

## PRESS RELEASE

The ZKM exhibition *Open Codes* (from 20.10.2017) examines the power and effect mechanisms of codes in our *Living in Digital Worlds*.

Around 120 artworks and scientific pieces show digitalization as a new cultural technology in an extraordinary exhibition format.

**Karlsruhe, 18 Oktober 2017.** Thousands of years ago, humans began to assign words and images to things. Now, things, words, images and sounds are assigned to data and this data can in turn be converted back into images, sounds and texts. Previously, images and words could not be directly converted into objects. But now, with 3D printing, data can be turned into things. Alphabetic code was irreversible. Digital code, based on the binary numerical system of 0 and 1 (Leibniz, 1697), is reversible, more comprehensive and therefore more powerful than alphabetic code.

You unlock your mobile phone with “Enter code”, you open front doors with codes – codes, from Morse code to genetic code, form the key to the present, globalized world. The exhibition *Open Codes. Living in Digital Worlds* therefore centers around the term “codes”. All-encompassing digitalization, a precondition of globalization, has produced disruptive technologies and unforeseeable cultural techniques that are revolutionizing our ways of life.

The triumph of the digitalization of the world started with Isaac Newton’s *Mathematical Principles of Natural Philosophy* (1687). In this, he was following Galileo Galilei, who in 1623 asserted: “The book of nature is written in the language of mathematics”. Physics is now posing the question of “The Unreasonable Effectiveness of Mathematics in the Natural Sciences” (Nobel Prize winner Eugene Paul Wigner, 1960). In parallel to the mathematization of physics, a technization has taken place. Formulas have become the starting point for technical innovations, from the discovery of electromagnetic waves to transistors to microchips. The discovery of electronics made it possible for electrically powered computers to be operated with binary code. This made it possible for a network of intangible data transmission and storage to enfold the Earth as an “infosphere”, similar to the atmosphere. People interact with an environment of codes and computers, of algorithms and automatic machines.

With *Open Codes. Living in Digital Worlds*, the ZKM has gathered around 120 artistic and scientific works presenting the fantastic possibilities for an individual experiencing and shaping of the world through the knowledge and use of codes. They also show the far-

Oktober 2017

**Open Codes**  
Exhibition

Duration of exhibition  
**Fr 20.10.2017 – Sun 05.08.2018**

Press conference  
**Wed 18.10.2017, 11.00 am**

Opening  
**Thu 19.10.2017, 7.00 pm**

Venue  
**ZKM\_Lichthof 8+9**

### Press contact

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reaching socio-political consequences that codes have. The works are allocated to eight themes which help us to better understand the digital environments that surround us:

“Artificial Intelligence & Machine Learning”, “Labor & Production”, “Algorithmic Economics”, “Algorithmic Governance”, “Genetic Code”, “Virtual Reality”, “Neuroscience” and “Human-Robot Interaction”.

The cooperation partners of the exhibition are Karlsruhe research institutions such as the Fraunhofer Institute for Optronics, System Technologies and Image Exploitation (IOSB), the FZI Research Center for Information Technology, the Karlsruhe Institute of Technology (KIT) and the Akademie Schloss Solitude in Stuttgart.

In the exhibition, artworks, scientific works, historical writings (from the Ars Magna of Raimundus Lullus to the pioneering mathematical works of George Boole and Claude Shannon), artifacts (sets of figures, microchips, combinational circuits, right up to microprocessors) and props are presented, which are based on both analog and digital codes. They visualize and explain the complex dynamics of codes. *Open Codes. Living in Digital Worlds* examines how codes find their way into our lives and what structures of knowledge produce codes. The artworks and scientific works shown examine the physical and mathematical principles upon which codes are based and their material implementation in microchips, relays and circuits.

### Exhibited artworks (selection)

**Cerith Wyn Evans** has programmed chandeliers so that they send flashing Morse signals. At the ZKM you can see an exhibit that emits extracts from the publication *Astrophotography: Stages of Photographic Development* (ed. Siegfried Marx, 1987) in the form of Morse signals. Wyn Evans has created a series of around 20 chandeliers that are magnificently designed in a Venetian style. The work visualizes the theme “coding”: A character sequence is transformed into a particular format in order to transmit or store data conveniently.

*The Trial of Superdebthunterbot* by Helen Knowles seeks to explore questions of ethics and accountability in relation to the increasing and often unseen computer automation of our lives.

The work imagines a speculative scenario in which a debt collecting company, Debt BB, codes an algorithm, the “Superdebthunterbot,” to ensure fewer loan defaulters by targeting individuals through the use of big data, placing job adverts on web pages they frequent. Five individuals have died as a result of the algorithm’s actions. The work illustrates the fictitious trial of this intelligent algorithm, and raises the

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question of who is accountable for machine-learning agents. Can the said algorithm, on trial for manslaughter, be found guilty by the fictional “International Ether Court”? The work is an exploration of the materiality of algorithms and the way in which we can judge their intellectual capacities before the law.

