



HUMAN+

THE FUTURE OF OUR SPECIES

Centre de Cultura Contemporània de Barcelona
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Press Release

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INDEX

01.- Beta exhibitions	4
02.- About Science Gallery	5
03.- Introduction	6
04.- Exhibition wall texts	8
05.- Exhibited works	11
06.- Glossary	23
07.- Beta Station: programme of side events	26
08.- Debates	27
09.- Curators' bio	28
10.- Artist's websites	29
11.- General information	30
12.- Credits	31

1.- BETA EXHIBITIONS

HUMAN+. **The future of our species** is being held as part of the **CCCB's Beta** series of exhibitions. The Beta series opened with [Big Bang Data](#) in 2014 and is made up of projects that look at 21st-century culture and the major transformations of our age, while exploring the intersections between culture, technology and society. The dialogue between artists, scientists, designers and programmers is growing and defining an extremely intense work horizon. There are no definitive maps for these new territories, yet, nevertheless, they form the basis for some of the crucial questions about our future as a species and the world we are creating.

This line of exhibitions is the natural and logical consequence of the work in research and innovation in the cultural sphere that the CCCB Lab has been carrying out over the last five years and that, with this project, is advancing towards new formats.

The objective of this exhibition series is to show how exhibitions can be a language and a code for tackling questions that are revealed to us as being of capital importance, and with respect to which we are not sufficiently distanced in time to allow us to generate conclusions. With these exhibitions, we will be talking about a confrontation that is occurring right now and that affects our day-to-day existence.

This exhibition includes a new laboratory space that accommodates processes of production, research, and dissemination and that will remain permanently established at the Centre: the "BETA STATION"*. Each instalment of Beta will thus include an exhibition and an integrated activity space. However, why a working space in the exhibition? If we work on a culture under construction, we feel it is essential to include the processes in the account. If we have to talk about a culture that is related with community construction and with relational processes, then including as part of the exhibition the laboratory where people can visualise how the work processes and dynamics are as important as the results, represents for us a statement of principles.

The objective of this Beta cycle is to work with communities close to the questions tackled, encourage meetings, create new communities and work with the city's cultural calendar (festivals, meetings, collaborations with other cultural and academic spaces) in order to make ourselves, for a period of seven months, the work space on an issue: in the case occupying us now, to make ourselves the home of the data culture.

***Beta (β)** is a term used in software to describe a version of a program that is launched to the public as part of an open process of evaluation and continuous development. It is a stage subsequent to the first version of the program, alpha (α), but is not yet the version 1.0, which is considered as stable.

2.- ABOUT SCIENCE GALLERY

ABOUT SCIENCE GALLERY DUBLIN

In 2008, a car park in a forgotten corner of Dublin was transformed by Trinity College Dublin into a living experiment called Science Gallery, with a mission 'to ignite creativity where science and art collide'. In the last seven years, over two million visitors to Science Gallery Dublin have experienced 34 unique exhibitions ranging from materials science to lifelogging, and from the future of the human race to the future of play. Primarily orientated towards young adults between the ages of 15-25 years old, Science Gallery develops an ever-changing programme of exhibitions, events and experiences fuelled by the expertise of scientists, researchers, students, artists, designers, inventors creative thinkers and entrepreneurs. Science Gallery Dublin focuses on providing programmes and experiences that allow visitors to participate and facilitate social connections, always providing an element of surprise. Science Gallery Dublin is kindly supported by its founding partner the Wellcome Trust, through government support from the Department of Arts, Heritage and the Gaeltacht, Science Foundation Ireland, and by 'Science Circle' Partners — Deloitte, ESB, Google, ICON, NTR Foundation, and Pfizer.

For more information visit: dublin.sciencegallery.com

ABOUT THE GLOBAL SCIENCE GALLERY NETWORK

Pioneered at Trinity College Dublin, Science Gallery is an innovative new approach to inspiring young adults to deepen their engagement with science, technology and creativity. Having received significant international acclaim, the model is now being replicated through the Global Science Gallery Network, launched in 2012 and supported by Google.org, with the goal of establishing eight Galleries worldwide by 2020. The Network will be developed in partnership with leading universities and research institutions in dynamic urban centres, and each Science Gallery will have a mission to ignite creativity and discovery where art and science collide. The first new galleries in the Network will open at King's College London and the Indian Institute of Science in Bengaluru (Bangalore) in 2017. Discussions are also underway to establish galleries in Melbourne, Singapore and New York.

For more information about the Network, visit: international.sciencegallery.com

3.- INTRODUCTION

The [Centre de Cultura Contemporània de Barcelona](#) with the collaboration of [Science Gallery at Trinity College Dublin](#) presents the exhibition **HUMAN+. The future of our species** from 7th October 2015 to 10th April 2016. The artist **Cathrine Kramer** is the executive curator and has been assisted by the researcher **Ricard Solé**.

The exhibition has been produced with the curatorial team of **Juliana Adelman, Rachel Armstrong, Michael John Gorman, Aoife McLysaght, Ross McManus, Richard Reilly** and **Charles Spillane**.

This exhibition explores potential future trajectories of our species by considering both historical and emerging technologies, as well as their cultural and ethical contexts. What does it mean to be human today? From Assisted Reproductive Technologies (ART) to human digital remains, our lives are mediated and defined by our tools and scientific discoveries. However, this exhibition is not a blind celebration of technology, but is intended to present a range of imagined and real possibilities, allowing visitors to make up their own mind about the preferred future of the human species.

The exhibition explores the boundaries of what it means to be human—boundaries of the body, boundaries of the species, boundaries of what is socially and ethically acceptable. Should we enhance ourselves, or seek to modify our descendants? Are we approaching a singularity of human-machine hybridization or de-skilling ourselves through our ever-increasing reliance on technological extensions of the body? Is extended human longevity a wonderful aspiration or a dire prospect for the planet?

First presented at Science Gallery Dublin in 2011, HUMAN+ re-emerges now as a co-production, featuring many additional works, and accompanied by both a comprehensive event series and new catalogue. The exhibition marks the first co-production for CCCB with Science Gallery, who have received international acclaim for a transdisciplinary approach that bridges art and science, and connects the work of respected international artists with emerging research.

AUGMENTED ABILITIES

Humans have always developed tools to augment abilities. From external prosthetics that enhance or augment bodily functions to internal medical interventions, we have always been cyborgs, curious about bodily form and function. The development of human enhancements has been motivated by both necessity and desire. Augmentations can offer radical and liberating ways of being, but can also be tools of oppression, enforcing social norms and expectations. Taking into account historical and speculative examples, Augmented Abilities showcases a range of physical, chemical and biological methods for augmenting the mind and body.

ENCOUNTERING OTHERS

Emerging technologies are changing the ways we encounter others: family, co-workers and even pets. Are the personalities we interact with on our devices living, artificial, or some combination of the two? While some humans yearn for a future of robotic lovers that can predict and respond to their every desire, others are simply hoping not to get run over by a self-driving car or accidentally killed by an unmanned aerial vehicle. The social technologies that we make can be creative, expressive and deepen our connection to others, but they can also replicate the inequality and violence present in our society. This section explores the changing nature of human, technological and social relationships and what that says about our needs and desires as inherently social creatures.

