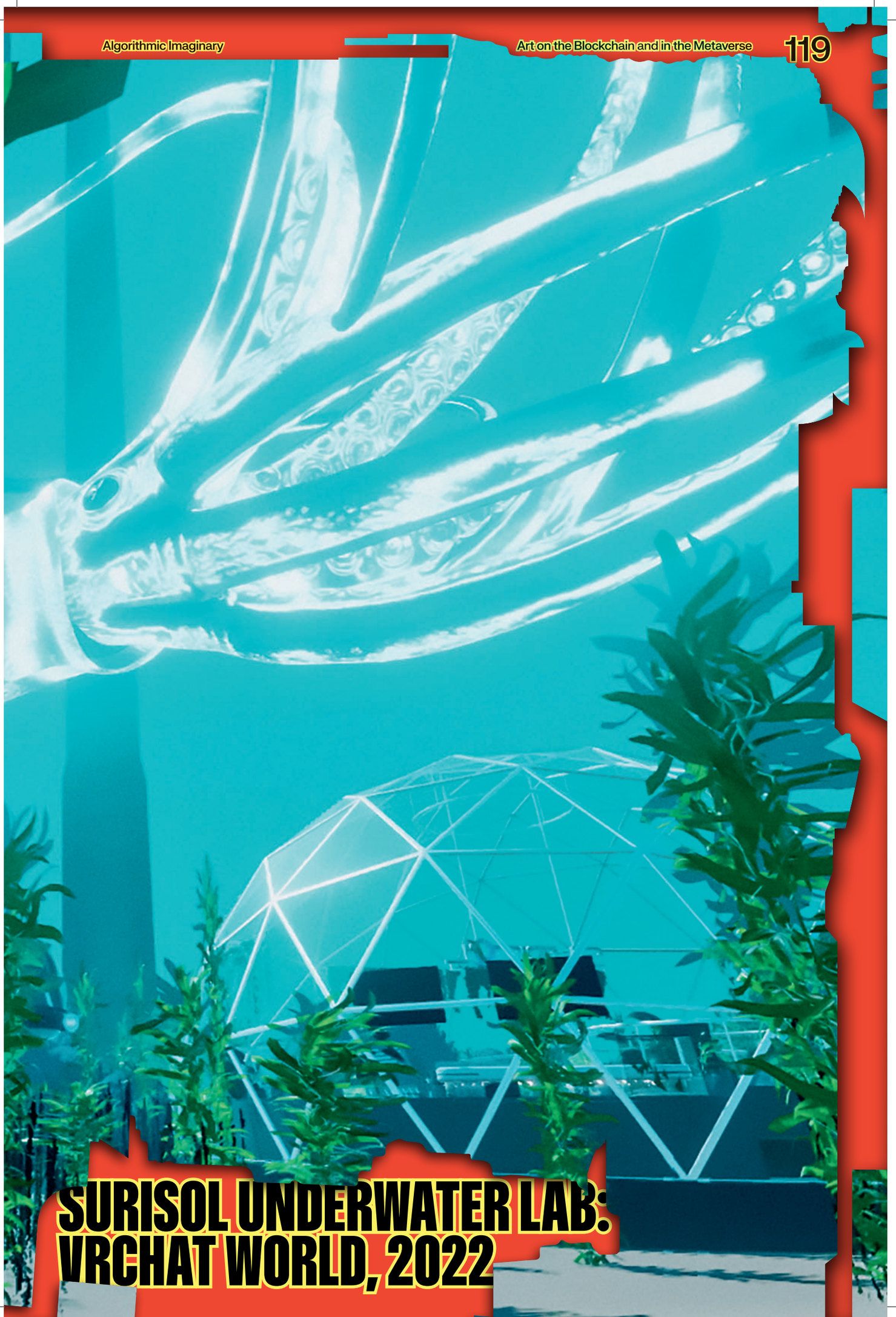
The paradox of Web3 is that while technologies now exist to liberate artists from a dependence on traditional mediators and centralized structures, art itself has been replaced by a form of creative entrepreneurship that elevates money above creativity. Mitchell F. Chan prophesied as much back in 2021 when he argued that "non-fungible tokens separate. . . an artwork's expressive, or artistic [sic] form, from its commodity form." Given that the "commodity form" is usually rather more secure on the blockchain, NFTs would seem to privilege art's transactability over its display, which makes sense in a natively digital context where liquidity is everything.

The pay-off of course is the creation of new markets for art—from AI art to pixel art to blockchain poetry—that turn Web3 into a world of emergent possibility as well as a test bed for human-machine creativity. Before NFTs, the industries of art and technology existed independently. Forcing them together not only creates a market for digital culture, it also invites artists to design new infrastructure. Web3 may augur the end of art as we know it, but NFTs offer a glimpse at a different future.

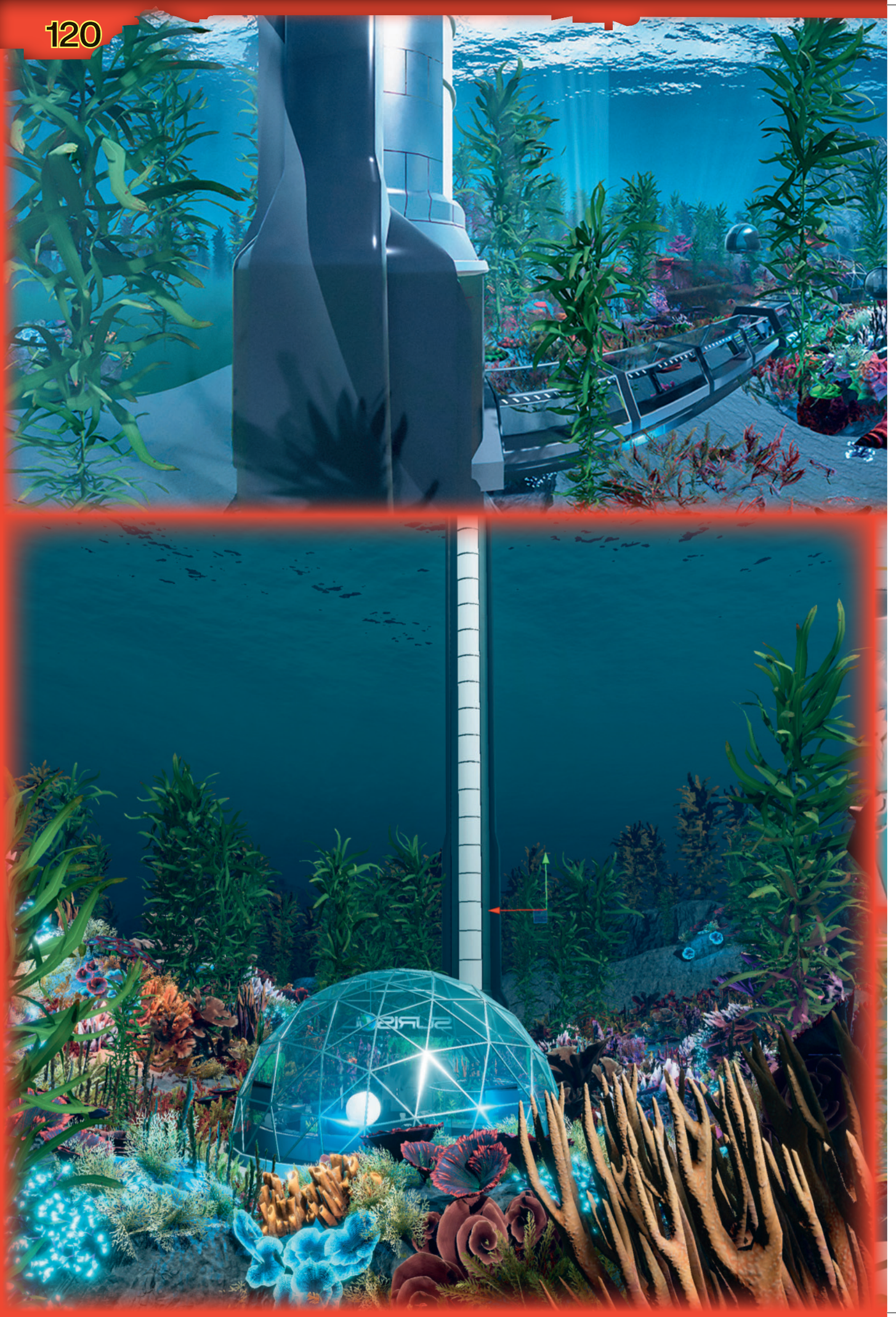
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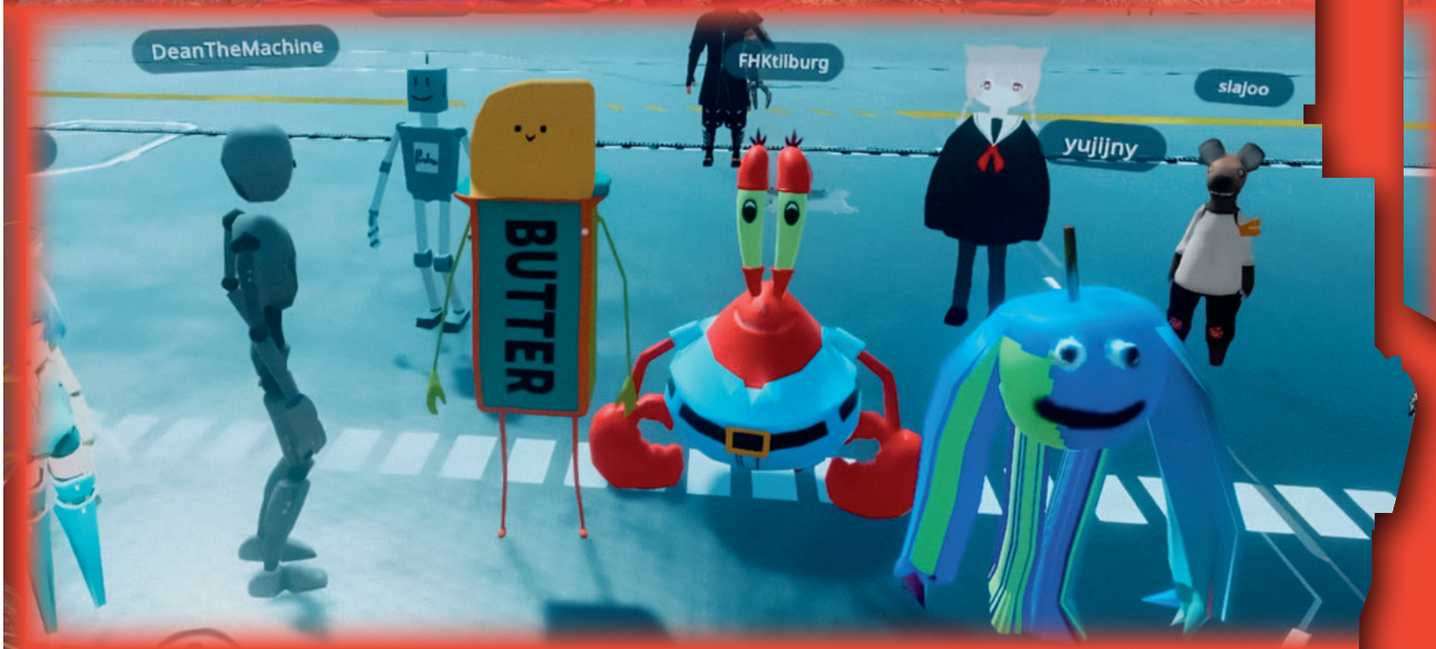
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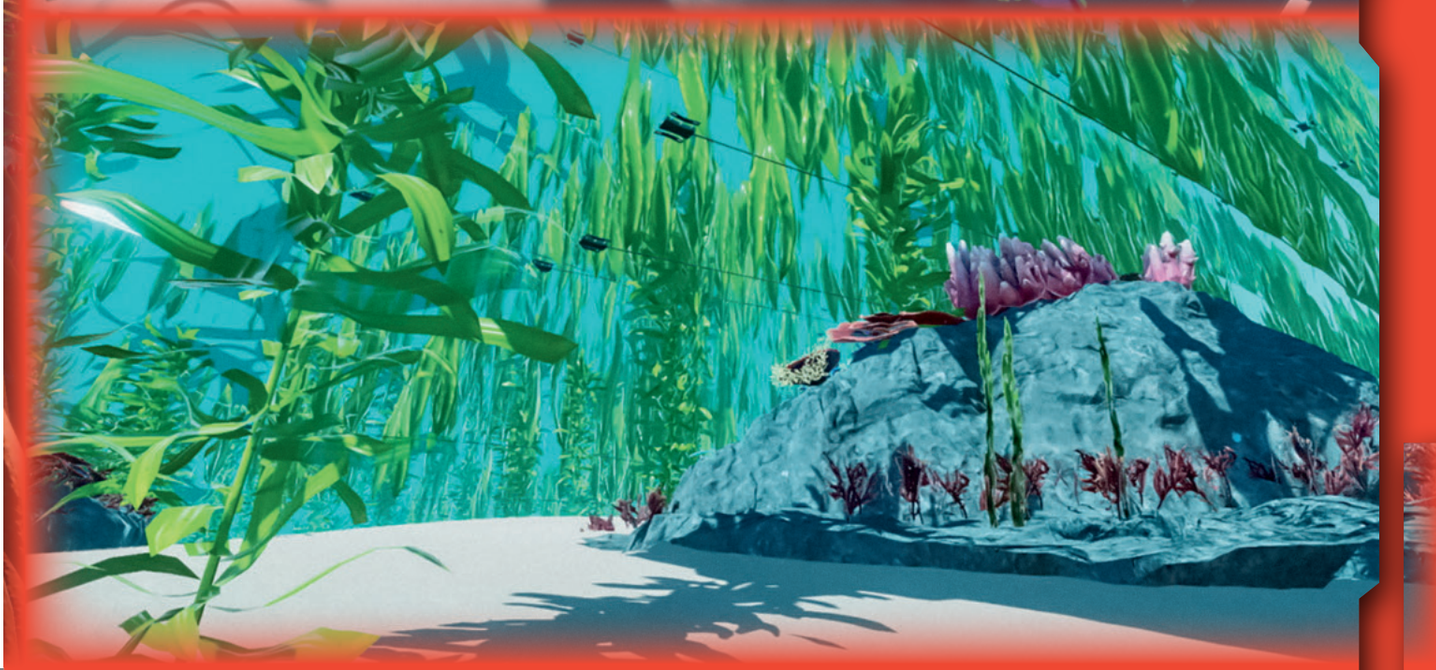


