Reactive matter

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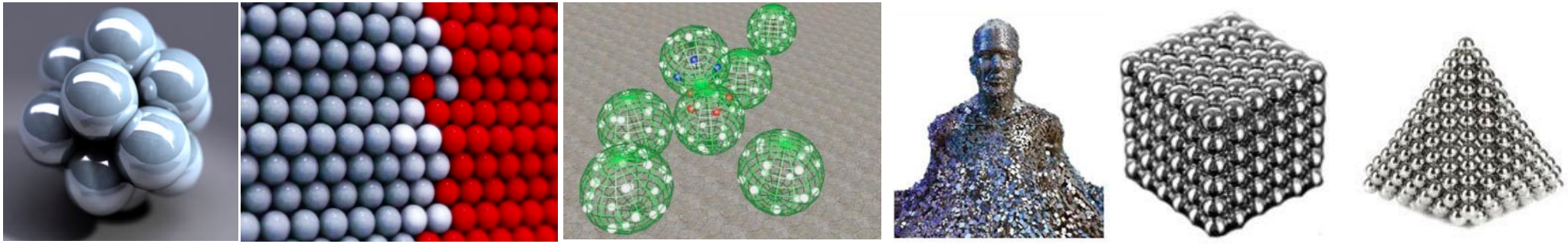
Interactive Sculpture
Programmable material / Electronic clay / Artificial Intelligence and Robotics
Scenocosme : Grégory Lasserre & Anaïs met den Ancxt

Glossary

«Programmable Matter» and «Claytronics» (electronic clay)

The nano-metric robots called “claytronics” atoms (or “catoms”) could be assembled to form larger objects. The denomination is a contraction of “clay” and “electronics”. The principle is to create small interactive objects capable of being linked together for design large structures that can be freely transformed. This is the concept of synthetic reality. They are Called catoms” by analogy with the term “atom”. Assembling through electromagnetic forces these objects can interact together. These “catoms” can form easily modifiable objects such as modelling clay.

The fabrication methods for realizing these “catoms” is being invented. For now, only few research laboratories in the world are developing macroscopic-sized prototypes. They are also developing new algorithms and specific electronics that allow “catoms” to communicate together to constitute a single whole. Each element of this matter can be programmable.



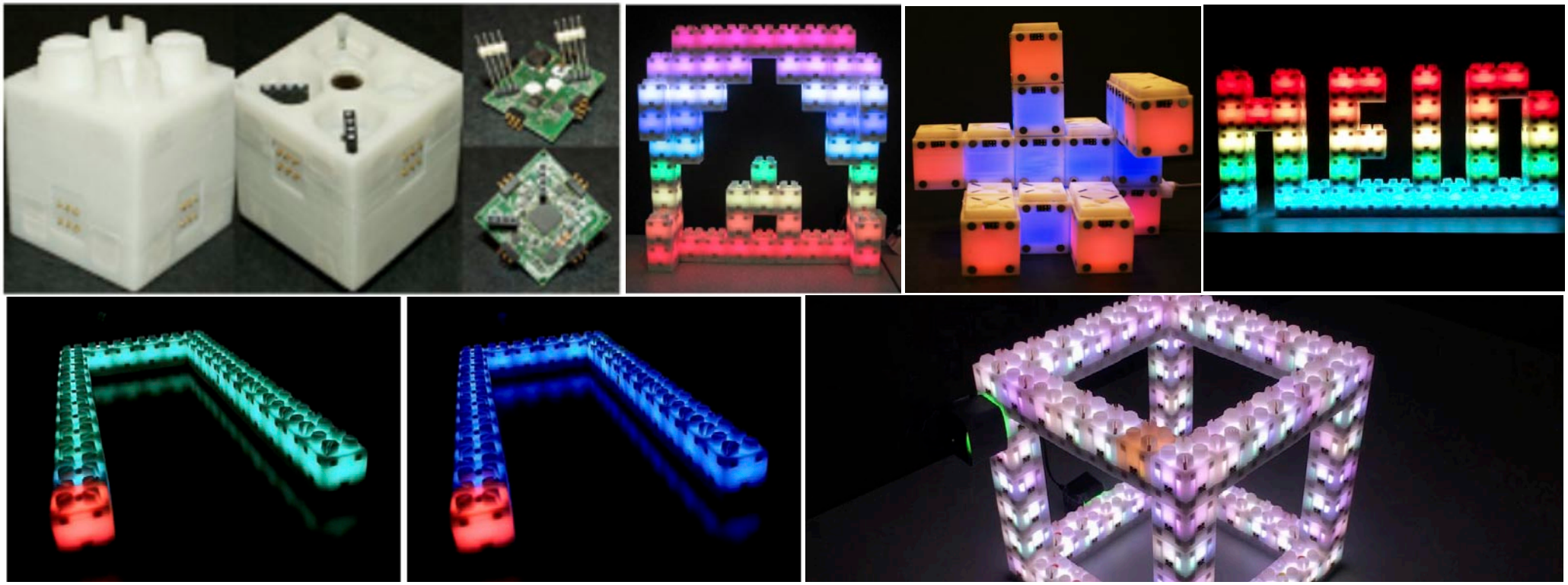
Example of claytronics

The “Blinky Blocks”

The artists Scenocosme: Grégory Lasserre & Anaïs met den Ancxt are currently developing several interactive sculptural projects with a specific «Programmable Matter» hardware: the “Blinky Blocks”. For doing this project they collaborating with the scientists Julien Bourgeois and Benoit Piranda of the research lab FEMTO-ST (Science & Technology).

This project have started during the Art & Science residency program: Vertigo S-T-ARTS (Science Technology and the ARTS). Initiated by IRCAM, this project aims to «promote the collaboration of artists with projects in the field of technology»
The “Blinky Blocks” are “claytronics” originally developed by the Carnegie Mellon University in Pittsburgh, Pennsylvania. In France, at Montbéliard, on the site Numerica, the research laboratory FEMTO-ST (Science -Technology) is working on the algorithmic part of the Blinky Blocks.

The current generation of “Blinky blocks” are cubic, 4cm-side. These electronic devices are capable of emitting coloured light and sound. They are equipped with a gyroscopic sensors and a microphone. They are perceiving the sound, the vibrations, the movements and they can interact with each other. It is possible to agglomerate them by magnetization and they are able to transmit computer data to their neighbours.
Other «Programmable Matter» hardware are being developed at the University of Tokyo with a spherical shape, a size of a few millimetres and with the ability to move by themselves. The difficulty is to create object capable of changing shape and being conscience of its shape in the physical space. This is necessary to inject programs and «Artificial Intelligence» into these tiny robots to give them the ability to shape complex objects and to interact with each other.
We are all made up of atoms aggregate together. The principle of «Programmable Matter» is similar: to develop primary bricks capable of communicating with each other in order to organize themselves.



Blinky Blocks (crédit FEMTO-ST & Carnegie-Mellon)

Artistic approach

Our artistic project is to use the Blinky blocks to create several sculptural and interactive luminous and sonorous artworks with organic behaviours. When we concept our artworks, the technology is hidden. We focus our approach on the sensory relations with the elements and the emotional relation with the people.
We explore the symbolic surface of the skin, it porosity and it various interactions with the environment. We want to do hybridizations between this “programmable matter” and other elements for extend the possibilities and the textures of this material : some kind of artificial and sensitive skins.

