Orbital Art in the Age of Internet and Space Flight:
From Terrestrial to Orbital Perspectives
— with a particular focus on German artist Achim Mohné

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This is Major Tom to Ground Control
I'm stepping through the door
And I'm floating in a most peculiar way
And the stars look very different today
For here
Am I sitting in a tin can
Far above the world
Planet Earth is blue
And there's nothing I can do

("Space Oddity" by David Bowie)

Abstract

The shift of perspectives, from local via global to orbital, and back down to Earth again, is fundamental to the concept of the Anthropocene. It is a recently proposed geological epoch dating from the commencement of significant human impact on Earth's geology and ecosystems, including anthropogenic climate change. Contemporary art reacts to these epochal shifts in a variety of ways. It is not only about creating new spectacular views and scenery but rather, in many ways, about basic changes of perception and experience that lead to a new critical awareness and heightened environmental consciousness. Artists like Trevor Paglen and Achim Mohné, among others, are interested in exploring and discussing the increasing importance of comprehensive surveillance systems and data mining by satellite technology and drones nowadays. Sometimes, they appropriate, or they try to hack these new scopic regimes with their artistic rhetorics and aesthetics. For instance, they are smuggling their poetic artworks into the networked systems, or are scrutinizing its unique digital image culture, which sometimes produces strange imagery like, for example, the glitch and digital abstraction. In the end, this contemporary digital art also asks what becomes visible and what remains invisible in a cyber-control age that highly commercializes the use of satellites and camera drones as well as live-observation of the planet. Moreover, in the age of digitalization, picture-taking is everywhere getting more and more automatized, and more and more images are produced as well as generated and processed with the help of orbital satellite cameras with intelligent, deep-learning algorithms nowadays. These are the post-human eyes onto Earth.

On the Shift of Perspectives:
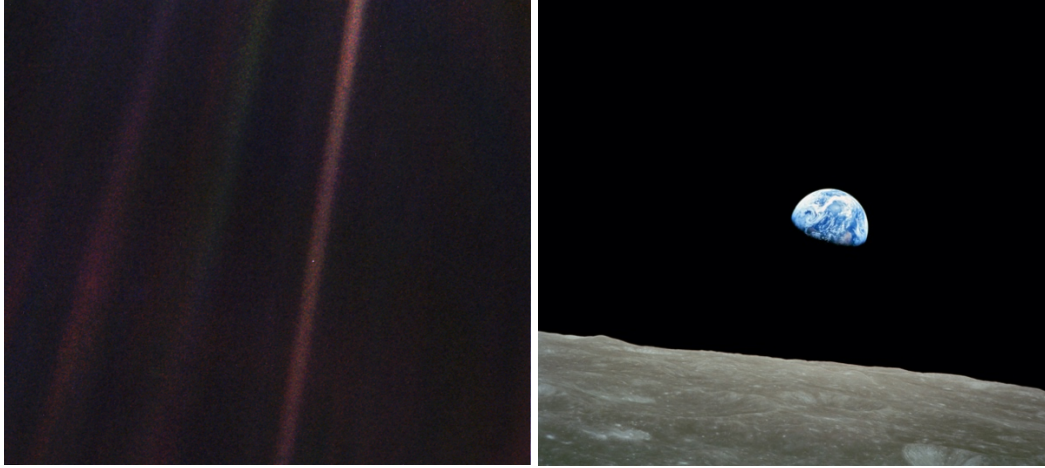## from the global to the orbital, and back down to the Earth again

Figure 1: Earth, described by scientist Carl Sagan as a "Pale Blue Dot," as seen by Voyager 1 from a distance of more than 4 billion miles (6.4 billion kilometers). Source: NASA/JPL-Caltech. Published: February 5, 2019. Historical Date: February 14, 1990. Image source: https://solarsystem.nasa.gov/resources/536/voyager-1s-pale-blue-dot/.

Figure 2: "Earthrise", taken on December 24, 1968, by NASA/ Apollo 8 astronaut William Anders. Image source: https://www.hq.nasa.gov/office/pao/History/alsj/a410/AS8-14-2383HR.jpg.

In the age of globalization, the image of the "pale blue dot" (Fig. 1) has slowly replaced the famous "Earthrise"- photograph (Fig. 2), which had been a global icon of the post-war period as well as the Cold War with its race to the moon. According to NASA, this stellar color image of the Earth globe is a part of the first-ever 'portrait' of our solar system taken by Voyager 1. The spacecraft acquired a total of 60 frames for a mosaic of the solar system from a distance of more than 4 billion miles away from humankind's home planet and about 32 degrees above the ecliptic. From the technical sonde's far reach, our small Earth is a mere point of weak light, less than the size of a picture element even in the narrow-angle camera. Our home-planet was a crescent of only 0.12 pixel in size. "Coincidentally, Earth lies right in the center of one of the scattered light rays resulting from taking the image so close to the Sun. This blown-up image of the Earth was taken through three color filters—violet, blue and green—and recombined to produce the color image. The background features in the image are artifacts resulting from the magnification."[1] So, that is how a technical apparatus 'sees' our world, humankind's fragile habitat. Before cult scientist Carl Sagan called it the "pale blue dot" in space, it was also known as "the blue marble" since the NASA-Apollo missions of the sixties and seventies. (Fig. 3)

Figure 3: "The Blue Marble", by the NASA/ Apollo 17 crew (1972);
taken by either Harisson Schmitt or Ron Evans. Image source:
https://www.nasa.gov/multimedia/imagegallery/image_feature_329.html.

Moreover, in the age of digitalization, picture-taking is everywhere getting more and more automatized, and more and more images are produced as well as generated and processed with the help of smart cameras with intelligent, deep-learning algorithms nowadays. These are the post-human eyes on Earth. Furthermore, Earth observation today is carried out via satellites in real-time. Environmental problems, wildfires, pollution of the seas, or melting of ice, for instance, can now be observed and tracked more easily and quickly.
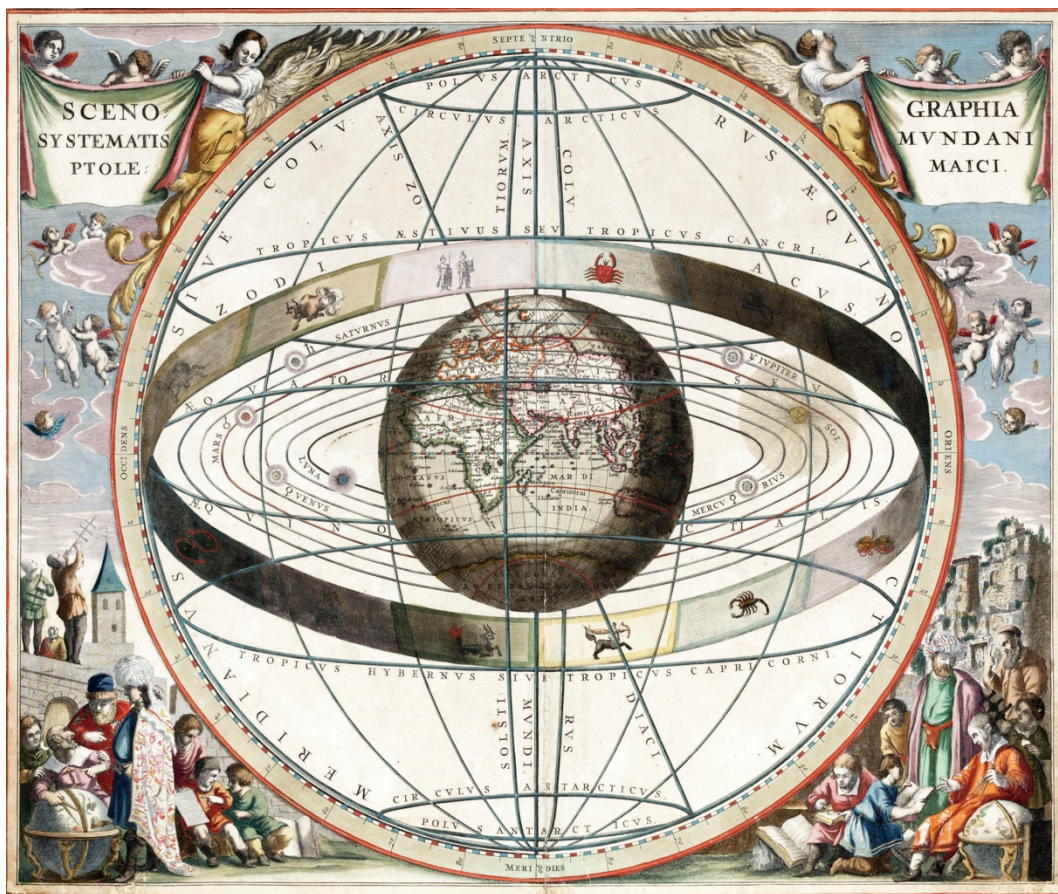
Figure 4: In the Ptolemaic world view, the moon, the planets and the sun orbit the earth.
From Andreas Cellarius Harmonia Macrocosmica, 1660/61, Image source:
https://upload.wikimedia.org/wikipedia/commons/d/d4/Cellarius_ptolemaic_system_c2.jpg.