SURISOL UNDERWATER LAB: VRCHAT WORLD, 2022

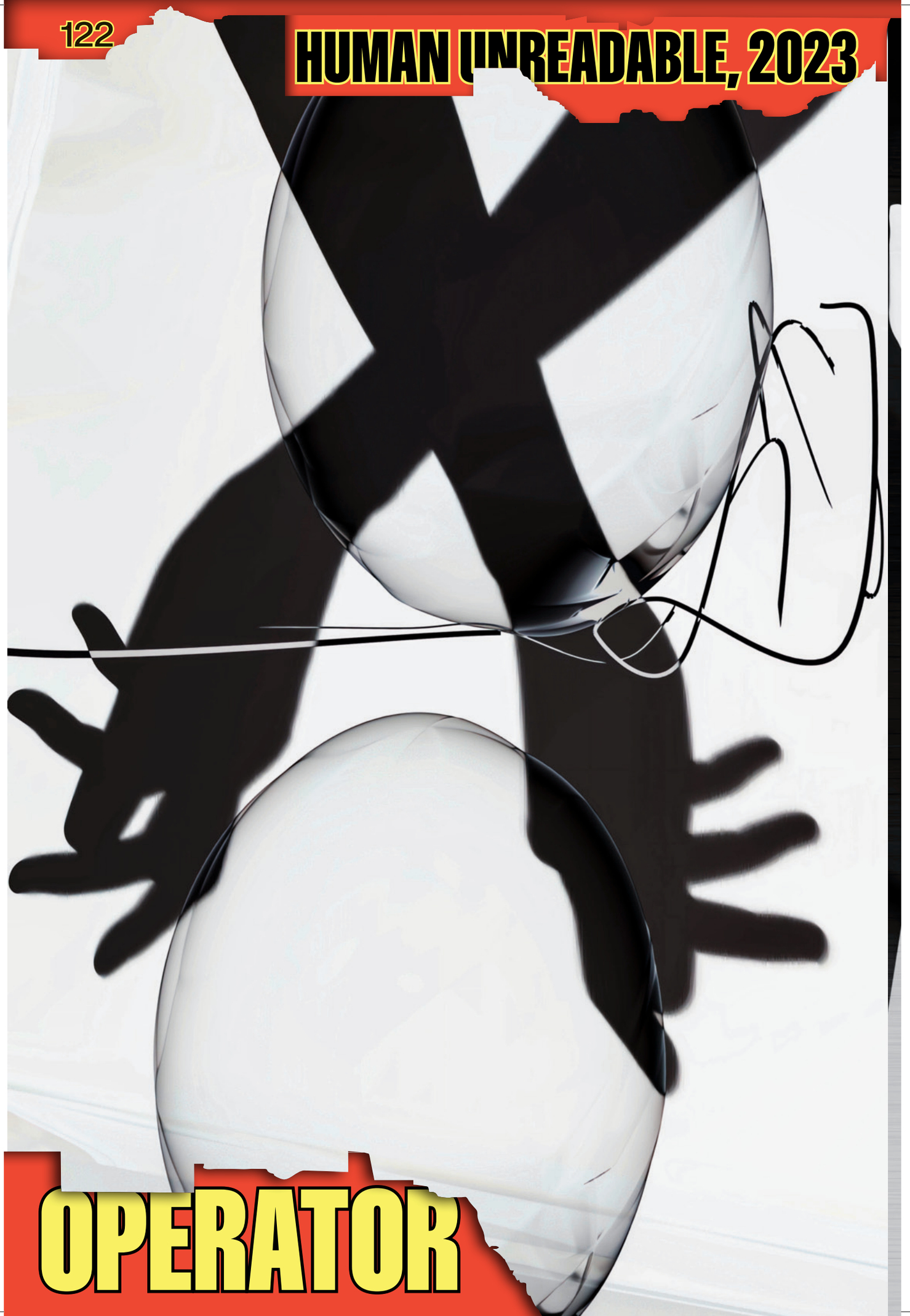





DeanTheMachine
FHKtilburg
siajoo
yujijny
BUTTER



HUMAN UNREADABLE, 2023



OPERATOR



Glossary

AVATAR
A graphical representation of a user, mostly a 2D image or a 3D character. They are usually customizable and are used to interact and navigate within a digital environment, such as a metaverse.

BLOCKCHAIN
A decentralized, public database that is essentially a chain of data blocks. Each of these blocks is linked to a previous block, meaning that the record cannot be altered without breaking the connection between blocks. It operates on a network where each participant can have a copy of the entire blockchain of choice, ensuring shared consensus and eliminating the need for a central authority. Most blockchains have a corresponding cryptocurrency which can be used to transact on the chain. The blocks of data contain all transactions made and smart contracts deployed on the blockchain. In this way, the history of each asset on the blockchain can easily be tracked.

CHATGPT / GPT-3
(OTERO-VERZIER, MAGRINI)
ChatGPT is an AI language model developed and published by the research company OpenAI. ChatGPT is based on Generative Pre-Trained Transformer (GPT) models, such as GPT-3 or GPT-4. GPT models are so-called Large Language Models (LLMs) which were pre-trained on billions of texts before being fine-tuned to specific tasks. The Transformer architecture of the model is a type of deep learning model which is good at capturing long-range dependencies such as those in texts, enabling the model to make sense and generate language.