As media artists, we explore capacities of technologies in order to draw sensitive relationships through specific stagings where senses are augmented. Our works came from possible hybridizations between the living world and technology which meeting points incite us to invent sensitive and poetic sonorous and/or visual languages. We translate the exchanges between living beings and between the body and its environment. We suggest interrelations where invisible becomes perceptible. Materialized, our sensations are augmented. Through a poetic interpretation of invisible mechanisms, technologies allow us to draw sensory relationships, and to generate unpredictable living interactions. Then, most of our artworks stimulate relationships, exchanges, beyond a basic connection.

We design sensory, organic and symbolic interactions between the body and its environment. In our artistic way, we overturn the technology in order to find poetic gestures and substances, and to offer stagings where audience share sensory experiences. When we concept our artworks, the technology disappears in order to enhance sensory relations with various elements. The body is involved in artworks where senses are augmented.

The bricks of the work are also like voxels in a real physical space. They can be assembled like cells and have the ability to function in interdependence but they can communicate with each other. We want to approach the notion of rhizome and to develop specific cellular structures like interactive roots able to transmit informations,light and sound such as nutrients or stimuli. We also want to add transplant to the cellular robots and inject them different behaviours.

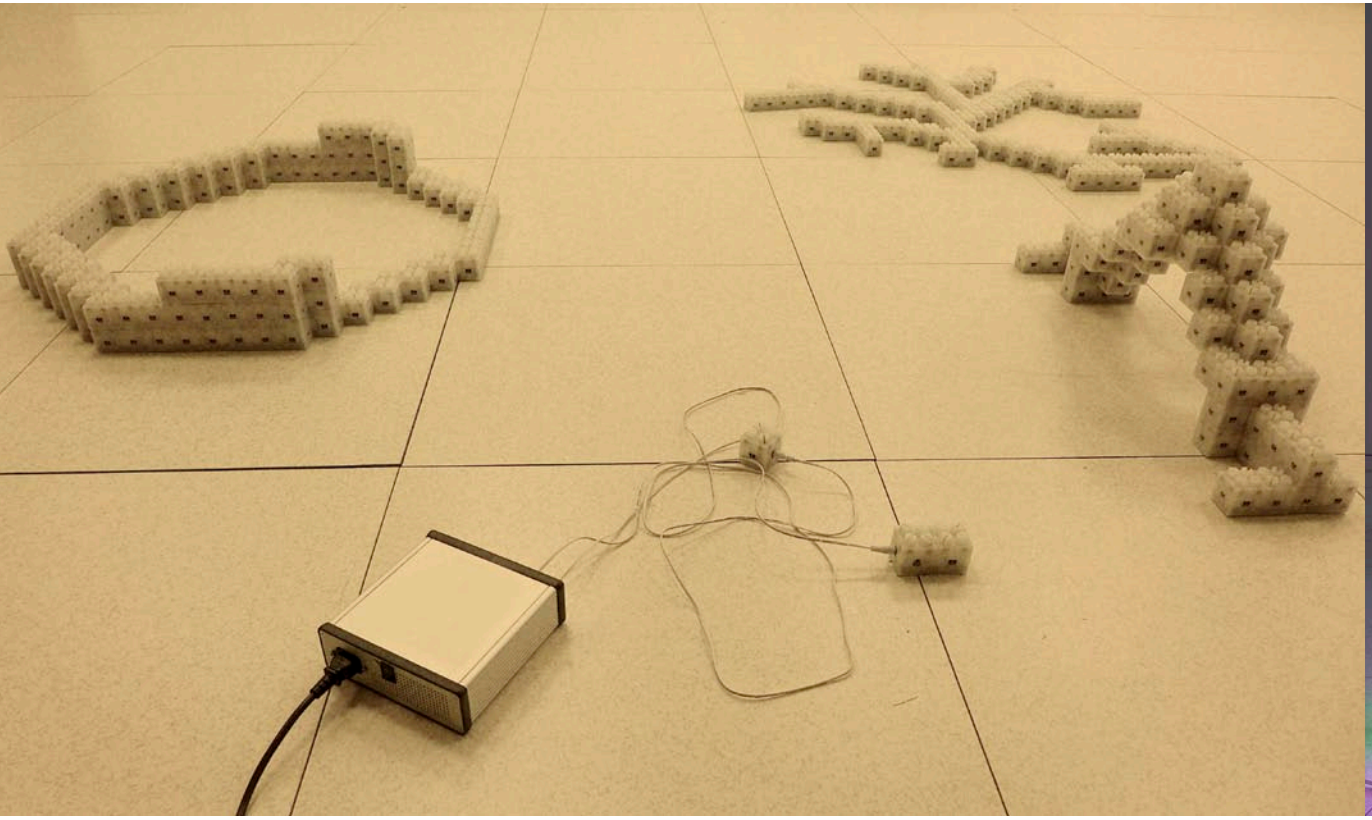
Most of our artworks are interactive with the body through the touch, and sometimes though the breath, in order to play with sensitive degrees of proximity and intimity. The concept of electronic clay crosses our artistic approach. With the Blinky blocks, we are interested to develop new interactive artworks which explore the quality of touch, breath and voice interaction and its various significances. Most of our artworks explore our relationships with natural elements by creating sonorous or visual languages and feedbacks in order to question spectators about their relationships with our contemporary environment.

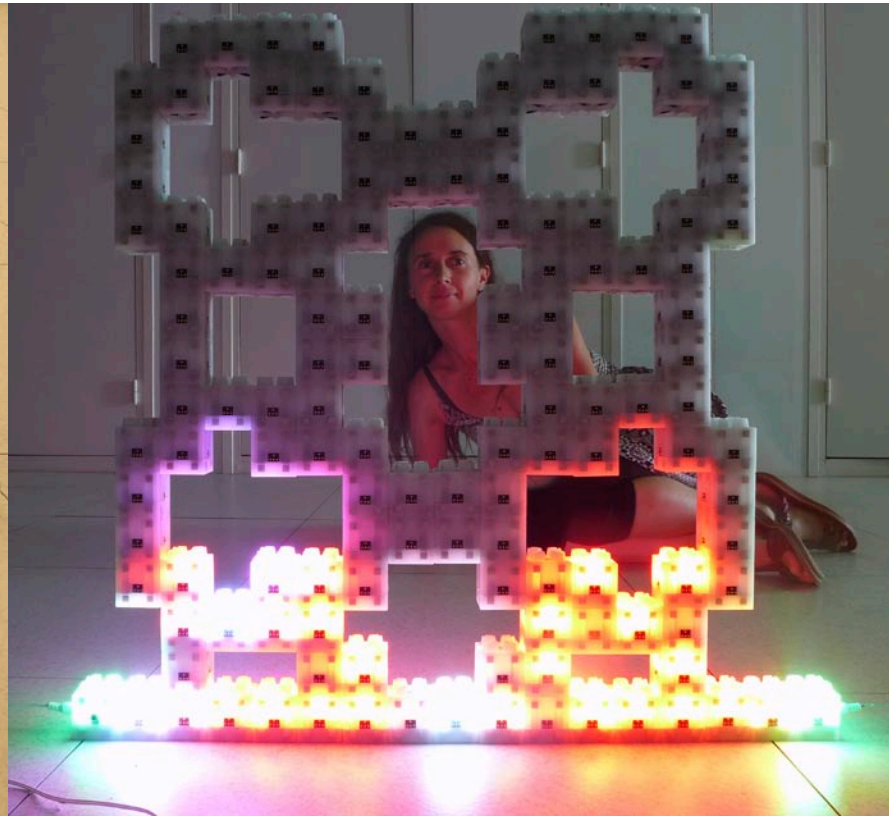
We are doing new interactive and sculptural artworks with programmable matter in order to design new ways of interaction with the public.
Each robotic cell of the sculpture is able to hear the voice and breath of the spectators and also to feel their contact.

