THE NEW ART EVENT IN THE DIGITAL AGE

GLOBALE
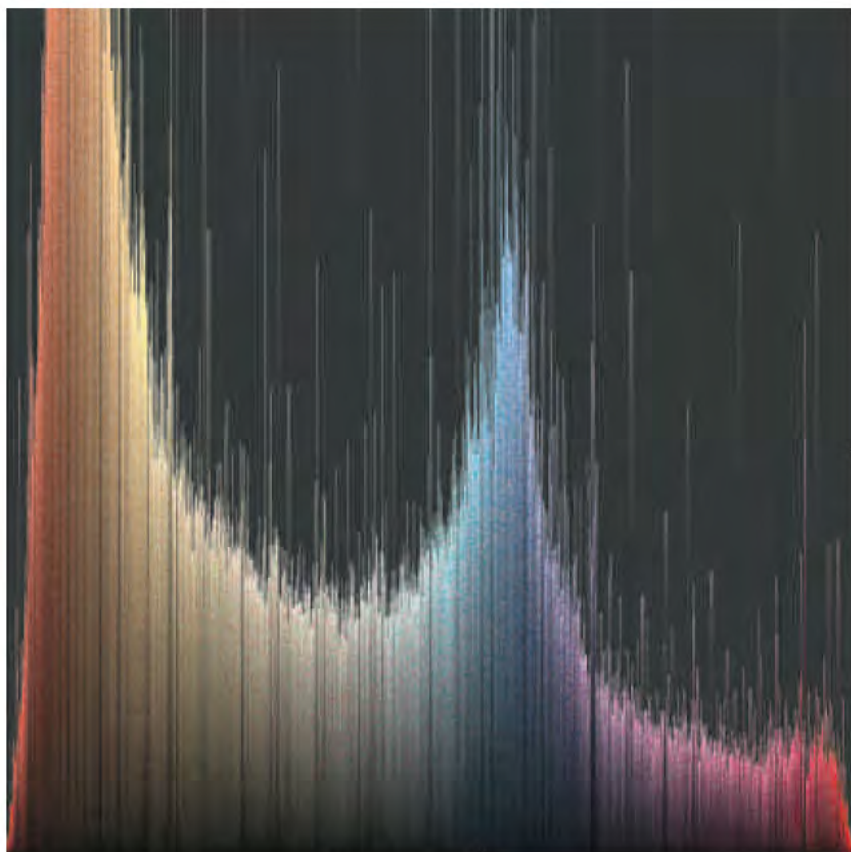
Infosphere
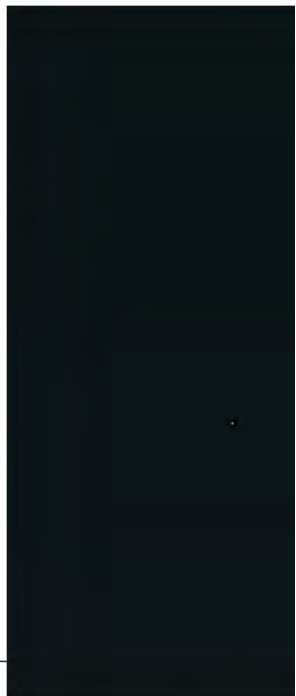
4.9.2015 –
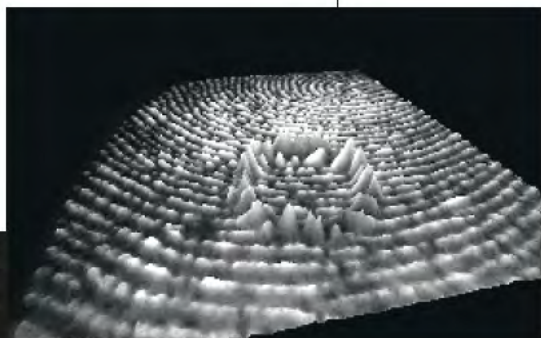31.1.2016

ZKM_Atrium 1+2
Ground floor

ETPLISIA

/////////KIII zkm karlsruhe

Software Studies Initiative, *Instagram Cities*, 2013–2015

Clement Valla, *Postcards from Google Earth*, 2010 – ongoing

Jonathan Minard & James George, *CLOUDS*, 2014–2015

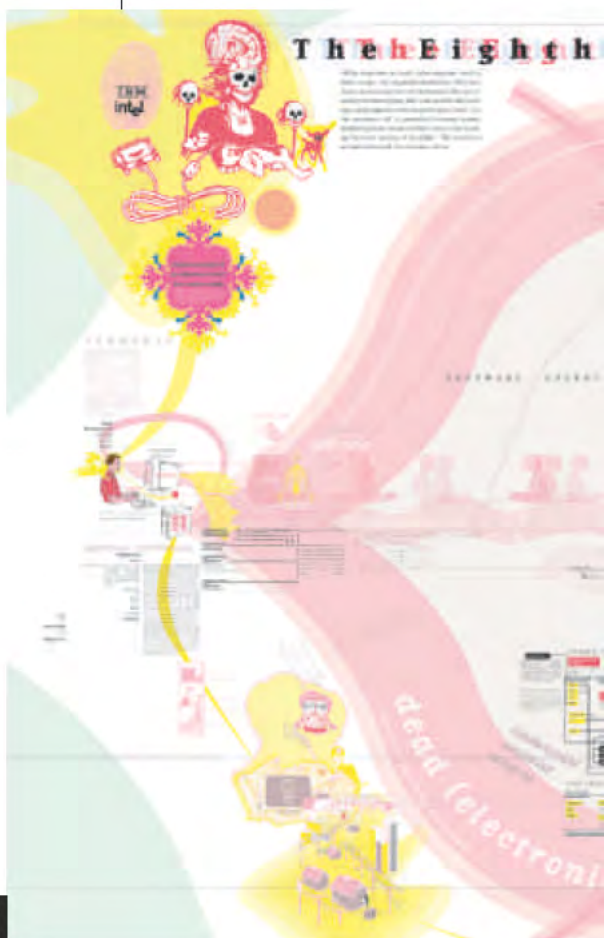Unknown Fields Division, *Rare Earthenware*, 2015, photo © Unknown Fields/Toby Smith

Yoon Chung Han, Byeong-Jun Han, *Digiti Sonus*, 2012–2014, installation view Seoul Art Space_Geumcheon, Seoul, KR

Mario Santamaría, *The Phantom of the Mirror*, 2013—2015

Bureau d'Études, *The 8th Sphere*, 2010

REMOTEWORDS, *RW.27*, 2015, Ghetto Biennale, Port-au-Prince, Haiti, © VG Bild-Kunst, Bonn 2015

Zach Blas, *Contra-Internet*, 2014–2015
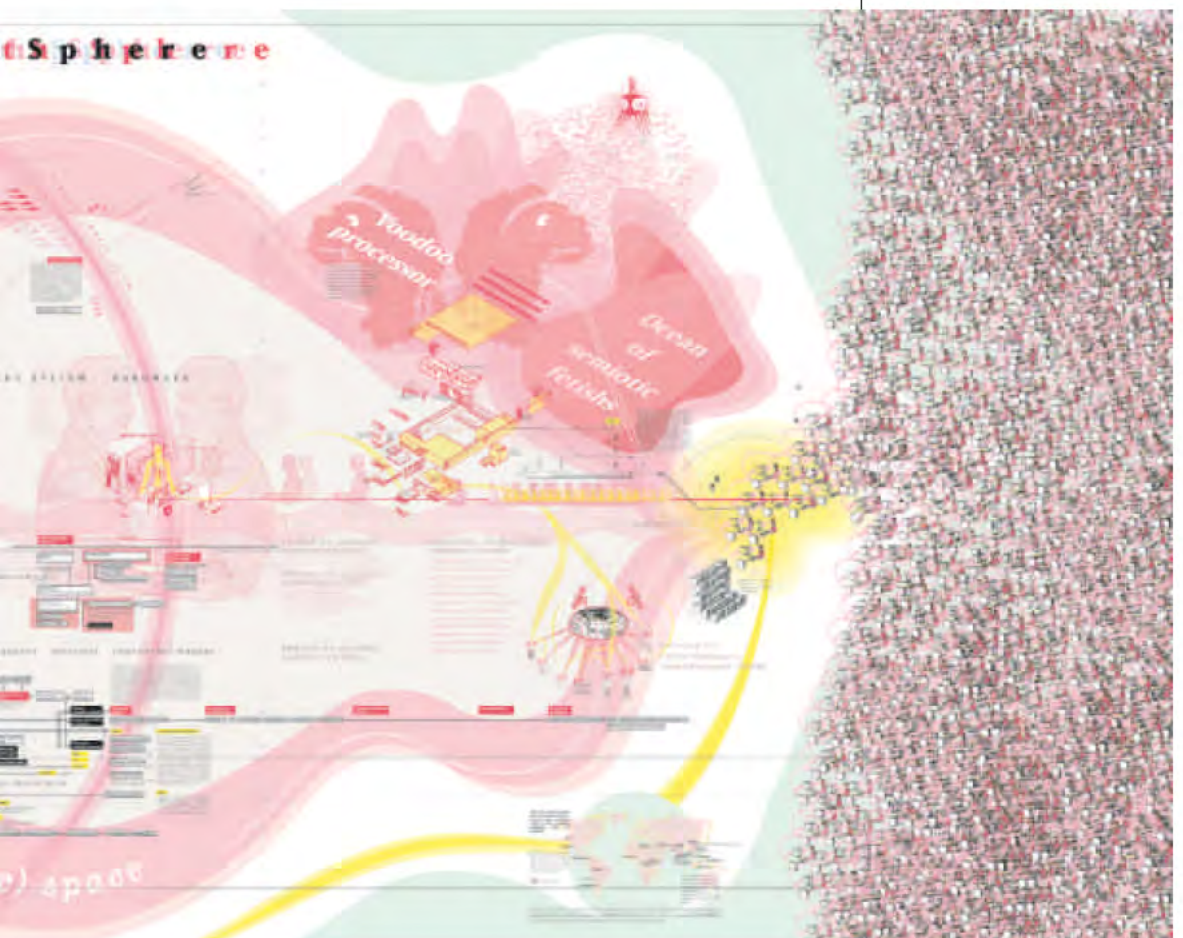
The Otolith Group, *Anathema*, 2011, Courtesy of The Otolith Group and LUX, London

Jennifer Lyn Morone™ Inc, *Jennifer Lyn Morone™ Inc*, 2014–2015, photo: Ilona Gaynor

Marc Lee, *10.000 Moving Cities – Same but Different*, 2015

Karolina Sobecka, Christopher Baker, *Picture Sky*, 2015, photo © Karolina Sobecka

Superflux, *Drone Aviary*, 2015

Brian House, *Quotidian Record*, 2012, photo: Eyebeam Art & Technology Center, New York

Peter Weibel

Curator of the exhibition and CEO of ZKM | Karlsruhe

Infosphere: The Transformation of Things into Data

In the old world, the analog world, there were mainly things. Human beings gave the things names, and these relationships between words and things defined culture and civilization for thousands of years. That's why contemporary philosophical books still have titles like *Word and Object* (Willard Van Orman Quine, 1960) or *Les mots et les choses* [literal translation: Words and Things] (Michel Foucault, 1966). But people didn't just name things, even back in primitive times, they were already making images of things. In the course of time, the world of words and the world of images have both developed lives of their own and become autonomous worlds. The relationships between words and objects and between images and objects constitute the two most important evolutionary stages of abstraction. The third stage was the substitution of objects, words, and images by numbers.

Thus arose the new digital world of data. How did it come about that things, images, and words became data? It took an infinite number of theories and inventions to bring about this transition from things to data. I shall single out only a few.

Numbers created an abstract realm that transcended the existence of things, i.e. the existence of *sensua* (sensual data). You can express all the numbers in the world with ten figures (1 to 0). Gottfried Wilhelm Leibniz's 1697 invention of the binary number system, the expression of all numbers by combining just two digits, 0 and 1, constitutes one of the decisive axioms for the infosphere. Around 1800, the mental and machine-assisted efforts to mathematize the world were intensified. In the preface to his masterpiece, *Méchanique analitique* [Analytical Mechanics] (1788), Joseph-Louis de Lagrange had already emphasized that he was able to completely describe the world, solely using algebraic operations. This brilliant work implicitly conceived the universe as a digital machine. In *Mechanization Takes Command* (1948), Sigfried Gideon describes the industrial effects of this mathematization. George Boole proved, in *An Investigation of the Laws of Thought* (1854), that logic and algebra are identical. This led to the development, with the aid of Gottlob Frege (*Begriffsschrift. Eine der arithmetischen nachgebildete Formelsprache des reinen Denkens* [Concept Notation, a Formula Language of Pure Thought Modelled upon the Formula Language of Arithmetic], 1879), and Bertrand Russell and Alfred North Whitehead (*Principia Mathematica*, 1910–1913), of a mathematical logic whose ideal was the isomorphism of thought in logic, and of logic in mathematics. This created the prerequisites for the programming languages that were to evolve in the 1950s.

The mother of programming languages, developed from 1958 to 1963 by Peter Naur, Friedrich L. Bauer and John W. Backus, among others, is ALGOL 60, for "algorithmic language." All programming languages are so-called semi-Thue systems, based on Axel Thue's essay *Probleme* über *Veränderungen von Zeichenreihen nach gegebenen Regeln* [Problems Involving Combinations of Sequences of Symbols in Accordance with Certain Constraints] (1914). The models of universal grammars of natural languages by Noam Chomsky (from 1956 on) are also semi-Thue systems. Today's programming languages, the numeric code on which the infosphere is based, have their philosophical forerunners in the work of the twentieth-century logicians and philosophers from Poland

and Austria. Two exemplary titles are Rudolf Carnap's books: *Der logische Aufbau der Welt* [The Logical Structure of the World] (German original 1928) and *Logische Syntax der Sprache* [Logical Syntax of Language] (German original 1934). They clearly evidence the aim to extend logic, beyond the analysis of the logical structure of language, to represent the universe itself as a mathematical structure. To exemplify the position of digital philosophy, a panorama projection (a production by ZKM's Insitute for Visual Media with the Institute Vienna Circle) shows the development of the Vienna Circle. Today this investigation is reflected in Max Tegmark's book (*Our Mathematical Universe*, 2014). All these mathematicians, logicians, and analytical philosophers of the last two hundred years were committed to the task of transforming, by means of mathematizing the world, the world of objects into a world of data controlled by human beings.

In their "A Logical Calculus of the Ideas Immanent in Nervous Activity" (1943), Warren S. McCulloch and Walter H. Pitts successfully formalized, as a logical calculus, neural activity as the basis of thought. Last but not least, Kurt Gödel and Alan Turing, at the end of their deliberations concerning the mathematizations of the world, reflected on the mathematization of mathematics itself. Turing's essay "On Computable Numbers" (1936/1937) poses the question, how numbers and numeric processes themselves can be computed. It thus became evident that earlier notions of truth, created and expressed in verbal sentences, had to give way to logical operations; illustrated, for example, by Ludwig Wittgenstein's truth tables (*Tractatus Logico-Philosophicus*, 1921). The truth of statements is based on logical provability and, since Turing and Alonzo Church, only that is considered provable that is computable.

Numbers operate through numbers, but numbers also operate through images, words, and things. Numeric operations have an influence and effect on images, words and things. This gives rise to a new form of ontology, whose contours are only beginning to dawn on us. The Theorem of Parmenides, asserting that thought and being are the same, is, in an odd way, confirmed by digital technology. Normally, people write numbers and calculation specifications, such as addition, as a "+" on paper; but do the computing themselves, in their heads; and then write the result of the computation on paper. In pocket calculators, the symbols and calculation specifications are part of the machine, which the human user applies as part of the arithmetic operation. The machine produces the result. The machine computes for the human – mentalism and mechanism being identical. In other words, if computation is an element of thought, computation, and thus thought, can be mechanized. The extended Church-Turing thesis asserts precisely this: Anything that can be formalized, can be computed. And anything that can be computed, can be mechanized. In the digital universe, thinking and language, language and being, thinking and being converge at a defined event horizon. Not everything that exists can be thought, and not everything that can be thought can be said. So there is more than we can think and say. But that part of being that can be thought and that part of thinking that can be said, can be formalized and digitized. In this area, the dictum of Parmenides is true, verified by the example of Boole and Shannon. We have only limited access to the universe, and it reveals to

us only its formal, mechanical, digital side. Our minds and our tools grant us access only to the digital side of the universe, but to an increasing extent. To quote Parmenides, "Either it is, or it is not." Statements like this reveal the ontology itself to be a digital, binary code: To be or not to be, 1 or 0. Numbers operate above being, through being, with being. One is tempted to speak of an operative ontology. Anything that can be formalized, can be realized. As a consequence, the domination of machines is followed by the domination of data. Both are new forms of reality construction; both are new manners of being, extending ontology.

This strange ontological turn was posited by Claude Shannon in his master thesis "A Symbolic Analysis of Relay and Switching Circuits." In this work, he proved that Boolean algebra can be used to simplify the layout of relays; and, vice versa, a targeted application of electronic circuits can be used to solve Boolean equations. The combination of these two systems, proposed by Shannon, plus the use of the binary property of electrical circuits (on – off, 1 – 0, current – no current) for the execution of logical functions, subsequently defined the set-up of all electronic digital computers. Shannon showed that the mental formulas of Boolean algebra could also be applied to material switching algebra. Electronic circuits – i.e. matter – behave in accordance with Boolean algebra, with the rules of the mind. Mind over matter? Linking Leibniz's invention of the binary code with electronic circuits now enabled machines to compute all numbers, using just two digits; thus answering Turing's question. The computer age began, characterized by the transformation of things into data and by operating on this data itself as if it were something existential. This explains why, in physics, mathematics is so, apparently inexplicably, effective (Eugene Wigner, "The Unreasonable Effectiveness of Mathematics in the Natural Sciences," 1960).

Digital philosophy doesn't claim that everything can be formalized, on the contrary (Kurt Gödel, "Über formal unentscheidbare Sätze der Principia Mathematica und verwandter Systeme I" [On Formally Undecidable Propositions of Principia Mathematica and Related Systems], 1931). It realizes that more exists than we can express in language, i.e. can formalize. Nor can everything that we think be formalized. Yet human beings increasingly try to grasp with their thoughts what is or could be; and, to get an ever stronger grasp on – i.e. formalize – their thinking. So the world of data doesn't complete the world of things, words and images; on the contrary, it transforms them into an open system.