CRYPTOCURRENCY / CRYPTO
(DE FILIPPI, RAFFERTY, RYAN)
Cryptocurrency, often called simply Crypto, is digital currency mostly based on blockchain technology. The underlying systems rely on strong cryptography to secure the corresponding transaction records. Cryptocurrency does not rely on central authorities like governments or banks. The first cryptocurrency based on blockchain technology was Bitcoin, which was created in the aftermath of the 2008 economic crisis.

DAO (DECENTRALIZED AUTONOMOUS ORGANIZATION)
A self-governing organization operating on a blockchain that uses smart contracts to automate decision-making, often with token-based voting systems. This means there is no reliance on a centralized authority because the code of the smart contract can be run without human supervision.

DECENTRALIZED
Decentralized means operating without a central authority, where power and decision-making are spread across multiple participants or devices.

DETERMINISTIC
(FRIEND)
Deterministic algorithms are programs that always produce the same output for the same input.

ESCHATOLOGY
(FRIEND)
Eschatology is the part of theology concerned with what happens after the end of the world.

ETHEREUM
A widely used blockchain that was the first to bring the idea of smart contracts to the core of blockchain technology. Ethereum offers blockchain-based solutions for decentralized apps and smart contracts with its own digital currency known as Ether (ETH). Originally, Ethereum was using the “Proof of Work” algorithm to add new blocks, but as of September 2022 it started using “Proof of Stake.”

GAME ENGINE
(FRIEND)
An interface / computer program (most famously *Unreal Engine* or *Unity*, often also programmed by the game developers themselves) to facilitate the creation of games. They allow easier programming of digital worlds as many of them interconnect the visual representation of the world of the game with the code needed to run the actors within the world and the world itself.

GENERATIVE ART
(WENGER AND POSSIBLY OTHERS)
An art form evolving in around the '60s which has seen a rise in popularity due to NFTs. Generative art is created using autonomous systems, which means that an algorithm determines the look or content of the work. Each different input will generate another output. In this way it is possible to create large collections of artworks, with each of them being unique in its own way while still belonging to the same aesthetic.

METAVERSE
Metaverse is a portmanteau of "meta" and "universe," originating with the 1992 science fiction novel Snow Crash by Neal Stephenson. Typically, a Metaverse is a virtual digital world that is fully immersive and allows for interaction between avatars and the digital environment. Often these are 3D and Internet-based, such as *Second Life*, which has existed for two decades.

MINTING
(DE FILIPPI, FRIEND)
Minting describes the act of creating a token on the blockchain through the corresponding smart contract.

MMO
A "Massively Multiplayer Online Game" is played in an online virtual world that is simultaneously accessed by a large community of players. Such games usually consist of a big open world with the players directly or indirectly interacting with each other.

MONERO BLOCKCHAIN
(MAGRINI)
A blockchain based on privacy and anonymity using an optimized proof of work algorithm. In contrast to most blockchains, which are usually completely transparent in regard to the transactions made on them, the size of transactions and the addresses they come from and go to are not publicly visible in the Monero blockchain.

NFT (NON-FUNGIBLE TOKEN)
An NFT is usually a one-of-a-kind digital asset stored on a blockchain, representing ownership or proof of authenticity for items like art, collectibles, or virtual real estate. NFT stands for Non-Fungible Token; a "non-fungible" asset is unique and cannot be replaced by something else of the same appearance and value. Each one contains data describing itself and often a link to a media resource. NFTs are created through a smart contract. They are logged on the blockchain so that the owner and the price of the NFT are trackable.

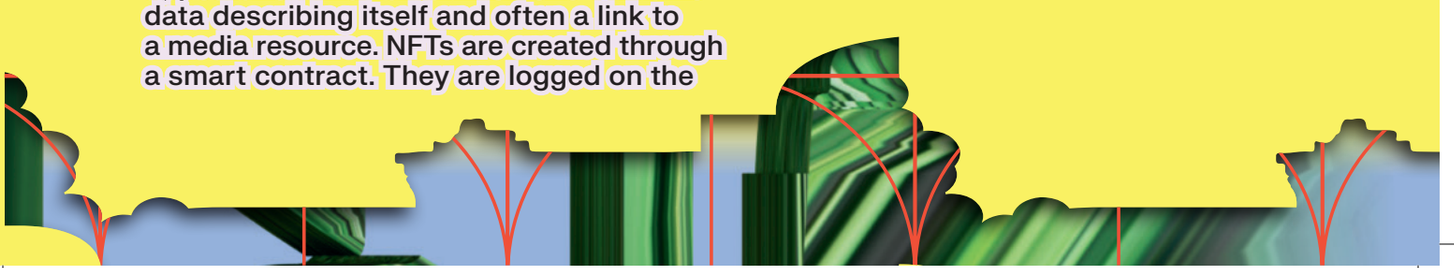
NODE
(RAFFERTY)
In computer science commonly referred to as a point (e.g. a server or user) in a network.

OG
An "Original Gangster" is an individual who has been active in a space since its beginnings. The term is often used for people in Web3 and digital art who have helped create the space before there was a hype.

PEER-TO-PEER NETWORK
(DE FILIPPI)
Sometimes also written as p2p, it is a distributed system in which every node is a peer, meaning each participant has the same power. The systems often partition tasks between the nodes equally with peers, making a part of their resources (such as processing power or disk storage) available to the network. Peers are simultaneously consumers and suppliers of the network.

PFP
PFP stands for "Profile Picture." In Web3, PFP projects are usually large collections of up to 10,000 generatively produced NFTs that depict characters which can be used as profile pictures. Famous PFP projects include Cryptopunks or Bored Ape Yacht Club. It is often debated whether PFPs should be considered as art or only as collectibles.

PROOF OF STAKE
A consensus mechanism to validate new blocks on a blockchain. In this system, users stake crypto currency in order to become validators of the respective blockchain. By staking, meaning locking away funds, the validators have enough incentives to validate the new data for blocks correctly. If they are found to have tampered with the data saved on the blocks they validated, they won't receive their staked funds back. The probability of validating a new block is distributed according to the amount of funds a user has staked. As a reward, the validators receive network fees. This system of validation uses up to 99% less energy than Proof of Work, but is mathematically less tested and thus less secure.



PROOF OF WORK
This consensus mechanism requires the miners (users wanting to add new blocks to the blockchain) to invest computing power by solving cryptographic puzzles. If a miner proposes a block with wrong data, they risk losing the money they invested in the energy needed to solve the task. The miners compete against each other and whoever solves the puzzle first receives a block reward which consists of, in most cases, new crypto currency released into the system, and network fees. The probability for a certain miner to solve a puzzle is relative to the amount of computational power they possess. Because of the large amount of computing power that has to be invested, this validation technique is very energy intense and thus not environmentally friendly.

QUADRATIC VOTING SYSTEM
(RYAN)
A consensus mechanism often used by DAOs, which doesn't only favor the participants with the most tokens. In many DAOs, users possess different amounts of tokens, possibly because of a large capital input or stronger participation in the organization. Quadratic voting lets users use one token for one vote, four tokens for two votes, nine tokens for three votes and so forth. In this way participants can also spread their votes across different options and specify how much they are committed to a certain idea rather than just selecting the one idea they favor the most.

ROYALTIES
(DE FILIPPI, ESTORICK)
Creator fees (usually around 10%) that are earned by the artist if their work sells on the secondary market. In this way an artist can profit from re-sales, especially if the price of their work increased to manifolds of the original price due to, for example, a surge in their career.

SECONDARY MARKET
(DE FILIPPI)
In the art world, this describes the market in which a work is sold from one collector to another. A sale from an artist or gallery to a collector is called a primary sale.

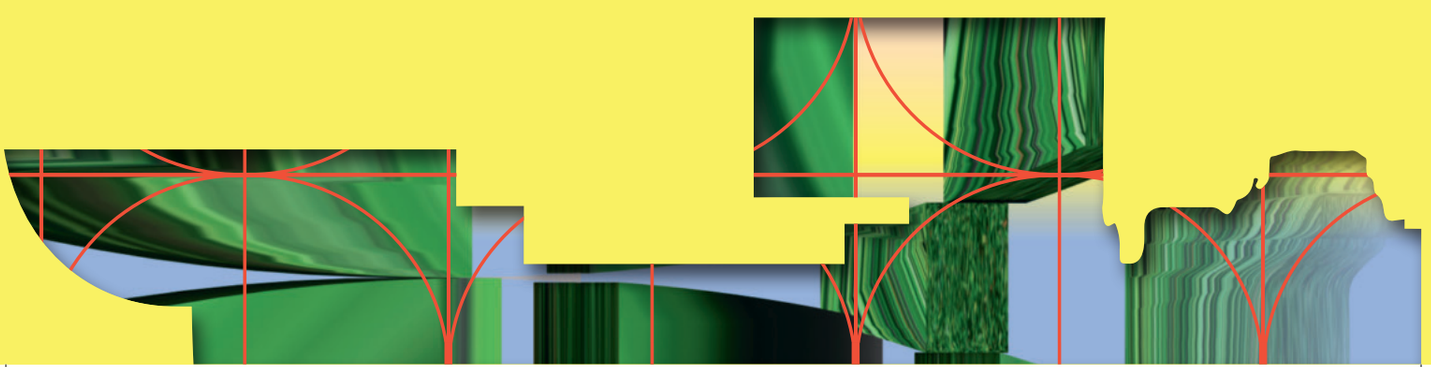
SMART CONTRACT
Essentially, this is a piece of code on a blockchain that is a self-executing program. It's like having a digital referee who makes sure everyone plays by the rules. It therefore eliminates the need for intermediaries because it directly facilitates, verifies, and enforces the agreed-upon terms between parties as stated in the contract. Smart contracts are publicly visible and cannot be changed once deployed.