Thousands of years, humankind was considering itself to be the center of the universe and looked up into the sky, to the distant stars that represented gods in their mythologies. Nevertheless, a bird's view, for example, entered the history of painting before the Wright brothers even invented the first successful airplane at the beginning of the 20th century. Then planes, rockets, and satellites conquered the skies and, literally, broadened our horizons. Humankind suddenly could also look down at the Earth, and that changed how it sees itself fundamentally. Today, Google Earth and similar apps allow everyone to take a virtual tour around the globe in orbital scales. Recently, virtual globes have even substituted real globes or maps. (Fig. 4) No doubt, the photographic view of our planet from outer space is an epochal event of historical importance. Photographic images taken by satellites, moon astronauts, or space probes like Voyager 1 and 2, which stand in a long tradition of so-called artist illustrations and science fiction mock-ups, have created a new awareness of what it means to inhabit a small globe as the natural environment. It also brought about a sweeping change in consciousness and promoted new notions of a planetary unit and the "earth system." French philosopher Bruno Latour calls it—in preparation for an upcoming thought-exhibition at the ZKM Karlsruhe—the endangered 'Gaia.[2]'

Thus, sometimes it takes a distance to see huge problems very close to you. For long, in cultural history the globe also has functioned as an illustration as well as a metaphor of the globalization that started at the latest by 1492 with the discoveries of Columbus. But by now looking down from space to the soil, humankind can observe and study various local as well as global catastrophes and human-made crises on its planet: "By now everybody knows that there is an existential threat to our collective conditions of existence, but very few people have any idea of how to cope with this new CRITICAL situation. It is very strange, but citizens of many developed countries are disoriented; it is as if they were asked to land on a new territory, an Earth that they have long ignored having reacted to their action. The hypothesis we want to propose is that the best way to map this new Earth is to see it as a network of CRITICAL ZONES, which constitute a thin skin a few kilometers thick that has been generated over eons of time by life forms. Those life forms had completely transformed the original geology of the Earth, before humanity transformed it yet again over the last centuries."[3]
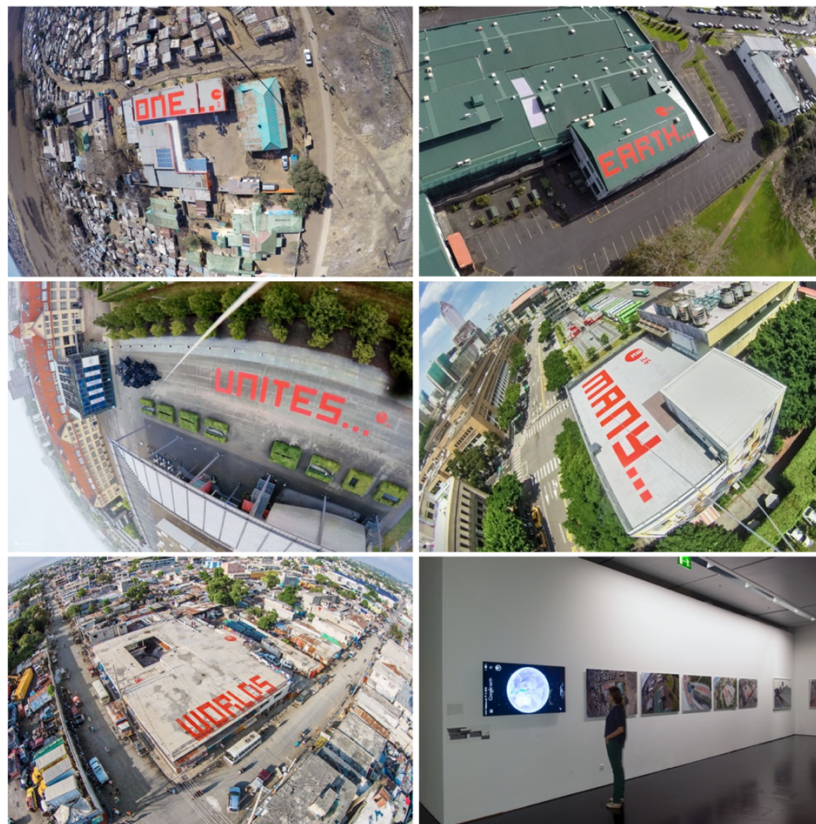
Cybernetic theories, new technologies, and a long-lasting romanticism about nature coincide in this photographic image of the Earth as a fragile tiny sphere in the vast space of our universe—such as, for example, produced and distributed by German Astro Alex from inside the Cupola of the ISS. (Fig. 5-6)

Figures 5-6: Earth in our Window: Earth 'fits' in the Cupola of the International Space Station; photographed by Alexander Gerst on 6 July 2014, Image ESA/NASA. Source: https://www.nasa.gov/content/astronaut-alexander-gerst-checks-out-station-cupola and https://twitter.com/Astro_Alex/status/490150268701790208/photo/1.

REMOTEWORDS

Moreover, the climate change debate and the current philosophical concept of the so-called Anthropocene age are fundamentally shaped by the notion of the one planet. Thus, *"one Earth unites many worlds,"* states the CEO of the ZKM Karlsruhe, 2017, for an art project by REMOTEWORDS (Uta Kopp and Achim Mohné)[4], which emphasizes connectedness as well as cultural diversity in global unity. It is titled FIVE ROOFS | FIVE CONTINENTS: ONE EARTH UNITES MANY WORLDS for the GLOBALE event in Karlsruhe. (Fig. 7-12) Herefore, the Cologne-based artist duo REMOTEWORDS installed a stark message with five words on five continents authored by Peter Weibel on the occasion of the 100 day-lasting ZKM exhibition. Its five parts, RW.26, RW.27, RW.28, RW.29, and RW.30, have been installed in Taipei at Taipei Artist Village, in Port-au-Prince, Haiti, with Ghetto Biennale, in Kliptown, Johannesburg at SKY–Soweto Kliptown Youth, in Auckland at MIT, Manukau Institute of Technology, and in Karlsruhe in cooperation with ZKM in front of the museum's building. The whole statement then could only be read from high above and by taking a virtual tour around the globe.