Aside from the mathematical information theory of communication, numerous other telecommunication inventions were necessary – from Heinrich Hertz's experiments (1886–1888) to the transistors of John Bardeen, Walter Brattain, and William Shockley (around 1946) – to create the infosphere, meaning the technical infrastructure of the data world. For some 150 years, the telematic media – telegraphy, telephony, television, radar, radio, satellite, Internet – have created a technical network spanning the globe and enabling the global exchange of data, as well as the organization of the transportation of people and goods. With his experiments, Heinrich Hertz provided empirical proof for the existence of electromagnetic waves. This launched the age of wireless radio

technology, which enabled the separation of messenger and message, allowing data to travel through space without the body of the messenger.

In the twentieth century, building on the technical innovations of radio technology, combined with a computer technology based on basic mathematical and logical research, a closely interconnected communications and information network of mobile media evolved – the infosphere: an envelope of radio and other electromagnetic waves covering the planet. By means of artificial, technical organs, human beings, for the first time, can use the electromagnetic waves, for which humans so far had no sensorium, for the line-less transmission of words, images and other data. The social media, which have changed our everyday life, are part of these technical networks. Therefore, the equation "Machinery, materials, and men" (Frank Lloyd Wright, 1930), which was valid for the nineteenth and twentieth century, must be reformulated for the twenty-first century, into the equation "Media, data, and men" (Peter Weibel, 2011). Since the replacement of the alphabetical code by the numeric code, algorithms – from stock exchange to airport – have become a fundamental element of our social order. Today, people live in a globally interconnected society, in which biosphere and infosphere are interpenetrating and interdependent.

The modules *Armin Linke: The Appearance of That Which Cannot Be Seen* and *Fabrizio Tamburini: Beyond Einstein's Dream. Riding the Photons*, as well as Franz Pichler's *Rapid Transmission of Writing in the Nineteenth Century – Electric Telegraphy* [Schnelle Übertragung von Schriften im 19. Jahrhundert – Die elektrische Telegrafie], are also part of the *Infosphere* exhibition. The exhibition architecture by Stadelmann Schmutz Wössner, composed of flexible constellations of modules, constitutes a spatial model of permeation – a permeation representing the perforation of the natural perceptual space by the technical media. The constellations can be spatially ramified, rhizomatic systems, similar to those in stellar constellations or molecular formulas; i.e. drawn from nature and culture, or from social networks. But they can also organize themselves into black boxes, into closed cells. The infrastructure of the infosphere – made visible, for example, in Armin Linke's photographs (showing unseen sides of the infosphere, including cables and hardware, data centers, espionage, reconnaissance and weather satellites, server rooms of financial investment firms and banks, and control rooms with countless monitors) – is also reflected in this permeable, variable system of architecture, with its biomorph and algorithmic references.

Timo Arnall
Jack Schulze
Einar Sneve Martinussen

1

Timo Arnall
*1976 in London, GB

Jack Schulze
*1976 in London, GB

Einar Sneve Martinussen
*1982 in Kirkenes, NO

Immaterials:
The Ghost in the Field 2009

Shot with long exposures and combined with stop-motion animation, the photographs of Timo Arnall, Jack Schulze, and Einar Sneve Martinussen visualize the otherwise invisible radio fields of so-called RFID tags; i.e. of transponders for transmitting and receiving electromagnetic waves. In their video, the artists present various experiments and introduce viewers to a previously unknown and invisible world, showing the energy pulsating in a space through their devices. The visualized area must not be confused with the radio field itself, though. Rather, it shows the boundaries of the space within such a field in which an RFID transponder and an RFID reader can interact with each other. The positioning of the reader with respect to the transponder changes the form of the field. This gives rise to stunning imaginary shapes, visualized with the aid of variously colored LEDs. **Anna Sahli**

1-channel HD video, color, sound, 4:09 min., 4 photographs on aluminium composite panel

http://vimeo.com/7022707

2

Amy Balkin

*1967 in Baltimore, US, lives and works in San Francisco, US

The Atmosphere: A Guide 2013/2015

The Atmosphere: A Guide (2013/2015) is a poster-essay that illustrates human influences on the sky, from pollution to spatial politics to climate change to the electromagnetic spectrum. Artist Amy Balkin's work allows the viewer to situate the infosphere within the concrete reality of our globe and ecosystem. Going through the layers of the atmosphere, from sea level to the uppermost exosphere, the work touches on complex questions related to atmospheric politics and their multiple influences, be they chemical, narrative, spatial, or political.

Visually and conceptually, the guide draws on the Cloud Code Chart, also known as the Sky Watcher Chart, a pre-satellite visual resource for weather observers. The artist has transformed this original model into a visual essay. What appears to be a data report from a sequence of case examples serves as a starting point for reflections on the state of the atmosphere. By showing the concurrence and interrelation of factors in determining present and potential future conditions for our ecosystem, the essay raises the viewer's spatio-ecological and political awareness. **Giulia Bini**

Poster, 2 essays

Exploratorium Observatory by Amy Balkin
Charting the Sky by Megan Prelinger

Thanks to: Susan Schwartzenberg, Peter Richards, Josh On, Elizabeth Terzakis, Kevin Boyd, Mary Miller, and Sebastian Martin

http://tomorrowmorning.net

Aram Bartholl
15 Seconds of Fame 2009

3a

On the morning of October 13, 2009, as Aram Bartholl was drinking his usual coffee at Café MÖRDER in Berlin-Mitte, he suddenly spotted a passing car, one of the Google Street View camera vehicles.

In 2007, when Google began systematically photographing the streets of all cities in the US, putting them online through its Web service Google Earth, German privacy activists had voiced strong protest. But Bartholl seized the opportunity, abandoned his coffee and ran after the Google Street View drive-by vehicle to get into the shot. In a fifteen-second performance, Bartholl hijacked Google's Street View for his own artwork. More than a year later, the tracking shots of Berlin-Mitte went online on Street View; since then Aram Bartholl's performance has been on public record.

Bartholl's work is an ironic reference to an Andy Warhol quote from 1968, according to which, in the future, everyone will be world famous at some point in his life, for fifteen minutes. Warhol was referring to the fleeting nature of media celebrity — in *15 Seconds of Fame*, Bartholl further underbid the fifteen-minute span. **Anna Hennig**

4 C-prints of screenshots from Google Street View mounted on aluminium composite panel , 40 × 60 cm, video, performance

www.datenform.de

Courtesy DAM Gallery and XPO GALLERY

Aram Bartholl
Forgot Your Password? 2013

3b

Today millions of people in more than two hundred countries use the online network LinkedIn, a service primarily for maintaining professional contacts. In the summer of 2012, this network was targeted by a hacker attack and lost its entire user database — all the user names and passwords were stolen and posted online a few months later, for all to read. In a sort of encyclopedia in eight volumes, Aram Bartholl compiled 4.7 million of these LinkedIn passwords in alphabetical order. To protect the private data, he has listed only the passwords without the user names.

Bartholl's work reflects the tension between public and private interest, between the protection of privacy, on the one hand, and the publication of data, on the other. The eight volumes clearly illustrate the volume of data available online. At the interface between digital and real identity, exhibition visitors are invited to look up their own passwords. **Anna Hennig**

8 books, each 27 × 21 cm

www.datenform.de

Courtesy DAM Gallery and XPO GALLERY

Wafaa Bilal

4

3rdi 2010–2011

*1966 in Kufa, IQ, lives and works in New York, US

2 cameras, 1 laptop with shoulder bag and Bluetooth USB flash drive, photo-documentation on wall panels

www.3rdi.me

In 2010, Wafaa Bilal had a digital camera implanted in the back of his head, as a sort of third eye. For an entire year, this camera took one photograph per minute, with a USB cable permanently connecting the digital camera to a laptop. The pictures were thus published directly on the artist's website. This year-long performance shows the artist's activities, with the perspective on things that happen literally behind his back. In the Roland Barthesian sense, one might call the shots – taken without the aid of a photographer and published without any conscious selection – "radically objective" or "innocent." The story-telling potential of the images was greatly amplified by their online distribution – viewers must provide their own necessarily subjective interpretation of events. **Anna Hennig**

Zach Blas

5

Contra-Internet 2014–2015

*1981 in Point Pleasant, US, lives and works in New York, US

www.zachblas.info

TOTALITY STUDIES
Contra-Internet Totality Study #1: Internet, a Definition, 2015, cutting plotter text

Contra-Internet Totality Study #2: Internet, a .gif triptych, 2015, 3 .gif animations

INVERSION PRACTICES
Contra-Internet Inversion Practice #1: Constituting an Outside (Utopian Plagiarism), 2015, 1-channel HD video, color, sound, 5:58 min.

Contra-Internet Inversion Practice #1: The End of the Internet (As We Knew It), 2015, book

Contra-Internet Inversion Practice #2: Social Media Exodus (Call), 2015, 8 prints (screen shots)

Contra-Internet Inversion Practice #2: Social Media Exodus (Response), 2015, 1-channel HD video, color, sound, 3:21 min.

PERFORMANCE LECTURE
The exact date will be announced on the ZKM website.

Contra-Internet addresses the emerging militancy and subversions of "the Internet," such as the global proliferation of autonomous mesh networks, encryption tactics, and darknets. *Contra-Internet* aims to function as a conceptual, practical, and experimental framework for refusing the neoliberal logic of "the Internet," while building alternatives to its infrastructure.

Comprised of multiple series, *Contra-Internet* firstly critiques "the Internet" as both a hegemonic descriptor for digital networking and premier arena of political control, and secondly documents and speculates upon network alternatives that social movements and activists are developing globally. Inspired by theorist Paul (Beatriz) Preciado's *Manifiesto contrasexual* (2002), *Contra-Internet* is oriented from a feminist and queer perspective, in an effort to unite such political positions with a hacker ethos. **Zach Blas**

Blast Theory   6
Karen ²⁰¹⁵

Active since the early 1990s,
located in Brighton, GB

App for iOS

www.blasttheory.co.uk

With *Karen*, an app for smartphones that is a cross between interactive film and computer game, users contact life coach Karen. She starts off by asking several personal details, to get a picture, and seems almost too friendly. The questions that provide the basis for the app and Karen's artificial intelligence are drawn from hundreds of evaluated questionnaires, which are used for psychological profiling. Based on their replies, the software assigns users to a psychological category and administers advice accordingly.

The narration takes the artistic permutation of this psychological profiling to an extent where Karen grows increasingly curious, and appears insulted if one fails to call her back. She consciously ignores personal boundaries, increasingly intruding into one's private sphere, and seems to know things about the user that are not her business.

Blast Theory have developed *Karen* against the background of a rising relevance of Big Data. Such large corporations as Facebook and Google, as well as governments, gather the data of private citizens, which they also use to ascertain algorithms for human behavior, making it predictable.

At the conclusion of their game experience, users are given a personalized data sheet revealing their individual psychological profile, so they can also compare themselves with other players. **Stephan Schwingeler**

Bonjour, interactive lab   7
Passage ²⁰¹³

Founded in 2013 in Paris, FR

Gustave Bernier, *1982 in Campinas,
BR, lives and works in Paris

Jean-Philippe Jacquot, *1979 in
Pont-à-Mousson, FR, lives and works
in Paris

Alexandre Rivaux, *1987 in Paris,
lives and works in Paris

Interactive installation

www.bonjour-lab.com

Data defines our digital life today, encompassing our past as well as our future. When we surf the Internet, we leave traces: Internet logs record our browsing activity, visited pages are saved. This trail reflects our preferences, thoughts, and feelings, creating a digital image of ourselves. At the same time, this image is renewed and overwritten with each new visit in the Internet.

The installation *Passage* visualizes our temporary data trail and the resulting digital profile, while simultaneously accentuating it with sound.

A digital scanner converts the viewers' bodies into a 3-D pixel image, which appears only for seconds in the darkened room and then, underlaid acoustically, disintegrates into its pixel elements. Similar to our traces in the Internet, this 3-D pixel image is also fed with new information from each new visitor before it decays; leaving an empty screen, in anticipation of new data. **Anna Sahli**

Natalie Bookchin

8

*1962 in New York City, US, lives and works in New York City

Zorns Lemma 2 2007

This remake of Hollis Frampton's structuralist film *Zorns Lemma* (1970) combines dozens of screenshots of security camera videos into a coherent work. It starts off with alphabet letters, which alphabetically structure the order of the following images. In each subsequent run through the alphabet, another letter is replaced by a webcam image. This procedure is repeated until all the letters of the alphabet have been replaced.

1-channel video, color, silent, 12 min.

http://bookchin.net

Unlike Frampton's use of shots of purely English lettering in the public space in *Zorns Lemma*, Bookchin takes shots from around the world – thus expanding the concept of the original work by adding the topical examination of surveillance in a globalized world. **Matthias Pfaller**

Dineo Seshee Bopape

9

*1981 in Polokwane (Limpopo), ZA, lives and works in Cape Town, ZA

(Notes on a Project of the Monument for the Anthropocene) 2014/2015

Dineo Seshee Bopape's work generates awareness that geological resources are what makes contemporary media culture possible. The materiality of the Infosphere begins underground – with the minerals, precious metals, and heavy metals that are needed for the production of computers, tablets, and smartphones. The geography of extracting these raw materials, most of which are mined in China, Congo, Brazil, Russia, or South Africa, reflects the neocolonial logic behind the technologies for which they are mined.

Mixed-media installation, photographs and videos as well as protest songs as found in the Internet, notes of the artist

http://seshee.blogspot.de

Bopape dedicates her work to the geopolitical aspects of media in South Africa. Her art connects online images of gold, platinum, copper, and their by-products with images of mine workers – the proletariat that labors below the earth's surface. Mine workers are the ones who pay the high price of Western technological progress. Metals are very often extracted under inhumane labor conditions without any safety measures or protective gear. Mining also entails the resettlement of thousands of people, and brings with it human suffering and often severe environmental damage. An incident in Nkaneng township, South Africa, in 2012 demonstrated just how much people suffer from these working conditions: 34 mine workers who were demonstrating peacefully for a living wage were brutally massacred by the police. **Daria Mille**

David Bowen

10

tele-present water [2011]

*1975 in Indianapolis, US, lives and works in Duluth, US

The moving grid structure constructed by David Bowen is controlled by a sophisticated mechanism suspended from the ceiling of the exhibition space. The undulating movement exactly replicates the swell in the middle of the Pacific: A buoy sends data on water height and intensity of movement to the National Oceanic and Atmospheric Administration in the US. Bowen uses this data for his project — the wave behavior is scaled to fit the installation space, but all other data is unchanged.

Aluminum, plastic, electronics, water data

www.dwbowen.com

Yet this access to detailed information about a remote place also demonstrates the snippety nature of our knowledge: The buoy's precise geographic position is unknown, since it went adrift from its mooring. So the relevance of *tele-present water* lies in demonstrating to the viewers that the infosphere is full of holes; and our knowledge, however detailed, is still particulate. **Matthias Pfaller**

James Bridle

11

The New Aesthetic May 6th, 2011 – ongoing

*1980 in London, GB, lives and works in Athens, GR

It all started on May 6, 2011 with a post titled "The New Aesthetic," in which James Bridle presented images and links that he had been collecting for years and decided to sum up in a blog for the first time. Such early posts as "Guardian gallery of agricultural landscapes from space," "Tracking iPhone locations," or "CV Dazzle (Camouflage from face detection)" already revealed Bridle's intentions: In modern network culture, the act of selecting and organizing the disparate material available online is a way to express a personal view on it, and a critical understanding — as the artist himself states — "of the politics and politicization of networked technology."

Tumblr-Blog

http://new-aesthetic.tumblr.com

For Bridle the term "new aesthetic" doesn't concern beauty; rather it investigates the Web's visual contents, and the heterogeneous, multiple realities they reflect. Thus, the Web reveals its potential as a tool for accessing overlapping realities and as an instrument for knowledge production. **Giulia Bini**

Bureau d'Études
The 8th Sphere 2010

12

The conceptual work of the art collective Bureau d'Études focuses mainly on the map as a medium. The artists chart the distribution of power, possessions, and interests; in politics, business, and social matters; on global and local levels. Their work reveals the ruling symbolic order.

With *The 8th Sphere*, the artists investigate the paths of communication and the structure of power in the world of cognitive capitalism, which is characterized by the knowledge society and the dominance of computer technology. The totality of all machines in the world corresponds to the "general intellect" formulated by Karl Marx, a planet-spanning gigantic network, constituted of synapses like a nervous system. It is the transmission of information by means of electromagnetic waves, and through software and hardware manufacturing, which allows knowledge production in this socio-technical system. The technology creates a structure of abstract dominance, which determines the social and bi-political order.

Does the thematized transition from an organic to a technical intellect, from human being to machine, seem to prognose a dystopian future; or is Bureau d'Études merely recording the status quo? **Daria Mille**

Emma Charles
Fragments on Machines 2013

13

The title of this film refers to the so-called "fragment on machines" from Karl Marx's *Outlines of the Critique of Political Economy* (1857/1858), which connects both the material and the immaterial with human labor and outlines abstract dominance through knowledge.

In the film, the artist explores skyscrapers in the Manhattan financial district that are built in the Art Deco style, an architectural style that is read today as a symbol of late nineteenth-century and early twentieth-century capitalism. These buildings now house the infrastructure of the Internet: servers, mainframe computers, and kilometers of fiber optic cable. Emma Charles's film delves into the heart of post-industrial financial capitalism. There is a reason for the proximity of server rooms to companies and high-trading-volume banks: the closer a company is to Internet infrastructure, the faster its algorithms reach their goal.