AUTHORING ENVIRONMENTS

When imagining the future of our species we must consider the context in which we live. Humans cannot exist in isolation, but are reliant on complex and messy ecosystems that support life on earth. We have always manipulated environments and organisms, for better or for worse, to satisfy our needs and desires. The scope of these interventions is now planetary in scale, defined as the Anthropocene: a measurable geological era caused by human activity. We are authors of our environment, whether we want to acknowledge it or not. So how should we author the environments we inhabit more thoughtfully? The future of our species relies on maintaining the complex environments, natural and built, that support human life on earth.

LIFE AT THE EDGES

The start and end points of human life on Earth are known. If there is birth, eventually there will be death. Although absolute, the edges of life are not hard. Assisted reproductive technologies are redefining fertility and pregnancy, raising challenging ethical, social and technological questions. Death, the endpoint of life, is also a shifting threshold, with biomedical advances and life-support machines extending the length, if not always the quality, of human lives. We remain visible online after our mortal death, haunting or comforting friends and family. Radically extended lifetimes and demographic changes are forcing a reconsideration of the social norms and rituals that emerged when life was short and families large. This section will focus on changing definitions and blurry edges of birth and death, and our endless fascination with these topics.

4.- EXHIBITION WALL TEXTS

Cyborgs, superhumans and clones. Evolution or extinction? What does it mean to be a human today? What will it feel like to be a human a hundred years from now? Technological capabilities are increasing at a rapid pace—should we continue to embrace modifications to our minds, bodies and daily lives, or are there boundaries we shouldn't overstep?

HUMAN+: The Future of Our Species is an exhibition that explores potential future trajectories of humankind by considering the implications of both historical and emerging technologies. The 'plus' symbol in Human+ implies a positive direction for the future of our species. But what is that direction? For the majority of the 20th century, progress has been measured by increased speed and efficiency—faster, better, stronger—but the side effects have been fatter, sadder and exhausted. Our definition of success needs to be recalibrated.

The 21st century will be characterized by the confluence of fields such as biotechnology, robotics and artificial intelligence. Manipulating biological processes, controlling digital and mechanical machines and creating non-biological intelligence above and beyond what humans can comprehend— these advances raise ethical questions about the appropriation of life and the alteration of the self. The converging forces of these and other currents will lead us to a new and unknown place.

From subtle provocations to grand gestures, the artworks in this exhibition consider how these changes might be adopted and assimilated. The value in speculation is not prediction, but reflection. What are we striving for?

We are designing our future, consciously or not, and every creator, whatever their discipline, will play a part in this process. In this exhibition artists, designers and scientists speculate on and imagine many possible futures. Now it's your turn.

AUGMENTED ABILITIES

What superpower would you like to have?

Will bioengineering create a new race of humans?

What will be considered beautiful in a hundred years?

From contact lenses to heart valves: are we all already cyborgs?

Should the government, your doctor or you regulate what augmentations to your body you can have?

Humans have always developed tools to augment abilities. From external prosthetics that enhance or augment bodily functions to internal medical interventions, we have always been cyborgs, curious about bodily form and function. The development of human enhancements has been motivated by both necessity and desire. Augmentations can offer radical and liberating ways of being, but can also be tools of oppression, enforcing social norms and expectations. Taking into account historical and speculative examples, Augmented Abilities showcases a range of physical, chemical and biological methods for augmenting the mind and body.

ENCOUNTERING OTHERS

Will virtual reality become the new reality?

What if artificial intelligence knew what you wanted before you did?

Would you have an intimate relationship with a robot?

What would happen if the internet shut down today?

What if a robot were more competent than you at your job?

Emerging technologies are changing the ways we encounter others: family, co-workers and even pets. Are the personalities we interact with on our devices living, artificial, or some combination of the two? While some humans yearn for a future of robotic lovers that can predict and respond to their every desire, others are simply hoping not to get run over by a self-driving car or accidentally killed by an unmanned aerial vehicle. The social technologies that we make can be creative, expressive and deepen our connection to others, but they can also replicate the inequality and violence present in our society. This section explores the changing nature of human, technological and social relationships and what that says about our needs and desires as inherently social creatures.

AUTHORING ENVIRONMENTS

Will we go extinct if we don't change how we live?

To what extent should we genetically manipulate living organisms?

If we change the environment, will we have to change ourselves in order to adapt to it?

Would you live on another planet?

When imagining the future of our species we must consider the context in which we live. Humans cannot exist in isolation, but are reliant on complex and messy ecosystems that support life on earth. We have always manipulated environments and organisms, for better or for worse, to satisfy our needs and desires. The scope of these interventions is now planetary in scale, defined as the Anthropocene: a measurable geological era caused by human activity. We are authors of our environment, whether we want to acknowledge it or not. So how should we author the environments we inhabit more thoughtfully? The future of our species relies on maintaining the complex environments, natural and built, that support human life on earth.

LIFE AT THE EDGES

Should parents be allowed to choose their children's genetic traits?

In the future who will hold the ownership of genetic materials?

Would you upload your brain to the internet?

Is immortality the new 40?

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5.- EXHIBITED WORKS

AUGMENTED ABILITIES

The Fall of Icarus, 1636-1637

Jacob Peter Gowy

Museo Nacional del Prado, Madrid

This work by Flemish painter Jacob Peeter Gowy (c. 1615 - c. 1661) focuses on the episode in Ovid's *Metamorphoses* where Icarus appears depicted with his father Daedalus, at the moment of his dramatic fall into the sea when they are escaping by flying from the labyrinth where they were held prisoners on the island of Crete. The ingenuity and skill of Daedalus had led him to make two pairs of wings that were attached to their shoulders with beeswax. Icarus, filled with enthusiasm and ignoring his father's advice, flew so close to the sun that the wax attaching the wings to his body melted, causing him to fall. A founding myth about the permanent human desire of surpassing one's own capacities.

Model for Alyssa Dee Krauss, 1998-1999

Ramon Guillén-Balmes

Collection Sensi Cervantes Quevedo

In the late 1990s, Ramon Guillén-Balmes produced a series of pieces called "models for use" that opened up a process of work with his friends in a particular procedure of investigation into art's usefulness. His collaborating friends expressed in writing what they desired and the artist produced a kind of made-to-measure prosthesis, for a determined function; these were extensions of the body, or objects that can be attached to the body and emphasise any of its parts. This "wing-aid" for designer Alyssa Dee Krauss connects us with Leonardo da Vinci's ornithopter or with Tatlin's flying machine and, in short, with what has been an essential human desire throughout time: flight.