Figures 7-12: REMOTEWORDS (Uta Kopp and Achim Mohné):
"Five Roofs | Five Continents: ONE EARTH UNITES MANY WORLDS," 2017.
Courtesy the artists. © Achim Mohné / VG Bild-Kunst.

Peter Weibel emphasized its central role for the GLOBALE event in Karlsruhe: The artist group REMOTEWORDS "... traveled five continents from New Zealand to North America and searched for places where they could place a word so significant that it could easily be captured by a satellite orbiting the Earth. In so far as this work collects information, it is an excellent example of the link between globalization and the so-called infosphere. By the way, the artists asked me for a five-word sentence for the five continents, and I gave them the following along the way: "One earth unites many worlds." By the way, the word "unites" is written on the forecourt of the ZKM. This is precisely what marks the theme: for from the small planet on which we live, we set out on a panicky search for exo-planets in the hope of finding suitable living conditions outside the Earth's sphere. But so far, we have only one earth on which we have the conditions necessary for life. Therefore, we must not destroy it. This "unites" is a word as important as "many," which stands for the existence of different cultures, languages, and peoples, i.e., for diversity. In physics, too, there is a constant search for the unification of contradictory theories such as the theory of relativity with the theory of quantum mechanics. Unifying or uniting is a primary theoretical task. You can see what unification means when you have no argument. The European Union cannot function without it. On the contrary, it makes Europe fall apart."[5]

Figure 13: Forecourt ZKM Karlsruhe, Germany, with the single word
UNITES by REMOTEWORDS written in red paint on the ground, 2017. Photo: Pamela C. Scorzin.

Thus, this epic public art project comprehends the physical globe—in the tradition of the Land Art movement—itself as an expanded art territory. Once updated on contemporary virtual globes like Google Earth, Bing or Apple Maps, the whole phrase ONE EARTH UNITES MANY WORLDS could be read comprehensively only by taking a virtual tour around the world that digitally references the impressive new scales and the orbital perspectives of our technologically net-worked times. As once Jenny Holzer in the realm of public art, REMOTEWORDS bring messages into environmental space, but by now, both physical-real as well as virtual-digital. The hand-painted, analog single words on the roofs and the ground instead were hard to be perceived by a local audience close to it. (Fig. 13).

Herewith, in the long-established modern art practices of *parasitage* as well as *détournement,* the artists secretly hacked a global surveillance system that is primarily used for several commercial, economic, and especially military services, but so far not for the arts. Referring to the heritage of prehistoric Earthworks like the mysterious Nasca lines and up to modernist Land Art USA[6], REMOTEWORDS is a long-term artistic and inter-disciplinary urban project in global measures founded in 2007 by Achim Mohné and Uta Kopp in Cologne, Germany. Established at the cross-over of art, literature, design, internet culture, and navigation technology, REMOTEWORDS now worldwide installs short messages and statements on roofs of cooperating partners such as cultural institutions and art centers. They are applied with paint in the form of permanent, capital letters in a kind of pixelated typography. Each collaboratively developed message represents a semantic unit with its particular hosting location and the environment. Thus, the site-specific analog words themselves are not directly visible on the spot but are necessarily subjected to the view from outer space via commercial satellite photography, hot air balloons, planes, or drones. Instead, they are experienced worldwide via virtual globes such as Google Earth, Apple, or Bing Maps. REMOTEWORDS literally takes the art audience to higher grounds.

In an interview with Stefanie Strigl artist Achim Mohné remarked: "We understood the virtual globes which appeared for the first time in 2005 as »Google Earth« as a new medium that would be interesting to cast artistically. We saw a »possibility space« in the truest sense. The entire surface of the earth was there like a white canvas, an unexploited action area which had only just come into being through the new technology. Based on this, in 2007 we developed the concept for »REMOTEWORDS« as a subversive strategy of »analogue hacking«. In contrast to

graphic artists, we operate in harmony with institutions, but not with the distributors who transport our message. Satellites observe us without being asked and we send our message back on the same channel. (…) I think the attraction lies especially in the paradox of proximity and distance, i.e. that the visible messages are not occluded locally and can only be experienced by means of a medium, but the medium is globally comprehensible. In the tradition of »land art« we utilize the surface of the earth and process it nearly traditionally, not different from the draftsmen of the Nazca Lines thousands of years ago. However, we do not arrange these areas for a (potential) divine view, i.e. not in a natural sense, but with the goal of creating a new artefact that functions as an »orientation tool« in an extremely mobile era."[7]

In 2010, for the E-Culture Fair at Dortmund, the concept of this new public art-project by REMOTEWORDS had already been expanded into another digital realm, into a virtual game.[8] A large-scale, accessible satellite picture of the surrounds of the then exhibition space, the Dortmund U, invited each visitor to cover one roof with a comment. On the spot, the participants' statements were directly applied to the satellite picture. Using REMOTEWORDS' blog, virtual visitors from around the world could also contribute messages and comments on issues such as urbanity, navigation, digitality, virtual simulation, and the city (urban space), etc.

Another interactive game version was then launched in 2015, precisely 165 days before the start of the GLOBALE at the ZKM Karlsruhe, curated by Peter Weibel; moreover, the concept of this pioneering art project was being expanded back into real life again: A large-scale, individually accessible satellite picture of the exhibition premises of the ZKM Karlsruhe invited each visitor again to cover a roof with a short message. The individual statements were then instantly applied to the provided satellite picture by hand. Visitors as users were here asked to contribute comments once more on issues such as urbanity or globalization. But then, at predetermined times, remote-controlled drones would fly over the 10 x 6 m walk-around satellite picture. The pilotless aircraft was equipped with a CCTV system that, during its overflight, was relaying live images of the scenic area below onto a projection wall in the exhibition space. At the same, there, the digital live image was remarkably indistinguishable from a real flyover-video of Karlsruhe. (Fig. 14)

Figure 14: REMOTEWORDS, interactive game version, ZKM Karlsruhe, 2015.
© Achim Mohné / VG Bild-Kunst.