At first, we are exploring different scenarios of luminous and sonorous feedback in relation with the quality of the interaction. We are creating a sensitive sculpture able to react to some sounds. The “Blinky Blocks” microphone would be used to feel spectators’ voices, sounds and breaths.
We invite people to whisper in front of the work in order to wake it up and generate lighting relations with the installation. The light evolves according to the location and intensity of the breath or voice’s sound.

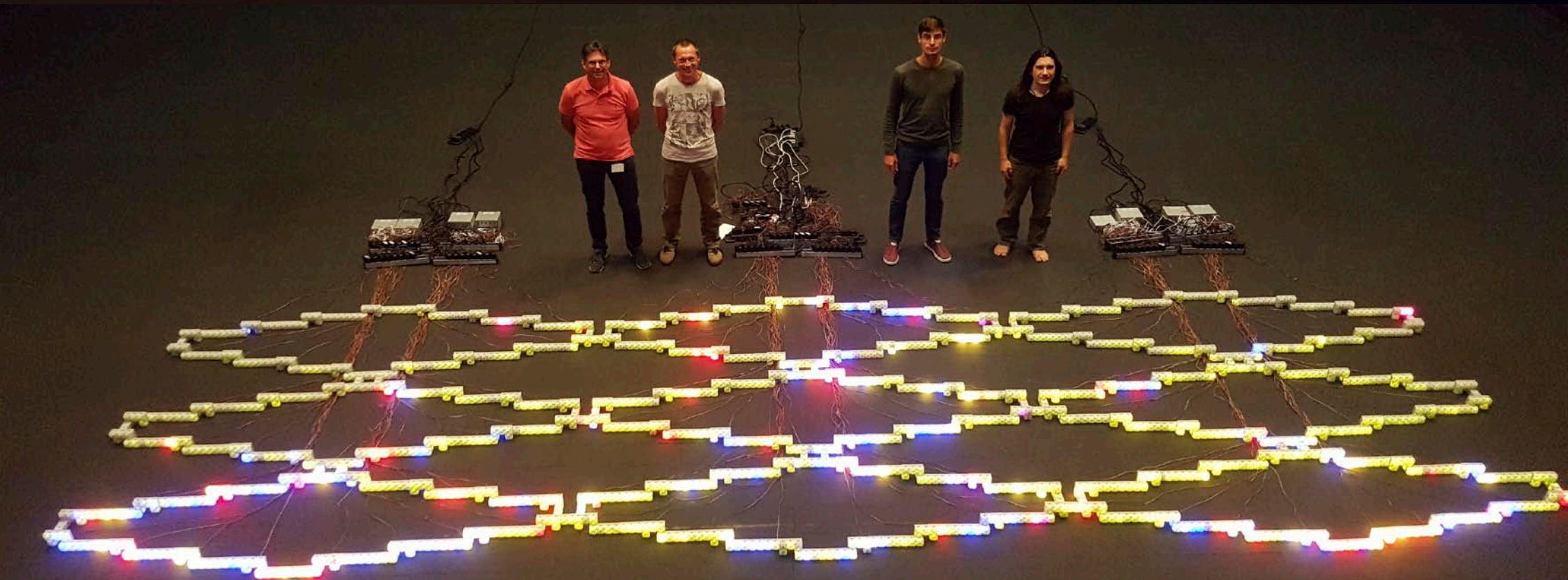
In the future, we would like to continue to work with smaller claytronic atoms, able to move. We want to create artworks with robotic artificial intelligence, able to grow and move in space and able to change its shape itself at any moment according to several kinds of feedbacks and triggers.

“Blinky Blocks” can be assembled as easily as LEGO. With these elements the artists Scenocosme build interactive sculptures in which each brick has its own software and behaviour. The whole object is able to produce environments with simulated artificial behaviours.

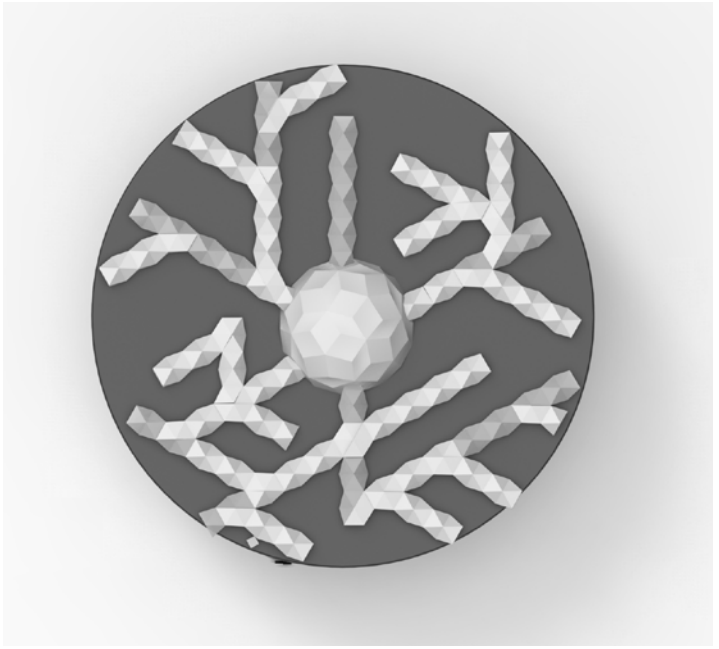


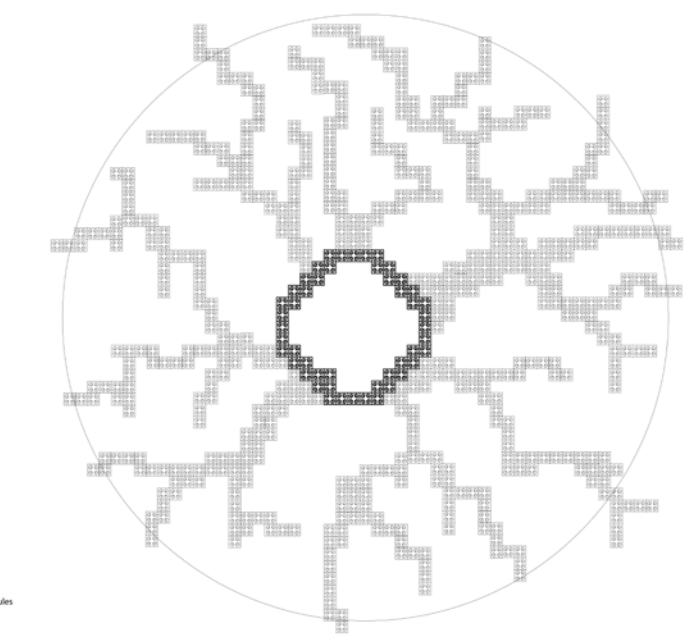


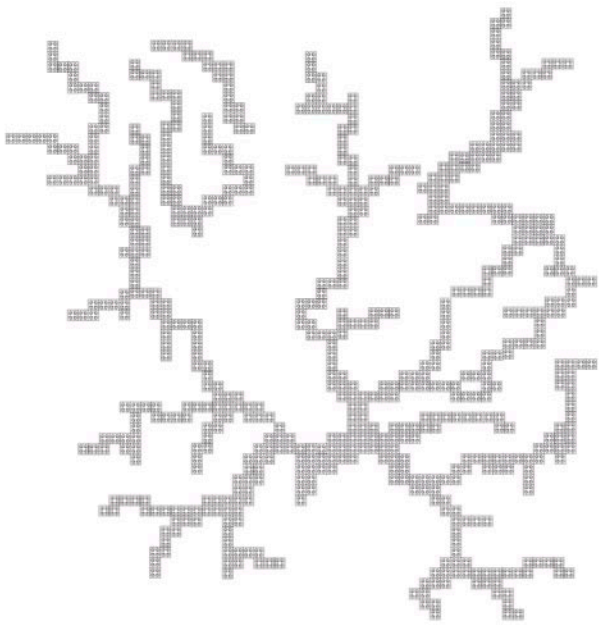
Award : Guiness world record 2022 : Largest autonomous light block robotics structure