Avatar Machine, 2010

Marc Owens

Avatar Machine is a wearable system that replicates the aesthetic of third person gaming. A super wide camera is mounted to a body harness and the video is streamed live to a head mounted display worn by the user. The effect is real life viewed in third person. Real and virtual space have distinct sets of rules and normative social behaviours and the artist believes his system could potentially diminish a sense of social responsibility, leading the user to demonstrate behaviours normally reserved for the gaming environment. The blurring between the real and the virtual will inevitably change human culture and the ways we relate to ourselves and each other. *Avatar Machine* gives a sneak preview of these emerging relationships.

Decelerator Helmet, 2014

Lorenz Potthast

The *Decelerator Helmet* offers the wearer a view of the world in slow motion. Signals from an externally mounted video camera and microphone are processed, showing slowed down images of the external environment on a head-mounted display inside the helmet, and on a monitor on the exterior of the helmet. The lapse of time can be set to three different modes by a remote control. A physical bubble, the helmet offers a space for reflection. A place where the wearer can think about the flow of time and the relationship between sensory perception, environments and corporeality, in our increasingly fast moving society. Imagine a shift to 'personalized perception'—could it eventually lead to a detachment from a universal perception of time?

Animal Superpowers, 2008-2015

Chris Woebken and Kenichi Okada

Animal Superpowers is a series of wearable prototypes that playfully enhance how we experience our surroundings. Animals have extraordinary abilities, interpreting information and perceiving the world through sensory systems far beyond what humans can experience. Inspired by these animal abilities, this project uses technology and design to change human perspectives. For example, the ant apparatus consists of gloves with embedded microscope cameras that connect to a screen mounted inside a helmet. The wearer can then explore the world like an ant by seeing through their hands at 50x magnification, relieving a secret and hidden world. Perhaps by taking on animal superpowers, humans can become more empathetic to the animals we live alongside and the natural systems that support us.

Cheetah Legs

Aimee Mullins

Aimee Mullins first received worldwide media attention as an athlete. Born without fibulae in both legs, by age two, she had learned to walk on prosthetic legs, and spent her childhood doing the usual athletic activities of her peers. She competed in the 1996 Atlanta Games with woven carbon-fiber prostheses that were modeled after the hind legs of a cheetah, sparking a media debate about the radical design of her prototype sprinting legs. Mullins later made her runway debut as a Model in London at the invitation of fashion designer Alexander McQueen and has been influential in changing perceptions of people with varying abilities.

Historical Prosthetics , 1500-1600

The Science Museum, London

These two prosthetic arms from the 1500s demonstrate the long-standing history of replacing missing body parts and the craftsmanship involved. During the 16th century, most limbs were amputated due to war injuries or accidents, but the history of surgical amputations goes back to at least ancient Greece, with Hippocrates—the ‘father of Western medicine’—recording the practice by surgeons of the day. The two historic prosthetics on display are an articulated artificial right arm and an artificial left hand and forearm. The right arm would have enabled a certain range of movements, attached to the body via hinged metal and leather straps. Similarly, the left forearm and hand had an internal mechanical structure (now missing) that may have allowed the fingers basic movement.

Fablab Low Cost Prosthesis Program

WAAG Society

The Fablab Low Cost Prosthesis program develops technologies to produce a 'lower knee' prosthesis in line with the ‘open innovation’ principles, so that end users, designers, researchers and manufacturers can collaborate to create product innovations. The Low Cost Prosthesis program aims at developing a self-adjustable lower leg prosthetic with production costs below \$50. This is an important cause, because the need for prostheses is growing and the costs are often high. Due to the increasing rate of amputations, there is an ever-growing demand for prosthetic limbs. There are many research elements to the program, for example, experimenting with the use of cheap and locally available materials. The program is also exploring how the Fablab infrastructure can enable local production of customized prostheses.

The Alternative Limb Project, 2011-2015

Sophie de Oliveira Barata

The *Alternative Limb Project* works with amputees to express themselves through their prosthetics, re-imagining the form and function of the body in exciting and empowering new ways. The Alternative Limb Project was created in September 2011 after prosthetic limb designer Sophie De Oliveira Barata was inspired by a young client who was bored with a realistic limb replacement year after year and started to make requests for something fun and different. Barata has several clients, including Viktoria Modesta, a singer-songwriter and model who has had a left below-the-knee amputation and has commissioned various alternative limbs to use as part of her artistic expression, thrilling audiences and changing the way people think about disability.

Yor-Dy: Make your own replacements like a Dummy

DIY Bio Bcn

We will still have to wait some years to be able to produce complete, functional organs that can replace those of ill patients, but the 3D printing of human cells is making fast progress. We are now close to being able to print skin or cartilage. Today, re-absorbable prosthetics are being used along with micro-tissues for investigating medicine toxicity. YOR-DY is a prototype of a 3D printer that follows the basic principles of the first organ printers that were produced, with a basic technology that is now available to us. If we manage to print made-to-measure organs, will we limit ourselves to medical aims or redesign ourselves to increase our capacities? Will pianists print themselves a sixth finger? Or will we make ourselves new eyelids that allow us to see in the dark like felines do?

Plasmapheresis: A technique for exchanging plasma

Grífols

We think of blood as a red fluid or liquid that flows around the veins and arteries, but in fact approximately 45% of blood consists not of liquid but of cells such as erythrocytes, leucocytes and platelets that need to be transported to all corners of the body in order to oxygenate, protect and heal organs and tissues. This transport function is provided by the liquid 55% of blood, known as plasma.

Plasma is not an inert fluid. It contains thousands of dissolved substances which are vital for the functioning of organs and tissues and for the elimination of waste substances. Plasma proteins fulfil highly specialised functions such as the control of coagulation or of the immune system. Albumin is the most abundant plasma protein and is responsible for transporting other substances to their places of action or elimination.

Plasmapheresis is a technique developed by J.A. Grífols in 1951 for obtaining plasma: in a blood donation, a centrifuge separates the cells and returns them to the donor while only the plasma is preserved. Based on plasmapheresis, plasma exchange is used as a treatment for diseases that involve the accumulation of toxic products in the blood. A patient's plasma is extracted almost in its entirety and replaced with a fluid such as an albumin solution.

Grífols has spent over 10 years researching the role of albumin in the treatment of Alzheimer's disease. An abnormal protein called amyloid beta accumulates in the Alzheimer's brain. This protein circulates around the plasma bound to albumin, therefore through plasma exchange using albumin, the amyloid beta can be removed and the clean albumin starts filling up again with amyloid beta. In the AMBAR trial, almost 400 patients are being treated at 40 hospitals in Spain and the USA, and the trial is now at a very advanced phase.

Nobody's perfect, 2008

Niko von Glasow

The documentary film NoBody's Perfect follows Niko von Glasow as he looks for eleven people who, like him, were born disabled due to the disastrous side-effects of Thalidomide, to pose naked for a book of photos—allowing those who regularly throw furtive glances at Thalidomiders and other physically disabled people, to take a good, long look.

As the film approaches its climax – the photoshoots – von Glasow completes the picture with scenes showing his unsuccessful attempts to make contact with the chemical company Gruenthal, to talk about Thalidomide and its effects. With a darkly humorous touch Von Glasow presents an impressive portrayal of the sensitivities and feelings of disabled people, and our society's reactions to them.