From Environmental Art to Climate Change Art

In November 2017, artist Achim Mohné installed another large-scale floor piece that needs to be viewed from an orbital perspective to be fully perceived. It ran parallel to the United Nations Climate Change Conference, which took place in Bonn, Germany. (Fig. 15-16) Here, Mohné transposed the famous "Earthrise"-image from the digital realm of the internet onto the physical area of the Bundeskunsthalle museum forecourt, by aligning the digital pixels of the iconic NASA image with a corresponding number of concrete floor tiles. As a result of this, the German media artist recreated a low-tech copy as an analog, large-scale mosaic composed of 6400 square floor tiles, each 25 x 25 cm, total expanse 20 x 20 m; with floor paint in different colors: 14 shades of blue, 20 shades of grey as well as white and black. When seen at ground level, the image is unrecognizable and seemingly abstract. Still, the groundwork "0,0064 MEGAPIXEL—Planet Earth Is Blue, And There Is Nothing I Can't Do" becomes strikingly visible as a pixelated image of the earth in aerial photographs and satellite images. The 6400 pixels, each 25 x 25 cm in size and adding up to an area of 20 x 20 meters, smartly corresponded to a digital camera resolution of just 0.0064 megapixels. Although the public art piece appears not to be aligned with its near surroundings, it is situated on a north-south axis so that it is perpendicular to the grid of virtual maps

and appears straight 'upright' on virtual internet globes. Therefore, the low-tech analog format cannot be detected by digital spam filters and thus adopted into the data pools of virtual worlds such as Google Earth, Bing, or Apple Maps, which will automatically spread the information and data, or rather the smuggled-in artwork worldwide. With the next upgrade of the mentioned apps, the 'new' image will then become visible as 'earth in space' seen from space—thus, it is hidden in plain sight within these all-encompassing new, global surveillance technologies. Achim Mohné comments: "Earthrise is an analog color photograph taken by astronaut Bill Anders on 24 December 1968 during a lunar orbit of the American Apollo 8 mission. Hailed as 'the most influential environmental photograph ever taken,' it was published in the news magazine Time in January 1969. This pioneering photograph taken from space–and others like it–were the first to bring home the thinness of earth's atmosphere and to highlight the fragility and vulnerability of our planet. Just a few weeks later, David Bowie wrote his famous song Space Oddity: Bowie drew on the image, which has since acquired iconic status and become firmly rooted in our collective memory."[9]
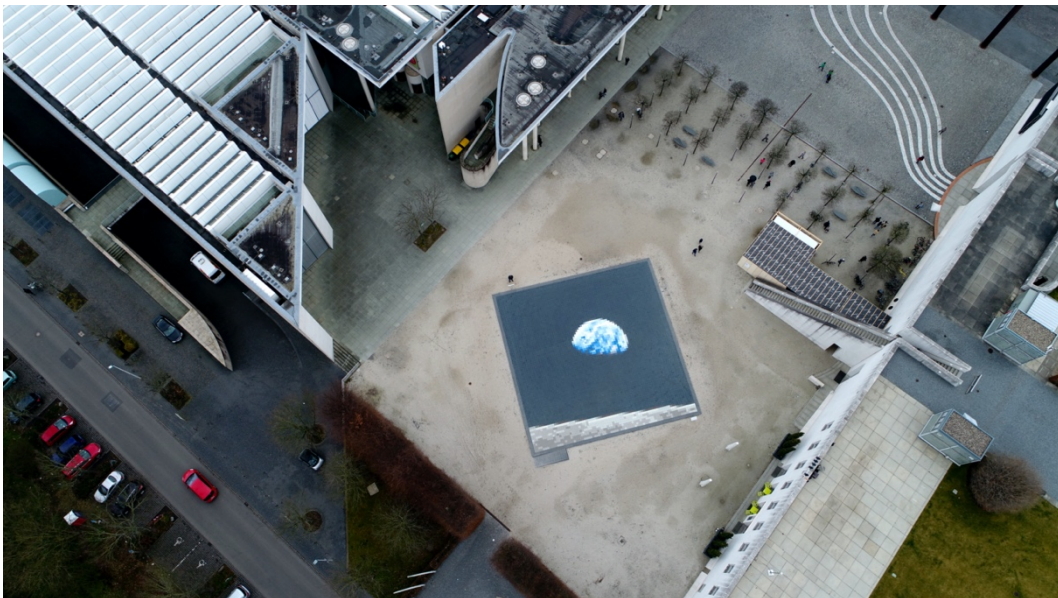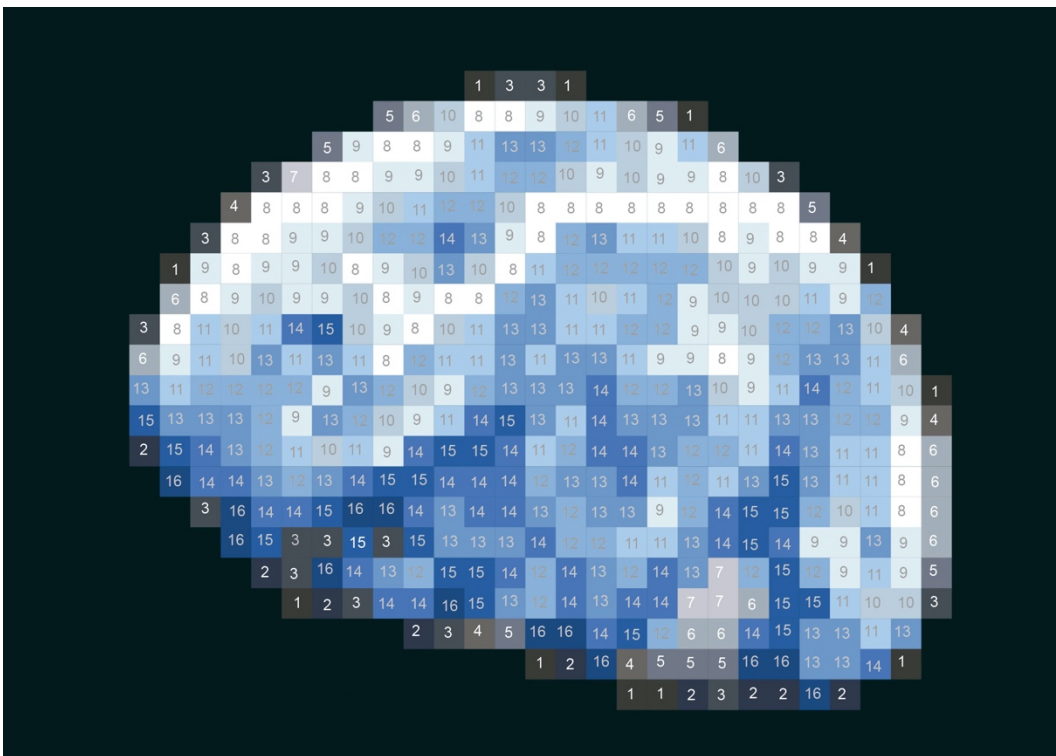

Figure 15: "0,0064 MEGAPIXEL—Planet Earth Is Blue, And There Is Nothing I Can't Do" ,
Bonn: Bundeskunsthalle, Germany. Photo by Klaus Goehring.
© Achim Mohné / VG Bild-Kunst.

Like Popstar David Bowie, Mohné has investigated questions of proximity and distance, inside and outside, up and down, strange and familiar. The artist's use of material exchanges and translations, reversals, filters, appropriations and adaptations, and last but not least, irritations prompts the viewers to halt and take a closer look. Furthermore, in times of 'fake news,' the question of the truthfulness and power of images—or even words—is crucial and acts as an appeal to the viewer's critical faculties. After all, everything depends on a flexible perspective: Every change of one's position, one's point of view, transforms the (analog) abstraction into a (digital) concreteness, into a pixelated digital image—and vice versa. It would help if you found your standpoint anyhow. The more we engage with something that we initially do not understand, and the more we look at it from different angles and varying perspectives, the more we will eventually get out of our dawning deeper understanding. Moreover, it is for this reason that this new public art project is for Achim Mohné a symbolic as well as an activist artwork—an appeal to be sensitive, attentive, and mindful in the way we treat each other and our shared space, so far humankind's only habitable planet. For that, it seems, we need further to adopt at least an orbital perspective instead of a mere global.