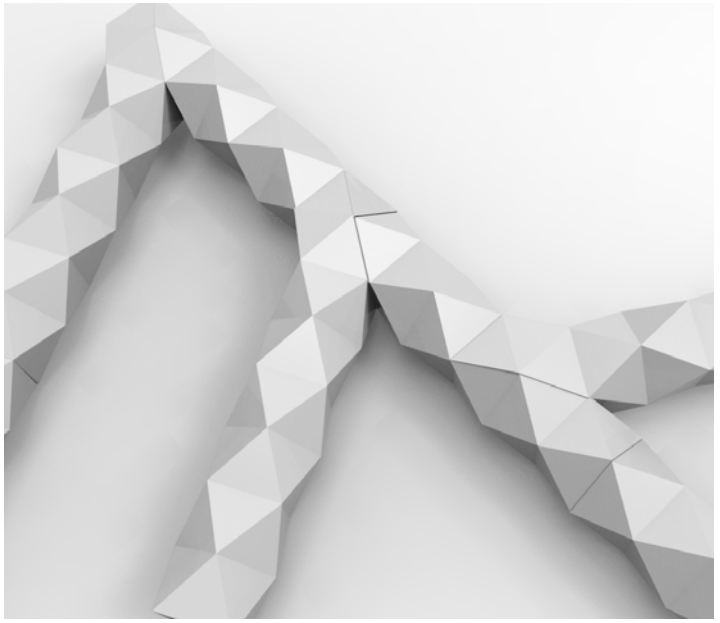


First research on the developments of Rhizomes in an exhibition space

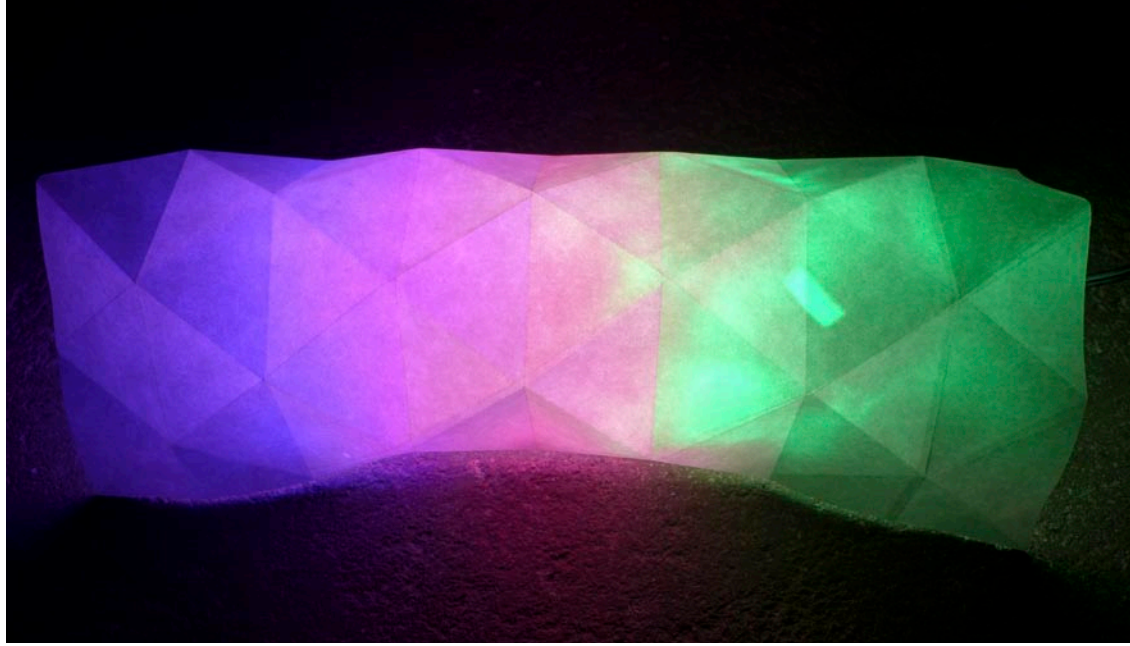




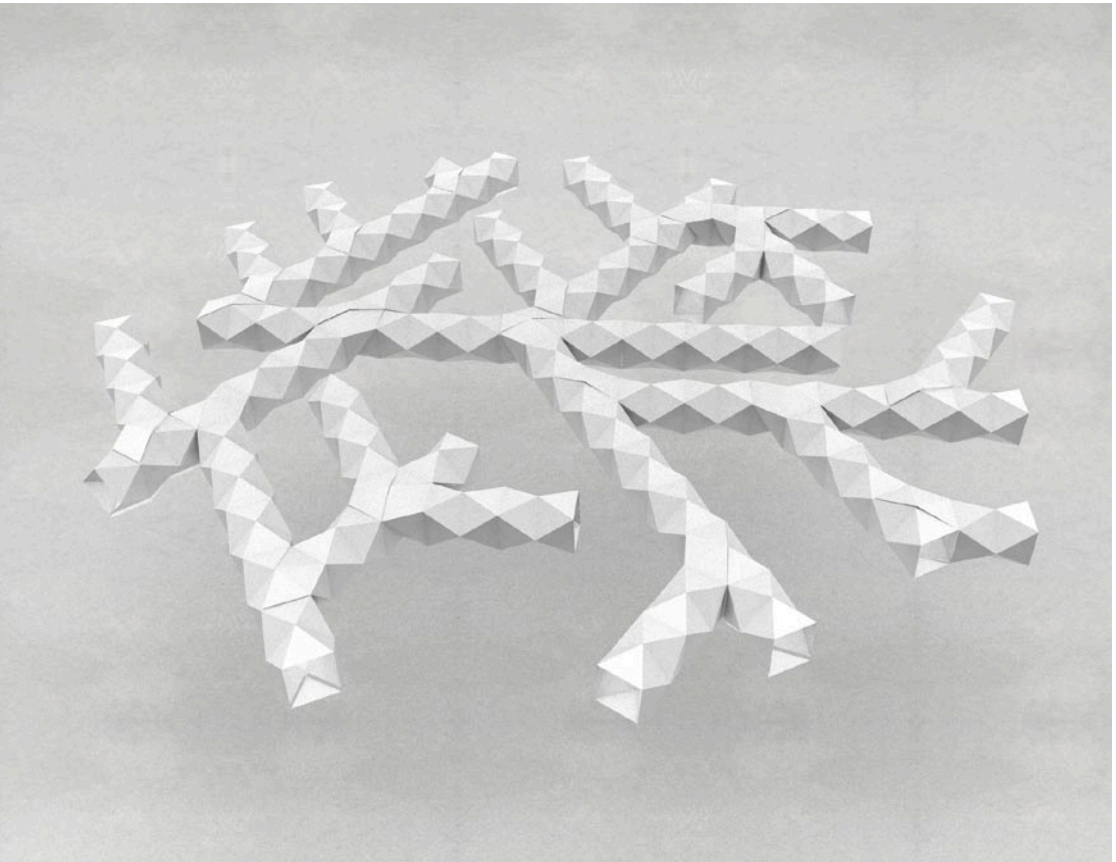




Reactive matter : Rhizome 001

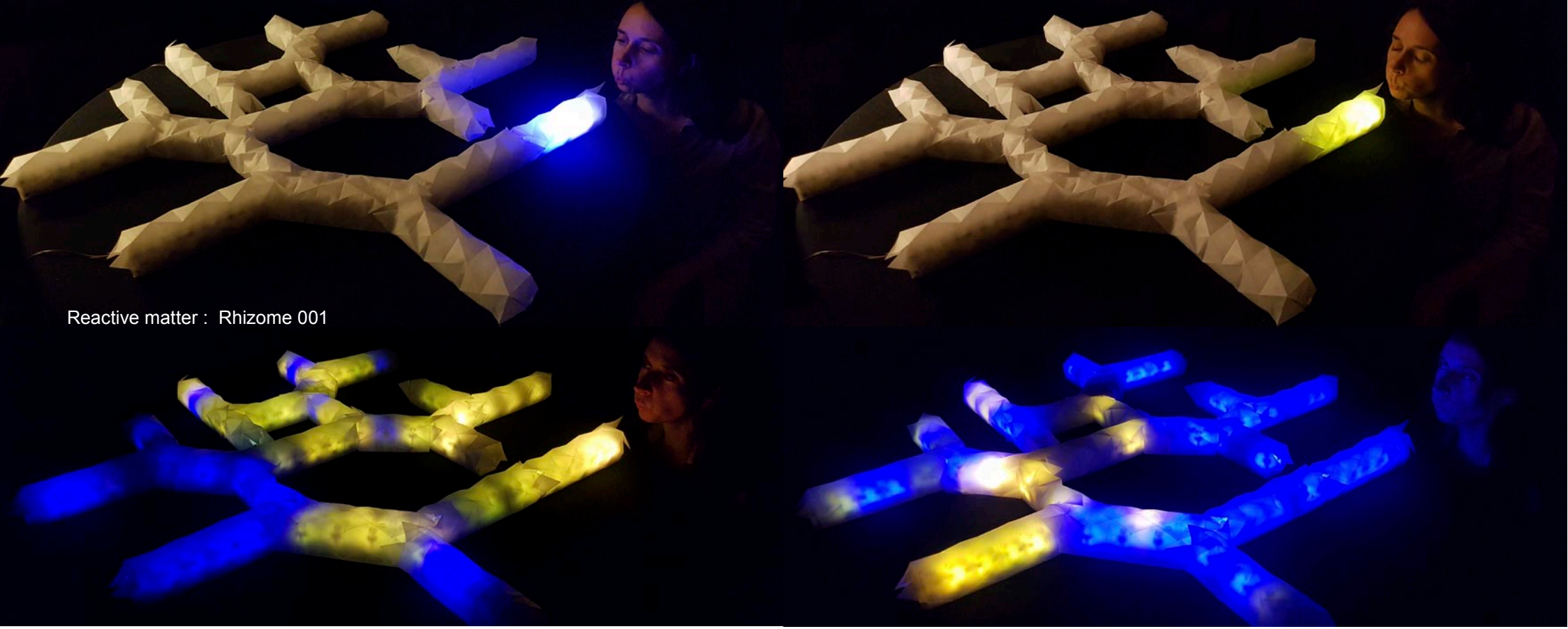


Interactive Rhizomes are able to transmit impulses on membranes and react to sounds



Reactive matter : Rhizome 001

Reactive matter : Rhizome 001
Biennale Experimenta / Arts Sciences - Grenoble (Fr)



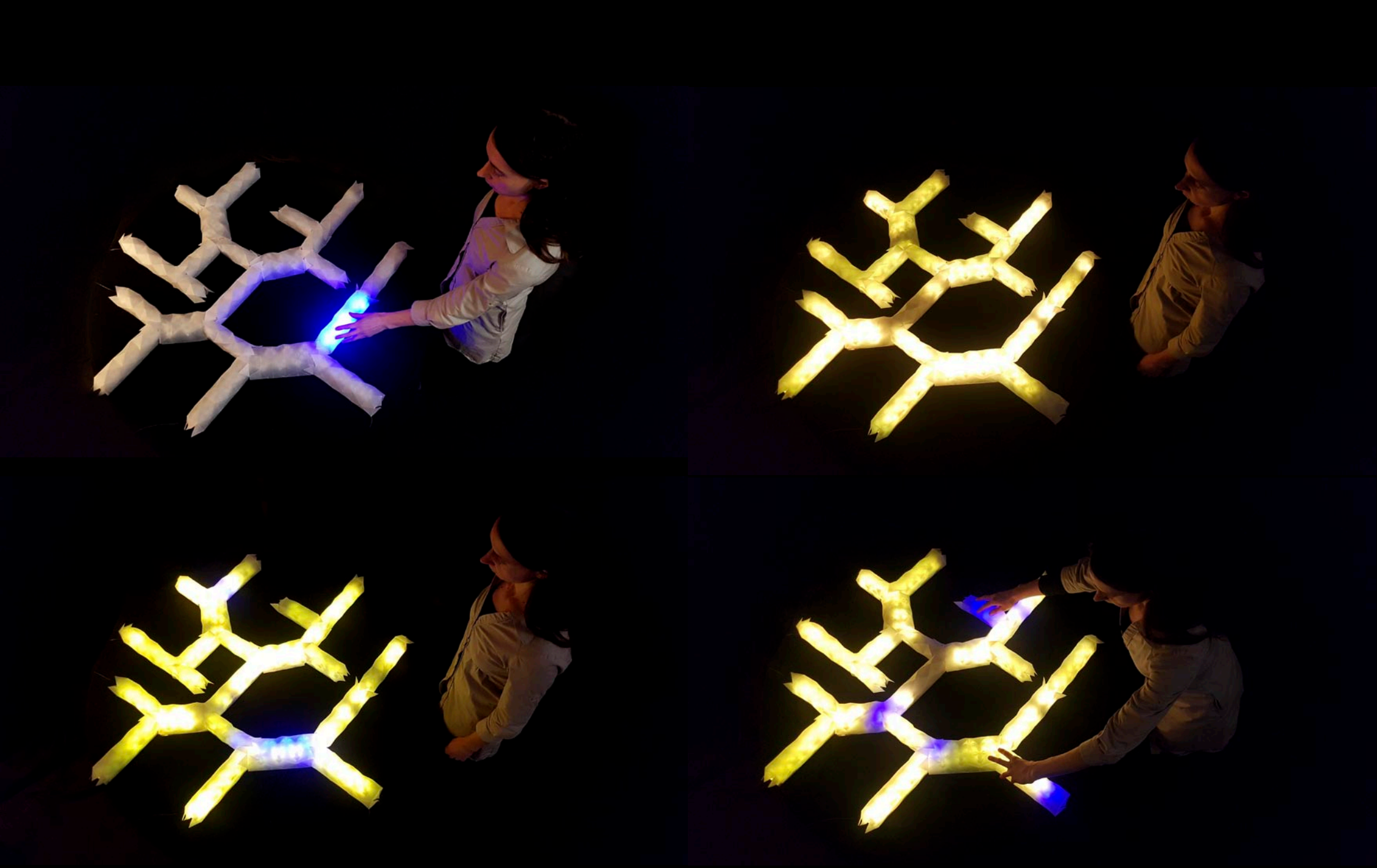
Reactive matter : Rhizome 001

Approach and emit different vocalizations **Blow on the membrane of the artwork or caress it gently**

«Rhizome 001» is a sculptural and interactive artwork that reacts like a living organism.
Like a root, this sculpture deploys in the area, perceives and feels its environment. This hybrid electronic ecosystem is composed of more than 120 independent cellular robotic structures that are linked together.
Each group of cells is grafted with a transparent membrane that allows it to feel the caresses and breath of the spectators. Each robotic structure also perceives sounds and reacts with different feedbacks. The variations change depending on the intonations of the voices and the duration of the vocalizations. Each of the 120 electronic cells is retroactive. They emit different sounds, rhythms and light intensities in response to the audience stimuli.