The satirical artwork *Autonomous Trap 001* by James Bridle shows a vehicle sitting in the middle of a parking lot surrounded by a salt circle, with Mount Parnassus in the background. The artist drew the circle as a trap for a self-driving car: the solid and dotted line form a “no entry” sign in 360 degrees. The vehicle, which relies on machine vision and processing to guide it, has been put under a spell by the materials of a magic ritual: it cannot leave the circle without breaking its own programming. Self-driving cars are gradually becoming available to the public. Many vehicles have self-driving capabilities already; trucks on US highways and cabs in crowded cities such as Singapore will also have them soon. Bridle developed his own self-driving car. All the code developed for the DIY self-driving car is open source and available online. Autonomous vehicles bring many developing technologies, such as machine vision and artificial intelligence, into contact with crucial social issues like the atomization and changing nature of labor. The salt trap is a sign of resistance, but also an attempt to define a shared space where both human and machine can converse.

Shot in a Chinese Bitcoin generating factory, Chinese Coin (Red Blood) by artist duo **UBERMORGEN.COM** (lizvix and Hans Bernhard) enters a space generally unseen and about which very little is known, and explores both the unpredictability and the subversive power of cryptocurrencies.

Chinese Coin mining has recently made the People’s Republic of China the world’s largest Bitcoin producer. Mining requires effort and it slowly makes new currency available at a rate resembling the speed at which resources like gold, diamonds, silver, and zinc are mined from the ground. One reason for this growth is the build-out of hydropower in western China. The first mining farms were in Shanxi and Inner Mongolia where coal was cheap and plentiful, but cheap coal can’t compete with free water and now the farms are migrating farther westwards.

#### Artists and Scientists include:

Jean-Michel Alberola, Morehshin Allahyari, Isaac Asimov, Lisa Bergmann, Michael Bielicky & Kamila B. Richter, Patrick Borgeat, James Bridle, Ludger Brümmer, Can Büyükberber, Emma Charles, Matthieu Cherubini, Arthur C. Clarke, Tyler Coburn, Max Cooper & Andy Lomas,

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Shane Cooper, Larry Cuba, Frederik De Wilde, Simon Denny, Götz Dipper, Constant Dullaart, Margret Eicher, Jonas Eltes / Fabrica, César Escudero Andaluz & Martín Nadal, Cerith Wyn Evans, Claire L. Evans, Harun Farocki, Thierry Fournier, Kristof Gavrielides, Jan Gerigk, Julia Gerlach, Julia Ghorayeb, Melanie Gilligan, Fabien Giraud & Raphaël Siboni, Manfred Hauffen, Daniel Heiss, Anton Himstedt, Yannick Hofmann, ICD/ITKE, Simon Ingram, Eduardo Kac, Helen Knowles, Beryl Korot, Anton Kossjanenko, Brigitte Kowanz, Marc Lee, Donna Legault, Jan Robert Leegte, Lawrence Lek, Armin Linke, Bernd Lintermann, Fei Liu, Christian Lölkes, Solimán López, Shawn Maximo, Tamara Mchedlidze, Rosa Menkman, Ben Miller, Chikashi Miyama, Andreas Müller Pohle, Jörn Müller-Quade, Greg Niemeyer, Helena Nikonole, Julian Palacz, Elizabeth Pich, Matthew Plummer-Fernandez, Julien Prévieux, Peter Reichard, Manfred Kraft & Michael Volkmer, Matthias Richter & Josef N. Patoprsty, Chandrasekhar Ramakrishnan, Betty Rieckmann, Robotlab, Curtis Roth, RYBN.ORG, saai | Südwestdeutsches Archiv für Architektur und Ingenieurbau, Chris Salter, Karin Sander, Karl Sims, Rasa Smite & Raitis Smits, Space Caviar, Barry Stone, Monica Studer & Christoph van den Berg, The Critical Engineering Working Group, Jol Thomson, Suzanne Treister, UBERMORGEN.COM, Ruben van de Ven, Harm van den Dorpel, Koen Vanmechelen, Ivar Veermäe, Nikolaus Völzow, ::vtol::, Clemens von Wedemeyer, Peter Weibel, Alex Wenger & Max-Gerd Retzlaff, Where Dogs Run, Dan Wilcox, Stephen Willats, Manfred Wolff-Plottegg & Wolfgang Maass, World-Information Institute.

The exhibition was designed by Peter Weibel and curated by Peter Weibel, Blanca Giménez, Yasemin Keskintepe und Livia Nolasco-Rózsás and Natalia Fuchs and Franz Pichler as external consultant.

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#### Basic information on the exhibition

Press conference: Wed., 18.10.2017, 11.00 a.m.  
Opening of the exhibition: Thur., 19.10.2017, 7.00 p.m.  
Duration of the exhibition: 20.10.2017–05.08.2018

Opening times: Wed.-Fri. 10.00 a.m.–6.00 p.m.  
Thur. until 10.00 p.m.  
Sat./Sun.: 11.00 a.m.–6.00 p.m.

The exhibition is an educational experiment. You can find further information on the communication program and the accompanying events here: [www.zkm.de](http://www.zkm.de)

Admission to the exhibition is free.

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