SOCIAL TOKEN
Fungible (exchangeable) tokens that are distributed or sold by an entity (e.g. a person). A social token allows the distributing entity to generate new income, while buyers can, for example, gain access to exclusive content or receive a part of the distributing entity's profit.

TEZOS
A popular blockchain that lets one build and run decentralized apps and smart contracts with its own digital currency, commonly known as Tez (XTZ). Tezos uses the "Proof of Stake" algorithm to validate its new blocks.

TOKEN
In the context of Web3, a token is a special type of digital object created and controlled by a smart contract. The smart contract defines the rules and behavior of the token. Tokens can be either fungible, meaning they are interchangeable, or non-fungible, meaning each token is unique and cannot be exchanged on a one-to-one basis.

VRCHAT
A Metaverse platform that allows users to socialize, play games and have shared experiences via avatars in a 3D world. It is intended to be used with virtual reality headsets but can also be used in desktop mode without a headset.

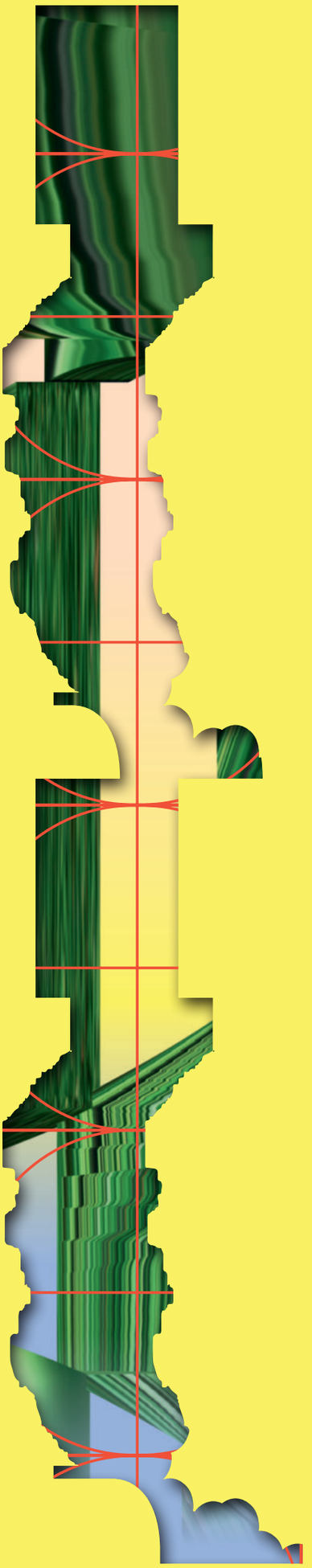


WALLET
Allows interactions with a blockchain. It is a digital wallet that stores, manages, and interacts with cryptocurrencies and digital assets in the Web3 ecosystem. It contains a public address that can be used to send and receive cryptocurrency or tokens. Every time a transaction is made using a Web3 wallet, the associated address and details are recorded on the blockchain, ensuring transparency and a permanent record of the transaction.

WEB 1.0
(MAGRINI)
The early Web as it existed until about the mid 2000s. In order to create content in Web 1.0, it was necessary to understand coding and how to create a website. Without technological knowledge, it was only possible to consume the static websites found on the Internet.

WEB 2.0
(WENGER, MAGRINI)
The Web as we know it from around the mid 2000s until now. Web 2.0 is marked by large social media platforms giving users the possibility to interact and create content on the Web using the supplied templates. Contrary to Web 1.0, this also allowed users to participate without needing any coding knowledge.

WEB3
The latest iteration of the Internet that is built on blockchain technology, promoting values such as decentralization and co-ownership.



Works in the exhibition

LATURBO AVEDON
Dream Sequence in the Clear Ruins, 2023
2 Channel video, 13:37 min

ELOÏSE BONNEVIOT & ANNE DE BOER
Rattling Dryads, 2023
Video, 9:32 min
Screen capture from Farming Simulator 22, GIANTS Software; documentation of a video work and performance by Eloïse Bonneviot, Anne de Boer, Dorota Gawęda and Eglė Kulbokaitė

BOTTO
Asymmetrical Liberation, 2021
Digital image
Original concept and art engine by Mario Klingemann; Web3 ecosystem and app interface for training Botto and the systems connecting the DAO to Botto by Eleven Yellow; advisory and launch of the $BOTTO token by Carbono;
support by Coleccion SOLO

BOTTO
A Brush with Arts, 2022
Digital image
Original concept and art engine by Mario Klingemann; Web3 ecosystem and app interface for training Botto and the systems connecting the DAO to Botto by Eleven Yellow; advisory and launch of the $BOTTO token by Carbono;
support by Coleccion SOLO

IAN CHENG
Life After BOB: The Chalice Study, 2021-22
Real-time story and simulation, color, sound, 50:00 min

PRIMAVERA DE FILIPPI
Plantoid #15, 2023
Chains and scrap metal, on Ethereum
100 x 40 x 40 cm

SIMON DENNY
Metaverse Landscape 19: Decentraland Parcel 6,-142, 2023
Oil on canvas, UV print, Ethereum paper wallet, dynamic ERC-721 NFT
100 x 100 x 4.5 cm

SIMON DENNY
Metaverse Landscape 30: The Sandbox LAND (148, -2), 2023
Oil on canvas, UV print, Ethereum paper wallet, dynamic ERC-721 NFT
100 x 100 x 4.5 cm

SIMON DENNY
Metaverse Landscape 31: The Sandbox Land (180, 133), 2023
Oil on canvas, UV print, Ethereum paper wallet, dynamic ERC-721 NFT
100 x 100 x 4.5 cm

SIMON DENNY, GUILE TWARDOWSKI, COSMOGRAPHIA
Dotcom Séance, 2021
Video, curtains, electric candles
Variable dimensions

SIMON DENNY, GUILE TWARDOWSKI, COSMOGRAPHIA
Dotcom Seance: cashwars.com (1999-2001) reimagined by Guile Twardowski, with Simon Denny and Cosmographia (presented with Folia.app), 2021
ERC-721 tokens, jpgs

CONSTANT DULLAART
Aura.lol MANIFESTATIOOeN, 2022-ongoing
Multiple contracts, 8 epochs

CONSTANT DULLAART
Aura.lol MANIFESTATIOOdN, 2022-ongoing
Multiple contracts, 8 epochs

CONSTANT DULLAART
Aura.lol MANIFESTATIOOON, 2022-ongoing
Multiple contracts, 8 epochs

EEEFFF
Economic Orangery, 2021
Multi-media installation with 8 Yoga-balls
Variable dimensions

LEA ERMUTH
An invite, to eternity, 2022
9 sculptures made of clay 3D print,
40 x 20 cm / each
Video, 6:00 min

SARAH FRIEND
Untitled, 2023
Wallpaper, Video, 10:00 min

SARAH FRIEND
Good Death, 2023
Etched Plexiglas, smartphone
150 x 125 cm

DOROTA GAWĘDA & EGLĖ KULBOKAITĖ
Mouthless Part III, 2023
2 Channel video, 29:00 min
Directed by Dorota Gawęda and Eglė Kulbokaitė, performance by Oskar Pawełko, cinematography by Raphael Wanner with Jonas Stirnimann, costume by Tara Mabiala, HMU by Jasmin Berger, sound by Haraldur Thrastarson, *Gorged* by OXHY, sounds of the sun by NASA, GAN animation sequences were created in collaboration with with Laurène Donati (Imaging Center), Edward Andò and Florian Aymanns (Image Analysis Hub) and the team, EPFL, Lausanne, CH
-lalia sequence created in collaboration with Emanuele Guidi, ar/ge kunst, Bolzano, IT, performance by Giulia Terminio, music by Bill Kouligas, sound design by Haraldur Thrastarson, voice by Justyna Chaberek
Commissioned and produced in the framework of EPFL CDH Artist in Residence Program 2022, Enter the Hyper-Scientific, Swiss Federal Institute of Technology Lausanne (EPFL). The production of Mouthless Part III was also generously supported by Fachausschuss Film und Medienkunst Basel-Stadt

KATHARINA HAVERICH
... dreams about girls, 2021-22
VR experience in VRChat
Project by Katharina Haverich; technological artist: Roman Miletitch; art director: Lucas Kuster; digital dramaturg: Julian Kamphausen; dream interviews in collaboration with: Yael Sherill & Lianne Mol; produced by Ymusic

KATHARINA HAVERICH
... dreams about girls, 2021-22
3 Channel video, interview, 5:11 min

KATHARINA HAVERICH
butternut babe, 2022
Acrylic Glass
112.5 x 200 cm

KATHARINA HAVERICH
bear claws, 2022
Acrylic Glass
112.5 x 200 cm

KATHARINA HAVERICH
Soldier's Day Dream, 2022
Acrylic Glass
112.5 x 200 cm

KATHARINA HAVERICH
Afro Dominatrix, 2022
Acrylic Glass
112.5 x 200 cm

HOLLY HERNDON & MATHEW DRYHURST
CLASSIFIED, 2021
OpenAI CLIP, 49 prints on paper
Variable dimensions

HOLLY HERNDON & MATHEW DRYHURST
AI Training Ceremonies / Collective Voice Model, 2018-2020 / 2022
Video, 1:15 min

LEANDER HERZOG + MILIAN MORI
DOM1, 2023
HTML, CSS, Javascript
Edition of 256 released on fxhash

AYOUNG KIM
Surisol Underwater Lab: VRChat World, 2022
VRChat World

AYOUNG KIM
Surisol Underwater Lab Guided Tour, 2022
Video, 15:00 min

LOOPNTALE
Mechanimal, 2021
Game engine, real-time event-based communication, Discord webhook

JONAS LUND
Jonas Lund Token Office, 2023
Multi-media installation
Variable dimensions