The film's three chapters, *Metropolis*, *Servers*, and *Flood*, move outward from the interior of these structures, into the city and then further into nature, which in its unpredictability constantly threatens both technology and machines. **Daria Mille**

Tyler Coburn

14

Waste Management 2013–2015

*1983 in New York City, US, lives and works in New York City

Scholar Stones
Found artworks, dimensions variable, CRT monitor glass, epoxy, glass fiber powder from printed circuit boards

Adventures of a Genre
Print takeaway, including an "it-narrative" written from the perspective of the "it-narrative", designed by Harsh Patel, German translation by Anna Hennig, Chinese translation by Esther Lu

http://tylercoburn.com

Waste Management addresses the global problem of electronic waste by focusing on the efforts of a particular recycling company in Taiwan. The country famously produces more electronics per capita than any other in the world, so it should come as no surprise that it leads the rush to develop e-waste processing technologies. Present outputs of recycled waste include architectural bricks, gold potassium cyanide, precious metals, and even art. Waste Management thus takes form as an installation of "found" artwork: two cast stones made of CRT monitor glass and glass fiber powder from printed circuit boards. These objects are accompanied by two stories: one, in English, narrates the circulation and eventual transformation of a CRT monitor into the stone artworks; the other, in Chinese, recites Joseph Addison's 1710 story *The Adventures of a Shilling*, concluding with an artist melting the protagonist into one of his works. Both stories follow from the "it-narrative," a subgenre of British eighteenth-century literature in which currencies and commodities narrated their circulation within a then-emerging global economy. **Matthias Pfaller**

Sterling Crispin

15

Data Masks 2013–today

*1985 in Maui, US, lives and works in Los Angeles, US

Sterling Crispin's masks are based on software for biometric facial recognition, with algorithms that analyze geometric arrangement and surface texture to identify frontal views of the human face.

Instead of revisualizing the devisualized information, Crispin proceeds in the opposite direction: What appears to us as a pixelated, non-human ghost mask is what a computer takes to be a human face. These shadows of a face are eery portraits, which, instead of portraying a specific person, show how machines perceive human beings – reducing them to general recognition features, abstracted from their actual appearance.

Crispin examines what constitutes human existence, while investigating the boundaries between individuality and general recognizability.

6 masks, 3-D printed nylon, mirror, generated with the software for biometric facial recognition

www.sterlingcrispin.com

At the same time, though, his masks also illuminate the invisible processes of surveillance mechanisms and inquires how humanity is perceived – and perhaps even altered – by surveillance technology, and to what extent human being and machine interact. Behind all this, Crispin's aim is not to condemn facial recognition but to make its structures transparent. **Anna Hennig**

The Critical Engineering Working Group

16

The Deep Sweep – Himmel über Berlin 2015

Julian Oliver, *1974 in New Zealand, lives and works in Berlin, DE

Bengt Sjölen, *1972 in Sweden, lives and works in Stockholm, SE, and Berlin, DE

Daniil Vasiliev, *1978 in Russia, lives and works in Berlin, DE

In *The Deep Sweep*, the artists probe realms that are meant to remain concealed from the public. The artwork is composed of a weather balloon that rises up into the stratosphere, the second layer of the earth's atmosphere. This is the domain of unmanned aircrafts and spy, earth observation and weather satellites. The balloon is equipped with GPS, a computer, and radio technology. The balloon opens up the possibility of exploring the secret space above our heads and visualizing data and flight traffic at these heights. In this way, a space can be experienced which is normally inaccessible to the public and is reserved exclusively to governmental and military interests.

Over the course of an hour-and-a-half-long journey, the helium-filled balloon rises 30 km into the air. While doing so, it saves data that it intercepts from radio waves and microwaves. At a certain height, the balloon bursts and falls back to earth with a parachute. The balloon is installed in the exhibition space, with visualizations of the data material testifying to its flight. **Stephan Schwingeler**

Balloon, meteorological equipment, radio hardware, embedded computers, printed documentation, video

Stéphane Degoutin Gwenola Wagon

17

World Brain 2015

Stéphane Degoutin, *1973 in Toronto, CA, lives and works in Paris, FR

Gwenola Wagon, *1975 in Paris, FR, lives and works in Paris

World Brain is an online project and non-linear essay film that takes the viewer along on a journey through Internet folklore and the current architecture of the infosphere.

The documentary aspect of the film is based on found footage. YouTube videos, interviews, and scientific and pseudoscientific reports lay bare the physical and virtual infrastructure of the Internet: the data centers, satellites, undersea cables, logistics, knowledge sharing, and principles of high-frequency trade that provide the foundation for cognitive capitalism.

6–channel video, color, sound

www.nogovoyages.com

The film's narrative strand, meanwhile, explores utopias that have been foretelling the collective intellect for centuries: animal magnetism and galvanism, the ether, the interlinking of nature, the noosphere, and human interconnection through a shared network. Some of these theories are rather esoteric, and some of them were part of 1960s counterculture and early cybernetic society. The Internet can be interpreted as the first realization of this kind of nerve system or network.

A group of scientists that uses Wikipedia and *The Whole Earth Catalog* to seek to survive in the woods thus combines unexpectedly with internet kittens, telepathic rats, a shark gnawing on undersea cables, DIY devices, and much more to form a fabric that gives rise to the *World Brain*. **Daria Mille**

Production: Irreverence Films
http://worldbrain.arte.tv

Dennis Del Favero with
Elwira Titan and Peter Weibel   18
Vogesen 2015

Dennis Del Favero, *1953 in Sydney, AU, lives and works in Sydney

3-D computer graphic installation

Programming: Som Guan, Volker Kuchelmeister, Robert Lawther, Alex Ong
Composer: Kate Moore
Voice-over: Sacha Horler

Courtesy iCinema, William Wright, and the artists

Supported by:

Rather than continuing to regard the atmosphere as a natural spectacle that is separate from human life, *Vogesen* emphasizes reciprocal influences in the cycle of the earth's climate. In the Anthropocene era, artists and theorists must delve into a multilayered conceptualization of this relationship between people and their environment so that they can adequately grasp and aesthetically render the upheavals that are evident. The concepts of atmosphere, biosphere, and infosphere coalesce here – the global weather, people's immediate surroundings and the interconnected scientific community cross-fertilize, manipulate one another, overlap and appear in every regard to be mutually dependent and subject to one another's influence. The paradigmatic project *Vogesen* visualizes these complex interplays using previously unseen satellite images that plotted the earth's cloud formations over the course of two full years, which the visitor can explore via an intuitive navigation system. **Matthias Pfaller**

Aleksandra Domanović   19
From yu to me 2013–2014

*1981 in Novi Sad, YU, lives and works in Berlin, DE

1-channel HD video, color, sound, 34:33 min.

https://vimeo.com/95833310

Courtesy the artist an Tanya Leighton, Berlin, DE

In the film *From yu to me,* Aleksandra Domanović draws on interviews, archival material, and television footage to probe the history of the Internet in Yugoslavia. This story reflects the historical upheavals that seized the country after 1989: Yugoslavia began to collapse shortly after the introduction of the top-level domain .yu. The domain .yu gave way to the domains of multiple independent countries, finally becoming history itself and ending up as a museum piece.

The film focuses on two women computer scientists who administered the domain at different times: Borka Jerman-Blažič and Mirjana Tasić. Their narration brings to light an often-hidden side of the network: its material nature and dependence on the labor of specific individuals who kept their network functioning in the face of bureaucracy and wars.

The "Belgrade Hand Prosthesis," a robotic hand that was developed at the University of Belgrade in the 1960s, is inserted into the film at several points as archival material and as computer-generated animation, serving as an uncanny symbol of the relationship between human and machine. **Daria Mille**

Thomas Feuerstein

Manifesto 2009

A larger-than-life carved hand moves across the wall as if by magic, leaving traces of charcoal behind it. The hand draws an infinite line on the basis of trade data from big insurance companies such as Lloyd's of London, which is transmitted to the hand by a computer server that takes the form of a container ship. Unlike conventional representations of bull and bear spreads, the data is subjected to a new topology. Across time and the events of the market, the hand continually writes over what it has previously written. Its lines increasingly thicken to form a dark cloud: networked systems and global capital flows become a meteorological category that transforms the economy into the weather conditions of our civilization. The hand evokes associations with Adam Smith's invisible hand, but appears to have been severed, amputated from the body and brain, and is guided by what seems to be a Ouija board for the summoning of higher powers.

Mixed media installation, dimensions variable

www.thomasfeuerstein.net

The container ship (DAIMONIA) functions as a server and as an allegory for the distribution of goods and wealth as well as an angel of destiny, a messenger or demon of the economy. While the Greek *daimon* was an allocator and distributor of destiny, today the economy determines our destiny by acting as allocator and distributor of goods, resources, energy, and information. Because destiny is a risky variable, adequate management has always been necessary, whether it entails sacrificial rituals, shared risk pools or insurance companies. The idea of insurance as a collective acceptance of risk represents the secularization of magic and a belief in capitalism, while the name Lloyd's invokes history, as the company used to insure expeditions to the colonies. Following his artistic method of "conceptual narration," Thomas Feuerstein posts large-format drawings and placards that ironically connect the economic and the systemic with surrealist *Écriture automatique* and the mythical *acheiropoieton*, an artwork that is not made by human hands. Economics and capitalism, belief and destiny, cybernetics and class struggle connect in surprising ways and become a spatial story in which different hands are at play. The hand (Latin: *manus*) becomes a manifest. **Eva M. Kobler**

Courtesy Galerie Elisabeth & Klaus Thoman, Innsbruck/Vienna, AT

Fraunhofer IOSB (Fraunhofer Institute of Optronics, System Technologies and Image Exploitation) Karlsruhe 21
Sensorbox 2015

Sensors (3-D camera), software, mini-PC

Fraunhofer is Europe's largest institution for applied, future-oriented research. The Fraunhofer IOSB specially researches and develops solutions in a broad range of areas, from electric vehicle grid integration to Industry 4.0 research projects to maritime safety.

The arrival of information technology in all spheres of life means that the interfaces between computers and their users play an ever-increasing role in the world. The *Sensorbox* exhibits the present scientific and technological state of camera-based human-machine interaction. Exhibition visitors are recorded by a camera, and the information that is captured is visualized in a technical illustration. The *Sensorbox's* range of possibilities includes tracking people, analyzing posture, recognizing gestures as well as a turning head, and identifying whether someone is paying attention. The unique feature of this technology is the possibility of creating a dispersed installation so that larger areas can be covered by multiple *Sensorboxes*.

The potential fields of application of the *Sensorbox* illustrate the challenges that technologies and science create for us: The *Sensorbox* could be used in areas including consumer research, security, and surveillance. There is no simple solution to the dilemma of "good" or "bad" use of it, which must be discussed and negotiated by the public. **Daria Mille**

Courtesy ZKM | Karlsruhe

Laurent Grasso 22
HAARP 2007

*1972 in Mulhouse, FR, lives and works in Paris, FR

Animation, 3:20 min., loop

The acronym *HAARP* stands for High Frequency Active Auroral Research Program, an American research project that used radio waves transmitted from a facility in Alaska to investigate the ionosphere in civilian and military realms, including researching the extent to which magnetic storms and disturbances in the upper atmosphere can influence global radio communications, electricity grids, or satellite-controlled navigation systems.

The area with antenna arrays (a phased-array shortwave transmitter) that is reconstructed in Laurent Grasso's animation is reminiscent of Nicola Tesla's visions of the future. High-frequency waves can be sent into the ionosphere from *HAARP*, as with a radio broadcaster. A giant virtual mirror is created, which – like an antenna – has the ability to send extremely low frequencies back to earth. Grasso's interest in the *HAARP* facility arises from the atmosphere of secrets, anxieties, rumors, and conspiracy theories surrounding the program: some people have speculated that *HAARP* can alter the global climate, divert airplanes and missiles, intercept radio communications, or exert an influence on human consciousness. **Daria Mille**

Yoon Chung Han
*1983 in Seoul, KR, lives and works
in Oakland, US

Byeong-Jun Han
*1982 in Seoul, KR, lives and works
in Seoul

Interactive audiovisual installa-
tion, processing, MaxMSP, finger-
print sensor, Arduino

http://yoonchunghan.com

Yoon Chung Han
Byeong-Jun Han   23
Digiti Sonus 2012–2014

Digiti Sonus is an interactive audiovisual installation based on a musical and
visual interpretation of the biometric data of a fingerprint. The individual,
characteristic lines formed by the papillary ridges on the fingertip of the par-
ticipant are turned into sound. This is transformed in real time into a musical
composition representing the participant's human identity. At the same time,
the biometric data from the fingerprint, together with the sound gener-
ated by it, are visualized as animated 3-D images. The installation thus
illustrates complex anatomical patterns, while enabling the participant
to explore his or her own identity and compare the sound and appearance of
different fingerprints with his or her own.
By varying the starting point of the animated fingerprints, the musical notes
reorganize and form different sounds, which resonate in the audience's ears.
Anna Sahli

*1979 in Burlington, US, lives and
works in Brooklyn, New York, US

Takeaway poster

Jonathan Harris   24
Data Will Help Us 2013

In 2013, Jonathan Harris was commissioned by *The New York Times* to com-
pose a manifesto about the potential and the risks of big data. The text he cre-
ated appears in vibrant rainbow colors, confronting the recipient with current
issues. Running through the entire text is the idea that data helps make our
lives easier, while also channeling them in unforeseen directions and raising
new ethical questions about the use of data.
Technology is currently advancing at great speed. Harris encourages viewers
to pause for reflection, and he uses questions to prompt them to contemplate
current trends and changes.
The manifesto powerfully illustrates that technological developments and
their effects must be brought into question – otherwise, growth will cease
and ethical standards will shift. New questions open the door to unexpected
possibilities and discoveries, and now it is up to us to decide where the path
of this data-based logic will lead us. **Anna Sahli**

Mishka Henner
Scambaiters 2014

25

*1976 in Brussels, BE, lives and works in Manchester, GB

Photographs, hand-painted boards, banners

www.mishkahenner.com

What happens if you respond to a spam e-mail rather than simply deleting it? These unwelcome messages are generated not only by robots who send automated messages, but also by real people, most of them from Ghana or Nigeria, who earn their living through the time and work they invest in those spam messages.

On the other end of these spam messages are their recipients, most of them in Europe or North America. Some of these recipients, known as "scambaiters," get involved in the spammers' game of payment requests, promises of profits, and dubious services. A fascinating tale of fictional characters unfolds in their correspondence with spammers. The spammers attempt to convince their addressees that the scenarios they present are genuine, while their would-be victims demand evidence for their claims. The latter often ask for elaborately staged photographs. Mishka Henner collects and reproduces these images and messages – some of them funny, some of them humiliating – and thereby shows how the business of e-mail fraud oscillates between virtuality, fiction, materiality, and reality.

In the end, this work generates awareness that at both ends of the fiber optic line there are people whose virtual actions have real consequences.

Matthias Pfaller

Courtesy the artist and Carroll/Fletcher

Femke Herregraven
Rogue Waves 2015

26

*1982 in Nijmegen, NL, lives and works in Amsterdam, NL

Sculpture, aluminum, 4 pieces, 2.5 × 200 × 2.5 cm each

http://femkeherregraven.net

Interested in global finance, information, and geopolitics, Femke Herregraven investigates financial markets in the age of abstract transactions and immaterial trades. *Rogue Waves* is a series of aluminum sculptures whose forms evoke a system of measurement that echoes ancient mediums of economic exchange such as carved bones and wooden sticks. The sculptures reflect the contemporary version of such exchange: a financial transaction between machines. The four aluminum sticks give us a glimpse of what is known as "high frequency trading," in which sophisticated software and algorithms act on the market rapidly, hunting for value in microseconds. The four sculptures thus materialize a web of micro-events and imperceptible trading strategies driven by software, which can be extremely influential, contributing to the volatility, variability, and instability of the stock market.

Giulia Bini

Brian House
Quotidian Record 2012

*1979 in Denver, US, lives and works in Providence, US

Vinyl record and cardboard sleeve, sound, 11:03 min.

http://brianhouse.net

Quotidian Record is a limited edition vinyl recording, which is the audio translation of location-tracking data collected by the artist over one whole year. Each and every place Brian House visited, from home to work and from a friend's apartment to a city abroad is mapped to a harmonic relationship. The 11-minute-long track portrays one year of the artist's life, suggesting that our daily life can have its inherent musical qualities. Dealing both with electronic music sounds and with the aesthetic and materiality of the vinyl, *Quotidian Record* connects the contemporary digital data culture to the history of pop culture. It turns a flow of data into an object that can be collected, adding a nostalgic nuance to the narratives of classification and control which characterize state and corporate data infrastructures. The names of the cities featured on the vinyl mark the artist's travels, making of the object a strange time capsule connected to the year of its realization, while at the same time sketching an alternative portrait of an individual. **Giulia Bini**

Scottie Chih-Chieh Huang
Dandelion Mirror 2015

*1982 in Taipei, TW, lives and works in Taipei and Hsinchu, TW

Interactive installation, algorithm, LED monitor, embedded system, webcam, semi-reflective mirror, 80 × 50 × 10 cm

The artist Scottie Chih-Chieh Huang is presenting an installation of a mirror that features a physiological measuring device with non-contact sensor technology.

The biosensor is able to analyze the facial expressions of observers and convert them to the form of a dandelion. The mirror does not just reflect the image of a person, but also functions in equal measure as the presentation surface of the interactive installation. On the basis of a complex fractal and recursive algorithm, the data that is measured is transformed into the form of a growing virtual plant.

The virtual dandelion blooms when the viewer smiles, shrinks when the smile fades, and becomes a flower bud if the viewer does not smile.

In this piece, smart technology and media art point to the importance of every smile, while virtual patterns underscore the symbiosis of data visualization and human mirroring. **Anna Sahli**

Jennifer Lyn Morone™ Inc

29

*1979 in Redbank, US, lives and works internationally

Jennifer Lyn Morone™ Inc 2014–2015

The new digital economy enables companies to generate billions in profits from our personal information (effectively from the sheer fact of our biological existence). Companies' and governments' trade in personal data often occurs without our knowledge or consent; it lies beyond our control. We no longer possess our own identities. Jennifer Lyn Monroe offers a counter project to this state of things by taking charge of the alienation of her own data. She proposes an "extreme capitalism" of radically and unconditionally individual data sovereignty.