Figures 16: "0,0064 MEGAPIXEL—Planet Earth Is Blue,
And There Is Nothing I Can't Do," Bonn: Bundeskunsthalle, Germany.
© Achim Mohné / VG Bild-Kunst.

Thus, compared to the "Earthrise"-image taken by an US-American astronaut, the tiny blue dot against a black background is an even more striking image since it allows humankind to look through a technical prosthesis and from a smart camera perspective. It solely comes from a mechanical space probe that is taking one last look at its place of origin before it leaves our solar system forever and disappears into interstellar space—boldly going to where no man has gone before…Almost as a galactic postcard as well as a final farewell, it sent humankind a breathtaking image that far surpasses the icon of the rising Earth's globe taken from the moon in the late 1960s. Computer-supported technical apparatuses have long since taken over the production of images and deliver remarkable imagery that affects us, biological beings, most. In the so-called Space Age, orbital perspectives, in particular, have gained in importance and spread globally on the Internet. This kind of visuals range from computer-generated images for the big blockbuster cinema à la GRAVITY (2013, directed by Alfonso Cuarón) (Fig. 17), INTERSTELLAR (2014, directed by Christopher Nolan), THE MARTIAN (2015, directed by Ridley Scott) or VALERIAN AND THE CITY OF A THOUSAND PLANETS (2017, directed by Luc Besson) as well as popular culture to current science images that are distributed by NASA or ESA on the Internet and that ubiquitously pop up on our screens. These already common and familiar visuals now occupy our understanding of space as a matter of course, even before we all become space tourists ourselves. However, we can already immerse ourselves in orbital balloon rides in AR/VR installations like in Marie Lienhard's over-whelming artwork: "A two-meter diameter gilded helium balloon, onto which a 360° panoramic camera is attached, rises into the skies. This camera films the entire environment: the world gets smaller and smaller on its way to the edge of space until it bursts at 35 km altitude.

Figure 17: Screengrab from GRAVITY
(2013, directed by Alfonso Cuarón).
Image source: https://www.imdb.com/title/tt1454468/mediaviewer/rm2605702656.

The spectacular moment in which the balloon explodes, spreads its gold particles, as well as its fall back to earth, are also part of the 360° VR video. The fully immersive virtual reality results visually give a surprisingly overwhelming physical experience of weightlessness."[10] (Fig. 18)

We use such specific digital imageries today as a matter, of course, to travel to orbital dimensions, at least in our minds, when we access apps installed on our smartphones and use Oculus Rift. The transgression of boundaries, the broadening of horizons, and the consciousness of no-limits in the sign of the 'one earth' seen from a divine view has come to a further discourse in contemporary art practices. They all stand in the tradition of the "Whole Earth Catalog," which in the late 1960s was a central document of the California counterculture and became highly influential to the Silicon Valley Techs, Nerds, and Sci Fi Geeks. Besides already anticipating the concept of the Internet, it also played a crucial role in mediating and popularizing images and concepts of the critical 'earth system.' At the same time, megalomanic Earth Works and Land Art flourished across the USA—with major ground projects by Robert Smithson, Michael Heizer, and James Turrell, among others. So, both the vision of a global Internet and central concepts of the ecology movement can be traced back to this moment, too, that combined science fiction with environmental awareness, and transferred new economic-systemic ideas to society, politics, and the arts.

Figure 18: Videostill 'Explosion' from LOGICS OF GOLD by Marie Lienhard, 2018;
Virtual reality video, 5'00", 22 carat gold flakes, sheet metal gold, weather balloon & helium,
360° panorama camera. Image source: http://marie-lienhard.com/logics-of-gold.

The Orbital View and the Arts in the Age of the Anthropocene

The Anthropocene is a recently proposed geological epoch dating from the commencement of significant human impact on Earth's geology and ecosystems, including, but not limited to, anthropogenic climate change. Contemporary art reacts to this epochal shift and to the accompanying change from local via global to orbital perspectives in a variety of ways. Yet, it is not only about new spectacular views, but in many ways about fundamental changes of perception and experience that lead to a new awareness and heightened environmental consciousness—as in Eames' epochal short film "The Power of Ten" (1968). (Fig. 19)
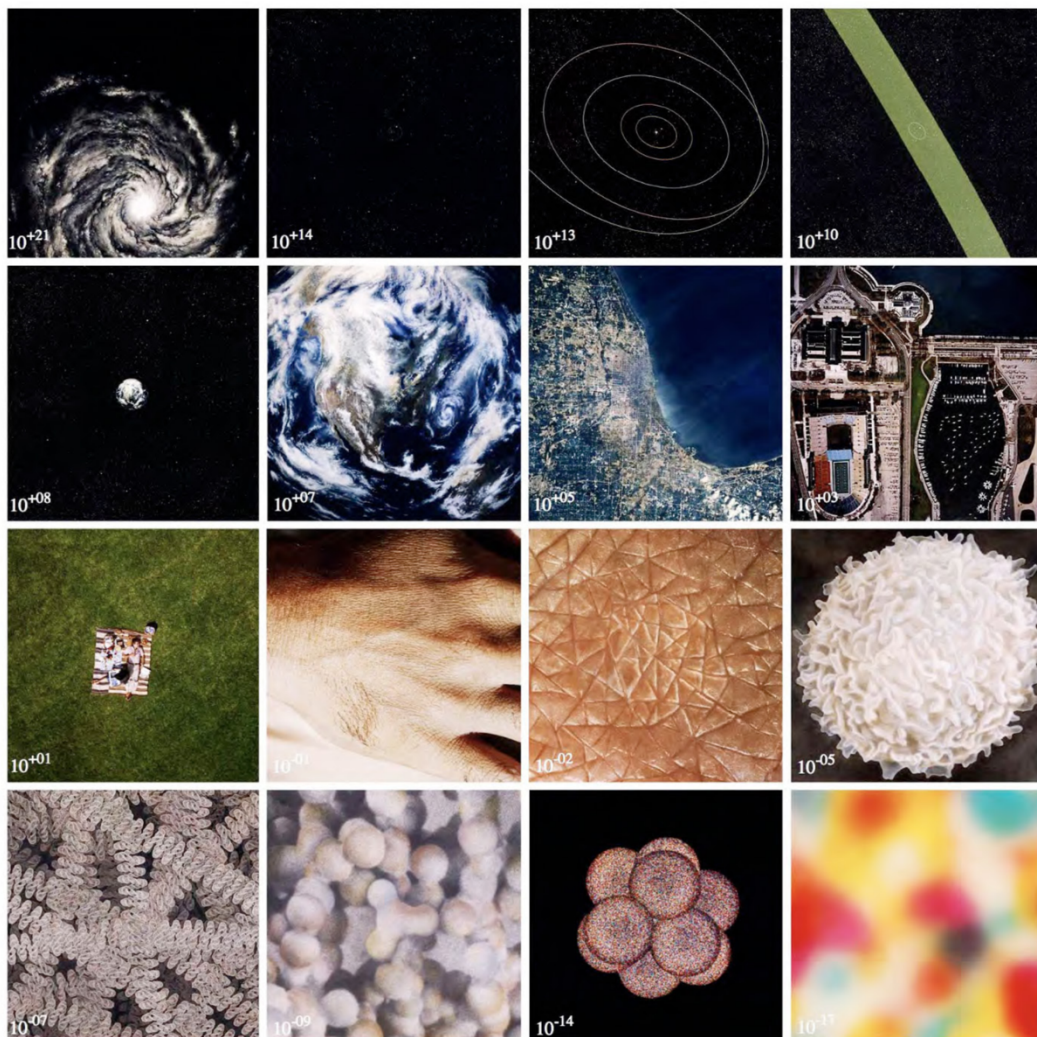

Figure 19: Filmstills from "Power of Ten" by Ray and Charles Eames, 1968.
Image source: https://medium.com/@barryvacker/powers-of-ten-honoring-the-40th-anniversary-of-the-existential-masterpiece-5c5affa46249.