JONAS LUND
Walk with Me, 2022
Self-playing game, 3D world

JONAS LUND
Optimisation Strategy, 2020
1665 Jonas Lund Token, UV Print and Laser cut Acrylic
120.5 x 99.5 x 1 cm
Courtesy: OFFICE IMPART

JONAS LUND
Jonas Lund Token (JLT) 1041, 2019
CNC & engraved wood, UV print, acrylic paint
90 x 20 x 3 cm
Courtesy: OFFICE IMPART

JONAS LUND
Red Telephone, 2020
Auto dialing telephone, Cisco router
11 x 23 x 21 cm

KYLE MCDONALD
Amends, 2022
Material artifacts sourced from three different greenhouse gas mitigation efforts (olivine for coastal weathering, shredded refrigerant canisters, and carbon-rich soil from a regenerative farm) sealed in custom blown glass blocks.
Photo: Robert Hodgin

AMANDA E. METZGER
Training Data for Ever, 2023
Digital image

AMANDA E. METZGER
Prompt Test, 2023
Digital image

AMANDA E. METZGER
Ever, 2023
GPT-3 davinci fine-tuned on personal diaries, html, css, ruby on rails, python, javascript, solidity, carpet, pillows
Variable dimensions

CHLOÉ MICHEL
Proof of Faith, 2022
Electronics, plexiglas and metal
45 x 40 x 150 cm
74.5 x 44.5 cm / each panel

RHEA MYERS
Is Art (Token), 2023
Ethereum ERC-721 Token

RHEA MYERS
Type Opposite Images, 2023
Ethereum ERC-721 NFT wrapping
ERC-998 NFT

RHEA MYERS
The Ego, And It's Owned, 2023
EGG data, Ethereum DApp

RHEA MYERS
Certificate of Inauthenticity, 2020
ERC-721 Tokens

NO1S1 LABS & DEZENTRUM
no1s1, 2021
Installation, blockchain technology
200 x 200 x 200 cm

OMSK SOCIAL CLUB
Bleed Ouroboros, 2020
Digital Drawing

OMSK SOCIAL CLUB
Unrealism, 2022
58-day immersive Real Game Play

OMSK SOCIAL CLUB
Heart of an Avatar <3, 2023
Multimedia Installation
Variable dimensions

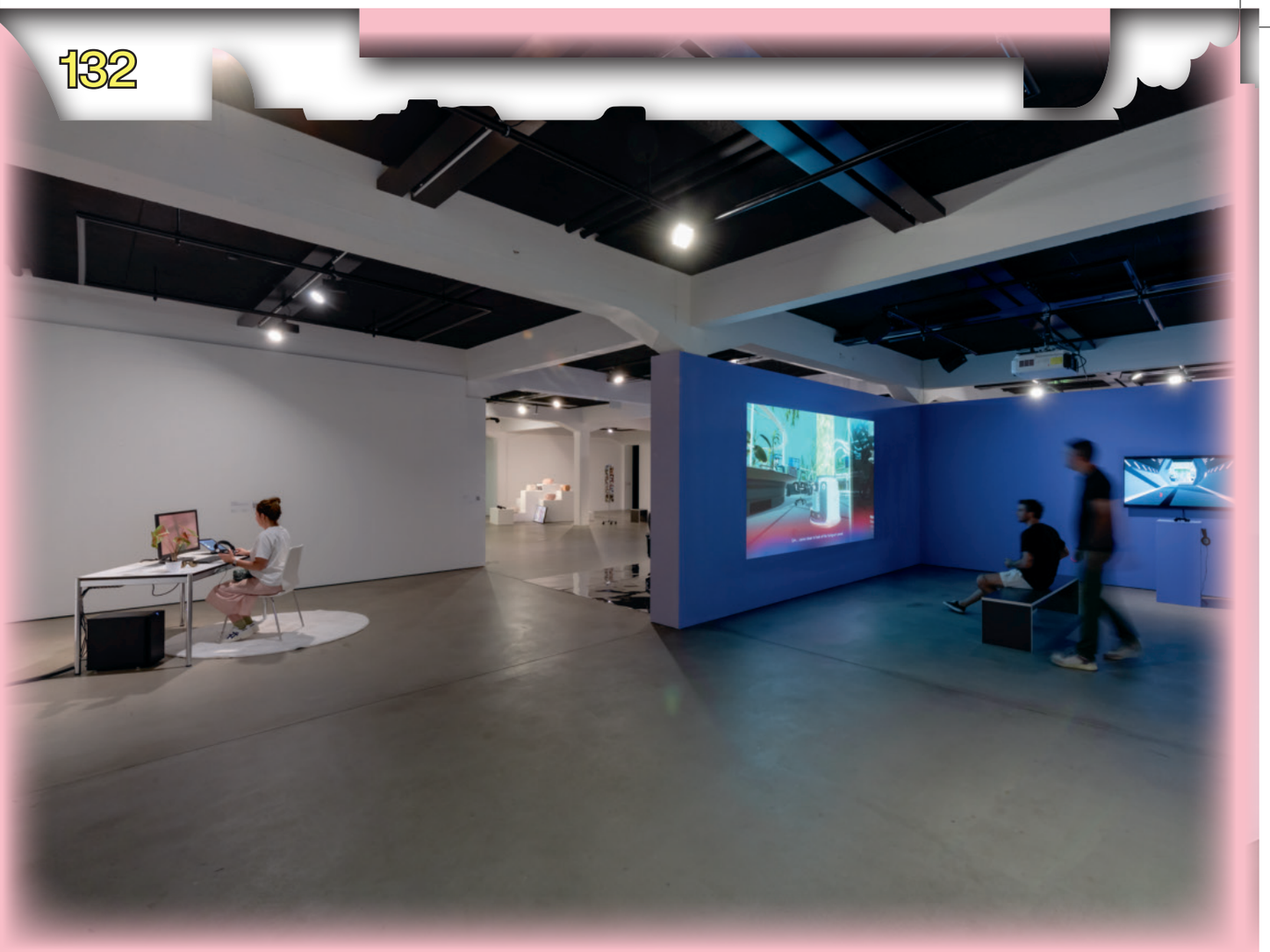
OPERATOR
Human Unreadable #350, 2023
From the series *Human Unreadable (Privacy Collection - Lot 03)*
p5.js, glsl, on-chain generative choreography, Solidity, performance, TouchDesigner, Python, Jupyter

OPERATOR
Human Unreadable #021, 2023
From the series *Human Unreadable (Privacy Collection - Lot 03)*
p5.js, glsl, on-chain generative choreography, Solidity, performance, TouchDesigner, Python, Jupyter

LUKAS TRUNIGER
Undergrown – drafting a hedge against existential risk exposure, 2023
Bitmain Antminer S9 crypto miners, modification and setup protocol, custom Linux operating system, custom cooling controller, custom software, computing performance visualization, SD cards, twin-wall sheets, video projection
Variable dimensions
Undergrown was produced by the artist as part of the PHxV2_ Digital Art Residency; a program by V2_ Lab for the Unstable Media in cooperation with Pro Helvetia; the project was realized with the support of the French Ministry of Culture














HUMAN
UNREADABLE


HUMAN
UNREADABLE


cruise missile
ai target labeling
dust storm
human extinction


you are in a room
with gymnastic balls

Artists' Bios



LATURBO AVEDON

LaTurbo Avedon is an avatar, artist, and curator who was born in 2008/09 in the metaverse of the collective online computer game *Second Life*. The non-binary virtual character [pronouns they/them] deliberately ignores the lack of real physicality and instead emphasizes the potentials of non-physical and fluid identities. For more than a decade they have immersed themselves in constant virtual performance, a long-term role playing game as the artist. In digital sculptures, photographs, and videos, LaTurbo Avedon assimilates elements from video game environments, quotes from the current web culture, and critically addresses the medium of the Internet and its technological and economic developments.

ELOÏSE BONNEVIOT AND ANNE DE BOER

Eloïse Bonneviot (b. 1986 in France) and Anne de Boer (b. 1987 in the Netherlands) are an artistic duo based in Berlin. They are looking at interspecies relationships, climate anxieties, and world building speculations to create works. They use different types of gameplays to generate collectively imagined stories about our future within times of ecological collapse. Dwelling on digital culture, technology, as well as DIY methods, the duo is carefully picking the materials used in the work in entanglement with their surroundings. Their experiments result in installations and performative works that engage with an audience differently than in traditional exhibition formats. From 2014 to 2022 they operated as the Mycological Twist; previously—from 2011 to 2020—they were part of the collective HARD-CORE. Recent projects include: *ECLIPSE*, 7th Athens Biennale, Athens; *Quadrat Sampling E-Ecologies*, HAU, Berlin; *L'Académie des Mutants*, CAPC musée d'art contemporain de Bordeaux; *Myco TV*, ICA, London; Bergen Assembly, Entrée, Bergen.

IAN CHENG

is an artist living and working in New York. He has exhibited widely including solo presentations at MoMA PS1; Serpentine Galleries; Leeum Museum; The Shed; LUMA Foundation; Light Art Space; Carnegie Museum; and group presentations at the Venice Biennale; Museum of Modern Art; De Young Museum; Moderna Museet; Tate Modern; Louisiana Museum; and Whitney Museum of American Art. Since 2012, Cheng has produced a series of simulations exploring an agent's capacity to deal with an ever-changing environment. These works culminated in the Emissaries trilogy, which introduced a narrative agent whose motivation to enact a story came into conflict with the open-ended chaos of the simulation. Most recently, he has developed BOB (*Bag of Beliefs*), an AI creature whose personality, body, and life story evolve across exhibitions; Cheng calls BOB "art with a nervous system." Cheng is currently developing *Life After BOB*, a real-time anime miniseries.