The artwork surface is made of 120 micro-controllers, 120 independent micro-speakers, 120 light sources, etc.
Sensitive, robotic bases also influence each other, between neighbouring cells, like cooperative living organisms. «Rhizome» is inspired by the communication and spatial arrangement of plants, corals, termites, fireflies, micro-organisms etc.

More information and video : Reactive matter : Rhizome 001 www.scenocosme.com/reactive_matter_e.htm



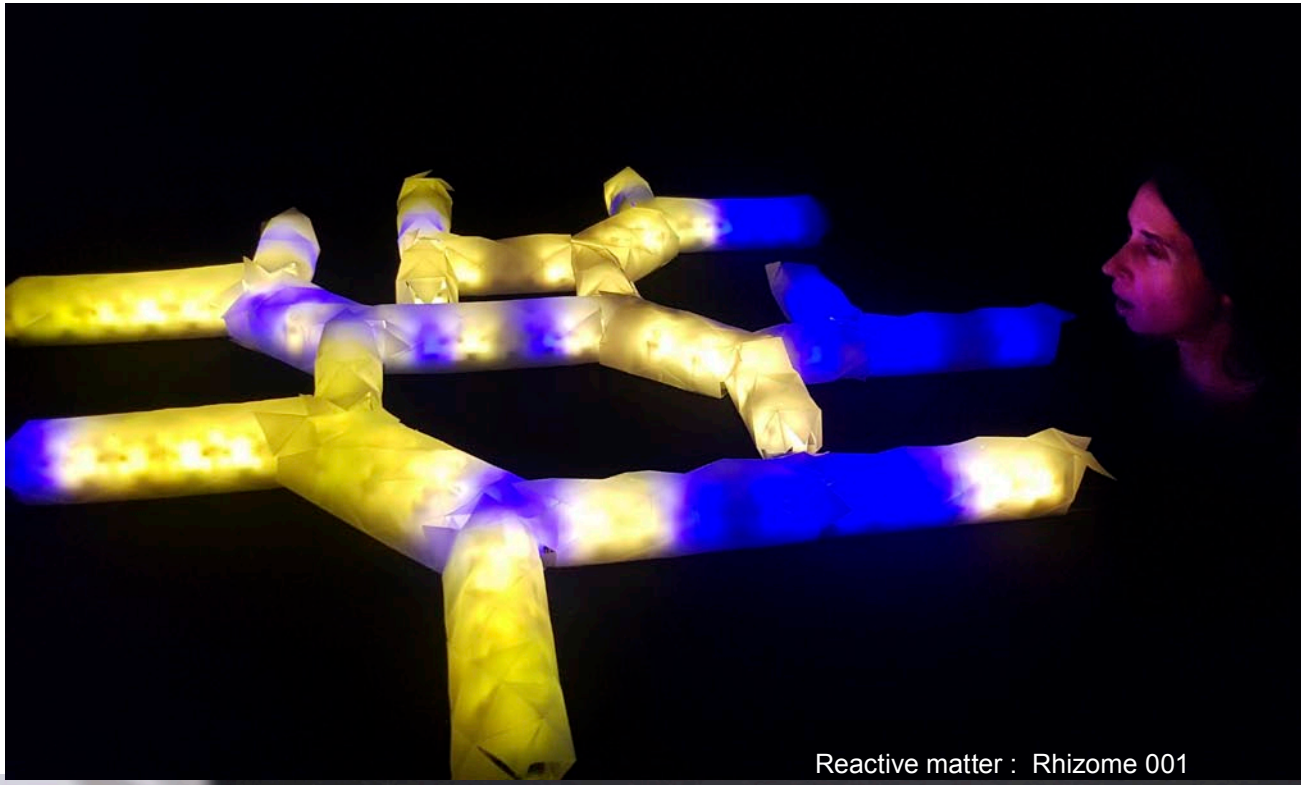
Reactive matter : Rhizome 001
Le Centquatre - Paris (Fr) / STARTS Residencies / «Art X Technology X Innovation»

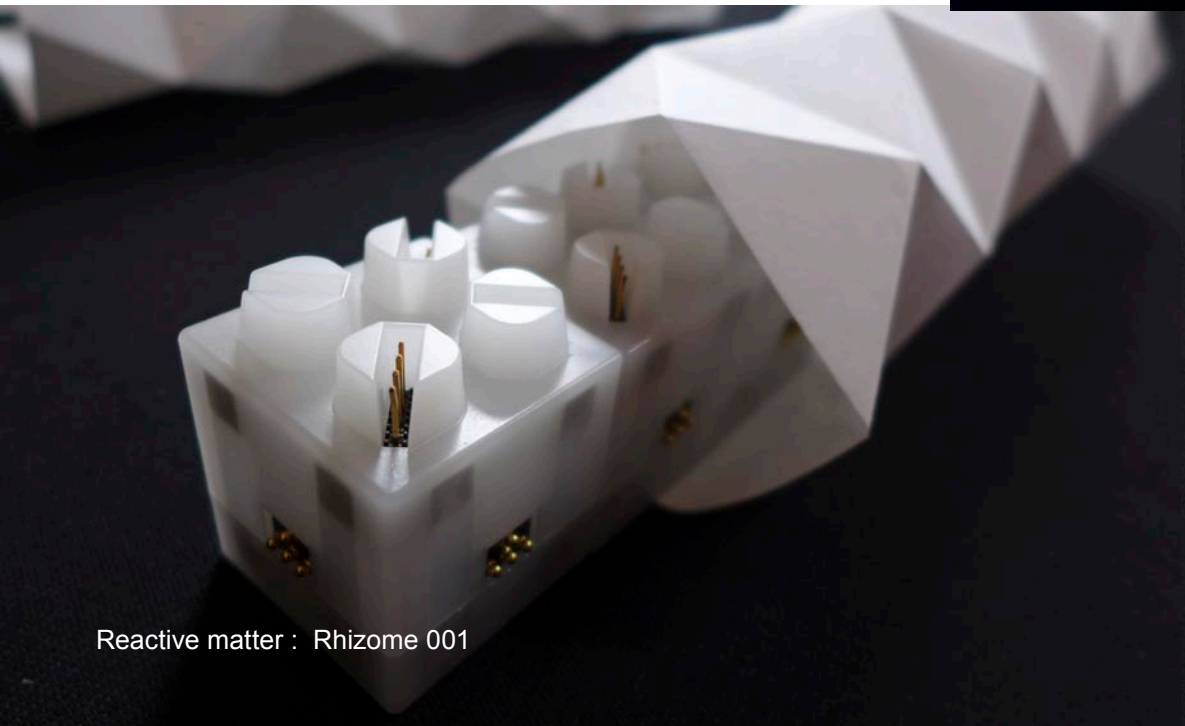
Previous exhibitions of
Reactive matter : Rhizome 001
(Creation february 2020)