Law of Averages, 2014

Addie Wagenknecht

How do online image searches reinforce accepted norms? Law of Averages is a series of prints that are algorithmically computed. Using pixel averages from image search results, the pieces are then computed and compiled using eye tracking and RGB averages to create a 'perfect average', generating a composite of the aggregated data. The series was inspired by looking at beauty ideals perpetuated by American beauty pageants. Struck by how all of the contestants looked similar, Wagenknecht wanted to find a way to compare them all at once, quantifying an ideal. In the resulting series, the chosen search terms—for example, 'Miss America 2013', 'Selfie' and 'Terrorist'—point to a range of social, political, personal and gender norms.

Cut Through the Line, 2005

Regina José Galindo

Cut Through the line is a performance that explores gender expectations and notions of female beauty. Dr. Billy Spence, who participated in the performance, is one of the most sought-out plastic surgeons in Venezuela. Galindo asked him to mark where he would make surgical modifications on her body in order to achieve the perfect female body according to Western beauty standards. The documentation of this activity shows Spence using bright colored pens to deconstruct Galindo's body into a series of abstract shapes, highlighting the unrealistic expectations of beauty women contend with today. Attitudes towards cosmetic surgery vary widely across cultures, gender, age and class. As cosmetic surgery becomes increasingly prevalent, perhaps even expected, how will conceptions of beauty change?

Series under the Influence, 2010-2015

Bryan Lewis Saunders

Bryan Lewis Saunders (Washington DC, 1969) is an artist, performer, video artist and poet known for his unnerving live diatribes, theatrical performances and tragic monologues within the sphere of "stand-up tragedy". The artist has devoted himself obsessively to self-portraits as a substantial part of his work: "During the last twenty years I have created at least one self-portrait every day and I am going to continue doing so for the rest of my life. "After experiencing drastic changes in my environment I searched for other experiences that could radically affect my perception of myself. Thus I subjected myself to another experiment, in which on a daily basis I took a different drug or toxic substance and portrayed myself while under its effects. A broad series of these self-portraits under the effects of different substances is presented here.

Improvised Empathetic Device I.E.D., 2005

S.W.A.M.P. (Matt Kenyon and Douglas Easterly)

The United States-led war in Iraq resulted in an enormous number of human casualties. While the number of Iraqi deaths is underreported, an exact account of U.S. military deaths is broadcast. I.E.D. is a wearable device that prompts awareness of the death and violence in the Middle East by creating physical pain in correspondence to reports of killed American soldiers. When news of an American death is reported, the LCD readout displays the soldier's name, rank, cause of death and location, and then triggers an electric solenoid to drive a needle into the wearer's arm, drawing blood. I.E.D. can be seen as an emotional prosthetic, causing physical pain to remind the wearer to care.

Consumer Index, 2015

S.W.A.M.P. (Matt Kenyon)

Every year fresh consumer data is collected to build profiles that are predictive of future consumer behaviour worldwide. Consumer Index is a site specific performance in which the artist enlists himself as one of a select group of study participants who are monitored as archetypal consumers. The performance is a hack, and the artist, an aberrant indicator of the archetypal consumer he purports to represent. Kenyon reconfigures the Nielsen Homescan bar-code scanner and fuses it with a micro-video camera. Implanting the camera inside of his mouth, he literally comes to embody the consumer profile represented by the data he collects. His act of ingestion alters data broker's conception of his consumer behavior even as his archetypal profile becomes less like his actual self.

Oblique: Images from Stelarc's extra ear surgery, 2007

Nina Sellars

In 2006, Sellars travelled to Los Angeles to photograph the Extra Ear project, a surgery involving an ear being attached to the performance artist Stelarc's left forearm. The photographic outcome was the Oblique series, a set of tightly framed images of the surgery. In Oblique, the twisted bodies, discoloured flesh and extensions into the bodily space—also associated with Baroque imagery—have been transformed into an extended body. A palette of Mannerist-like flesh is revealed, formed by a mix of iodine stains and restricted blood flow. Oblique is situated between a surgical theatre and the theatricality of the Baroque, providing an ambiguous space for an anatomically augmented body.

Brain Polyphony. Neurosonification Architecture

Starlab

The Centre for Genomic Regulation (CRG), Starlab and the BRAC (Barcelona Research Art & Creation) group from the University of Barcelona have created Brain Polyphony, a system whose objective is to develop a tool so that those people with cerebral palsy can communicate their emotions through the translation of brain waves into sound. A pioneering communication system which, in real time, converts the electrical waves produced in the brain into an entire polyphonic orchestra, according to the type of emotion and reaction that a determined feeling causes in the body. With *Brain Polyphony*, brainwaves can be listened to live and amplified until the audible range for humans is reached, live and direct.

Cyborgism

Cyborg Foundation, Neil Harbisson and Moon Ribas

In the year 2010, the international Cyborg Foundation was founded with three objectives: to help humans become cyborgs, to defend the rights of cyborgs and to promote cyborgism as an artistic and social movement. The Foundation defines “cyborgism” as the practice in which artists express themselves through new senses created by the union between cybernetics and their own body. These artists no longer use technology as a tool for creation: it constitutes part of their body as an extension of their capacities for sensation and perception. Within the context of HUMAN+ the Cyborg Foundation is presenting two life-size cybernetic sculptures that in appearance imitate classical sculptures but into which are encrusted sensors that allow the sculpture to connect to certain data in real time and the body and mind of the artist. the Seismic Arm based on the perception of earthquakes of Moon Ribas and the Sonochromatic Head based on the perception of colours of Neil Harbisson.

ENCOUNTERING OTHERS

Whose Utopia? 2006

Cao Fei

This video was created at the OSRAM light bulb factory in Foshan in the Pearl River Delta area of China. Cao Fei held workshops with the workers, many of whom are young emigrants from the inland provinces of China, asking them about their dreams and aspirations. Some of the responses were captured in *Whose Utopia?*, which starkly contrasts the dreams and aspirations of the people with their everyday lives as factory workers. By focussing on the hopes and dreams of individuals within a mass system, *Whose Utopia?* celebrates creativity and resilience of the human spirit, while questioning the systemic aspirations of economic development and efficiency: a system that desires machines with human intelligence and humans that can perform like machines.

Optimization of Parenting, Part 2, 2012

Addie Wagenknecht

This robot arm gently rocks the bassinet whenever the baby inside cries or awakes from sleep. As an artist and a mother, Wagenknecht developed this artwork imagining ways to balance her creative practice with motherhood. Being a stay at home parent without help is equivalent to having four full time jobs, exempt from the expectations of rational behaviour and labor. Can some automatic repetitive tasks be transferred to robotic devices without affecting the development of the baby? Many technologies have claimed to make domestic work easier, but motherhood is still considered sacred. Suggesting that a robot take over some parental tasks is a provocative gesture that highlights the struggle mothers have to find a live/work balance.