Mixed media installation, neon sign, documents, diagrams, data sheets, donation box, website, video, dimensions variable

http://jenniferlynmorone.com

Jennifer Lyn Morone™ Inc is a company of which the artist herself is the founder, CEO, shareholder, and product. *Jennifer Lyn Morone™ Inc* caricatures the exploitative logic of large corporations and grants legal protections and rights to all output of the person Jennifer Morone. The company draws its capital from her past and present resources, from the sale of shares in the artist's future potential, and from the collection, classification and analysis of data generated by the artist in her life. Jennifer Morone's personal data is the property of her company. **Daria Mille**

Jia

30

*1979 in Peking, CN, lives and works in Berlin, DE

The Chinese Version 2012–2015

In the 1950s, the Communist Party of China decided to simplify the Chinese writing system in order to facilitate communication across class and educational boundaries. To this day, two thirds of what were originally thousands of traditional Chinese characters are not permitted for publication, only some ten percent are in everyday use. In *The Chinese Version*, Jia thematizes this loss of a culture several thousand years old. The work mixes the characters so they no longer make sense as a text and can be perceived only as a formalist structure. This, for one thing, recalls the lost characters and their meanings, which are gradually vanishing from contemporary culture, because they are no longer taught and are inaccessible. On the other hand, the work exposes the hollow meaning of the simplified characters and neutralizes their propagandistic affect. **Anna Sahli**

Acrylic on canvas

JODI

Geo Goo 2014

Active since 1995, operating from the Netherlands

1-channel HD video, color, 63 min.

http://wwwwwwwww.jodi.org

The Internet art pioneers JODI (Joan Heemskerk and Dirk Paesmans) are interested in the dysfunctions of media and human-machine interactions. By cultivating the errors and disturbances of digital media and celebrating the specific aesthetics of errors, JODI expose the ways in which software, interfaces, and media applications work: In a rhetoric of perturbation, they show how things don't work – using errors to make their actual function evident.

Geo Goo diverts Google Maps from its intended use. The symbols and icons meant to increase comprehension and orientation display autonomous activity on the screen, seem to develop lives of their own, thus subverting all conventions of use, customs, and expectations. The map is obscured by patterns and a gibberish of symbols and code. By divesting the icons of their sense and meaning, the artists take the application Google Maps ad absurdum. Geo Goo is a piece of concrete Internet art that displays the intrinsic beauty of errors, while directing attention only to the surface of the interface. **Stephan Schwingeler**

Matt Kenyon (SWAMP)

Consumer Index 2008–2015

*1977 in Baton Rouge, US, lives and works in Metro Detroit, US

1-channel HD video, color, sound, 8:52 min.
Modified Nielsen Homescan bar code scanner, micro video camera, prints

www.swamp.nu

Consumer Index is a site-specific performance, in which Matt Kenyon alias SWAMP (Studies of Work Atmosphere and Mass Production) explores the mechanisms of personal-data collection used by data brokers and large-scale companies worldwide, for the purpose of building profiles to predict future consumer behavior.

For this project, Kenyon has registered himself as a "Nielsen Family" member. Under a false identity, he becomes a source of data, associated with the characteristics which the Nielsen company identifies to measure humans as archetypal consumers: gender, race, education, and socio-economic status.

The artist reconfigured the "Nielsen Homescan," a bar code scanner, and fused it with a micro video camera. For the perfomance, he implants the enhanced Homescan in his mouth. The performance thus adds a physical element to the idea of big data flows and literally embodies the concept of consumption, as well as the ingestion of data. Kenyon proceeds to accomplish an impossible task: to scan any product within the global retail environment, for example in shopping centers from the USA to New Zealand. Intervening in the process of data collection, as a virus, a contaminant in the "Nielsen Family," the artist alters both the data brokers' anticipation of his consumer behavior and his profile. Becoming less like his actual self, he escapes categorization and embodies an insatiable, unpredictable consumer. **Giulia Bini**

Erik Kessels

33

24 HRS of Photos 2012

*1966 in Roermond, NL, lives and works in Amsterdam, NL

Digital print

Various platforms and communities enable images to be shared collectively online. Image-sharing sites such as Flickr, Pinterest, and Imgur and social networks such as Facebook intermingle private and public images every day, exposing the personal visual worlds of their users seemingly without inhibition. The art and prerogatives of photography are no longer the exclusive preserve of professional artists and photographers. Rather, digital society has the privilege of recording its life in pixels and feeding visual stories into the World Wide Web to share countless memories with the world.

In *24 HRS of Photos*, the artist Erik Kessels demonstrates this overpowering digital flood of images by materializing the plethora of images available on the Internet and thereby lending it a physical form. Kessels printed out all images uploaded to the platform Flickr over the course of one day and fills the exhibition space with these 350,000 images. The sea of images that is thereby created gives a visual form to the feeling of drowning in the memories, experiences, and impressions of strangers. **Anna Sahli**

Jeong Han Kim
Hyun Jean Lee
Jung-Do Kim

34

EMC (Emergent Mind of City) III: Karlsruhe, Washington, D.C. and Seoul 2015

Jeong Han Kim
*1971 in Seoul, KR, lives and works in Seoul

Hyun Jean Lee
*1976 in Seoul, KR, lives and works in Seoul

Jung-Do Kim
*1982 in Seoul, KR, lives and works in Seoul

Interactive multichannel installation (projectors, computers, monitors, kiosk, touch screen monitor, real-time data visualization)

The installation *EMC (Emergent Mind of City) III* is based on a real-time data visualization and presents the emotional spirit of three cities: Seoul, Washington D.C., and Karlsruhe.

The collective emotional qualia of the three cities are probed through the installation's conceptual and visual treatment of the growth of trees and nerve cells. By building up the emotional coordinates of the system both diachronically and synchronically, EMC aims to illuminate the environmentally influenced network of empathy with micro-individual and macro-social emotions.

The three cities have been selected on the basis of analogies in their historical events and experiences: the layout of Washington DC was inspired by twelve European cities, including Karlsruhe, and Karlsruhe was the site of an American military basis after the Second World War, from 1945 to 1995. In Seoul, the Eighth US Army has been stationed in Yongsan district since 1944.

The organizational concept of *EMC* shows the diversity of public perspectives in cities that have lived through similar experiences. **Anna Sahli**

Brian Knappenberger

The Internet's Own Boy: The Story of Aaron Swartz 2014

*1970 in Bloomfield, US, lives and works in Venice, US

1-channel video, color, sound, 105 min.

The documentary film *The Internet's Own Boy: The Story of Aaron Swartz* offers insight into the life of the computer programmer, author, and Internet activist Aaron Swartz (born in 1986). Swartz advocated for free access to knowledge and fought against censorship, and was considered something of a wunderkind in the American tech world. As a fourteen-year-old hacker, he took part in the development of the web content syndication format RSS. Over the further course of his career, he worked on the technical implementation of creative commons licensing and helped develop the platform Reddit. In 2011, Swartz broke into the online databank JSTOR, which stores academic articles that are available to be read for a fee. He was sued for having downloaded 4.8 million articles illegally.

The film shows interviews with family members and friends as well as experts from the tech and Internet scenes who worked with Swartz. The film ends with Swartz's suicide in the context of a legal dispute with JSTOR in 2013. Swartz was 26 when he died. The film is freely accessible online under a CC license. **Stephan Schwingeler**

Creative Commons

Oliver Laric

Versions 2010

*1981 in Innsbruck, AT, lives and works in Berlin, DE

Versions is an ongoing project by Oliver Laric dealing with historical and contemporary ideas concerning image hierarchies. In *Versions*, the artist highlights the cultural consequences of the reproduction and manipulation of images, and the resulting constant proliferation of new, remixed contents and meanings. Traversing various eras, Laric underscores the historical lineage of the process of copying, which has its roots in ancient Greek and Roman traditions – the production of a first representation creates the possibility of a proliferation of

HD video, color, sound, 9:06 min.

http://oliverlaric.com

copies. Each copy adds different information, generating something new and distinct from the original.

This process, long present in popular culture and already utilized throughout the twentieth century by the cinema industry, is highlighted today by image processing manipulation, and the editing and remixing of images – while affecting our contemporary perception of reality through online image circulation.

In the age of digital reproduction, the hierarchical distinction between original and copy vanishes; many versions coexist simultaneously. Beyond the simple degradation and loss of aura, these "versions" rather participate in a process of knowledge production, in which a multitude of different authors contribute to the hybridization of styles and aesthetics, thus producing altered information and forms. **Giulia Bini**

Courtesy the artist, Seventeen Gallery, London and Tanya Leighton, Berlin

Marc Lee

37

*1969 in Knutwil, CH, lives and works in Egilsau, CH

10.000 Moving Cities – Same but Different 2015

In his installation *10.000 Moving Cities*, Marc Lee deals with the world of information exchange, of user-oriented content and news about places, people and events. The digital interface allows visitors to select any place in the world. A real-time search scans the Internet for the latest text, photo, video, and sound information, which is then processed both visually and audio-technically. Each new query creates new perspectives and images of the real world, in an interactive interplay between visitors and the digital Infosphere. Drawn from social networks, the audiovisual information is not produced by a particular organization, a company or specific artists, but by the public (user-generated content). This all but inexhaustible source feeds the Infosphere, from which *10.000 Moving Cities* generates countless cross-sections. With Oculus Rift, special technical glasses, the visitors may immerse in the virtual reality of worldwide data flows. **Matthias Pfaller**

Interactive Internet- and tele-presence-based installation

www.1go1.net

With support of Pro Helvetia, Swiss Arts Council

George Legrady

38

*1950 in Budapest, HU, lives and works in Santa Barbara, US

We Are Stardust 2008

We Are Stardust is a two-screen projection installation with infrared camera that maps the sequence of sky observations by the NASA Spitzer Space Telescope during its cold mission from 2003 to 2009. Spitzer is a satellite orbiting the sun, trailing in the earth's orbit. The satellite has three infrared temperature-sensing instruments to measure heat-based information out in space.
The installation consists of two projections on opposite sides of the gallery space, visually tracing the chronological sequence of Spitzer's scientific observations. One projection features the sequence of some 46,000 observations, showing where scientists have looked into space. The full sequence takes place over an eight-hour period, in cycles of one thousand observations, laid over a map of the universe. The second projection features views of the exhibition space taken by the military-grade infrared camera placed in the gallery above the audience, whose angle of view is determined by the chronological sequence of the Spitzer observations. Situated in the exhibition gallery, it visually records spectators' thermal presence and actions.
We Are Stardust was commissioned by the Art Center College of Design and the Spitzer Science Center Program, managed by the NASA Jet Propulsion Laboratory. The installation premiered at the Art Center College of Design in 2008, and was also exhibited at the 2010 Vancouver Winter Olympics. **George Legrady**

Production team:
George Legrady (artist), Javier Villegas (engineer) and Andres Burbano (scientist)

Custom software, projection

www.georgelegrady.com

In cooperation with: ZKM | Center for Art and Media Karlsruhe, NASA Spitzer Science Center, California Institute of the Arts, Williamson Gallery, Art Center College of Design, UCIRA (University of California Institute for Research in the Arts)

Rafael Lozano-Hemmer
Please Empty Your Pockets 2010

*1967 in Mexico City, MX, lives and works in Montreal, CA, and Madrid, ES

Interactive installation, conveyor belt, computer, HD projectors, HD camera, 273 × 42 × 124 cm

www.lozano-hemmer.com

Rafael Lozano-Hemmer, a Mexican-Canadian media artist, is best known for his interactive installations, whether placed in an urban, public space (as in the case of his Relational Architecture series) or in a gallery. In his artworks the artist makes use of a wide range of new media and devices such as sensors, biometric scanners, surveillance cameras, tracking systems, and microphones.

The installation *Please Empty Your Pockets* consists of a computerized scanner and a conveyor belt. Anybody may participate in the creation of a new piece of interactive art by placing a small item of their choice on the conveyor belt. The installation's structure is reminiscent of an airport security scanner, the only difference being that in this case civilian participation is optional. Scanned images of the objects appear at the other end of the conveyor belt. New items reemerge together with those scanned earlier and those drawn from a bank of 600,000 items scanned and recollected in the installation. With the aid of "augmented reality" techniques, the installation combines real objects with the traces they leave, thus functioning as a collective memory of the consumed objects. **Daria Mille**

ZKM | Karlsruhe

!Mediengruppe Bitnik
Random Darknet Shopper – The Bot's Collection 2015

Founded in 2003, in Zurich, CH, operates in Zurich, CH, and London, GB

3-channel HD video installation, color, sound, 4:51 min.

https://wwwwwwwwwwwwwwwwwwwww.bitnik.org

With support of Pro Helvetia, Swiss Arts Council

In the hidden underground of the Internet, inaccessible to conventional browsers and search engines, lie flourishing markets where one can buy anything under the sun, including hard drugs and all varieties of weapons. The Zurich art collective !Mediengruppe Bitnik has programmed a software that shops these markets – automatically, uninfluenced by the artists. The software's allotted budget was $100 in bitcoins, an anonymous, encrypted, digital cryptocurrency. Their so-called bot's purchases include counterfeit sneakers and brand-name jeans, a credit card, the scan of a Hungarian passport, and ecstasy pills.

After an exhibition in St. Gallen, Switzerland, the purchased objects were confiscated by the Swiss district attorney. Yet, to what extent can software, acting without human influence, be made responsible for illegal actions? And how is it possible to reconcile the confiscation with the principle of artistic freedom? The Swiss authorities annihilate the ecstasy, to preclude endangering third parties, and finally returned the objects to the artists.

Random Darknet Shopper aligns itself with the tradition of Mail Art, in which the organized infrastructure of sending and receiving via postal service becomes the material of artistic transformation. **Stephan Schwingeler**

Laurent Mignonneau & Christa Sommerer

41

Portrait on the Fly 2015

Laurent Mignonneau
*1967 in Angoulême, FR, lives and works in Linz, AT, and Paris, FR

Christa Sommerer
*1964 in Gmunden, AT, lives and works in Linz, AT, and Paris, FR

Portrait on the Fly consists of a series of interactive portraits and plotter drawings. Sommerer and Mignonneau have modeled virtual insects, aligning themselves to compose human portraits in real time. The work echoes Giuseppe Arcimboldo's mid-fifteenth-century fantastic composite heads, considered by Roland Barthes as the result of a quasi-scientific endeavour.

The insects detect the visitors' facial features and arrange themselves so as to reproduce them, in a playful and visionary subversion of the facial detection system. The so-called selfie culture is at the same time challenged by the incessant, fluid movement of the flies, which react to the slightest change, thus bestowing the image with a constant impermanence.

Portrait on the Fly also exists in the form of plotter drawings and short video sequences. Snapshots of the digital fly portraits are printed out in the style of 1960s plotter drawings. The artist themselves and numerous pioneers of media art theory and practice (Frieder Nake, Peter Weibel, Mark Wilson, Marie-Hélène Tramus, and Christine Schöpf among others) appear in the series, highlighting the piece's link with the broad, ever-changing tradition of media art.
Giulia Bini

Interactive installation

Courtesy the artists and DAM Gallery, Berlin

Jonathan Minard & James George

42

CLOUDS 2014–2015

Jonathan Minard
*1985 in Boston, US, lives and works in Brooklyn, New York, US

James George
*1985 in Moscow, US, lives and works in Brooklyn, New York, US

With *CLOUDS*, a community of new-media artists, curators, designers, and critics question the value of code as a medium for visual and artistic expression, while reflecting on the impact of emerging technologies on our lives.

This interactive documentary invites viewers to explore a web of ideas, allowing them to navigate among the protagonists, all belonging to a new generation of artists and hackers who use open source technologies for experiments in art and design. Hybrid in its format, between a documentary and a video game, and impressive in its visual effects, *CLOUDS* grants 3-D consistency to digital pioneers, sharing their research, visions, and discoveries; while giving its rhizomatic aesthetic and theoretical essence back to the infosphere. Each speaker adds a new perspective on the contemporary and future scenarios offered by algorithms and codes, sketching out an open field, with multiple possibilities still to be explored. **Giulia Bini**

Interactive documentary

http://jamesgeorge.org

Warren Neidich
The Search Drive 2014/2015

43

*1958 in New York, US, lives and works in Berlin, DE, and Los Angeles, US

1-channel video, color, sound, 17:36 min.

www.warrenneidich.com

The video *The Search Drive* exposes some of the software programs used by the National Security Agency to spy on Americans and foreigners – and then uses them to search the Web for the artist's personal and classified information. His Google, Facebook, Wikipedia, and bank accounts are hacked. Together, these traces unveil a biographical sketch of Neidich's artistic comings and goings, activities, and friendships to create what he calls a "Hackography." A number of things are revealed about him. One is his relationship and association with his studio assistant Ashiq Khondker, a Bangladeshi expat, whose real activities are a blur but hypothetically link him to radical causes in Berlin and the Far East: In one found image, he is hanging out with Pussy Riot and, in another, wearing Arab robes. This is followed by a construction of Warren Neidich's fictional bio, based upon linkages of press releases with pictures of his work and videos of his performances. An unofficial verdict of guilty for these subversive activities triggers a drone-deploying program. It locates Neidich in Saint Petersburg, performing at Manifesta 10. The video ends with a series of questions: "Are you sure you want to deploy drones?" **Warren Neidich**

The Office for Creative Research
Gate Change 2012

44

Mark Hansen
*1964 in Petaluma, US, lives and works in New York, US

Ben Rubin
*1964 in Boston, US, lives and works in New York, US

Jer Thorp
*1976 in Vancouver, CA, lives and works in New York, US

Multi media installation, 2-channel HD video with 5.1-channel surround sound

http://o-c-r.org

At this moment, there are more than one million people in the sky. *Gate Change* offers new critical perspectives on the complex choreography of twenty-first-century air transportation. Using new documentary footage and advanced visualization techniques, the artists look deeply at the state of air travel today. As passengers traverse the technologically enhanced landscape of ports and pathways that connects the airport's critical nodes, individual travelers begin to resemble data packets being routed, switched, and cued in a digital network. *Gate Change* will examine the rhythms and patterns of air travelers en masse, and will also focus on individual passengers as they navigate from touch-screen kiosk to security checkpoint, onto moving walkways and through food courts, boarding shuttle trains, and escalators on the way to a gate area, Jetway, and finally, onto a flight. As the number of passengers taking flight in a single year surpasses the world population, *Gate Change* helps us imagine the enormous number of people who are airborne at this very moment and the vast tapestry being woven in the air by their trajectories. **Matthias Pfaller**

The Otolith Group   45
Anathema 2011

Founded in 2002 by
Anjalika Sagar, *1968 in London, GB,
lives and works in London
Kodwo Eshun, *1967 in London, GB,
lives and works in London

Anathema by The Otolith Group plays with the common motifs of the dream factory capitalism: the ideology of the LCD touch screen, and the illusion of connection. Capital is essentially seen as a parasite, a shiny surface that enters the world, converting interaction between people into profit. The film imagines a sort of third dimension, where liquid crystals expand into everyday life. At the same time it is a metaphor of pervasive overwhelming capitalism, and the abstract representation of a world of tactility, where humans interact apparently under erotic drives, thus resisting through real contact the illusory connections promoted by communicative capitalism. An abstract translation of pervasive capitalistic sorcery, the film is permeated by the atmosphere of a modern psychedelia, in which the limits between humans and devices are blurred and cyber space becomes our actual space; rather than the prophecy of a condition, *Anathema* portrays a dimension which is already shaping our lives. **Giulia Bini**

1-channel HD video, color,
sound, 37 min.

http://otolithgroup.org

Courtesy the artists and
LUX, London

Julius Popp   46
bit.code 2009

*1973 in Nurnberg, DE, lives
and works in Leipzig, DE

bit.code plays with the reencoding of information and the recognizability of signs as a central concern in Popp's work. It explores the infinite possibilities for combination of a finite number of bits, the smallest units of information. The bits appear as black and white elements on the individual segments of a chain. Each chain is coded with the same bit pattern, which is reminiscent of the Morse code.