Charles and Ray's documentary—one of the most famous short films ever made— has been interpreted as an exemplar for teaching and understanding the importance of measure and scale. It also exemplifies the arising shift from terrestrial to orbital perspectives in its time: "Starting at a lakeside picnic in Chicago, 'Powers of Ten' transports us to the outer edges of the universe. Every ten seconds we view the starting point from ten times farther out until our own galaxy is visible as nothing more than a speck of light among many others. Returning to Earth with breathtaking speed, we move inward—into the hand of the sleeping picnicker—with ten times more magnification every ten seconds. The journey ends inside a proton of a carbon atom, which is within a DNA molecule inside of a white blood cell."[11]

The artist couple Charles and Ray Eames first created this documentary short in the Sixties. The film was called 'A Rough Sketch for a Proposed Film Dealing with the Powers of Ten and the Relative Size of Things in the Universe.' In the spirit of iteration for which the artists are known, they rereleased it in 1977 under the name 'Powers of Ten.' Their film is an adaptation of the 1957 book, 'Cosmic View,' by Kees Boeke, and more recently is the basis of a new book version. Both the film and book adaptations follow the form of Boeke's seminal work; however, they feature color and photography rather than black and white drawings. In 1998, "Powers of Ten" was selected for preservation in the United States National Film Registry by the Library of Congress for being "culturally, historically, or aesthetically significant."[12]

Thus, art can help us to change the way we see ourselves and the world we live in. However, the perspectives literally have shifted today; they have turned into an upside-down. That can best be demonstrated when American artist and geographer Trevor Paglen imagined in 2015 launching a reflective, nonfunctional satellite into low Earth orbit. (Fig. 20) This spectacular artistic gesture—in cooperation with the Center for Art + Environment at the Nevada Museum of Art— was intended to help to change the way we see our place in the world basically and to hack the sky filled with surveillance satellites with a poetic work of art. As the twenty-first century unfolds and gives rise to unsettled global tensions and severe climate change fears, Paglen's "Orbital Reflector" is designed to encourage all of us "to look up at the night sky with a renewed sense of wonder, to consider our place in the universe, and to reimagine how we live together on this planet. Picture a rocket launching into space. Inside of it is a reflective, inflatable sculpture affixed to a small satellite that, once ejected, will orbit the Earth

for several weeks before disintegrating upon re-entry into Earth's atmosphere. While most of us realize that everyday satellites link telecommunications systems, financial and transportation infrastructure, and military functions around the globe, it is sometimes easy to forget these all-but-invisible activities. After all, they happen up there in outer space—out of sight, out of mind. Orbital Reflector changes this by transforming "space" into "place." It makes visible the invisible, thereby rekindling our imaginations and fueling potential for the future."[13]
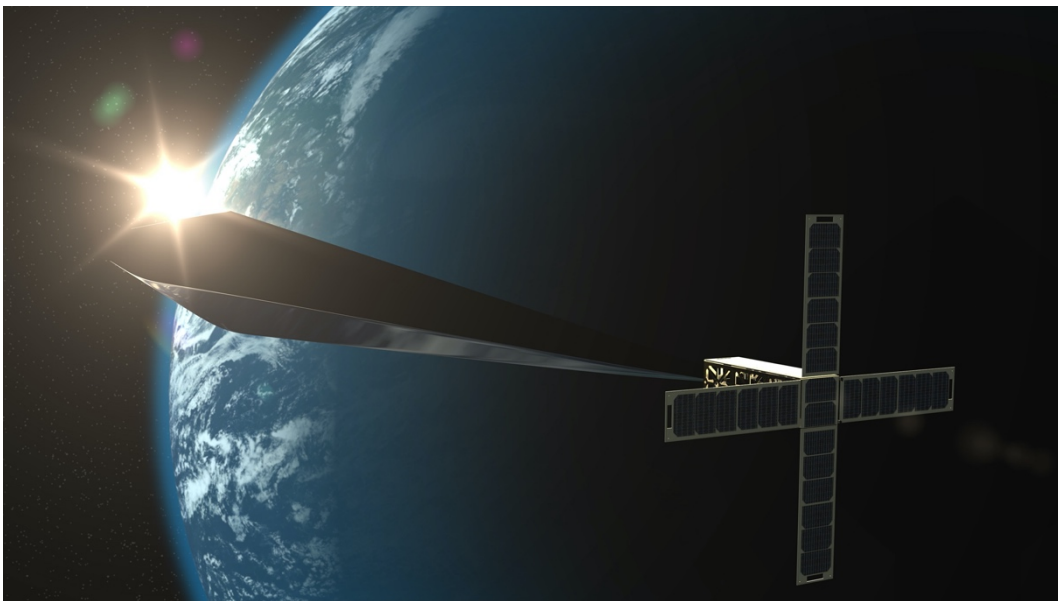

Figure 20: A rendering of the satellite art project "Orbital Reflector," created by Trevor Paglen and co-produced and presented by the Nevada Museum of Art, 2017 (Image credit: Trevor Paglen/Nevada Museum of Art). Image source: https://www.space.com/38282-museum-aims-to-launch-space-sculpture.html.

Thus, Trevor Paglen's "Orbital Reflector" is a visionary non-commercial project, and no doubt, it functions as a pioneer for future space art. It represents the first sculpture in art history designed to enter the Earth orbit and to function as an artificial star. So instead of another Tesla car by Elon Musk, on 3 December 2018, a SpaceX Falcon Rocket carried an artwork as a temporary, non-commercial satellite high up into the sky. However, Trevor Paglen's celestial artwork—an inflatable mylar balloon with a sun-reflective surface—failed to deploy, and unfortunately, at once was lost in orbit—thus instantly constituting space junk. Moreover, "Orbital Reflector" is expected—like a modern Icarus—to burn up in the atmosphere within the next few years. Yet, the concept and idea inflamed the fantasies of its audience almost as much as the appearance of the mysterious, first known interstellar object, comet "Oumuamua" did about the same time. (Fig. 21)

Figure 21: Collage "Orbital Reflector" vs. "Oumuamua" by the author, 2018, for Twitter Tweet.

Argentinian contemporary artist Tomas Saraceno as well experiments with sky art. (Fig. 22) Developed by the Aerocene Foundation—initiated by artist—, the project "Aerocene"[14] manifests in the testing and development of solar sculptures that float without any need for fuel or gas, i. e., carbon-free, just capturing the heat of the sun and the infrared radiation of the Earth's surface. Thus, his "Aerocene" is a multi-disciplinary project that wants to propose artistically a new epoch for humankind: In the wake of the debates on climate change, air pollution, and the so-called Anthropocene, it foregrounds the creative as well as the scientific exploration of environmental issues and promotes standard links between social, mental, and physical ecologies. Its vision is fossil- and emissions-free traveling and living in the atmosphere.