DNA Compatibility Test

Instant Chemistry

This exhibit shows one of many commercial DNA test kits that are intended for romantic matchmaking purposes. Instant Chemistry promotes its personalized DNA tests as a way for partners to assess their “underlying compatibility”. Commercial personal genomics services like Instant Chemistry and competing services make claims that range from the scientifically valid and verifiable to total hucksterism. However, the fact that there is a market for this kind of service indicates that some consumers believe that making romantic decisions based on biological analysis is an appropriate and valid way to assess their options. Are dating, romance and marriage joining the biotech revolution, or is this one aspect of cultural life that will largely resist the incursion of emerging biotechnologies?

Teledildonics for Long-Distance Relationships

Kiiroo

Our social lives are increasingly mediated by technology, is it inevitable that our sexual activities will be as well? Kiiroo is a company that hopes to bring teledildonics to the mainstream— enabling tactile sexual relations from separate locations via computers. Their interactive sex toys connect to other users to create “a new kind of internet experience.” Kiiroo claims: “You’ll be able to intimately connect to anyone, anywhere.” The risk of contracting STDs and pregnancy are eliminated, but notions of a network enabled ‘free love’ movement might be tempered by a new suite of risks. Fears of being hacked and privacy concerns might spoil the mood for increasingly intimate online activities. As these networked intimacy proliferates, how will social codes be re-defined?

Cumspin, 2015

Julijonas Urbonas

Cumspin is a proposal for an orgasm enhancing funfair machine. Based on the principle of a centrifuge, it exposes the love riders to variable gravitational forces. Spinning in one of the eight spherical capsules, the lovers may control the centripetal force by changing the distance between the axis and the capsule. The farther from the axis, the greater the force that pushes them against the wall. Coordinating movements with the forces could enable controlled blood flow, which could heighten sensations. Directing the blood to the lower extremities would cause the sudden loss of oxygen to the brain accompanied by euphoria. The latter in tandem with orgasm creates a sensation beyond any definition of pleasure: Hypergravitational orgasm.

The Machine to be Another

To Be Another Lab

To Be Another Lab is working on the limits of reality in a machine “to be another” that seems to be taken from science fiction stories of the 1960s. The system proposed is the result of a long-term investigation into empathy and the identity which with the use of protocols and neuroscientific technologies based on recent discoveries relating to cognition – such as mirror neurons – offers users an immersive experience that means that you feel as though you’re in the body of another person. Virtual reality is a unique technology that helps to “put us in the skin of another” and thus reflect on our own identity. The system has been used in performances to tackle experiences such as immigration, mother-daughter relations, pain tolerance or questions of ethnic or sexual identity.

Misbehaving: Media Machines Act Out, 2002-2015

Heidi Kumao

What is expected of robots? How do they enact or defy expectations? Can a robot be polite or misbehave?

This project features two robotic, female performers who represent women and girls who disobey or resist expectations. Each intimate installation focuses on translating “unseen” information (data from proximity sensors, sound data) into tangible activity such as erratic movement or “incorrect” behaviour. Unlike machines designed for perfect job performance, these machines declare their fallibility, impatience, approval, and disapproval through small gestural acts. In contrast to the precise technique and tireless efforts of a robot that plays chess or constructs automobiles, these robotic performers “act out” and misbehave. In these tableaux of protest and transformation, the machine is spirited, emotional, thoughtful, yet irregular.

Àrea V5, 2009-2010

Louis-Philippe Demers

Area V5 is a wall of disembodied robotic eyes that follow visitors as they walk by. It aims to trigger the Uncanny Valley—the point at which humans start to feel physical unease with robotic agents that look and move almost, but not exactly, like human beings. Recent developments in the field of social robotics and artificial intelligence suggest a prominent role of eye movement in establishing essential non-verbal dialogue between humans and machine. The installation invites the viewer to experiment with the enigmatic gaze of disembodied eyes. The title of the work refers to the visual area V5 in the brain cortex which is thought to play a major role in the perception of motion.

Human Version, 2007-2009

Yves Gellie

Galeria Baudoin Lebon, Paris

This photographic work presents a series of portraits of humanoid robots in their native environments. It captures the reality of the world's great research laboratories and gives a detailed insight into where and how humanoid robot research evolves. Gellie's concept was to focus on the genesis of these robots, the sites of their creation, the evolution of their physical appearance, and the tools and materials used to bring them to life. The images capture cultural differences between research centers from around the world, leaving room for us to speculate on the motivations of the creators and the place these robots may have in our everyday lives in the future.

Tardigotchi, 2010

S.W.A.M.P. (Matt Kenyon, Douglas Easterly and Tiago Rorke)

Tardigotchi features two pets: a living organism and an artificial life avatar. Playfully referencing the famous Tamagotchi toy from the 1990's, this toy encourages pet-owner behaviour through a device that is ostensibly more like a phone than a cat. In one half of a brass sphere is a tardigrade, a common microorganism which lives within a prepared slide. In the other half, the avatar (a caricature of the tardigrade) is depicted on an LED screen. Tardigotchi serves as a reminder of the special place humans have in communing with other animals—and perhaps equally for artificial ones. We, along with the inhabitants of Tardigotchi and every other living being, are neighbours subsisting on a single, incredibly precarious ecosystem.

True Love, 2008

Alexander Prokopovich, editor d'Astrel SPb

In 2008 headlines were made when Russian publishing house Astrel SPb claimed they were releasing a book written by a computer. The book is called True Love and is a variation of the classic novel Anna Karenina written in the style of Haruki Murakami. The publisher states that a group of developers and philologists collaborated to create a computer program that generated the manuscript. Once compiled, the text went through editorial corrections like any other novel. Can a computer accurately represent through language an expression of 'True Love'? The implications of cultural artifacts being authored by artificial intelligence (AI) are wide ranging, and raise some fundamental questions about how we define ourselves as humans.

AUTHORING ENVIRONMENTS

Our Daily Bread, 2005

Nikolaus Geyrhalter

Nikolaus Geyrhalter Filmproduktion GmbH / Karma Films

When imagining potential trajectories for our future, it is important to first understand and reflect on the present. From fields to factories, *Our Daily Bread* gives a panoramic overview of daily life within the industrial food system in Europe. At the same time monumental and intimate, the film captures surreal landscapes and a multitude of repetitive actions, depicting how modern food production companies employ technology to maximize efficiency, consumer safety and profit. Without voice-over narration or interviews, viewers are invited to form their own opinion about the filmic portraits of the food systems that sustain them.

The Human Pollination Project, 2009

Laura Allcorn

Honeybees provide pollination for over one third of our food supply. Since 2006, honeybees have been mysteriously disappearing. This phenomenon is known as colony collapse disorder. What if humans had to assume the pollination responsibility from the honeybee? Aiming to draw attention to the human reliance on honeybee pollination, Laura Allcorn has created a hand pollination toolkit, designed to be worn as a functional fashion accessory. Donning the tool kit, the wearer can attempt the delicate task of hand pollination, but may also find themselves in an uncomfortable and overwhelming situation; assuming the vast and tedious pollination responsibilities of the bee. These hand pollination tool kits aim to ask questions about the social and environmental implications of colony collapse disorder.