- Le Centquatre / établissement artistique - Paris (Fr)
  STARTS Residencies / «Art X Technology X Innovation»
- Biennale Experimenta / Arts Sciences - Grenoble (Fr)

Previous talk about
Reactive matter : Rhizome 001

- Biennale Arts Sciences - Besançon (Fr)
- Festival Scopitone - Nantes (Fr)
  Starts :Innovation at the nexus of science, technology and the arts
- Centre Pompidou - Paris (Fr)
  Festival Manifeste / IRCAM / Curated by IRCAM and VERTIGO
  Starts Residencies / Science Technology and the ARTS


Reactive matter : Rhizome 001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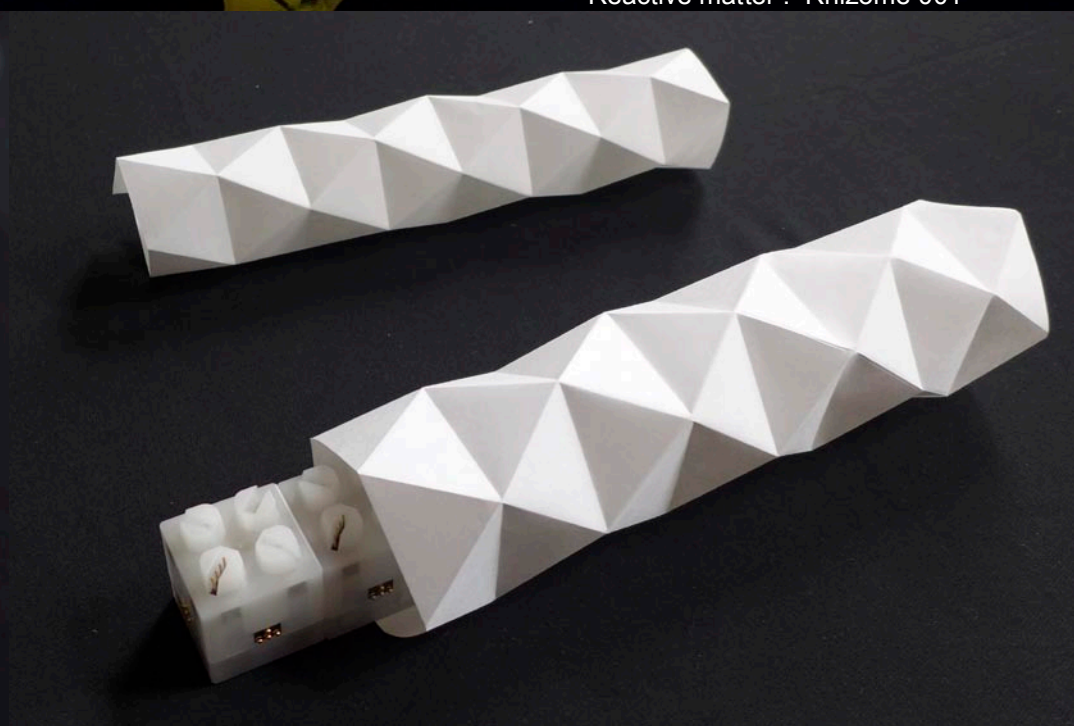
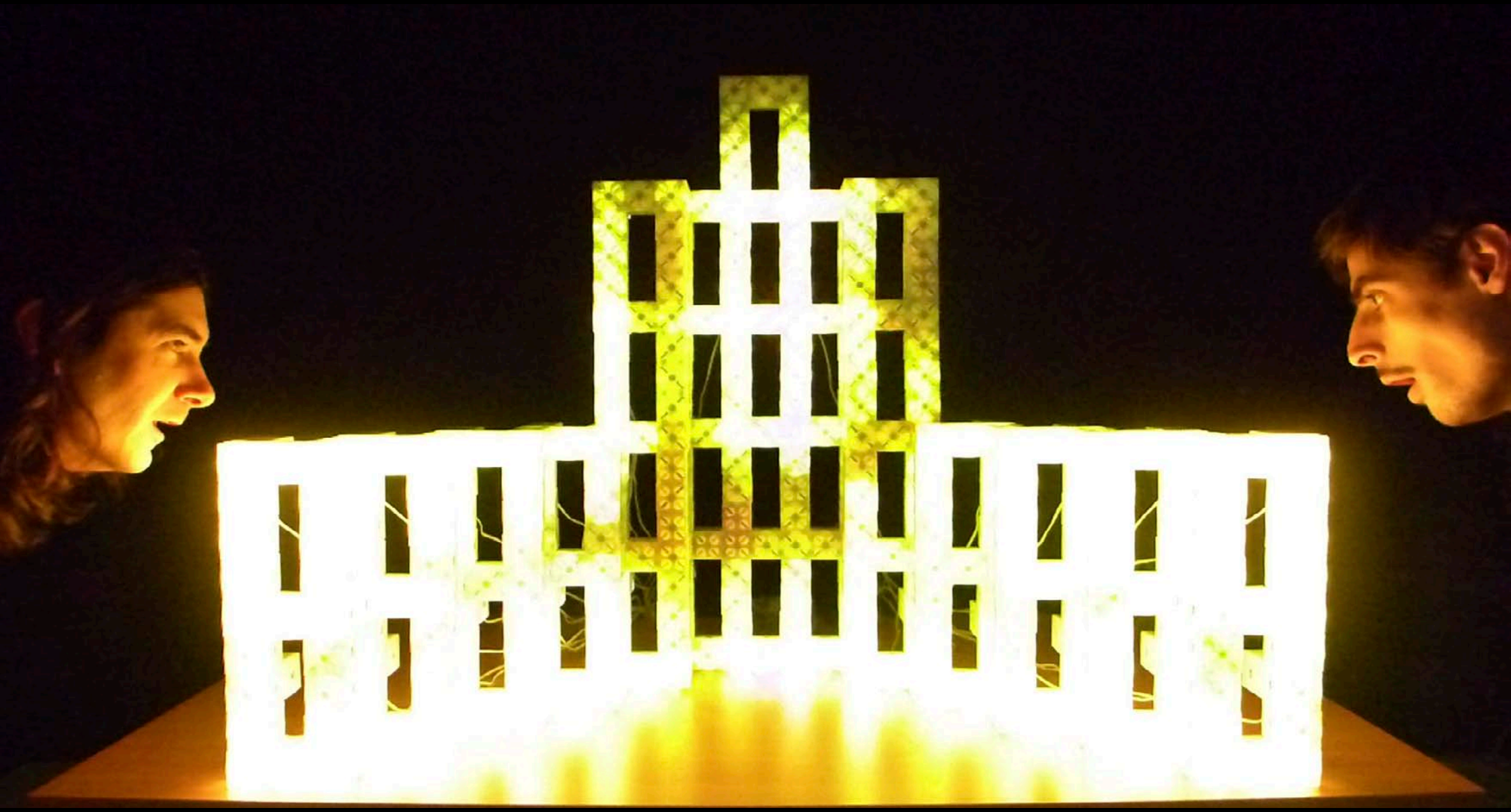
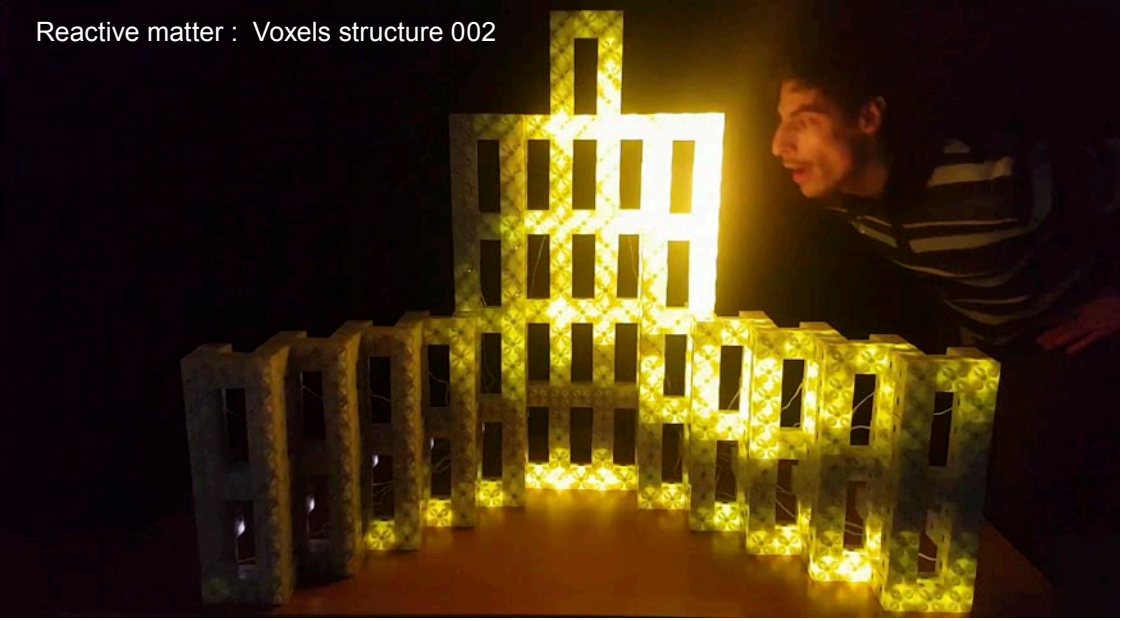
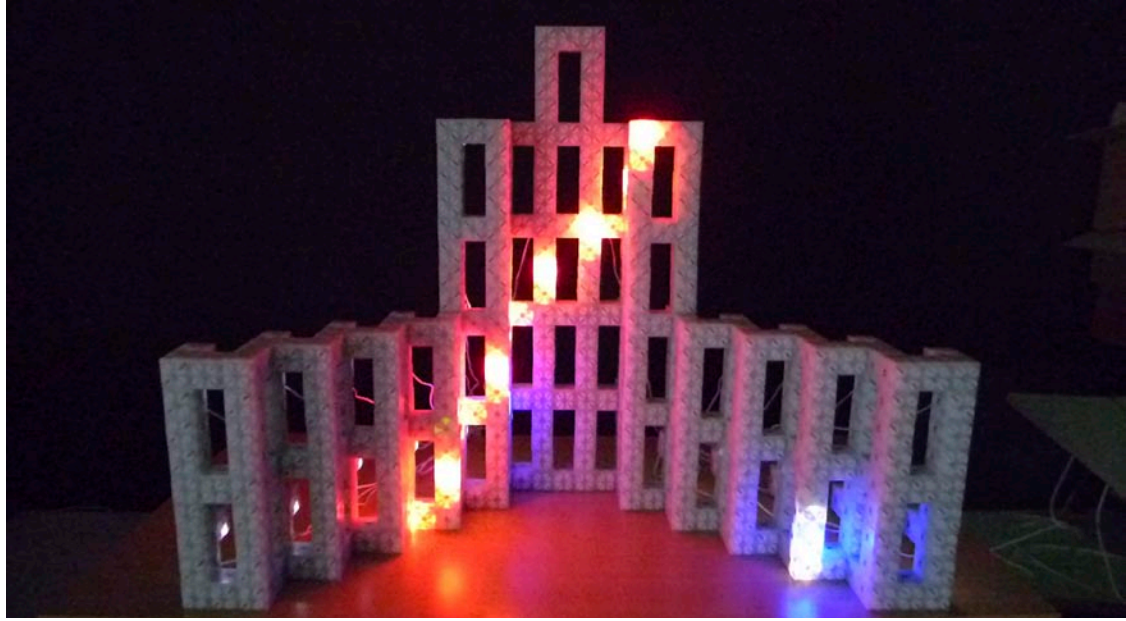