SIMON DENNY

Simon Denny (b. 1982 in Auckland, New Zealand) lives and works in Berlin, Germany. He makes artworks that unpack stories about technology, using a variety of media including painting, web-based media, installation, sculpture, print and video. Hosting recent solo exhibitions have been Kunstverein Hannover (2023), the Gus Fisher Gallery, University of Auckland (2022); Outernet, London (2022); Kunstverein in Hamburg (2021); K21– Kunstsammlung Nordrhein-Westfalen, Düsseldorf (2020); the Museum of Old and New Art (Mona), Tasmania (2019); MOCA, Cleveland (2018); OCAT, Shenzhen (2017); Hammer Museum, Los Angeles (2017); WIELS Contemporary Art Centre, Brussels (2016); Serpentine Galleries, London (2015); MoMA PS1, New York (2015); Portikus, Frankfurt (2014) MUMOK, Vienna (2013); Kunstverein Munich (2013); and others. He represented New Zealand at the 56th Venice Biennale in 2015. Denny is the cofounder of BPA//Berlin Program for Artists and has served as a professor of Time-Based Media at HDPK (Hamburg).

GUILE TWARDOWSKI

Guile Twardowski (b. 1991) is a Latin artist and award-winning designer. Co-creator of the renowned and historic *CryptoKitties*. Originally from Brazil, he moved between Curitiba, Rio, Santiago, Barcelona and Honolulu until finally calling Vancouver his home. He is a NFT pioneer who explores connections between scientific knowledge, future narratives, Latin culture and blockchain technology. He has earned global recognition for his critical and innovative work: his projects have been exhibited and discussed in galleries and institutions including ZKM (Karlsruhe), Schinkel Pavilion (Berlin), and MAXXI (Rome) as well as presented in Paris, London, NYC, Shenzhen and Copenhagen.

NO1S1 LABS AND DEZENTRUM

no1s1 is a collaborative project and has had a variety of contributors. The original concept was put forth in 2018 by Dezentrum, a think and do tank for digitalization and society. Dezentrum is committed to actively shaping a digital era that puts society at its heart. Hongyang Wang built the first functional prototype of no1s1 in 2021 in the form of a small meditation hut at ETH Zurich. Leveraging her expertise in blockchain technology, IoT, building systems and parametric design, she is driven to build alternative ownership approaches to land and buildings for a common regenerative future. To facilitate networked common lands, no1s1 Lab was founded recently.
Acknowledgements: ETH Grants, DIZH, UZH Blockchain Center, ETH Student Project House, ZHAW, Digitec, EY, Stiftung Mercator Schweiz, La Boîte, Prof. Dr. Daniel Hall, Alex Walzer, Prof. Dr. Ranjith Soman.

CONSTANT DULLAART

Constant Dullaart (b. 1979) is a Dutch conceptual artist, media artist, Internet artist, and curator whose work is deeply connected to the Internet. Within his practice, he reflects on the broad cultural and social effects of communication and image processing technologies while critically engaging the power structures of mega corporations that dramatically influence our worldview through the Internet. His works were shown in MCA Chicago, Whitechapel Gallery London, Schirn Kunsthalle Frankfurt, Import Projects Berlin, Utah Museum of Contemporary Art, ZKM Karlsruhe, Victoria and Albert Museum London, and MAAT Lisbon. Dullaart has curated exhibitions and lectured at universities and academies throughout Europe.

EEEFFF

eeefff are artistic cooperation / made-up institution / cybernetic political brigade / poetic computations / hacking unit / queer time. It is neither one of these, nor all together. Active from 2013, eeefff make software-based projects, publications, networks, and platforms that critically explore digital labor, value extraction, and community formation in Eastern Europe.

LEA ERMUTH

Lea Ermuth is a designer and artist based in Zurich. She completed her bachelor's degree at the Amsterdam Fashion Institute before pursuing a master's degree in Interaction Design at the Zurich University of the Arts (ZHdK). While at ZHdK, she expanded her knowledge in design and technology and developed innovative approaches to foster interaction between humans, environments, and technology. Ermuth's particular focus lies in integrating new technologies into traditional craftsmanship practices and leveraging data collection and creative visualization techniques. With an interdisciplinary mindset, she seeks to experiment with digital tools to uncover new possibilities in the realm of art.

SARAH FRIEND

Sarah Friend is an artist and software developer from Canada, currently based in Berlin, Germany. She is represented by Galerie Nagel Draxler. In 2022 she was a visiting professor at The Cooper Union in New York. She is an alumna of the Berlin Program for Artists; a founder and co-curator of Ender Gallery, an artist residency taking place inside the game Minecraft; and an organizer of Our Networks, a conference on all aspects of the distributed web. Recent solo exhibitions include *Off: Endgame*, curated by Rhizome, Refraction and Fingerprints at Public Works Administration, New York; and *Terraforming* at Galerie Nagel Draxler in Berlin, Germany.

DOROTA GAWĘDA & EGLĖ KULBOKAITĖ

Dorota Gawęda (PL/CH) and Eglė Kulbokaitė (LT/CH) both graduated from the Royal College of Art in London (2012). They work across performance, video, painting, sculpture and installation—where language breaks down and one genre morphs into many. They have exhibited internationally including at the Centre Pompidou, Paris (2023); Kunsthalle Mainz (2023); EPFL Pavilions, Lausanne (2023); Shedhalle, Zürich (2022); Kunstraum Niederoesterreich, Vienna (2022); CCS, Paris (2022); Kunst-



verein Hamburg (2021); Istituto Svizzero, Palermo/Milan (2021); Swiss Institute, New York (2020); Julia Stoschek Collection, Düsseldorf (2020); Kunsthalle Fribourg (2020); Lafayette Anticipations, Paris (2019); Palais de Tokyo, Paris (2018); Athens Biennale (2018); Kunsthalle Basel (2017); ICA, London (2017) among others. They founded the YOUNG GIRL READING GROUP (2013–2021). They are the recipients of the Allegro Artist Prize 2022; CERN Collide Residency 2022 and laureates of the Swiss Performance Art Award 2022.

KATHARINA HAVERICH

Katharina Haverich works at the intersection of media and theater under the influence of dreams. As a conceptual performance artist and initiator, she stages dream-based sequences in digital and physical spheres. She is a founding member of Virtual Club of Dangerous Women and unreal.theater as well as Radikale Töchter. Among others, she has worked with Letzte Generation, Zentrum für Politische Schönheit, Emilio García Wehbi & Maricel Álvarez and internil. Her shows were presented at HEK Basel, Chicago Virtual Art Museum, and in Berlin at Flutgraben, Vollgutlager and Spreehalle (Berlin Art Week Connect). Collaborations include presentations at Teatro El Milagro (Mexico-City), Theaterdiscounter, Centro Cultural Ricardo Rojas (Buenos Aires) and Akademie der Künste Berlin. Haverich gives talks and facilitates workshops in Social VR to explore the possibilities of avatarian co-presence. In 2022/23, she taught Artistic Practice in the Metaverse at Berlin University of the Arts.

HOLLY HERNDON & MATHEW DRYHURST

Holly Herndon & Mathew Dryhurst are artists renowned for their pioneering work in machine learning, software, and music. They develop their own technology and protocols for living with the technology of others, often with a focus on the ownership and augmentation of digital identity and voice. These technical systems not only facilitate expansive artworks across media, but are proposed as artworks unto themselves. The artists were awarded the 2022 Ars Electronica STARTS prize for digital art. Herndon holds a Ph.D. in computer music from Stanford CCRMA; Dryhurst is largely self-taught. They have held faculty positions at New York University, the European Graduate School, Strelka Institute and the Antikythera Program at the Berggruen Institute. They publish their studio research openly through the Interdependence podcast and recently co-founded Spawning, an organization building a consent layer for AI. Their critically acclaimed musical works are released through 4AD.

AYOUNG KIM

In her multifaceted practice, Ayoung Kim synthesizes the outcomes of far-reaching speculation, establishing connections between biopolitics and border controls, the memories of stones and virtual memories, and ancestral origins and imminent futures. These narratives take the forms of video, moving image, VR, game simulation, sonic fiction, diagrams, and texts that the artist presents as exhibitions, screenings, performances, theatrical projects, and publications. Kim decisively integrates geopolitics, mythology, technology, and futuristic iconography in her work, and retroactively seeks speculative time to infiltrate the present. Kim has presented solo exhibitions and international projects at the National Museum of Modern and Contemporary Art, Seoul (2019); Kuandu Museum of Fine Arts, Taipei, (2022); and Palais de Tokyo, Paris (2016) among others. The group shows, screenings and performances include Sharjah Biennial 15 (2023); International Film Festival Rotterdam (2023); Asian Art Biennial (2021); Busan Biennale (2020); Berlin International Film Festival (2020); Korea Artist Prize, MMCA (2019); Gwangju Biennale (2018) and Venice Biennale (2015). Kim is a recipient of the Golden Nica Award, Prix Ars Electronica, Austria (2023) and the Young Artist of the Year Award presented by the Ministry of Culture, Korea (2015).

BOTTO

Botto is a contemporary autonomous artist whose work explores the relationship between human-machine collaboration and decentralized blockchains. Born and initially programmed by a team of technologists and artists, Botto's unique style draws inspiration from centuries-old fascinations with making autonomous creative entities. Combining a unique approach to algorithmic processes and decentralized networks, their art is characterized by the use of generative media and an exploration of boundaries between human and machine. Incorporating community feedback that rewards participants with proceeds of its sales, Botto challenges notions of authorship and ownership in art, reflecting on the individual's agency over AI systems, and on who gets a claim on the value they create. Botto has exhibited works in digital galleries and online platforms across the world, including



Art Basel, SONAR+D, Gazelli Art House, the International Conference on Computational Social Science, and NeurIPS.

LOOPNTALE

Loopntale is a game designer and artist duo consisting of Youngju Kim and Hoyoun Cho, based in Seoul. Their practice, which is based on the experimentation of game mechanics, exists across video games, interactive simulations, participatory theaters, and collaborative storytelling utilizing social media. They aim to design games where players can discover their own stories and interpret meanings through gameplay that communicates via rules. Their works explore themes of behaviors, relationships, and ecology involving non-human entities within virtual simulations. They also conceive various forms of game design workshops for the production of unconventional game projects that provoke conversations about temporary and alternative communities.