Once in motion, the large number of chains produce words that are only legible for a moment, but disappear as soon as the chains proceed with their motion. The word input is formed by most recurrent words selected from defined news websites by a statistic-based computer program mirroring what is currently valid in our culture. The perceived information causes for the viewer a short opportunity for a moment of serenity, of clarity – before the permanent flow of constellations, motions and changes starts anew. At the same time *bit.code* illustrates the fact that we can only decode information, which is always present within the bits on the chains, when it is translated into a known writing code. So, the chain pattern contains complex information itself and every legible word that appears is not the solution of the whole, but only a small partial decoding. **Julius Popp**

Installation, energy chains,
stainless steel, electronics,
motors, computer

Jon Rafman

Warwick St, Gateshead, England, United Kingdom [2009]
Wang Noi, Phra Nakhon Si Ayutthaya, Thailand [2012]

*1981 in Montreal, CA, lives and works in Montreal

These prints are a part of the *9 Eyes* project, which derives its title from Google technology: using nine cameras, Google has been recording panoramic views of the world's streets since 2007. These streets then become part of Google Street View, an application of Google Maps. Likewise since 2007, Jon Rafman has been taking screenshots of individual Street View images before these images are removed from the program by the Google Maps filter. The Google copyright icon and the Street View directional arrows lend the images particular authenticity. Acting as a cyberflaneur and cyberarchaeologist, Rafman appropriates the images of the world that are seen by the machine. His photographic subjects attest to the violent, haphazard and peculiar nature of reality, thereby standing in sharp contrast to the seemingly cool and neutral aesthetic of the machine's vision. Rafman gathers uncanny traces and demonstrates his interest in the marginal. He self-identifies as a photojournalist who reveals what Henri Cartier-Bresson identified as the *moment décisif* – a decisive moment in which everything comes together to capture an iconographically incisive motif. **Daria Mille**

REMOTEWORDS
Uta Kopp / Achim Mohné

RW.26 – RW.30 [2015]
ONE EARTH UNITES MANY WORLDS
Words: Peter Weibel

Achim Mohné
*1964 in Aachen, DE, lives and works in Cologne, DE, and Zurich, CH
Uta Kopp
*1964 in Bad Kreuznach, DE, lives and works in Cologne, DE

REMOTEWORDS is a long-term project launched in 2007 by the art duo Achim Mohné and Uta Kopp, involving messages written on the roofs of cultural institutions. The letters are so huge, the messages are legible only from a certain distance. Suitable tools for this purpose are satellite views of our planet, such as those provided by Google Earth and Bing Maps. Borrowing a method from land art, *REMOTEWORDS* uses satellite photography as an artistic medium and for propagating news.

For the current project, a sentence penned by Peter Weibel will be distributed across five cultural institutions on five continents. This means that, alongside Karlsruhe – where the message will be visible on Platz der Menschenrechte [Human Rights Square], outside ZKM – the shared message will be published in four more places, in Taipei, Port-au-Prince, Johannesburg as well as Auckland. **Sarah Maske**

Stephanie Rothenberg

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Reversal of Fortune: Garden of Virtual Kinship 2013

* 1967 in Newark, US, lives and works in Buffalo, US

Interactive, kinetic installation, water tanks, plants, robot arm, computer

Stephanie Rothenberg's interactive, kinetic installation *Reversal of Fortune: Garden of Virtual Kinship* thematizes a new cultural phenomenon, crowdfunding for charity. Rothenberg's installation is tied directly to the website www. kiva.org, from where it draws its data. Kiva is a US non-profit organization with the mission to disburse, via the Internet, microloans and tiny, individualized amounts of money to small businesses and individuals in developing countries. This creates alternative funding models for business ideas in economically impoverished regions of the world.

To visualize this form of development aid based on the infrastructure of the Infosphere, Rothenberg has come up with an impressive metaphor – an irrigation system. In the exhibition space, water tanks are installed above a map of the world containing more than 650 small plants. A robot arm waters the plants according to how much money is donated via the Internet. If there are no donations, the plants dry up. In other words, the map presents a direct picture of the thriving and withering regions across the world, while also making the abstract, hidden infrastructure of data and money transfer physically graspable for visitors. **Stephan Schwingeler**

RYBN.ORG

50

The Algorithmic Trading Freakshow 2013/2015

Artist collective, founded 1999 in Paris, FR, operates in in Paris, FR

Multimedia installation, wall drawing, printed Plexiglas panel, Raspberry Pi, reading room

http://rybn.org

The financial crisis persisting since 2007, in particular, has demonstrated how obscure the workings of financial speculation are; mechanisms that are able to destabilize the global economy and manipulate markets. Just one example is high-frequency security trading, which, controlled by algorithms and with no human intervention, can generate incredible profits.

This fundamental transformation of the financial world through information technology is virtually unparalleled in modern business. First attempts to predict market price movements through various – often quite esoteric – methods, from probability theory to quantum physics, or algorithm engineering, were undertaken at the beginning of the twentieth century, shortly after the introduction of financial mathematics by Louis Bachelier. The art collective RYBN documents these attempts in its collection of now obsolete, often eccentric trading experiments, pseudo-scientific efforts to fathom the behavior of financial markets, by such means as meteorology or astrology, as well as, since the 1970s, through the application of the algorithms of speculative trading. **Daria Mille**

Mario Santamaría
The Phantom of the Mirror 2013–2015

*1985 in Burgos, ES, lives and works in Barcelona, ES

Since 2011, Google has pursued its ambitious museological project of digitizing not only all the works of art in museum inventories, but also the interiors of museums, collections and architectural monuments. To offer viewers worldwide a virtual tour of these places, a Google camera robot totally scans the respective spaces, taking 360° panorama photographs.

For *Screen-Captures*, Spanish artist Mario Santamaría has collected photographs in which these camera robots themselves are reflected in art objects or wall mirrors. Whereas Google aims to keep the cameras out of its images, to maximize the impression of objectivity and documentary neutrality, Santamaría shifts the act of photography into the foreground. The camera's unintentional self-portraits direct attention to the hardware behind the online service, showing a camera standing totally alone in a space, surrounded by art and objects from past centuries. *The Phantom of the Mirror* is part of the series *Trolling Google Art Project*. **Anna Hennig**

40 digital prints, 50 × 50 cm each

www.mariosantamaria.net

Philipp Schaerer
Diary 2005–ongoing

*1972 in Zurich, CH, lives and works in Zurich and Steffisburg, CH

Not only do we carry our work with us on our notebooks, we continuously write our private lives onto hard disks – the computer has become a digital diary, continuously and reliably recording a part of our being. We consciously or unconsciously create an ongoing documentary about ourselves, with the amount of data growing ever more confusing and incomprehensible, so that we can only access it in a fragmented manner.

Philipp Schaerer has been collecting all documents that he deems important (images, photographs, graphics, plans, schemata, text and layout documents) in digital form since 1998 and has used a media database to record them since 2005. The data is tagged according to criteria Schaerer finds coherent and then labeled with key words. Over the years, he has accumulated over 135,700 data entries (as of June 2015). All this data does not take up any physical room. Using search masks one is able to quickly and easily navigate this universe. However, all you can see on the computer are merely subsets taken out of context, the sense of quantity is lost.

The work *Diary* proposes a different approach to the collected data in that it seeks, by means of the optical senses, to experience the whole of the data volume as a picture. All of the data sets, spread out as thumbnail images, are presented chronologically and follow the logic and conventions of the ordinary diary. **Philipp Schaerer**

2 inkjet prints, 119 × 84 cm each

Diary 27.01.2005 – 05.03.2012, Records: 77'000
2015
Diary 05.03.2012 – 09.06.2015, Records: 58'700
2015

www.philippschaerer.ch

Semiconductor   53a
20 Hz 2011

Ruth Jarman, *1973 in Fareham, GB, lives and works in Brighton, GB

Joe Gerhardt, *1972 in Oxford, GB, lives and works in Brighton, GB

The field that appears to spread out before the camera vibrates and pulses like a sheet strewn with fine iron fillings and exposed to electromagnetic waves. Fluttering particles gleam out of nearly complete darkness as if they were illuminated by horizontal rays that light up their surface structure as well as vertical rays whose own light patterns form a counterpoint to the circular and linear movements of the material. This complex spectacle is not only visible, but also and above all audible: ambient noise, a crackling sound, a high chirping noise, and scattered grumbling accentuate both the moving material and the flickering light. In reality, this is a work of digital animation with its own software that enables Semiconductor to give the audible measurement data of the earth's magnetosphere a visible, sculptural form. The title *20 Hz* refers to the frequency range to which the signals captured by the magnetometer are reduced so that they can then be perceived by human ears. **Chiara Marchini**

1-channel HD video, 3-D, b/w, sound, 5 min.

http://semiconductorfilms.com

Semiconductor   53b
Magnetic Movie 2007

Ruth Jarman, *1973 in Fareham, GB, lives and works in Brighton, GB

Joe Gerhardt, *1972 in Oxford, GB, lives and works in Brighton, GB

In *Magnetic Movie* immerses the viewer in the atmosphere of a scientific laboratory on the boundary between science and fiction. Glimmering fields of color emanate wondrously from the laboratory equipment, diffuse with a hiss, and vanish again. An audio track plays interviews with scientists who have conducted Semiconductor at the NASA Space Sciences Laboratory at UC Berkeley during their study visit. Here the artists have particularly focused on the question of how one can describe natural phenomena in words while also developing a visual language for such phenomena. The film is composed of photographs taken in a laboratory that have been brought to life through cinematography and computer-generated animation. Current scientific descriptions of the magnetic fields of planets, as recorded by satellites, underlie the animation. The artists have emulated the form and movement of these visualizations in order to portray this scientific language. **Daria Mille**

1-channel HD video, color, sound, 4:47 min.

http://semiconductorfilms.com

Shinseungback Kimyonghun
Cloud Face – Real Time 2015

54a

Shin Seung Back, *1979 in Seoul, KR, lives and works in Seoul

Kim Yong Hun, *1980 in Uiryeong, KR, lives and works in Seoul

Installation, network camera, computer, projector, screen, monitor, specific software, dimensions variable

http://ssbkyh.com

Pareidolia is a form of sensory delusion in which people believe themselves to recognize familiar beings or objects in things and patterns. This phenomenon sometimes occurs with cloud formations. The human brain may perceive certain cloud formations as human faces, for example.

The installation *Cloud Face – Real Time* presents a collection of images of clouds in which human faces are detected – not by people, but rather by facial recognition software. The images portrayed are the result of a complex facial recognition algorithm. In this work, the artists explore the relationship between computer vision and human vision. **Anna Sahli**

Shinseungback Kimyonghun
CAPTCHA Tweet 2014

54b

Shin Seung Back, *1979 in Seoul, KR, lives and works in Seoul

Kim Yong Hun, *1980 in Uiryeong, KR, lives and works in Seoul

Web application

http://ssbkyh.com

CAPTCHA is an acronym for „Completely Automated Public Turing Test to Tell Computers and Humans Apart", which refers to the British mathematician Alan Turing. A CAPTCHA allows a computer to determine whether its communication partner is a human being or another computer. The test is conceived to be simple for humans, but unsolvable, in an appropriate span of time, for state-of-the-art computers, supercomputers, or artificial intelligence. The users of a website, for example, are requested to enter in an input field a particular combination of characters displayed on the page in distorted form.

The application *CAPTCHA Tweet* turns Twitter messages, so-called tweets, into CAPTCHA characters, thus enabling digital "cryptographic" communication, which cannot be read by computers. **Anna Sahli**

Adam Słowik

55

ABC Object 2011

*1980 in Skierniewice, PL, lives and works in Berlin, DE

Installation, neon tubes

www.adamslowik.com

Buchstabenmuseum, Berlin

At first glance, *ABC Object* confounds with its apparent voidness of content. But the four times folded neon tube is basic in appearance only and can be read from multiple perspectives.

When viewed in a manner that does not adhere to our usually three-dimensional perception, a flat and two-dimensional perception then, the seemingly simple tube is seen to depict all twenty-six letters of the alphabet. **Adam Słowik**

Smart Citizen Team in cooperation with IAAC | Fab Lab Barcelona, Media Interactive Design, and Hangar

56

Smart Citizen Project 2012−ongoing

Open source hardware and software

https://smartcitizen.me

People's inability to intervene actively in processes of data collection or to participate in the analysis of data that has been gathered is one of the greatest challenges presented by the current shifts in our environment. As a potential solution to this problem, the *Smart Citizen Project* conceptualizes a platform intended to strengthen citizen participation and collaboration in cities.

The project supports the development of a global network of sensors known as "smart citizen kits," which forward local environmental conditions to the online platform https://smartcitizen.me. The kit is able to measure, among other things, the temperature, humidity, air quality (for example, carbon monoxide and nitrogen dioxide levels) and light conditions of a location. The data that is gathered and visualized on the platform sensitizes people's perceptions of fine changes in their environment, thereby making effective and broadly accessible analysis of the connections between resources, technologies, communities, and services possible in an urban environment. **Anna Sahli**

Karolina Sobecka and Christopher Baker

57

Picture Sky 2015

Karolina Sobecka
*1977 in Warschau, PL, lives and works in New York, US

Christopher Baker
*1979 in Radford, US, lives and works in Chicago, US

Satellite photographs of the Earth are firmly integrated in our everyday reality; they are used in navigation, and surveillance, or for military reconnaissance. Human beings have taken the bird's eye perspective, while being equally controlled by it. Sobecka and Baker's project *Picture Sky* takes the opposite approach: It uses an app to assemble photos of the sky, which were taken by a group of people along a previously computed grid, with the aid of their smartphones. The photos are snapped at the very moment a satellite photographs the particular area from above. The result is the exact counter-image of the satellite image.

Mixed media installation, poster, digital print, 1-channel HD video, color, sound, 3:57 min.

www.gravitytrap.com

This counter-image, created by a crowd of individuals, enhances the technical photograph by adding human judgment, while also integrating human beings in the technological process. Moreover, the participative nature of the project emphasizes the significance of the social element in achieving technological innovation. **Matthias Pfaller**

Werner Sobek

58

Aktivhaus B10 Stuttgart/Deutschland 2013–2014

*1953 in Aalen, DE, lives and works in Stuttgart, DE

In 1927, the Deutscher Werkbund (German Association of Craftsmen) commissioned the so-called Weissenhofsiedlung [Weissenhof Estate] in Stuttgart. The architects who built here experimented with new materials and forms, testing how one might build and live in the future.

Planning 2013/2014
Execution 2014
Architectural model, 5 digital prints, video documentation

www.wernersobek.de

Since 2014, a long vacant lot – 10 Bruckmannweg – has been occupied by Werner Sobek's *Aktivhaus*, known simply as B10. The house is a research object, which demonstrates how innovative materials, constructions, and technology can sustainably improve our built environment. The term "Aktivhaus" refers to a building that, alone or in conjunction with other houses, generates more power than it requires itself. Thanks to its sophisticated energy concept and self-learning home automation, *Aktivhaus B10* generates twice the energy it consumes itself. The harvested surplus provides energy for two electrical cars and a heritage-listed monument, a house designed by architect Le Corbusier. Upon conclusion of the research project, *B10* will be fully dismantled and totally recycled. During the entire span of the project, parameters for the evaluation of energy consumption and production, as well a variety of other data, are being recorded and scientifically evaluated. **Anna Hennig**

Software Studies Initiative (Lev Manovich, Nadav Hochman, Jay Chow, Damon Crockett)

Instagram Cities 2013–2015

59

Founded in 2007, based in New York (Graduate Center, CUNY) and La Jolla (UCSD), US

The *Instagram Cities* graphics are a product of the project *Phototrails*, which processed data from the social media platform Instagram with the aim of gaining social, cultural, and political insight about its users. For this purpose, 2.3 million photographs from thirteen major cities worldwide were downloaded and evaluated. To generate the infographics, the project not only processed the images' metadata, such as the date they were taken, but also such visual characteristics as color tone and contrast. Based on these features, conclusions can be drawn about the cultural life in individual cities; such as, which metropolis has a high frequency of nighttime photography. Distinctive temporal features and local events were investigated, for example, whether one of three Israeli Memorial Days showed a marked change in upload frequency. And finally, the multi-scale principle was applied, so as to present not just a view of entire social groups, but to also reveal individual behavior. An interesting example is the illustration of the "visual routine" of the top users in Tel Aviv – the location and time of their uploads, for instance – by means of individual web-like diagrams. **Chiara Marchini**

6 prints on aluminum composite panel

http://lab.softwarestudies.com

Superflux

Drone Aviary 2015

60

Active since 2009, based in London, GB

In *Drone Aviary*, Superflux investigate the potentialities of a reality in which drones, as a part of the urban ecosystem, perform a wide spectrum of functions. The artists imagine a family of five civilian drones, each designed and programmed for a different function; namely for advertising, surveillance, traffic, journalism, and social media communication.