Figure 22: Tomas Saraceno: "Aerocene", collage numérique, 2015 © Studio Tomas Saraceno.
Image source: http://www.artists4climate.com/fr/artistes/tomas-saraceno/.

Google Earth Abstractions

It seems, more and more contemporary artists are interested in exploring and discussing the increasing importance of comprehensive surveillance systems and data mining by satellite technology and drones nowadays. Sometimes, they appropriate, or they try to hack these new scopic regimes with their artistic rhetorics and aesthetics. For instance, they are smuggling their artworks into the networked systems or are scrutinizing its unique digital image culture, which, as we all know, sometimes produces strange aesthetics like, for example, the glitch. In a technical sense, a glitch is the unexpected and momentary result of a system's malfunction. The term is thought to derive from the German 'glitschig', meaning 'slippery.' It was first recorded in English in 1962 during the American space program by John Glenn when describing problems they were having, Glenn explained, "Literally, a glitch is a spike or change in voltage in an electric current." Since then, 'glitch' is used to describe these kinds of bugs as they occur in software and hardware, in video games, images, videos, audio, and other forms of data creating digital abstractions. Thus, dissimulating and shifting the meaning of the content, and consciously and self-referentially, marking its mediality and data flow. Artist Clement Valla, for example, is using this phenomenon in a series of postcard works. However, his art postcards are not being sent from holiday resorts, but from Google's virtual globe, Google Earth.[15] (Fig. 23)
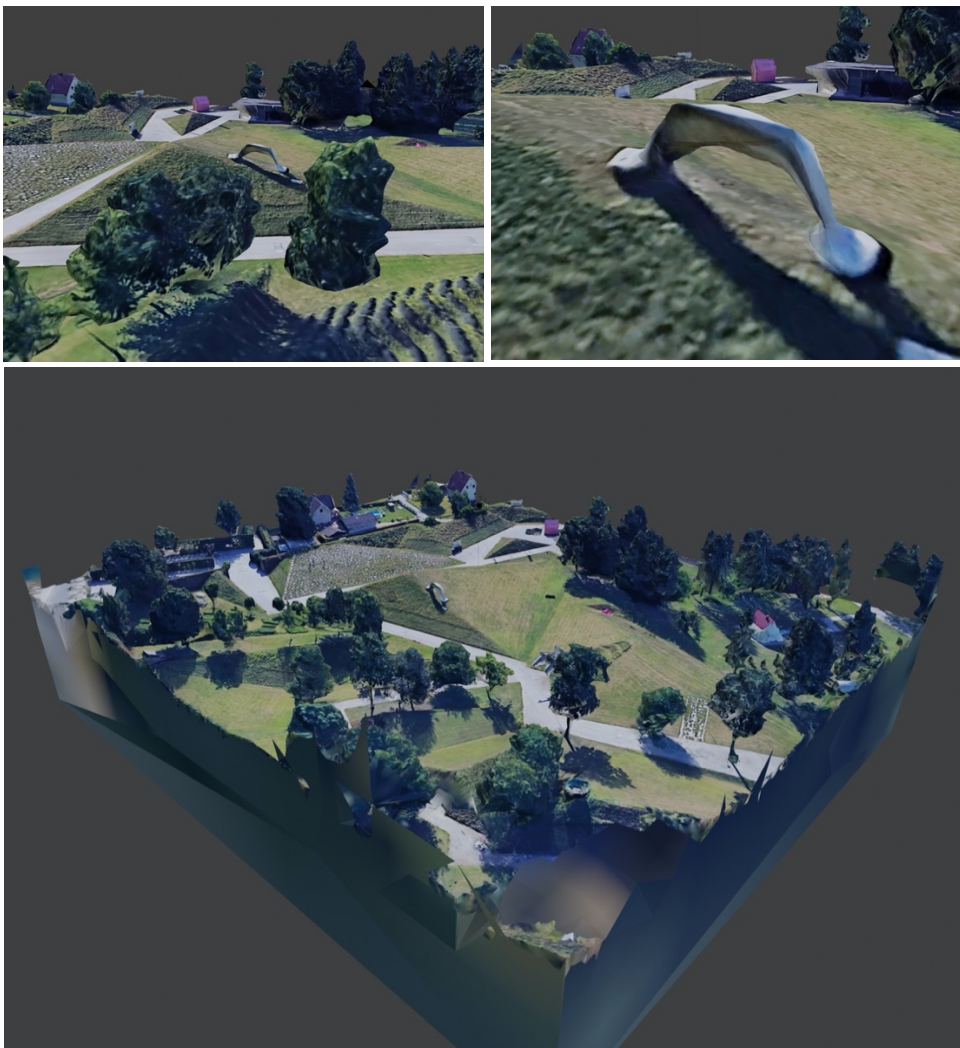

Figure 23: Clement Valla in the ZKM exhibition "Infosphere" © Clement Valla. Image source: https://zkm.de/en/event/2015/09/infosphere-opening.

The artist is particularly interested in digital images in which the illusion of a real space is not fulfilled but somewhat shattered by alogical formations and strange abstractions. What at first glance might seem to be glitches, simple errors in the algorithms, turns out to be more complex at second glance. Clement Valla's almost eerie postcards show the system's results, albeit atypical, but logical: outliers, peripheral phenomena, anomalies in the software, whose mode of operation the digital artist has set himself the goal of illuminating with his artworks. Google Earth creates the illusion of three-dimensionality in two steps. On the one hand, it makes use of the fact that the human brain recognizes a certain depth of space based on light and shadow and, based on everyday spatial experiences, also in the flat aerial and satellite images. Besides, the technique of so-called texture mapping is used, in which flat images are placed on 3D models. The supposed mistakes and flaws that can be made in this process, which appear on Valla's postcards as strange, dizzying, and false-looking landscapes, refer to problems that can arise in the superimposition. These bizarre aesthetics and digital abstraction resulting from the recording and translation of the Earth's surface by satellites and drones also recently attracted Achim Mohné in a new series of print sculptures. The first 3D-Google-Earth Model #1 (2018) was exhibited at the Fuhrwerkswaage in Cologne in December 2018.[16] Since then, the German artist has continually worked on the new 3D series in which he is investigating the 3D display methods of virtual globes, which "aesthetically prepare" users for future media such as VR or AR and mixed realities.[17] (Fig. 24)

Figure 24: Achim Mohné: "3D-Google-Earth Model #1," 2018.
© Achim Mohné / VG Bild-Kunst.

Printed out as three-dimensional photographs, they demonstrate and display the absurdity and artificiality of the digital representation of nature, landscape, and urbanity. They also serve as catalysts for apps that interface with augmented reality. Therefore, turning something immaterial back into material, Achim Mohné's print sculptures after Google Earth show a 3D-printed model of a specific location and urban environment, or even public artworks like Robert Indiana's iconic "LOVE"-monument in NYC, Richard Serra's much-debated "Terminal" in Bochum, Germany, or Peter Weibel's "The Globe as a Suitcase" (2004) at the Österreichischer Skulpturenpark Graz, Austria [18] (Fig. 25-27), as seen by the ubiquitous aerial photography of orbital satellites. The scale model is based on a unique analog-digital process which the German media artist recently developed with rendering 3D-software (PLY file). Thus, instead of photographing the real spaces on Earth, Achim Mohné takes hundreds of pictures directly in the available map apps, using virtual 'camera drones'—a method that can be compared to the popular In-Game-Photography among young gamers.