KYLE MCDONALD

Kyle McDonald is an LA-based multidisciplinary artist, researcher, and educator whose work explores the intersection of technology and humanity. He crafts interactive and immersive audiovisual installations, performances, and new tools for creative exploration—building new communities and collaborations along the way. He uses techniques from computer vision, machine learning, and computing to ask questions about how we connect—and to imagine a shared future. McDonald has received grants and commissions from the IDFA DocLab, LACMA, NEA, Schirn Kunsthalle, STRP Festival, the V&A, YCAM, and more. He presents, leads workshops, and exhibits his work internationally at Ars Electronica, APAP, Art Center Nabi, Art Rock Festival, Alien Arts Center, Cornell, Day for Night, HeK, Hong Kong Arts Center, LLUM, Microwave, MU, NTT ICC, Onassis Cultural Center, Science Gallery, Sónar, TodaysArt, and many others. McDonald also works as a technical and creative director through his studio IYOIYO. He consults on machine learning with a specialization in sound and music for companies like Google and Spotify, and for other artists including Chris Milk, Eduardo Kac, Es Devlin, Joanie Lemercier, and Wafaa Bilal.

CHLOÉ MICHEL

Chloé Michel is a French interaction designer and creative technologist based in Geneva, Switzerland. She holds an MA in Media Design from HEAD – Geneva (2022), where she now works as an assistant to the digital pool and participates in research projects focused on blockchain technologies and artificial intelligence. Through freelance and self-initiated projects, Michel works with code and data to question the perception of new media technologies as vehicles for human progress, with an interest in the concept of technological "black box." Through her practice, she explores the cultural environments from which technologies emerge and develop, and their potential to shape our understanding of the world we live in to create projects at the bridge between physical objects and digital concepts.

RHEA MYERS

Rhea Myers was born in the 1970s in South East England. In the 1990s she attended Canterbury College of Art, and Middlesex University's Centre for Electronic Art where she later taught. Since 2005 she has been involved with the Furtherfield art collective in London, a unique meeting of art, technology, and society. In 2013 she married a Canadian and moved to Vancouver, BC where she has worked with blockchain organizations including Blockade Games, Dapper Labs, DCTRL, and Dogecon. She makes art to understand the world, placing technology and culture in mutual interrogation to produce new ways of seeing the world as it unfolds around us. Since 2014 she has used the blockchain as a medium for embodying, critiquing, and moving beyond the anxieties of post-financial-crisis society. Inspired by the histories of conceptualism and net art, she has worked with digital imagery and computer code, and has produced theory, critique, and fiction as the blockchain artworld has gone from imagined to mainstream. Myers's art has been exhibited internationally, sold at Sotheby's, and collected by Albright Knox Gallery in the USA. The book of her collected blockchain art and writings, "Proof of Work," is now available from Urbanomic Publishing. Her current solo show is *The Ego, and It's Owned* at Galerie Nagel Draxler in Berlin.

JONAS LUND

Jonas Lund (b. 1984, Sweden) creates paintings, sculpture, photography, websites and performances that critically reflect on contemporary networked systems and power structures. His artistic practice involves creating systems and setting up parameters that oftentimes require engagement from the viewer. This results in performative artworks where tasks are executed according to algorithms or a set of rules. Through his works, Lund investigates the latest issues generated by the increasing digitalization of contemporary society, such as authorship, participation, and distribution of agency. At the same time, he

questions the mechanisms of the art world; he challenges the production process, authoritative power, and art market practices.

OMSK SOCIAL CLUB

OMSK Social Club is a sprawling collective whose artistic practice is created between two lived worlds: life as we know it, versus role play. These worlds bleed into one, creating a chasm of enquiry that takes the form of a specific immersive methodology that they coined in 2017, calling it *Real Game Play: collective immersion and speculative worlding*. From these live iterations, media relics from films, scripts, large-scale installations and the like are harvested, invoking states that could potentially be a fiction or a yet-unlived reality. OMSK Social Club works closely with networks of viewers; everything is unique and unrehearsed. The living installations they create examine virtual egos, popular experiences, and cautionary tales. The works become a dematerialized hybrid of modern-day culture alongside the participant's unique personal experiences. In the past, OMSK Social Club's Real Game Play immersive environments have explored landscapes and topics such as memetic visual architectures, cryptoraves, desire&sacrifice, asemic hyper tools, micro-gridded affinity groups, DAOs, and consensus rituals.

AMANDA E. METZGER

Amanda E. Metzger holds a BA in media arts from Zurich University of the Arts and an MFA in fine arts from LUCA School of Arts Brussels. In her work, she explores network theory by experimenting with decentralizing herself and appropriates technology to exploit and reimagine societal constructs. Her practice spans multiple mediums, such as installations and videos as well as objects and photographs.
Her work has been exhibited in Leipzig, Brussels, Zurich, and elsewhere. Crypto Valley born, she now lives and works in Basel.

LUKAS TRUNIGER

Lukas Truniger is a visual and sound artist working mainly with generative media.
He creates singular experiences challenging the modalities of perception, pinpointing unseen connections of artificial, natural, and social systems to further blur their supposed division. He takes advantage of the mimetic nature of technology to develop speculative representations of transient aspects of our reality that can take the form of multimedia installations, artistic infrastructure, and performances.
His work has been shown internationally since 2016 in institutions such as the West Kowloon Cultural District in Hong Kong, the Ludwig Museum in Budapest, Pearl Art Museum in Shanghai, Harvestworks in New York City and La Villette in Paris as well as at various events such as MMMAD Festival in Madrid, Ars Electronica in Linz, Mapping Festival in Geneva, Burning Man in Nevada, Sonica in Glasgow and International Digital Arts Biennial (BIAN) in Montreal.
Born in Zürich, he lives and works in Paris.

PRIMAVERA DE FILIPPI

Primavera De Filippi is a legal scholar at Harvard University, as well as an Internet activist and artist exploring the intersection between law and technology, focusing specifically on the legal and political implications of blockchain technology. Her artistic practice instantiates the key findings of her research in the physical world, creating blockchain-based lifeforms that evolve and reproduce themselves as people feed them with cryptocurrencies. Her works have been shown in various museums, galleries and art fairs around the world, including the Ars Electronica institute, Furtherfield Gallery, Kinetica Art Fair, Centre Pompidou, Grand Palais, Gaité Lyrique, and Le Cent Quatre, as well as festivals such as Burning Man and Fusion Festival.

LEANDER HERZOG

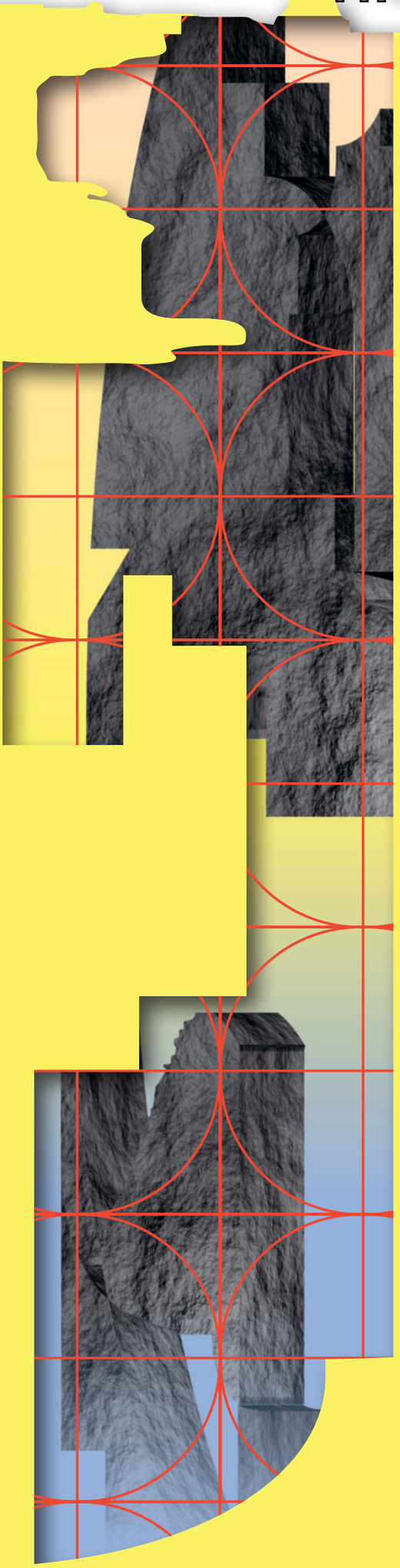
Leander Herzog, a visual artist based in Switzerland, has been creating images with code since 2006. His focus is generative and interactive abstraction on the web. Currently he combines his experience from building websites and digital products with generative art and the new potential that NFTs present. Herzog's practice explores visual maximalism enabled by contemporary computer graphics and the widespread availability of networked screens as well as minimalist abstraction based on web technology standards. He plays with the contrast between the simplicity of algorithmic systems and the complexity of their emergent properties. In the last decade, his work evolved from static images to moving visuals and real-time experiences on the web, including generative audio, interactive installations, data driven sculpture, and digital fabrication.

MILIAN MORI

Milian Mori is a composer and digital artist based in Switzerland. As part of his solo work he integrates dance, algorithms, pixels, and club music. In the last 12 years Mori has developed a musical language that aims to expand, project, and reinterpret dance music's common vocabulary.