Superflux explore the drones in their social, political, and cultural dimensions, questioning the possibility of considering them as democratic tools. Suspended in the exhibition space as models of a possible future, the drones are also featured in the video, which shows a near-future "smart" city, seen and scanned from a drone perspective. Beyond the simple framework of control, these intelligent machines perform sophisticated tasks, influencing and participating in human reality and daily life. As stated in the beginning of the film, in the quote from McKenzie Warks' essay "Globalization from Below: Migration, Sovereignty, Communication": "We no longer have roots, we have aerials [...]. We no longer have origins, we have terminals." A future scenario appears, in which emerging technologies – from drones to wearable computers and driverless cars – will cohabit with humans, becoming increasingly pervasive and reconfiguring the city through new physical and digital infrastructures. **Giulia Bini**

1–channel HD video, color, sound, 6:33 min., 5 drones (advertising drone, traffic drone, monitoring drone, journalism drone, insta drone), 2 posters

www.superflux.in

Projektmanagement: Jon Ardern and Anab Jain Design and development of prototypes: Jon Flint, Jon Arden, Dillon Froelich, Ian Hutchinson, DOME Studio

Timo Toots
Media Bubble 2008

*1982 in Tartu, EE, lives and works in Tartu

Installation, computer, beamer, 8 loudspeakers, 8-channel sound card, wooden disk, Arduino board, Xbee, compass sensor

http://works.timo.ee

ZKM | Karlsruhe

A small wooden disk on the floor of the exhibition space invites visitors, individually, to stand on it. Once a visitor occupies the platform, it begins to jerkily rotate, clockwise or counter clockwise. Immediately, local news headlines are projected onto the floor, multiplying and overlapping as they sweep in circles around the platform. A loud machine-generated male voice reads out each new headline until a raucous, overwhelming cacophony of latest reports fills the exhibition space. As soon as a visitor vacates the platform, the news stream slows, and the voices and text lines finally vanish. The installation *Media Bubble* addresses the specific exhibition site by drawing its headlines from local, regional, and national news, via the Internet. Moreover, the work puts the media consumers in the center of news production: "Without you, the media bubble doesn't exist." **Chiara Marchini**

Suzanne Treister
HEXEN 2.0 / Macy Conference Attendees 2009–2011

*1958 in London, GB, lives and works in London

Giclée prints on Hahnemühle Bamboo paper

www.suzannetreister.net

Collection of the artist, Courtesy Annely Juda Fine Art

In his book *From Counterculture to Cyberculture* (2006), media studies scholar Fred Turner portrays a cultural development, reaching from the birth of cybernetics in the 1940s and the hippie movement of the 1960s to the neoliberal cyberculture of the 1990s. The project *HEXEN 2.0* by Suzanne Treister appears to span a similar historic arc. The installation, comprising photography, prints, and a video, thematizes the so-called Macy Conferences that were held in den US between 1946 and 1953. There renowned scientists from various disciplines gathered to develop the foundations of cybernetics, and thus techniques for controlling the human psyche and society. Treister connects the narration of these institutional efforts to intensify social control with an esoteric language of form that uses "alchemistic diagrams" and numerology, also availing herself of spiritism and witchcraft, to refer to the counterculture. In referring to Web 2.0 in its title, the work finally invites visitors to regard the contemporary social significance of both the Internet and the social media as part of a complex and broad historic network. **Chiara Marchini**

Unknown Fields Division
Rare Earthenware ²⁰¹⁵

63

A nomadic design research studio directed by Kate Davies and Liam Young

Kate Davies, *1978 in Great Britain, lives and works in London

Liam Young, *1979 in Australia, lives and works in London

Mixed media installation, ceramic, 1-channel HD video, color, sound, 7 min.
3 vases (black stone ware and radioactive mine tailings)

www.unknownfieldsdivision.com

Film and photography in collaboration with Toby Smith, ceramic work in collaboration with the London Sculpture Workshop, animation assistance by Christina Varvia

Coproduced by the Victoria and Albert Museum, the Architectural Association, and ZKM | Karlsruhe

The Unknown Fields Division is a nomadic design research studio directed by Liam Young and Kate Davies, orchestrating expeditions to remote landscapes in hidden parts of the globe. Apparently distant from our daily life, such landscapes are the final link in a complex chain reflecting global economies and environmental politics.

Rare Earthenware is the product of an expedition following global supply chains back to their origins, tracing rare earth elements that are used in high-tech electronics and green technologies.

The documentary, which includes animated scenes, was developed in collaboration with photographer Toby Smith. It records the journey of Unknown Fields in reverse, from container ships and ports back to the banks of a barely-liquid, radioactive lake in Inner Mongolia – pumped full of tailings from the refining process. The three ceramic vases accompanying the exhibited film are composed of the black lake's radioactive mud; their different dimensions reflect the respective amount of toxic waste created in the production of three common technological items: a smartphone, a featherweight laptop, and the cell of a smart auto battery. Crafted according to Ming proportions, the vases refer to the infosphere's impact on remote places, traditions, and cultures; thus revealing unexpected scenarios and sophisticated global narratives – and the disturbing reality of what could seem fictitious. **Giulia Bini**

Clement Valla
Postcards from Google Earth ^{2010– ongoing}

64

*1979 in Paris, FR, lives and works in Brooklyn, New York, US

1-channel video, color, silent, 5:25 min., postcards

http://clementvalla.com

Clement Valla's postcards were not sent from some holiday destinations but came from Google's virtual globe: Google Earth. The artist has homed in on images that, instead of fulfilling the illusion of real space, shatter it. What first sight might take to be so-called glitches, mere errors in the algorithm, a closer look reveals to be more complex: Though almost uncanny, Valla's postcards show products of the system that, though atypical, are nonetheless logical: aberrations, marginal phenomena, anomalies in a software whose operating principles Valla aims to examine with his postcards.

Google Earth creates an illusion of three-dimensionality in two steps. On the one hand, it exploits the fact that light and shadow, along with accustomed spatial experiences cause the human brain to perceive a certain degree of spatial depth even in flat aerial and satellite photographs. In addition, they use a technique called texture mappings, with which flat images are projected onto 3-D models. The presumed mistakes that sometimes occur in the process and which appear on Valla's postcards as strange, dizzy, and wrong-looking landscapes point out problems that can occur during superimposition. **Anna Hennig**

Alex Verhaest
The Dinner Scene 2014

65

*1985 in Roeselare, BE, lives and works in Brussels, BE, and Amsterdam, NL

The Dinner und *Characters Studies (Angelo, Dolores, Hélène, Madeleine, Peter)*

Interactive 6-channel video installation, animation

Alex Verhaest's *The Dinner Scene*, is an interactive film bringing together such classical pictorial models as the Last Supper scene, and more contemporary motifs linked to the ambiguous and uncertain condition of incommunicability between individuals in the age of social platforms and networked devices.
As part of a series entitled *Idle Times / Temps Mort* inspired by Japanese writer Haruki Murakami's *Trilogy of the Rat, The Dinner Scene* portrays a family of five who appear both on the left and right of Angelo, the storyteller. As in early Renaissance painting, where the same characters are featured twice to convey the passing of time and to tell a story, the family members are depicted before and after the suicide of the absent father. The visitors are invited to call a specific number, thus entering the scene and activating a series of monologues that refer to the central figure. Cutting-edge technology here serves to highlight the psychological features of the protagonists, giving them a ghostly presence, while making them the enigmatic representation of our inability to deal with tragic events and communicate, although we seem constantly connected. **Giulia Bini**

José Luis de Vicente
From the Secret to the Monument 2014

66

Installation from the exhibition *Big Bang Data*, infographics, submarine cable map by TeleGeography, postcards

Sources:
Submarine cable map: TeleGeography www.telegeography.com
Data centers postcards: Telehouse West, 60 Hudson Street, Digital Reality Trust, Digital Beijing Building, Pionen Bahnhof, NSA Utah Data Center, Citi Data Center Frankfurt, Yahoo, Google Hamina, Alcalá Data Center Telefónicà, Intel, NAP of Americas, eBay Project Mercury, Apple Maiden, IBM, Detalis Radix Cloud, 375 Pearl Street Sabey, Cisco, IO

Curators: Luis de Vicente and Olga Subirós
Coproduced by CCCB (Centre de Cultura Contemporània de Barcelona) and Fundación Telefónica

The Digital Revolution, prevailing since the final quarter of the twentieth century, continues to transform analog technologies into digital ones; as it changes all realms of human life, with manifold influences on the process of globalization. The year 2002 marked the beginning of the "Digital Age" – for the first time it was possible to store more information in digital than in analog form.
Contrary to the widespread idea that digital data is independent of spatial conditions and geographic coordinates, its production, storage, and administration require a complex and resource-consuming physical infrastructure. The existence of this infrastructure first came to the attention of the general public during the course of the NSA affair. A global system of optical fiber cables, computer centers, buildings housing servers, and Internet nodes shatters the notion of the immateriality of the infosphere. The installation From the Secret to the Monument takes on the task of showing the dimensions of this infrastructure. Using a submarine cable map and a collection of postcards showing data center buildings, it visualizes the monumental dimensions of the infosphere, bringing them into the viewers' awareness. **Daria Mille**

Richard Vijgen

Architecture of Radio 2015

*1982 in Tilburg, NL, lives and works in Arnhem, NL

iOS application

www.richardvijgen.nl

ZKM | Karlsruhe

A dualistic distinction between the material and the immaterial remains one of the main aspects of the infosphere. We are surrounded by radio waves, dependent on a hidden physical system of data cables and radio signals from access points, satellites, cell towers. *Architecture of Radio* is an iPad application that reveals the invisible web of connections and radio waves that constitute the exhibition space's parallel immaterial infrastructure.

Information designer Richard Vijgen makes these invisible networks visible, uncovering the parallel ephemeral architecture which runs through and outside the museum.

Inspired by Mark Wigley's reflections on the architecture of radio and produced for ZKM | Karlsruhe, this site-specific smartphone application turns the space into a transient technological landscape – as the concrete walls are replaced by the configuration of waves we interact with through our devices. A new, unexpected horizon emerges, illustrating the network of wireless signals that regulates our digital lives. **Giulia Bini**

Christoph Wachter & Mathias Jud

New Nations 2009 – ongoing

Christoph Wachter
*1966 in Zurich, CH, lives and works in Berlin, DE

Mathias Jud
*1974 in Zurich, CH, lives and works in Berlin, DE

Online community project

www.wachter–jud.net

Mirroring the distribution of global power, the mighty nations of the world exert their influence in the virtual space of the Internet as well. The organization ICANN, for example, closely affiliated with the US government, assigns the so-called top-level domains, the top localization level for Internet sites, usually specified by a country or organization domain extension (.org, .de, .com, etc.). In their project *New Nations*, the artists Christoph Wachter and Mathias Jud deal with the Internet presence of cultural communities that have no claim to a top level domain because they are not recognized by international law. The artists make available Internet addresses and enable access through Web directories and search machines, so these communities can obtain representation and thus a communication base in the Internet. So far they have created domains for such communities as the Kurds (.ku), Tamil Eelam (.te), Tibetans (.ti) and Uighurs (.uu). In their exhibition, the artists present the websites that have been published on the respective domains, at computer stations that representatives of the respective communities have designed together with the artists. **Chiara Marchini**

Addie Wagenknecht

Deep Lab 2014–ongoing

*1981 in the US, lives and works in Austria

Initiated by Addie Wagenknecht, the research project Deep Lab unites researchers, artists, writers, engineers, and cultural producers who share not only an interest in privacy, anonymity, surveillance, art and "social hacking," but also a desire to take action against the still prevalent gender imbalance in the IT world. Many products in this field are still produced primarily by men for men, ignoring the needs of female users. This is particularly evident in the Deep web – that part of the Internet that cannot be accessed by traditional search engines – where female presence is largely reduced to sexualized or pornographic content. The members of the group use the creative potential of the Deep web to publish their work anonymously.

Collaborative research project 1-channel HD video, color, sound, 18:32 min.; book/publication

http://placesiveneverbeen.com

These activists consider hacking not a weapon but, in accordance with hacker ethics, an individual right, exercised in order to identify traditional and obsolete social structures.

The members, aside from Addie Wagenknecht, include Allison Burtch, Claire Evans, Denise Caruso, Harlo Holmes, Ingrid Burrington, Kate Crawford, Jen Lowe, Julia Kaganskiy, Joana Varon, Jillian York, Lindsay Howard, Lorrie Cranor, Madeleine Varner, Maral Pourkazemi, Runa Sandvik, and Simone Browne. **Anna Hennig**

bitforms gallery, New York

Gwenola Wagon

Globodrome 2012

*1975 in Paris, FR, lives and works in Paris

At the heart of *Globodrome* is the tension between maps and territories. While the route around the world that Gwenola Wagon sends us on is precisely the same as the route in Jules Verne's novel *Around the World in Eighty Days*, the narrator does not travel via train and steamship like Verne's protagonist Phileas Fogg – who was using the most modern forms of transportation of his time – but rather via digital image. One moves across this map not with steps and machines, but through finger movements. Speed no longer stands in relationship to distance, but rather is expressed in "clicks per minute" and "data per hour." Satellite imagery, 3-D visualizations and images and videos from social media create a map that in many ways reenacts the events of a real journey. Flight simulators and road journeys give the viewer front-row seats.

1-channel HD video, color, sound, 70 min., book

http://gwenolawagon.com

Globodrome shows a world cluttered with information, a world whose abstract construction often appears far more immediate to us than its actual locations. Whether or not this digital surface of the planet brings us closer to the earth itself remains an open question. **Matthias Pfaller**

Peter Weibel, Bernd Lintermann, Torsten Belschner, Mahsa Jenabi, Werner A. König

CloudBrowsing – Wiener Kreis 2015

A collaboration of the curators of the exhibition *Der Wiener Kreis* [The Vienna Circle], Karl Sigmund and Friedrich Stadler (University of Vienna), with the ZKM | Institute for Visual Media

Interactive installation for PanoramaScreen

CloudBrowsing – Wiener Kreis [Vienna Circle] Project management and organization: Jan Gerigk and Annina Zwettler (ZKM | Karlsruhe); Bea Laufsweiler (University of Vienna) Technical implementation: Manfred Hauffen, Jan Gerigk, Nikolaus Völzow

The installation *CloudBrowsing*, developed by Bernd Lintermann, Torsten Belschner, Mahsa Jenabi, and Werner A. König, at the ZKM | Institute for Visual Media from 2008 to 2009, conveys the search for Internet information as a novel experience. From our normal perspective, via the computer monitor, we perceive the multifarious information landscape of the Web only in fragmentary and linear form. Here, Web-based information is accessed as a spatial experience: Instead of returning the usual text-based link lists, search queries and results produce dynamic collages of images. Both the thematic contextualizion and the chronology of the performed search are visualized in the arrangement of the images representing the individual websites.

Visitors browse the *CloudBrowsing* version for the Vienna Circle in the free online encyclopedia Wikipedia – which is created by a global community, and represents the collective knowledge of the Internet. A preselection mechanism foregrounds the Vienna Circle and its member scientists and philosophers, offering direct access to its protagonists and their scholarly works.

In the installation, the cylindrical surface of the PanoramaScreen becomes an expansive browser – not just enclosing the users, but also creating a visual panorama of their movement in the virtual information space. **Jan Gerigk**

The installation will be presented at the PanoramaLab in the context of the exhibition *Infosphere*.

Where dogs run [Куда бегут собаки] 71

FIELDS 2.1 2009–2012

Founded in 2000 in Yekaterinburg, RU

Alexey Korzukhin *1973 in Sverdlowsk, RU

Olga Inozemtseva *1977 in Jalutorowsk, RU

Natalia Grekhova *1976 in Kamensk–Uralski, RU

Vladislav Bulatov *1974 in Sverdlowsk, RU

All live and work in Yekaterinburg, RU

From ancient Greek philosophy to contemporary science fiction, the idea of the consciousness of non-living matter has long been a source of inspiration for artists, philosophers, and scientists. As in Stanislaw Lem's novel *Solaris*, in which the ocean surface – which is indeed a planet-encompassing organism – studies human scientists, *FIELDS 2.1* seeks to create a metaphor for communication between humans and non-living matter.

In *FIELDS 2.1*, the inanimate substance of ferrofluid forms an eye with the help of magnetic fields (which are a crucial element of the infosphere). The eye is usually perceived as an element of consciousness innate to living creatures; it has also been researched extensively in the field of psychoanalysis. Jacques Lacan stated that the gaze corresponds to the desire for self-completion through the other.

The eve evolves on the surface when visitors approach the installation, and it also follows them. Is it a friend who wants to communicate and interact or an enemy who surveils and controls you? **Daria Mille**

Mixed media installation, 5 servomotors, magnets, microcontroller, sensors, micro-cameras, ferrofluid

http://where–dogs–run.livejournal.com

Krissy Wilson
The Art of Google Books 2011–ongoing

*1990 in Miami, US, lives and works in Chicago, US

More than ten years ago, Google began to digitize thousands of books, world-wide. Since 2011 Krissy Wilson has collected and presented, in her Tumblr blog project *The Art of Google Books*, the errors and peculiarities she found in the Google Books database. These include such analog traces of use as hand-written notes, worm holes or tobacco stains, but also errors in the digitization process. When the scanner's hand appears on a scan, for example, this is obviously evidence that the book digitization is not – as one might suppose – performed by robots but by human hand. Clearly, Wilson's odd, multifaceted, and astounding finds not only display an aesthetic appeal all their own, but also pose the question, who is behind the online service.

The aim of the work is to acknowledge the digitization as a sort of re-photography, while specifically appreciating the imperfection arising from those traces of use, which offer considerable insight into the material culture of the era of nondigital use. **Anna Hennig**

Tumblr–Blog

http://theartofgooglebooks.tumblr.com

Matthias Wölfel
in cooperation with Angelo Stitz
and Tim Schlippe
Voice Driven Type Design 2015

*1975 in Karlsruhe, DE, lives and works in Karlsruhe

The installation *Voice Driven Type Design* presents a method of transferring the characteristics of individual spoken language to written information. The spoken word transports not only the content of what is said, but also acoustic information such as specific qualities of the speaker's voice. Since the invention of lead typesetting, and thus of the mechanical reproduction of text, the transmission of written information has been paramount, while at the same time there has been a loss of individual, non-verbal linguistic expression.