Figures 25-27: Achim Mohné: "Peter Weibel's 'Der Globus als Koffer' (2004) at the Österreichischer Skulpturenpark Graz, Austria, generated from Google Earth data," 2020. © Achim Mohné / VG Bild-Kunst.

However, Achim Mohné takes numerous 'shots' from all sides and ankles of a selected location. Using computer-based and algorithm-enhanced photogrammetry, a 3-dimensional, virtual, architectural model is rendered from these various screenshots. The syntheses are then printed in 3D and displayed in the art gallery as material exponats. At the same time, the 3D-Google Earth-model, when viewed from above, and because of its photographed and 3D-printed color, strikingly resembles the underlying Google Earth satellite images and, at first glance, appears to be a kind of eerie 'material picture' of the place itself.

Besides, Achim Mohné now goes one step further and uses the thus developed 3D-models as a trigger for the transformation of the simple, 2D-virtual reality. Moreover, his 3D-models after Google Earth deal with the relationship of a real place to its virtual representations; its avatars, both of which are brought together in the final work—the small 3D-printed architectural model. Furthermore, Achim Mohné's reference to the existing physical place gives the work a digital-referential, representational, 'photographic' aspect, which is addressed not least by the numerous glitches, abstractions, and misformations that appear in the transformation of real space through images taken from the virtual imagery of the apps and by the photogrammetric application, against a digital media background.

In the end, this contemporary digital art also asks—like many of Hito Steyerl's critical works—what becomes visible and what remains invisible in a cyber-control age that highly commercializes the use of satellites and camera drones as well as image recognition software and live-surveillance? The new eyes on Earth are no longer gods, but they also might be omniscient—all-seeing and all-knowing. Can people actively hide themselves in other pictures like Achim Mohne's artworks do in the cybernetic systems?

Author Biography

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Notes

1. See https://solarsystem.nasa.gov/resources/536/voyager-1s-pale-blue-dot/. (Last accesss: February 2020)
2. See Bruno Latour: *Face à Gaia. Huit conférences sur le nouveau régime climatic,*
(Paris: La Découverte 2015).
3 See http://www.bruno-latour.fr/node/806.html. (Last accesss: February 2020)
4. See the REMOTEWORDS booklet on the Internet under the URL:
http://www.remotewords.net/pages/wp-content/uploads/sites/2/2018/06/rw_booklet_2018_s1.pdf; and
https://zkm.de/en/blog/2015/09/the-surface-of-the-earth-as-a-white-canvas. (Last accesss: February 2020)
5. See http://www.remotewords.net/pages/patron/weibel-peter-karlsruhe/.
(Last accesss: February 2020) Peter Weibel's original quote in German: Die Künstlergruppe
REMOTEWORDS (Uta Kopp, Achim Mohné) "…bereiste fünf Kontinente von Neuseeland bis Nordamerika
und suchte dort nach Plätzen, wo sie ein Wort so groß platzieren konnten, dass es ohne weiteres von
einem um die Erde kreisenden Satelliten erfasst werden kann. Insofern diese Arbeit Informationen
sammelt, ist sie ein gutes Beispiel für die Verknüpfung von Globalisierung und Infosphäre. Übrigens baten
mich die Künstler um einen aus fünf Wörtern bestehenden Satz für die fünf Kontinente, und ich gab ihnen
den folgenden mit auf dem Weg: „One earth unites many worlds." Das Wort „unites" steht übrigens auf
dem Vorplatz des ZKM. Genau das markiert das Thema: Denn von dem kleinen Planeten aus, auf dem wir
leben, begeben wir uns auf die panische Suche nach Exo-Planeten in der Hoffnung, uns gemäße
Lebensbedingungen außerhalb der Erdsphäre zu finden. Aber bis jetzt haben wir nur eine Erde, auf der
uns die zum Leben nötigen Bedingungen gegeben sind. Deshalb dürfen wir sie auch nicht zerstören.
Dieses „unites" ist ein ebenso wichtiges Wort wie „many", das für das Dasein verschiedener Kulturen,
Sprachen und Völker, also für Diversität steht. Auch in der Physik wird ständig nach der Vereinigung sich
widersprechender Theorien wie etwa der Relativitätstheorie mit der Theorie der Quantenmechanik
gesucht. Das Vereinigen oder Unifizieren ist eine große theoretische Aufgabe. Man sieht ja, was
Unifizierung heißt, wenn man keine Theorie hat. Ohne sie funktioniert die Europäische Union nicht. Im
Gegenteil, sie lässt Europa sogar auseinanderbrechen."
6. See Patrick Werkner: *Land Art USA. Von den Ursprüngen zu den Großraumprojekten in der Wüste*
(München: Prestel 1992).
7. "The surface of the earth as a white canvas" (22.09.2015) online under the URL:
https://zkm.de/en/blog/2015/09/the-surface-of-the-earth-as-a-white-canvas. (Last accesss: February 2020)
8. See http://www.remotewords.net/pages/portfolio/exhibition2010e-culture-fair/.
(Last accesss: February 2020)
9. Achim Mohné in a scenography guest lecture at the design department of the Dortmund University of
Applied Sciences and Arts, 18 December 2019. Many thanks to the artist for our discussions prior to this
essay. See also REMOTEWORDS/ Achim Mohné (ed.): *Orbitale Irritationen* (Cologne: Herbert von Halem
Verlag, 2018, (edition KHM; 2).
10. See http://marie-lienhard.com/logics-of-gold. (Last accesss: February 2020)
11. Cf. https://www.eamesoffice.com/education/powers-of-ten-2/. (Last accesss: February 2020)
12. Cf. https://www.eamesoffice.com/education/powers-of-ten-2/. (Last accesss: February 2020)
13. See https://www.orbitalreflector.com. (Last accesss: February 2020)
14. See https://studiotomassaraceno.org/aerocene/; https://arts.mit.edu/behind-artwork-tomas-saracenos-
aerocene-project/. (Last accesss: February 2020)
15. See Clement Valla on https://zkm.de/en/works-of-the-aritsts-s-z. (Last accesss: February 2020)
16. See http://www.achimmohne.de/content/3d-google-earth-model-1.html. (Last accesss: February 2020)
17. See Michael Reisch on http://www.darktaxa-project.net/artists/achim-mohne/; and
http://achimmohne.de/content/3d-google-earth-model-3.html. (Last accesss: February 2020)
18. Cf. https://www.museum-joanneum.at/skulpturenpark/skulpturen/plan-uebersicht/peter-weibel
(Last accesss: February 2020): "With this work ('The Globe as a Suitcase'), to be seen in the traditions of
Conceptual Art and Land Art, Weibel brings us close to the boundaries of perception. An oversized
suitcase's handle embedded in the heart of the landscape allows the beholder to assume that the globe is
a huge box filled with data, organisms, and objects, which are also, for their part, carriers of information.
One is reminded of Kant, who pointed out that, on their own, neither sensory experience nor the mind is
sufficient to obtain real knowledge of the world. Mind and sensory perception need to be brought
together for the development of knowledge."