Foragers, 2009

Anthony Dunne and Fiona Raby

The world is running out of food – we need to produce 70% more food in the next 40 years according to the UN. What if we could extract nutritional value from non-human foods using a combination of synthetic biology and new digestive devices inspired by digestive systems of other mammals, birds, fish, and insects? *Foragers* imagines a group of people who take their fate into their own hands and start building DIY devices. They use synthetic biology to create “microbial stomach bacteria”, along with electronic and mechanical devices, to maximise the nutritional value of the urban environment, making up for any shortcomings in the commercially available but increasingly limited diet. These people are the new urban foragers.

Eat the Sun

DIY Bio Bcn

So-called “breatharianism” promotes the false belief that human beings are capable of living without eating any food and that the necessary nutrients can come from the sun. Synthetic biology offers the possibility of actively intervening in evolution. Could we, then, become breatharians in the future? In the field of speculative fiction, DiyBioBcn has founded Synthetic Biology Systems Inc (SBS) which is postulated as the first company destined to introduce into the market products capable of endowing human beings with photosynthetic capacities. Will SBS guarantee access to this technology for towns in areas with endemic hunger? Will photosynthesis allow the first ever explorers to go beyond the solar system?

Postnatural Organisms of the European Union

The Center for PostNatural History

This exhibit from the collection of the Center for PostNatural History features organisms deliberately altered by humans: domesticated pets, agricultural seeds from the Norwegian Svalbard global seed vault, alcoholic rats, mice with Hox gene alterations, the red canary (the first genetically engineered species) and transgenic mosquitoes meant to fight malaria. Each of these organisms was modified and selected by an individual or institution for a specific purpose. This work asks us to examine the specimens and reflect on the natural, evolutionary history as well as a PostNatural, cultural history, of each organism on display. Collectively these organisms begin to map out the ways that human needs and desires are inscribed on the genetic diversity of the planet Earth.

The Incredible Shrinking Man

Arne Hendriks

It has been a long-established trend for people to grow taller. As a direct result we need more energy, more food and more space. But what if we decided to turn this trend around? What if we used our knowledge to shrink mankind? The Incredible Shrinking Man is a speculative design research project about the implications of downsizing the human species to 50 centimeters, in order to better fit the Earth. What motivates contemporary goals of physical enhancement and genetic improvement of the human species? Instead of desiring to become larger and more dominant, what would a smaller humankind that consumed less look like?

New City: Machines of Post Human Production, 2015

Liam Young

New City is an ongoing series of animated skylines of the near future. Photographs taken on expeditions around the world documenting emerging phenomena have been meticulously stitched together and reimagined to form future city skylines. New City: Machines of Post Human Production depicts the global trade infrastructure as a planetary-scaled conveyor belt. Along this endless factory floor, the human body has been enlisted as a machine, just one more component of a production line which connects the cities of consumption to the online shopping distribution centers, the autonomous container ships of maritime trade, the rows of choreographed factory robots and the super-scaled mining equipment that roam the earth.

LIFE AD THE EDGES

Transfigurations, 2013

Agatha Haines

Through surgical procedures our bodies can be stretched, shifted and sewn, yet still be functional. If a child is born with a disability, the child's family and doctors will try to improve the capabilities of that child to match average human abilities. But why stop there? Should we strive to medically enhance bodily functions beyond what our bodies are capable of? Transfigurations consists of sculptures representing five babies, each with a surgically implemented body modification. Each modification is designed to solve a potential future problem for the baby, ranging from medical or environmental issues to social mobility issues. How far might parents go to give their child an advantage? What reasons justify modifying a child's body?

Reproductive Futures

Zoe Papadopoulou and Dr. Anna Smajdor

From the stork to the invention of the microscope, the ‘birds and the bees’ to IVF—how will stories evolve as our methods for human reproduction become increasingly more diversified? This multidisciplinary project investigates how scientific and technological developments influence the narratives that we use to explain ‘where we come from’. Reproductive Futures presents a historical timeline that documents the development of reproductive technologies. By exploring new scenarios, this project aims to create a space for a broader discussion on Artificial Reproductive Technologies (ART) and the consequences and possibilities that these advances present.

Semi-Living Worry Dolls

Tissue Culture and Art Project (Oron Catts and Ionat Zurr)

The Semi-Living Worry Dolls were the first tissue engineered sculptures to be presented alive in a gallery in 2000. Tissue Engineering is the process of using living cells to manufacture connective tissues, and potentially even organs, within a lab environment. Inspired by the Guatemalan worry dolls given to children to whisper their worries and concerns to, the Semi-Living Worry Dolls were handcrafted out of degradable polymers (PGA and P4HB) and surgical sutures. The dolls were then seeded with living cells that gradually replace the polymers within a micro-gravity bioreactor that acts as a surrogate body. The worry dolls become partially alive. Neither alive, nor dead the Semi-Living Worry Dolls challenge our concept of life, consisting of animal cells sustained by a life-support machine.

Afterlife, 2009

James Auger and Jimmy Loizeau

Scientific research has yet to offer any tangible proof of life after death, so in terms of comfort and reassurance, what then is there for the grieving atheist? Afterlife proposes a contemporary and scientifically validated service that acknowledges humans as chemical entities providing perhaps the only genuine guarantee of life after death. Afterlife suggests harnessing our chemical potential after biological death as a microbial fuel cell, harvesting its electrical potential in a dry cell battery. Here, technology acts to provide conclusive proof of life after death, life being contained in the battery. What would you do with an afterlife battery charged either by yourself or a partner/family member?

When we all live to 150 , 2012

Jaemin Paik

In this project, Jaemin Paik explores the consequences of life extension by asking how family, a fundamental basic unit that makes up a society, would change if we all lived to one-hundred and fifty or beyond. With up to six generations living together, and the possibility of huge age gaps between siblings, the traditional model of the family would change dramatically, perhaps even becoming unsustainable with the burden of its large membership. This work proposes some alternative family models, re-defining social structures to better suit long life expectancy. For example, to ease the pressure of forming a lifelong bond, marriage is a contract-based 30 year commitment that can be renewed or expire.

The Island, a virtual experience of a real life

EventLab for Neuroscience and Technology

We have only one life. But through virtual reality we could have a thousand lives and experience in them many things from which we can learn. Can our experiences in virtual lives influence us and transform our way of seeing the real world? Let’s imagine what it would be like to live in a different world for a time, have a different body, make friends with whom we share tasks and experiences, people who only exist in the virtual world. The

EVENTlab team has set up an immersive virtual reality environment that gives you the possibility of experiencing an entire life compressed into a few minutes. An experiment which the visitor will be able to form a part of while contributing to a scientific study on perception and empathy.