The installation now transfers the individual qualities of a voice to the written form. New technologies make a high degree of variability in the depiction of graphic characters possible: The thickness of lines in the letters varies according to the volume, while the width of each letter depends on how quickly the speaker talks and the pitch affects the difference in width between each character's upstrokes and downstrokes. Wölfel thereby adds personal expression to the typeface so that it does not only reflect the characteristics of the voice, but also visualizes its changes over a longer period of speaking. **Anna Sahli**

Computer, monitor, microphone

Matthias Wölfel
in cooperation with Angelo Stitz   73b
Responsive Type ²⁰¹⁵

*1975 in Karlsruhe, DE, lives and works in Karlsruhe

The development of typeface and of its character shape derives from a static analog medium. The character shape, however, does not do justice to the specific traits of each individual. In *Responsive Type*, the artist Mathias Wölfel presents the alternative possibility of adapting the on-screen visual design of letters to the reader.

Here the graphic character is not perceived as immutable, but rather uses sensors to refer to the specific traits of the reader. This approach is inspired by the font that Marko Dugonjić developed in 2013, which automatically adjusts its size according to the reading distance. Wölfel's intention is to have the character shape adapt itself to the conditions of the reader. It takes age and vision problems into account, for example, and adjusts to the context (e.g. to the perspective). The artist's approach goes beyond simple size adjustment to replace the static character shape with responsive type. **Anna Sahli**

Computer, monitors, Kinect

Manfred Wolf-Plottegg with
Peter Weibel and Verena Noack   75
CONTENT GENERATOR ²⁰¹⁵

*1946 in Schöder, AT, lives and works in Graz and Vienna, AT

Only a small portion of the immense quantity of data and information available online is ever taken in by Internet users and used to form their behavior. The rules governing which information is selected and how are multifaceted and difficult to understand. When compared, they appear to act haphazardly. Nonetheless, each person's selected portions of the mass of information coalesce to form that individual's own personal informational structure and worldview. The *CONTENT GENERATOR* simulates this reality. From a pool of quotes about globalization, it selects individual fragments and assembles them into new content for statements about globalization. These combinations of scattered elements that were created at some point and are highly divergent in their content are packed into a new statement. This motley assemblage of information then constitutes a new reality.

Database and script Programmer: Richard Schaffranek

www.contentgenerator.global

This morphing of selected content is similar to the outcome of a *Cadavre exquis* [exquisite corpse]. The partial, disjointed, and random selection of scraps of information is "non-sequential reading" and thereby generates new and unexpected combinations. After centuries of linearity (in reading and in logic), the *CONTENT GENERATOR* lines up with today's anti-teleological understanding of the system. Information – like space and time – is non-homogenous.

The database encompasses excerpts of 400 quotes from 200 years, and is supplemented each day by words of the day (http://wortschatz.uni-leipzig.de/wort-des-tages, one word each from the categories of events, catchphrases, and organizations).

The data and script of the *CONTENT GENERATOR* are available on the website www.contentgenerator.global in addition to their presentation at the ZKM, and can be accessed from anywhere (including from mobile devices). **Manfred Wolf-Plottegg**

Expanded Senses
Collection of Wearables

Even Sigmund Freud described the human being as a weak creature: Only through cultural achievements were humans able to free themselves from nature and compensate their imperfect abilities with tools and media. Wearables (short for wearable computing), such as digital eye glasses, smartwatches, activity trackers, broaches, implants, or electronic clothing, will soon seem perfectly normal everyday apparel, and can be viewed in the context of the prosthesis theory developed by Freud and Marshall McLuhan, which consider the media to be extensions of human beings (McLuhan, *Understanding Media: The Extensions of Man*, 1964). The human being of today is enhanced, through extended motor and sensory functions. Modern technology has created miniaturized devices that are able to provide help without any prior interaction with an interface. At the same time, the new technology raises questions regarding physical and data privacy. Do wearables and the data gathered from them belong to the owner, the manufacturer, the wearer, or the cloud? **Daria Mille**

*1936 in Thalgau, AT, lives and works in Puchenau, AT

Franz Pichler

Rapid Transmission of Writings in the Nineteenth Century – Electric Telegraphy

Electrical research in the early nineteenth century laid out the basic physical principles of electrical telegraphy. In physics, the work of Alessandro Volta, Hans Christian Ørsted, André-Marie Ampère, Georg Simon Ohm, and Michael Faraday, above all, were of elementary significance. During the second half of the century, a global telegraphy network evolved, which, for the first time, permitted rapid transmission of written messages over large distances – a function that today is fulfilled by the Internet.

Of all the inventions made in connection with electrical telegraphy, that of US scientist Samuel Morse has proved by far the most successful. Until about the middle of the twentieth century, Morse telegraphy remained the proven means of written communication, and was used for postal and railway services, by the military and the press, as well as for sea rescue and weather services. The transmission of telegrams by electric means required the spanning of overhead landlines, as well as the laying of cable in the ground or sea. Overcoming great distances was an immense challenge and major achievement, such as the first transatlantic cable from Ireland to Newfoundland, which went into operation in 1866. Telegraphic long-distance connections – such as the connection from England via Germany, Russia, and Persia all the way to India – were, during the colonial era, of major importance to the European countries.

Guglielmo Marconi's 1897 invention of wireless telegraphy made wide-scale coverage possible and laid the foundation for modern radio communication via satellite.

As an integral part of the *Infosphere* exhibition, the presentation of the history of telegraphy comprises information on the technology of the instruments, as well as on the stages of network expansion, while offering visitors insight into the era of evolving global communication. For the foundation of today's interconnected global society was laid by a tremendous technical development that took place within just approximately one hundred years. **Franz Pichler**

Armin Linke:
The Appearance of That Which Cannot Be Seen

*1966 in Milan, IT, lives and works in Berlin, DE

Part 1
Setting 1: September 4 – October 11, 2015
Setting 2: October 14 – November 15, 2015
Setting 3: November 18 – December 13, 2015
Setting 4: December 16, 2015 – January 31, 2016

Part 2
April 9 – September 4, 2016

Location: ZKM_Atria 1+2, ground floor

For more than twenty years, Armin Linke has been photographing the effects of globalization, the comprehensive transformation of infrastructures, and the interlinking of postindustrial society through digital information and communications technologies. His works record the profound economic, environmental, and technological changes that shape our device-based world in the twenty-first century.

Armin Linke's photographs show the modern world as a gigantic world of data with a largely invisible material infrastructure of data processing centers, data highways, and server rooms. From the global transportation of goods to the organization of our private everyday lives, the infosphere of digital data has a fundamental impact on every aspect of our world today. Linke's image archive, which encompasses more than 500,000 photographs, documents both the supersession of the twentieth-century logic of production by the distributional logic of the twenty-first century and the growing significance of the financial economy relative to the real economy, as well as the increasing transformation of real objects into data. At the interface of the physical and digital worlds, his photographs open up a view onto central themes of GLOBALE such as digitalization and globalization, big data, climate change, and industry 4.0. They also prompt reflections on how these globally interconnected trends and processes will change life on earth not only technologically, but also politically and socially.

For *The Appearance of That Which Cannot Be Seen*, scientists and theorists were invited to engage with Armin Linke's photographic archive. In close cooperation with the artist, different images have been selected to be presented in the exhibition in various combinations. Texts, images, and video recordings do not form fixed units, but are rather part of shifting spatial settings in which the commentary of individual "actors" opens up different perspectives onto the photographs. By revealing the process of selection, the project thematizes the way we read our world through images; it also addresses the different methodical approaches to the topics of GLOBALE from the perspective of the respective research methods and research interests of the individual "actors."

As with Armin Linke's interactive installation *Phenotypes / Limited Forms*, which was exhibited at the ZKM in 2007 and invited visitors to independently arrange photographs in an online archive, in *The Appearance of That Which Cannot Be Seen* the legibility of photographic archives can be experienced spatially through display systems created specially for the exhibition. Here Linke is concerned not with the individual motif, but with compositions of his images and the narratives that are generated through these compositions. The fact that the photograph itself is a medium of reproduction, which is part of a technological media history and part of a political and social history, is made evident through the photographs' white borders, which derive from the use of different camera types with image formats originally developed for specific functional fields of application, and which Linke transfers to standard paper formats. In his works, Linke thereby also exhibits the history of photography

in a sense and makes clear that without this medium, "the appearance of that which cannot be seen, cannot be seen" (Bruno Latour). **Philipp Ziegler**

The participating actors:

Ariella Azoulay (*1962 in Tel Aviv, IL) is an Israeli curator, filmmaker, and theorist of photography and visual culture. She teaches at Brown University in Providence, Rhode Island. Her publications include *The Civil Contract of Photography*, Zone Books, New York, 2008.

Bruno Latour (*1947 in Beaune, FR) is a French sociologist and philosopher. He is one of the founders of Actor-Network Theory (ANT) and is an representative of scientific research. His recent publications include *An Inquiry into Modes of Existence: An Anthropology of the Moderns*, Harvard University Press, 2013, and the accompanying website modesofexistence.org.

Peter Weibel (*1944 in Odessa, UA) is an Austrian artist, curator, and media theorist. Since 1999 he is CEO of ZKM | Karlsruhe.

Mark Wigley (*1956 in Palmerston North, NZ) is an architectural theorist, author, and curator from New Zealand. From 2004–2014 he was the Dean of the Columbia University Graduate School of Architecture, Planning and Preservation, New York.

Jan Zalasiewicz (*1954 in Manchester, GB) is a British geologist and chair of the Anthropocene Working Group of the International Commission on Stratigraphy. In 2010 he published the book *The Planet in a Pebble: A Journey into Earth's Deep History*, Oxford University Press, Oxford.

Fabrizio Tamburini:
Beyond Einstein's Dream.
Riding the Photons

Light is a manifestation of the electromagnetic field as the main vector of information for man to know the world and the universe. It presents multiple symmetries, currents and related conserved quantities, or "degrees of freedom," that can be used to gain knowledge of nature, from the quantum realm to the classical domain.

In the International Year of Light and Light-Based Technologies 2015, the *UPPSALA-KARLSRUHE INSTALLATION* at ZKM's GLOBALE exhibition *Infosphere* invites visitors to experience the twisted MIMO.

September 4, 2015 – January 31, 2016

Location: ZKM_Foyer ZKM_Atria 1+2, ground floor

Adding a twist to spatial information – an action that opens new possibilities to interact with unseen properties of light, transferring information wirelessly in a new and efficient way. By riding the photon, we obtain more information that we currently have about stars and galaxies, which is encoded into light: For this, the orbital angular momentum (OAM), an extrinsic property of the photon is used, as well as vorticity, the spin that is intrinsic and related to polarization. Spin is like the 24-hour rotation of the earth around its own axis, while orbital angular momentum looks more like the revolution of the earth around the sun. Often waves with OAM carry a vortex, a twist in phase that structures, or "sculpts," spatial information into a wave front that is preserved during its propagation.

When we start riding a photon, we start manipulating and sculpting light, interacting with the universe in a way that has never been done before. We can share information and knowledge across large distances through new forms of frequency re-use, manipulate particles at small scales and sculpt materials at nanoscales. This opens up a new era, from astronomical scales to nanoscales: STRUCTURED LIGHT.

In the *UPPSALA-KARLSRUHE INSTALLATION*, frequency re-use occurs by using an electromagnetic vortex that is generated by the reflection of a radio wave onto the spiral staircase mask and from a standard wave emitted from a small dipole antenna in the same frequency band and polarization state.

The spatial information encoded in the vortex wave and the spatial properties of the geometric distribution of all the antennas make it possible to double the frequency: it is a MIMO (multiple-input-multiple-output) multichannel setup based on radio vorticity. This draws on the spatial information encoded on two electromagnetic waves for frequency re-use.

Two receiving antennas located in different positions are connected to each other to detect the spatial information of the two channels. One antenna is fixed, while the other can be moved mechanically to capture either the twisted wave or the standard wave.

Visitors can experience this "invisible" spatial information by moving one of the receiving antennas, which tunes it between the two video channels carried by the two electromagnetic waves.

Visitors also interact with these waves when they walk across the space where the invisible waves propagate, thereby disturbing the waves. Their bodies

cause reflections, absorptions, and refractions, similarly to what Heinrich Hertz did in 1887, but in this case interacting with and experiencing twisted light! The result is seen directly in random changes and interference on the two channels. **Fabrizio Tamburini and Freddy Paul Grunert**
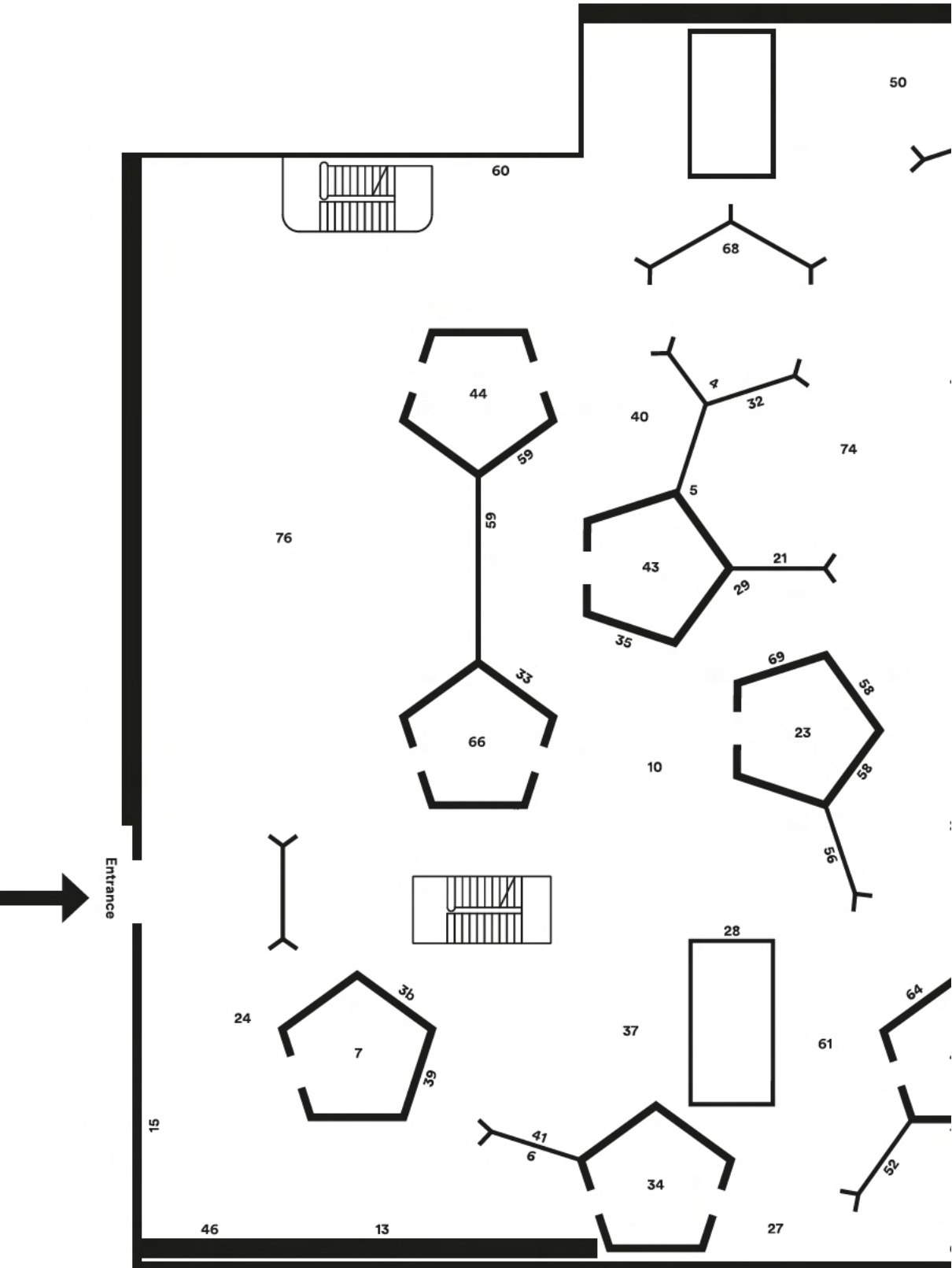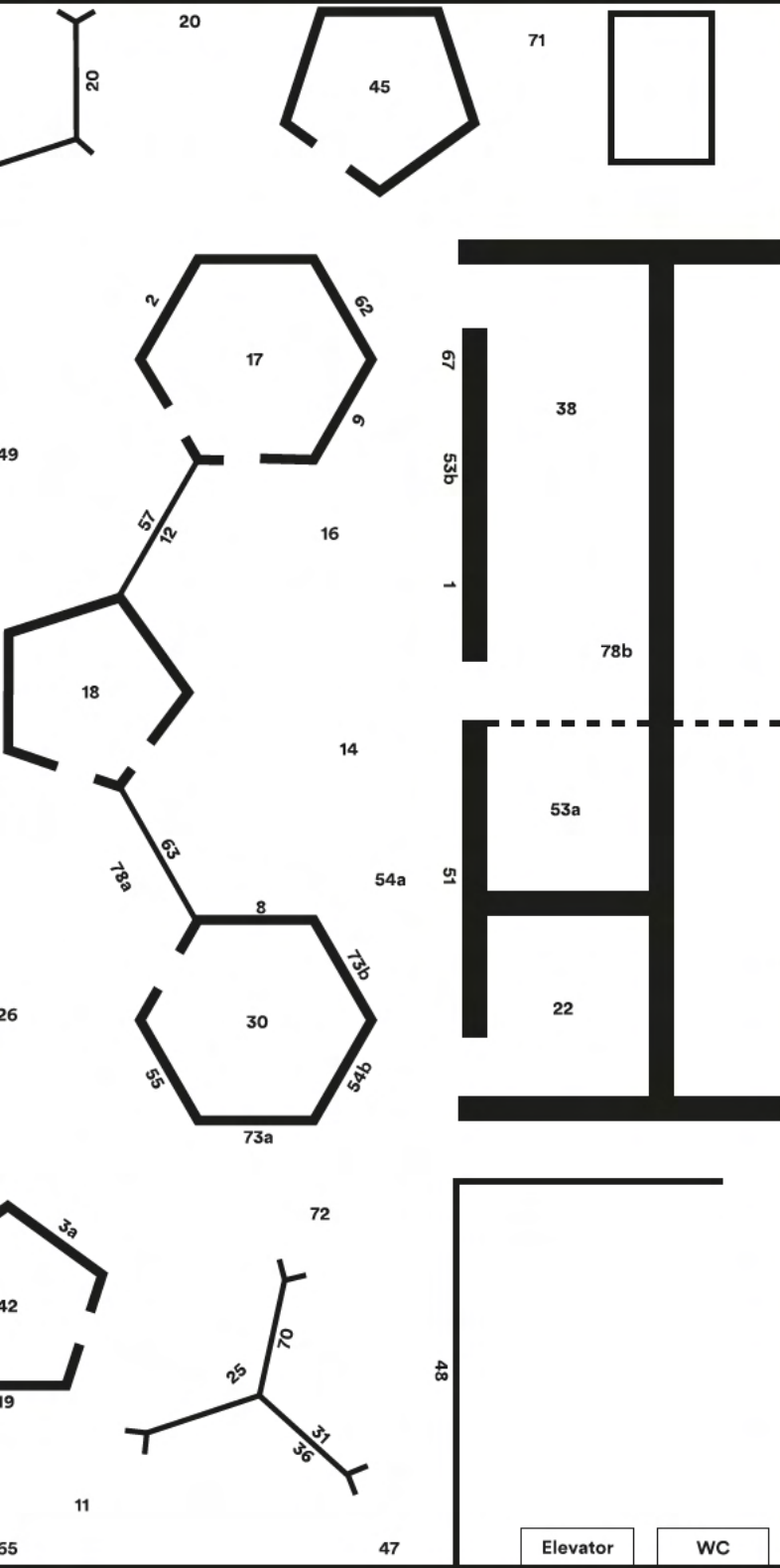
Symposium
Participants: Iwo Białynicki-Birula, Massimo Della Valle, Andrei Khrennikov, Fabrizio Tamburini
September 5, 2015
Location: ZKM_Lecture Hall

The conference is about the hidden beauty carried by light, information, symmetries, and structures in Maxwell's equations. Light is the main carrier of information, from the borders of Universe and between two people. Light is an electromagnetic wave, oscillations in time and in the propagating space of the electromagnetic field. Electromagnetic waves were first realized in Karlsruhe by Heinrich Hertz after the studies of Maxwell. The use of the mathematical beauty of the symmetries and conserved quantities of the electromagnetic field are paving the way for a new era, with the improvement of information transfer and to manipulate matter at a nanoscale.