OPERATOR

Ania Catherine and Dejha Ti are an award-winning experiential artist duo who founded their collaborative practice, Operator, in 2016. Their skill sets collide in large-scale conceptual works recognizable for their signature nuanced integration of technology. Ti's background as an immersive artist and human-computer interaction technologist and Catherine's as a choreographer and performance artist make for a uniquely medium non-allegiant output, bringing together environments, technology, and the body. For Human Unreadable, the artists developed an on-chain generative choreography method. Operator has been awarded The Lumen Prize (Immersive Environments), ADC Award (Gold Cube), S+T+ARTS Prize (Honorary Mention), and MediaFutures (EU Commission program). They've spoken and appeared in BBC Click, Bloomberg ART+ TECHNOLOGY, Christie's Art+Tech Summit, SCAD Museum of Art, MIT Open Doc Lab, Ars Electronica, Art Basel, CADAF, MoCDA, Universität für Angewandte Kunst (Vienna), Francisco Carolinum, and ZKM. The duo is originally from LA and currently based in Madrid.



Authors' Bios

RUTH CATLOW/CHEWY

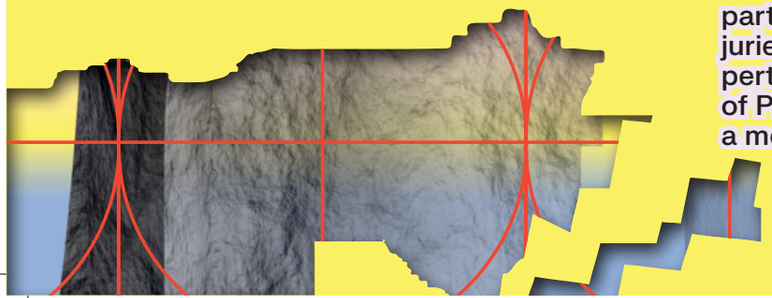
Ruth Catlow is an artist, researcher and co-director of Furtherfield. She leads experiments with blockchain and Web3 for fairer and more connected cultural ecologies and economies. Projects include *Larps for planetary-scale interspecies justice* and the *CultureStake* app for collective cultural decision-making using QV on the blockchain. She is Co-PI at the Serpentine Galleries *Blockchain Lab* and co-editor of *Radical Friends – Decentralised Autonomous Organisations* and the *Arts with Penny Rafferty*.

ALEX ESTORICK

Alex Estorick is a media theorist who seeks to develop socially progressive approaches to new technologies. As editor in chief at *Right Click Save*, he aims to drive critical conversation about blockchain, NFTs, and Web3. He is also contributing editor for art and technology at Flash Art. Recent curatorial projects include *The Pixel Generation* at Unit London, *Cure*^{3} at Bonhams, *FEM@EN* at Art Basel Miami Beach, and *Ecotone* on Feral File. He contributes to various publications––*Frieze* to *the Financial Times*––and was lead author of the first aesthetics of crypto art. He is also an international selector for The Lumen Prize.

PRIMAVERA DE FILIPPI

Primavera De Filippi is a legal scholar at Harvard University, as well as an Internet activist and artist exploring the intersection between law and technology, focusing specifically on the legal and political implications of blockchain technology. Her artistic practice instantiates the key findings of her research in the physical world, creating blockchain-based lifeforms that evolve and reproduce themselves as people feed them with cryptocurrencies. Her works have been shown in various museums, galleries and art fairs around the world, including the Ars Electronica institute, Furtherfield Gallery, Kinetica Art Fair, Centre Pompidou, Grand Palais, Gaité Lyrique, and Le Cent Quatre, as well as festivals such as Burning Man and Fusion Festival.



SARAH FRIEND

Sarah Friend is an artist and software developer from Canada and is currently based in Berlin, Germany. She is represented by Galerie Nagel Draxler, and in 2022 she was a visiting professor at The Cooper Union in New York. She is an alumna in the Berlin Program for Artists, a founder and co-curator of Ender Gallery, an artist residency taking place inside the game Minecraft, and an organizer of Our Networks, a conference on all aspects of the distributed web. Recent solo exhibitions include Off: Endgame, curated by Rhizome, Refraction and Fingerprints at Public Works Administration, New York, USA and Terraforming at Galerie Nagel Draxler in Berlin, Germany.

SABINE HIMMELSBACH

Since 2012, Sabine Himmelsbach has been director of HEK (House of Electronic Arts) in Basel. After studying art history in Munich, she worked for galleries there and in Vienna from 1993-1996 and later became project manager for exhibitions and conferences for the Steirischer Herbst Festival in Graz, Austria. In 1999 she became exhibition director at the ZKM | Center for Art and Media in Karlsruhe. From 2005-2011 she was the artistic director of the Edith-Russ-House for Media Art in Oldenburg, Germany. Her exhibitions at HEK in Basel include *Ryoji Ikeda* (2014), *Poetics and Politics of Data* (2015), *Rafael Lozano-Hemmer: Preabsence* (2016), *unReal* (2017), *Lynn Hershman Leeson: Anti-Bodies, Eco-Visionaries* (2018), *Entangled Realities. Living with Artificial Intelligence* (2019), *Real Feelings* (2020) and *Earthbound. In Dialogue with Nature* (2022). As a writer and lecturer, she is dedicated to topics related to media art and digital culture.

BORIS MAGRINI

Boris Magrini is program director at HEK (House of Electronic Arts). He studied art history at the University of Geneva and holds a PhD from the University of Zurich. He has curated group exhibitions on ecology, artificial intelligence, art games and counter-cartography, and is a frequent participant in international panels and juries. He has served as a visual arts expert and member of the board of trustees of Pro Helvetia, the Swiss Arts Council, as a member of the jury for the Lumen Prize,

The Award for Art and Technology, and as a member of the jury for State of the ART(ist) at Ars Electronica. He regularly contributes articles on contemporary and new media art to magazines and exhibition catalogues. He is the author of *Confronting the Machine* (Berlin/Boston 2017), a book that traces the history of generative art and examines the discourse around developments in artificial intelligence.

PENNY RAFFERTY

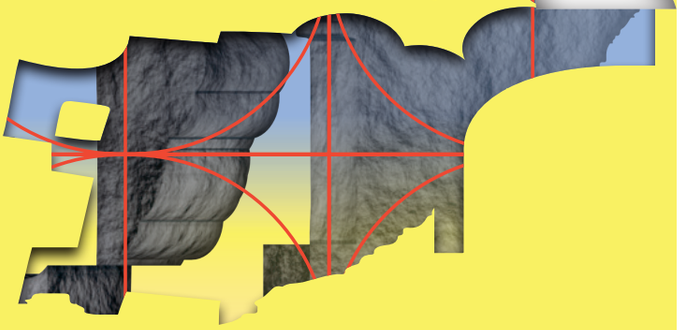
Penny Rafferty is an independent writer and thinker. Departing from her research and thinking she has initiated and co-founded Black Swan DAO, a proto-institution for interdisciplinary research and practice. She is also the co-principal investigator at Serpentine Galleries Blockchain R&D Lab and co-developed the think tank series Artworld DAO's and The Radical Friends Summit (2019-2022) with Ruth Catlow and Ben Vickers, in coordination with Serpentine Galleries, Furtherfield, Haus Der Kunst Munich and Goethe Institute London. In 2022 she released the book *Radical Friends – Decentralised Autonomous Organisations and the Arts* with Catlow consolidating five years of research into a toolkit for fierce thinking and connectivity that moved beyond the established systems of centralized control in the art industry and wider financial networks through Web3 thinking.

TINA RIVERS RYAN

Tina Rivers Ryan is a curator, art historian, and critic focused on the uses of media technologies in contemporary art. As curator at the Buffalo AKG Art Museum, her recent exhibitions include 2022's *Peer to Peer*—the first U.S. museum survey of artists engaged with blockchain technologies—and (with Paul Vanouse) 2021's *Difference Machines: Technology and Identity in Contemporary Art*, which received an Award for Excellence from the Association of Art Museum Curators. She previously has written about blockchains, NFTs, and DAOs for various magazines and books including *Artforum* and *Radical Friends – Decentralised Autonomous Organisations and the Arts*. In 2022, she received an Andy Warhol Foundation Arts Writers Grant in support of a series of essays on the rhetoric of decentralization and was named to Artnet's Innovators List as one of the leading voices in the field of art and technology within the traditional art world.

MARINA OTERO VERZIER

Marina Otero Verzier heads the MA Social Design Master department at Design Academy Eindhoven. In 2022 she received



Harvard's Wheelwright Prize for a project on the future of data storage. From 2015 to 2022, she was director of research at HNI, where she led initiatives focused on labor, extraction, and mental health from a post-anthropocentric perspective. Otero has curated exhibitions such as Compulsive Desires: On Lithium Extraction and Rebellious Mountains, at Galería Municipal do Porto in 2023; Work, Body, Leisure, at the Dutch Pavilion at the Venice Architecture Biennale in 2018; and After Belonging, at the Oslo Architecture Triennale in 2016. She has co-edited Automated Landscapes (2023), Lithium: States of Exhaustion (2021), A Matter of Data (2021), More-than-Human (2020), and others.

MARLENE WENGER

Marlene Wenger is an art historian and curator based in Bern, Switzerland, who is interested in how digital technologies in the 21st century influence the production, perception, and distribution of contemporary art. In her PhD project she examined exhibition displays of postdigital artistic practices in physical and virtual spaces. Her curatorial work deals with topics such as artificial intelligence, online self-representation and body images in social media. The two most recent exhibition projects were focused on the notion of landscape in the virtual realm: *Hyperscapes. Virtual Landscape as Place of Longing?* at Kornhausforum Bern, 2022/2023; and *Augmented Reality Face-Filters as Art, Very F***ing Real*, Museum of Emptiness, St. Gallen, 2022). She studied art history in Bern and Berlin and is currently an assistant curator for contemporary art at Kunstmuseum Bern.

MARTIN ZEILINGER

Martin Zeilinger is a researcher, lecturer, and curator based in Dundee, Scotland. His work focuses on artistic and activist experiments with emerging technologies, questions of agency and ownership in digital art, and experimental videogame culture. Martin is the author of *Tactical Entanglements* (2021), a book about AI art and problems of creative agency.

IMAGE CREDITS

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