Euthanasia Coaster, 2010

Julijonas Urbonas

John Allen, former president of the Philadelphia Toboggan Company, once said that “the ultimate roller coaster is built when you send out twenty-four people and they all come back dead. This could be done, you know.” Euthanasia Coaster is a hypothetical euthanasia machine in the form of a roller coaster, engineered to humanely take the life of a human being. The coaster is designed to subject its passengers to a series of intensive physical motions that induce a range of experiences from euphoria to thrill, tunnel vision to loss of consciousness, and eventually death. Drawing on research in aerospace medicine, mechanical engineering, materials technology and of course, gravity, the fatal journey is made pleasing, elegant and meaningful.

6.- GLOSSARY

NANOTECHNOLOGY

An interdisciplinary, scientific and engineering approach to the manipulation of matter at the molecular and atomic scales, using both living and non-living systems as the target for building devices, new forms of energy production or even novel types of medical therapies.

EXOSKELETON

A mechanical suit, usually designed as a machine that can be worn by a human. It is equipped with an energy source, motors and hydraulic joints in such a way that most required energy for limb movement is powered by the exoskeleton. It can be used in many fields, particularly to help rescue workers in dangerous environments or humans with limited mobility.

CYBORGS

The word is short for “cybernetic organism” and refers to a human that has integrated artificial technology as part of their body. This integration might be a replacement of lost body parts or to enhance existing capacities. This includes, for example, robotic implants or artificial organs.

CYBERNETICS

The term defines a theoretical approach to (natural or artificial) systems capable of self-regulation and feedback. It is based on multiple converging disciplines and became a well established field in the 1940s, particularly thanks to the work of Norbert Wiener.

ROBOTICS

This discipline revolves around the creation and development of robotic agents using electrical engineering, neuroscience and computer science and deals with the design, construction, operation, and application of either real or virtual robots, as well as computer systems for their control, sensory feedback, and information processing.

VIRTUAL REALITY

By creating virtual environments that imitate “real”, physical but also unphysical, imaginary worlds and appropriate immersion devices, VR provides a way of exploring alternative sensory experiences. It is used in gaming, medical therapies and neuroscience research.

AUGMENTED REALITY

Refers to a live direct or indirect view of a physical, real-world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data.

ARTIFICIAL INTELLIGENCE

The term refers both to the intelligence exhibited by machines or software and to the academic field of study that focuses on artificial systems (physical or virtual) capable of intelligent behaviour. The field has been successful in developing powerful “expert systems” capable of defeating chess masters or helping humans in solving complex decision-making problems, among other things.

TELEDILDONICS

The use of network-enabled sex toys that allow for users to engage in sexual activities by interacting across a network. Promoters of these devices have claimed since the 1980s that they are the “next big thing” in cybersex technology.

THE (TECHNOLOGICAL) SINGULARITY

A hypothetical event or occurrence when artificial intelligence or robots are able to design and improve themselves, creating an intelligence that far exceeds human intellectual capacity or control. Due to the lack of control or human comprehension the technological singularity is an occurrence beyond which events may become unpredictable, unfavourable, or even unfathomable.

GENETIC ENGINEERING

Molecular biology techniques used to engineer and manipulate specific genes and gene sequences. It usually involves adding, removing or modifying existing genes to make microbes, synthesise drugs, modify crops to resist environmental stress or cells to make biofuels.

SYNTHETIC BIOLOGY

Advanced genetic engineering approaches aimed at large-scale redesign of logical circuits in living cells, tissues and organs. Synthetic biology takes a machine-like view of living things amenable for redesign and re-engineering.

DIY BIO

DIY BIO stands for Do-It-Yourself Biology and is a global movement of people who do biological research in community-based informal labs. They are open community groups that believe greater public understanding about biotechnology has the potential to benefit everyone.

BIOHACKERS

People in DIY BIO groups are sometimes referred to biohackers, as their labs are sometimes in hackerspaces. Hackerspaces are community-operated physical places, where people share their interest in tinkering with technology, meet and work on their projects, and learn from each other.

ANTHROPOCENE

The term is used to label a geological era triggered by human activities in the last 12,000-15,000 years. It is connected to measurable, accelerated changes of atmospheric and biogeographic patterns linked to intensive overexploitation of ecosystems and energy resources.

EXTINCTION

The end of a species resulting from the disappearance of the last individual of a given group. It is often caused by environmental or ecological change. There is currently a great decrease in biodiversity on the planet and many ongoing extinction events are caused by human activity, sometimes referred to as the "Sixth Extinction".

EUTHANASIA

The practice of intentionally ending a human life, motivated by a desire to relieve the pain and suffering of a person who is terminally ill. This practice, also known as assisted suicide, is only legal in some countries.

BIOMIMETICS / BIOMIMICRY

The study of the models, systems, and elements of nature to inspire human engineering solutions to complex systems, materials or processes. Living organisms have evolved well-adapted structures and materials over geological time through natural selection.

Biomimetics has given rise to new technologies inspired by biological solutions at macro and nanoscales.

TRANSHUMANISM

A movement that promotes the study and use of present and future technologies for human enhancement. From the application of genetic engineering to artificial intelligence, followers believe technology can and should be used to enhance life expectancy, and perhaps even eliminate death.

GRINDING

Grinding is a cultural movement involving extreme body modification, self-experimentation and especially the design and integration of cybernetic technologies directly into the organic human body.

POSTNATURAL

The postnatural is a term used to describe organisms that have been intentionally altered by humans, through processes such as domestication, selective breeding and genetic engineering.

FABLAB

A fablab (short for fabrication laboratory) is one name for the small-scale workshop offering public access to digital fabrication tools such as laser cutters, 3D printers and CNC machines. There is currently a global network of over 400 Fablabs, which share common tools and research.

REGENERATIVE MEDICINE

A branch of medical research which seeks to engineer damaged tissues and organs by stimulating the body's own repair mechanisms to functionally heal previously irreparable tissues or organs.

PERFORMANCE-ENHANCING DRUGS

Chemical substances used to improve activity performance in humans, usually associated with the physical performance of athletes in sports, but also increasingly relevant to the cognitive performance of students and soldiers.

7.- BETA STATION

The exhibition includes an integrated activity space: the **Beta Station**.

The space, where mediators will organise visits and other activities, will feature a varied programme of events throughout the six months the exhibition is on.

The main activities organised as part of the exhibition include meetings with the artists, experiments with robotics, neurotechnology, virtual reality, encounters with biohackers, film seasons and a wide range of conversations and debates.

12th November 2015

Voice-generation with a supercomputer

26th November 2015

Robots and young children in a therapeutic setting

Robotics for children with an ASD (autism spectrum disorder) and children in hospital

14th January 2016

Monitored care

Changing medication through technology

28th January 2016

Emotion tracking

Storing and sharing my emotions

11th February 2016

Bits and atoms, a relationship to be formalised

More activities: <http://www.cccb.org/en/exhibitions/file/human-/129032>

8.- DEBATES

+Humans Lectures

From a philosophical perspective, these lectures aim at reflecting on our immediate future as species.