Fabrizio Tamburini: Beyond Einstein's Dream. Riding the Photons

Exhibition:
Curator: Freddy Paul Grunert
Curatorial assistance: Therese Joan Keßler
Project management: Philipp Ziegler
Technical project management: Andrea Hartinger
Museum and exhibition technical services: Team ZKM
Registrar: Marianne Meister, Nina Fernandez
Conservation: Nahid Matin Pour, Jonathan Debik, Morgane Stricot

Concept: Freddy Paul Grunert and Fabrizio Tamburini in cooperation with Bo Thidé
Project management: Giulia Bini

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Entrance

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Map labels:
20, 20, 71, 45, 2, 62, 67, 38, 49, 17, 9, 53b, 57, 12, 16, 1, 18, 78b, 14, 63, 53a, 78a, 8, 54a, 51, 26, 73b, 30, 22, 55, 54b, 73a, 3a, 72, 42, 70, 48, 25, 31, 36, 19, 11, 55, 47, Elevator, WC

Participating Artists

1. Timo Arnall, Jack Schulze, Einar Sneve Martinussen
2. Amy Balkin
3. Aram Bartholl
3a *15 Seconds of Fame*
3b. *Forgot Your Password?*
4. Wafaa Bilal
5. Zach Blas
6. Blast Theory
7. Bonjour, interactive lab (Gustave Bernier, Jean-Philippe Jacquot, Alexandre Rivaux)
8. Natalie Bookchin
9. Dineo Seshee Bopape
10. David Bowen
11. James Bridle
12. Bureau d'Études
13. Emma Charles
14. Tyler Coburn
15. Sterling Crispin
16. The Critical Engineering Working Group
17. Stéphane Degoutin, Gwenola Wagon
18. Dennis Del Favero with Elwira Titan, Peter Weibel and Som Guan, Volker Kuchelmeister, Robert Lawther, Alex Ong
19. Aleksandra Domanović
20. Thomas Feuerstein
21. Fraunhofer IOSB (Fraunhofer Institute of Optronics, System Technologies and Image Exploitation) Karlsruhe
22. Laurent Grasso
23. Yoon Chung Han & Byeong-Jun Han
24. Jonathan Harris
25. Mishka Henner
26. Femke Herregraven
27. Brian House
28. Scottie Chih-Chieh Huang
29. Jennifer Lyn Morone™ Inc
30. Jia
31. JODI
32. Matt Kenyon (SWAMP)
33. Erik Kessels
34. Jeong Han Kim, Hyun Jean Lee, Jung-Do Kim
35. Brian Knappenberger
36. Oliver Laric
37. Marc Lee
38. George Legrady
39. Rafael Lozano-Hemmer
40. !Mediengruppe Bitnik
41. Laurent Mignonneau & Christa Sommerer
42. Jonathan Minard & James George
43. Warren Neidich
44. The Office for Creative Research (Mark Hansen, Ben Rubin, Jer Thorp)
45. The Otolith Group
46. Julius Popp
47. Jon Rafman
48. REMOTEWORDS (Uta Kopp / Achim Mohné)
49. Stephanie Rothenberg
50. RYBN.ORG
51. Mario Santamaría
52. Philipp Schaerer
53. Semiconductor
53a. *20 Hz*
53b. *Magnetic Movie*
54. Shinseungback & Kimyonghun
54a. *Cloud Face – Real Time*
54b. *CAPTCHA Tweet*
55. Adam Słowik
56. Smart Citizen Team in collaboration with IAAC | Fab Lab Barcelona, Media Interactive Design and Hangar
57. Karolina Sobecka and Christopher Baker
58. Werner Sobek, Stuttgart
59. Software Studies Initiative (Lev Manovich, Nadav Hochman, Jay Chow, Damon Crockett)
60. Superflux
61. Timo Toots
62. Suzanne Treister
63. Unknown Fields Division
64. Clement Valla
65. Alex Verhaest
66. José Luis de Vicente
67. Richard Vijgen
68. Christoph Wachter & Mathias Jud
69. Addie Wagenknecht
70. Gwenola Wagon
71. "Where dogs run" group
72. Krissy Wilson
73. Matthias Wölfel in cooperation with Angelo Stitz
73a. in cooperation with Angelo Stitz und Tim Schlippe *Voice Driven Type Design*
73b. in cooperation with Angelo Stitz *Responsive Type*
74. Expanded Senses
75. Manfred Wolff-Plottegg (installation at the ZKM_Foyer)

- -

76. *Armin Linke: The Appearance of That Which Cannot Be Seen*
77. Franz Pichler: *Rapid Transmission of Writings in the Nineteenth Century – Electric Telegraphy* (LH 2, 2. OG)
78a und 78b *Fabrizio Tamburini: Beyond Einstein's Dream. Riding the Photons*

Stadelmann Schmutz Wössner Architects
Creating Relationships – An Exhibition System for the GLOBALE

The architecture for the *Infosphere* exhibition provides an open system that, unlike closed spaces, enables a non-hierarchical presentation of the exhibits, with maximum transparency. Wall modules featuring a light, wooden frame construction can be combined into module groups of various shapes and sizes, which are grouped around walk-in black boxes for screen projection, while also structuring the exhibition space. We can identify similar spatially ramified systems in different eras and cultures; they find expression in nature, science and art – timber framework, space frame, stellar constellations or molecular formulas are here condensed into a homogenous exhibition structure, which uses simple means to establish both spatial continuity and relationships.

The module constellations accommodate a flexible exhibition arrangement and provide a fine structure for different interconnected theme areas. Depending on exhibition requirements, the exhibits can be hung either on the paneled wall system or directly on the wooden framework. Tables, pedestals, and showcases constructed in the same manner round out the system into a family of modules, providing a discreet background for the presented exhibits. The space between the modules is flowing and can be used in a variety of ways. Visitors can freely navigate, gaining an individual experience of the exhibition.

The permeability of the modules, along with the superimposition of the presentation levels, provides for an interaction between the exhibits that allows visitors to experience their simultaneity. The transparent modular system reflects both the generous, open ZKM architecture, as well as the comprehensive, expanded concept of art in the context of the exhibitions interlinked within the GLOBALE. **Stadelmann Schmutz Wössner**

Infosphere
Curated by Peter Weibel
with Daria Mille and Giulia Bini

GLOBALE concept: Peter Weibel
GLOBALE project manager: Andrea Buddensieg

Exhibition architecture: Stadelmann Schmutz Wössner, Berlin / London
Infosphere **project manager:** Daria Mille
Assistant: Giulia Bini
Project team: Stephan Schwingeler and Anna Sahli; with support from Matthias Pfaller and Anna Hennig
Logistics, registrar: Marianne Meister, Nina Fernandez
Technical manager: Stefan Wessels
Technical project manager: Andrea Hartinger
Construction team: Volker Becker, Claudius Böhm, Mirco Fraß, Rainer Gabler, Gregor Gaissmaier, Ronny Haas, Dirk Heesakker, Daniel Heiss, Christof Hierholzer, Werner Hutzenlaub, Gisbert Laaber, Marco Preitschopf, Marc Schütze, Thomas Schwab, Martin Schläfke, Karl Wedemeyer
Travel coordinator: Silke Sutter
External companies: Anything is Possible, Amsterdam; Artinate; COMYK Karlsruhe; Essential Art Solutions
Conservation team: Nahid Matin Pour, Morgane Stricot, Jonathan Debik
Public relations and marketing: Dominika Szope, Hanna Hammerich, Regina Hock, Verena Noack, Stefanie Strigl, Harald Völkl, Sophia Wulle
Museum communication: Janine Burger, Banu Beyer, Regine Frisch, Maxie Götze, Kristina Sinn
Technical production and event managers: Viola Gaiser, Hartmut Bruckner, Hans Gass, Wolfgang Knapp, Cornelius Reitmayr, Johannes Sturm, Manuel Weber
Office managers: Sabine Krause, Alexandra Kempf and Julia Beister, Dominique Theise, Ingrid Truxa
Library: Petra Zimmermann, Christiane Minter, Regina Strasser-Gnädig, Timo Haubrich
Media library: Andreas Brehmer, Claudia Gehrig, Hartmut Jörg
IT support: Uwe Faber, Elena Lorenz, Joachim Schütze, Volker Sommerfeld
Shop and info desk: Petra Koger, Jandra Böttger, Daniela Doermann, Tatjana Draskovic, Sophia Hamann, Ines Karabuz, Susen Schorpp, Jutta Schuhmann, Marina Siggelkow
Special thanks to the artists, the lenders, Andreas Beitin, Lisa Bensel, Giovanni Carmine, Matt Carter, Forstamt Karlsruhe, Sarah Happersberger, KIT Karlsruhe, Sabiha Keyif, Sarah Maske, Cira Pérez, Lea Schaffner, Anja Schulze, Linnea Semmerling, and Philipp Ziegler

Unless otherwise noted, all works are solely the property of the artists.

CEO and Chairman: Peter Weibel

General manager: Christiane Riedel

Head of administration: Boris Kirchner

Founders of ZKM

Partner of ZKM

Baden-Württemberg
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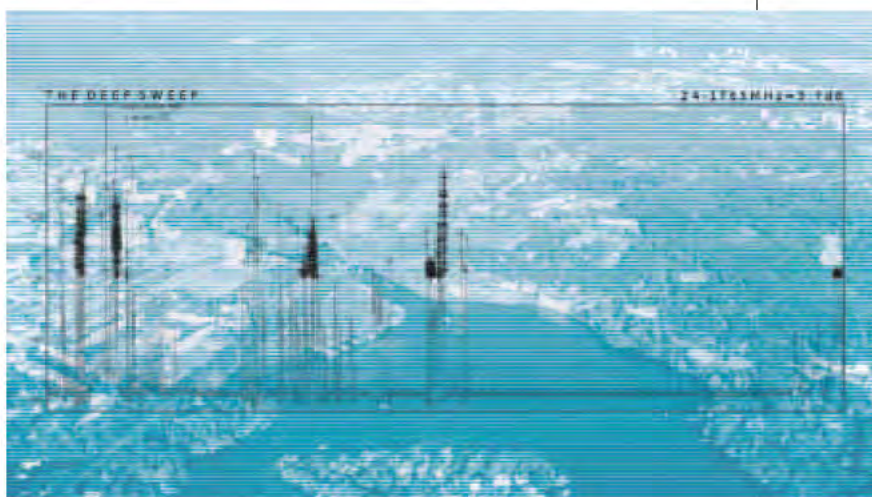GESELLSCHAFT
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Mishka Henner, *Scambaiters*, 2014, courtesy of the artist and Carroll / Fletcher

The Critical Engineering Working Group, *The Deep Sweep – Himmel über Berlin*, 2015

!Mediengruppe Bitnik, *Random Darknet Shopper – The Bot's Collection*, 2015, courtesy !Mediengruppe Bitnik, copyleft 2015

Sterling Crispin, *Data Masks*, 2013–2015

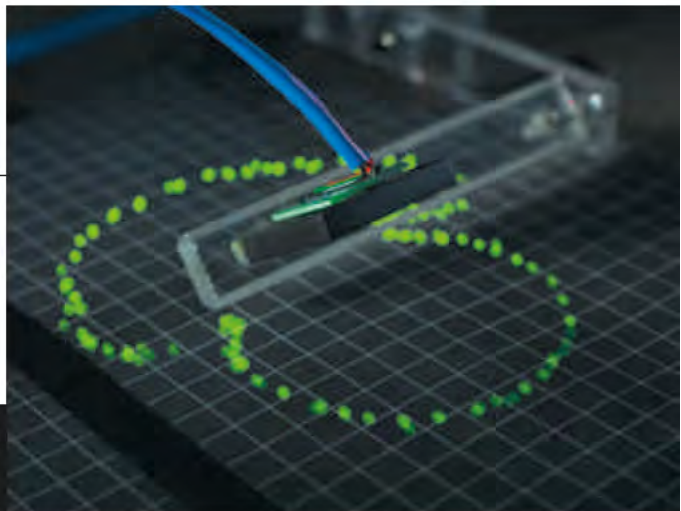Tyler Coburn, *Waste Management*, 2013–2015

Before, in Yugoslav times, we had the European Academic Network.

Aleksandra Domanović, *From yu to me*, 2013–2014, courtesy of the artist and Tanya Leighton, Berlin
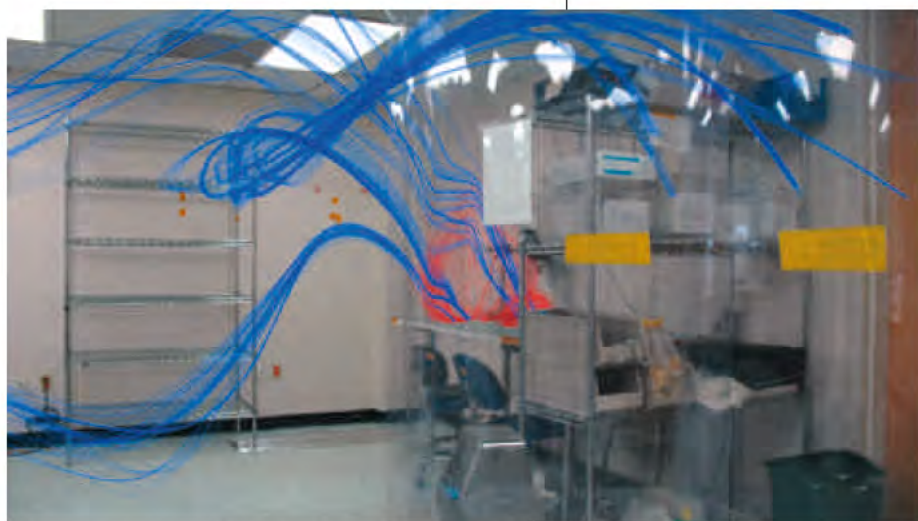

Aram Bartholl, *Forgot Your Password?*, 2013, courtesy DAM gallery & xpo gallery

Timo Arnall, Jack Schulze, Einar Sneve Martinussen, *Immaterials: The Ghost in the Field*, 2009, © Timo Arnall, 2009

The Office for Creative Research, *Gate Change*, 2012

Semiconductor, *Magnetic Movie*, 2007, photo © Semiconductor

Cover Image:
Emma Charles, *Fragments on Machines*, 2013

June 21 – September 27, 2015	From September 28, 2015
ZKM_Information Point Mon. 10 a.m.–4 p.m. Tues.–Fri. 9 a.m.–6 p.m. Sat. and Sun. 11 a.m.–6 p.m.	**ZKM_Information Point** Mon. and Tues. 10 a.m.–4 p.m. Wed.–Fri. 9 a.m.–6 p.m. Sat. and Sun. 11 a.m.–6 p.m.
ZKM | Shop Tues.–Sun. 11 a.m.–6 p.m. Mon. closed	**ZKM | Shop** Wed.–Sun. 11 a.m.–6 p.m. Mon. and Tues. closed
ZKM_Atrium 1+2 and 8+9 Tues.–Fri. 10 a.m.–6 p.m. Sat. and Sun. 11 a.m.–6 p.m. Mon. closed	**ZKM_Lichthöfe 1+2 und 8+9** Wed.–Fri. 10 a.m.–6 p.m. Sat. and Sun. 11 a.m.–6 p.m. Mon. and Tues. closed
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mint bistro.café.bar Tues.–Fri. 9:30 a.m.–6 p.m. Sat. and Sun. 10:30 a.m.–6 p.m. Mon. closed	**mint bistro.café.bar** Wed.–Fri. 9:30 a.m.–6 p.m. Sat. and Sun. 10:30 a.m.–6 p.m. Mon. and Tues. closed

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