Thursday 5th November, 7 pm

Lecture by **Judith Butler**

Bodies That Still Matter

<http://www.cccb.org/en/activities/file/bodies-that-still-matter/221316>

Judith Butler is Maxine Elliot Professor in the Department of Comparative Literature at the University of California, Berkeley. This lecture, organized in collaboration with the United Nations University Institute on Globalization, Culture and Mobility ([UNU-GCM](#)) in Barcelona, falls within the annual guest lecture series of this institute.

Monday 30th November, 7 pm

Lecture by **Rosi Braidotti**

The Posthuman Condition

<http://www.cccb.org/en/activities/file/the-posthuman-condition/221317>

Rosi Braidotti is Distinguished University Professor and founding Director of the Centre for the Humanities at Utrecht University. This lecture will focus on key aspects of Professor Braidotti's recent book *The Posthuman* (2013; published in Spanish as *Lo posthumano*, Gedisa 2015)

ICREA – CCCB Debates 2015

Machines That Think: Opportunities and Dilemmas of Artificial Intelligence

Tuesday 24th November, 7pm

Artificial Intelligence for War or Peace?

Luc Steels, ICREA Professor at the Institute of Evolutionary Biology (CSIC and Pompeu Fabra University)

Tuesday 1st December, 7pm

Intelligence as Evolution Strategy

Arcadi Navarro, ICREA Professor at the Evolutionary Genomics Lab (Pompeu Fabra University)

Wednesday 9th December, 7pm

The future of Artificial Intelligence

Hector Geffner, ICREA Professor at the Technology Department, Pompeu Fabra University

Tuesday 15th December, 7pm

Perception and Reality: the Understanding of Virtual Worlds

Mel Slater, ICREA professor and director of the eventLab (University of Barcelona)

Mavi Sánchez-Vives, ICREA professor at the August Pi i Sunyer Biomedical Research Institute (IDIBAPS)

9.- CURATOR'S BIO

CATHRINE KRAMER

Cathrine Kramer works internationally as an artist and curator. She is the co-founder of two artist-led think tanks: Center for Genomic Gastronomy, and CoClimate. In 2014, she received a VIDA Art and Artificial Life International Award for her work as the Center for Genomic Gastronomy. She has lectured at numerous academic institutions including Harvard GSD, NYU and Goldsmiths College, London. She holds degrees from the Royal College of Art, London and the University of Technology, Sydney. Cathrine works at the intersection of art and science, with a focus on the ecological, cultural and ethical dimensions of life on Spaceship Earth.

Cathrine was the researcher for HUMAN+ at the Science Gallery in 2011, and continued to define the focus of the exhibition for CCCB, encouraging a shift from the traditional technoutopian discourse of human futures towards an approach that considers a nuanced range of future possibilities.

website: www.callmecat.com

RICARD SOLÉ

A physicist and biologist, is ICREA research professor at the Pompeu Fabra University where he heads the Complex Systems Laboratory. He is also a visiting fellow at the Santa Fe Institute (New Mexico) and at the Center for Evolution and Cancer at the University of California (San Francisco). He is on the editorial advisory boards of several international journals. He has degrees in Physics and Biology from the University of Barcelona and obtained a PhD in Physics from the Technical University of Catalonia (UPC). He has been awarded grants from the James McDonnell Foundation, the Botín Foundation and an ERC Advanced Grant. He also received the 2004 City of Barcelona Prize for his research work. One of his main research interests is to understand the origins of complexity and its destruction in biological and artificial systems, with the aim of discovering how complex systems develop qualities such as multicellularity, the capacity for computation, robustness and the ability to evolve. In order to achieve this, his laboratory engages in both theoretical and experimental research, which includes an ambitious programme of synthetic biology.

10.- ARTIST'S WEBSITES (Selection)

Addie Wagenknecht - placesiveneverbeen.com

Arne Hendricks - www.arnehendriks.net

BeAnotherLab: Philippe Bertrand i Christian Cherene
<http://www.themachinetobeanother.org/>

Center for PostNatural History. Richard Pell - www.postnatural.org

Cyborg Foundation. Neil Harbisson&Moon Ribas - cyborgism.wix.com/cyborg

DIYBIO BCN - www.diybcn.org

Dunne&Raby - www.dunneandraby.co.uk)

EventLab. Neuroscience & Technology - www.event-lab.org

Heidi Kumao - <http://heidikumao.net/>

Isaac Budmen – <http://teambudmen.com/>

Julijonas Urbonas - julijonasurbonas.lt

Laura Allcorn - <http://www.lauraallcorn.com/>

Liam Young - www.tomorrowsthoughtstoday.com

Lorenz Potthast - <http://www.lorenzpotthast.de/>

Louis-Philippe Demers - www.processing-plant.com

Matt Kenyon - <http://www.swamp.nu/>

Regina José Galindo www.reginajosegalindo.com

SimbioticA. Oron Catts & Ionat Zurr - tcaproject.org

Yves Gellie - <http://www.yvesgellie.com/>

11.- GENERAL INFORMATION

Dates

7/10 2015 to 10/04 2016

Opening times

Tuesday to Sunday, 11am to 8pm. Closed Monday, except public holidays

Guided tours

Catalan: Sunday, 11.30am / Spanish: Saturday, 11.30am

Price: 6 €

Reduced admission: 4 € for senior citizens, under 25s, large families, single-parent families and groups (minimum number 15 people), and for the general public every Wednesday.

Free admission under 16s, Friends of the CCCB, senior citizens holding the Targeta Rosa discount card, unwaged, Catalan Government teachers' card holders, and Sunday from 3pm to 8pm.

Downloadable high-resolution images: <http://www.cccb.org/en/premsa>

12.- CREDITS

HUMAN+. The Future of Our Species was conceived and first exhibited at Science Gallery at Trinity College Dublin. This new iteration of HUMAN+ is a coproduction of the exhibition by Science Gallery and Centre de Cultura Contemporània de Barcelona (CCCB). The exhibition will be held at the CCCB between 6 October 2015 and 10 April 2016

Curatorial Team

Juliana Adelman (Trinity Long Room Hub), Rachel Armstrong (interdisciplinary researcher), Michael John Gorman (Science Gallery), Aoife McLysaght (Trinity College Dublin), Ross McManus (Trinity School of Medicine), Richard Reilly (Trinity College Dublin), Charles Spillane (National University Ireland Galway).

Project Director

Rosa Ferré

Executive Curator

Cathrine Kramer

Advisor

Ricard Solé

Coordination

Miquel Nogués
Montse Novellón

Exhibition Design

Indissoluble

Production and Installation

Servei d'exposicions del CCCB
Unitat de producció i muntatges del CCCB

Exhibition Installation

Central de Projectes

Audiovisual Coordination

Departament d'audiovisuals del CCCB

Registration and Conservation

Unitat de registre i conservació del CCCB

Communication Graphic Design

Postdata

Beta Station

Coordination of activities: Teresa Roig
Coordination of mediators: Marian Díaz

And the collaboration of CCCB Lab, CCCB Education, Centre for Documentation and Debates, Communication and External Resources Service and Administrative and General Service