Reactive matter : Voxels structure 002







Reactive matter : Voxels structure 002

Approach and emit different vocalizations **Touch the artwork**

«**Voxels structure**» is a sculptural and interactive work composed of 450 independent cellular robotic structures that are linked together.
The bricks of the structure are like voxels with artificial intelligence in a real physical space.

The sculpture reacts like a living organism.

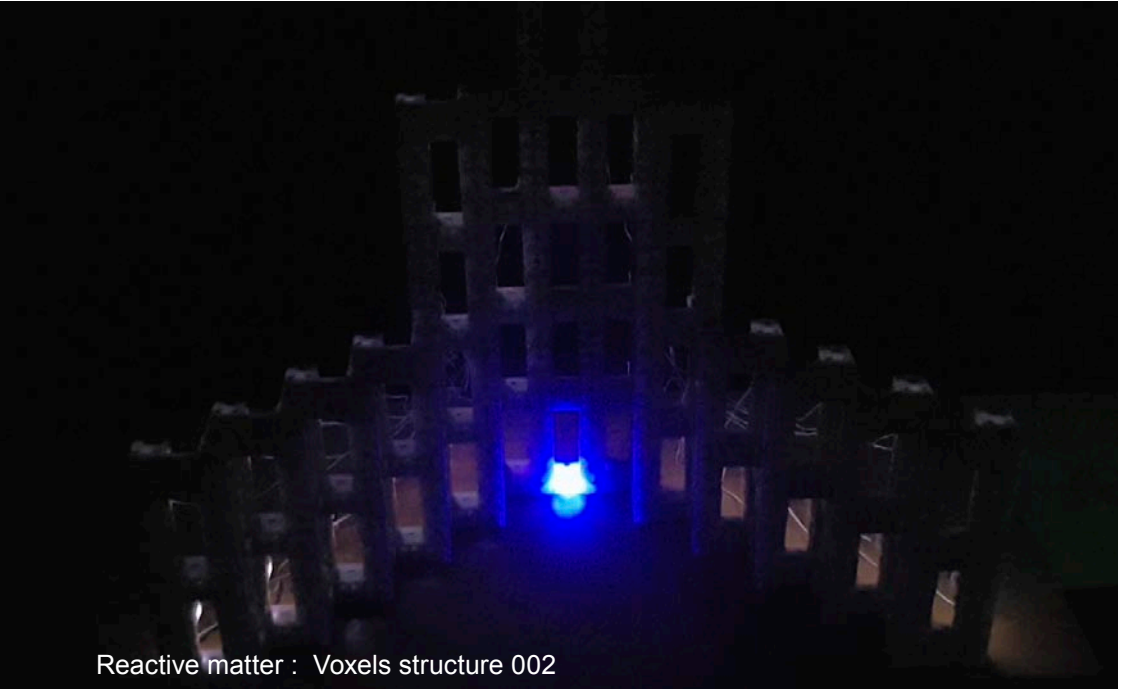
Each electronic cell perceives sounds and reacts according to the intonations of the voices and the duration of the vocalizations.
Each of the 450 electronic cells is retroactive. The artwork surface is made of 120 micro-controllers, 120 independent micro-speakers, 120 light sources, 450 x 6 - 2700 serialconnectors .. Etc..

They emit different sound behavioural scenarios, rhythms and bright colors in response to stimuli from audiences and neighbouring cells.
A sound stimulus influences the robotic bases between them, between neighbouring cells, like cooperative living organisms.

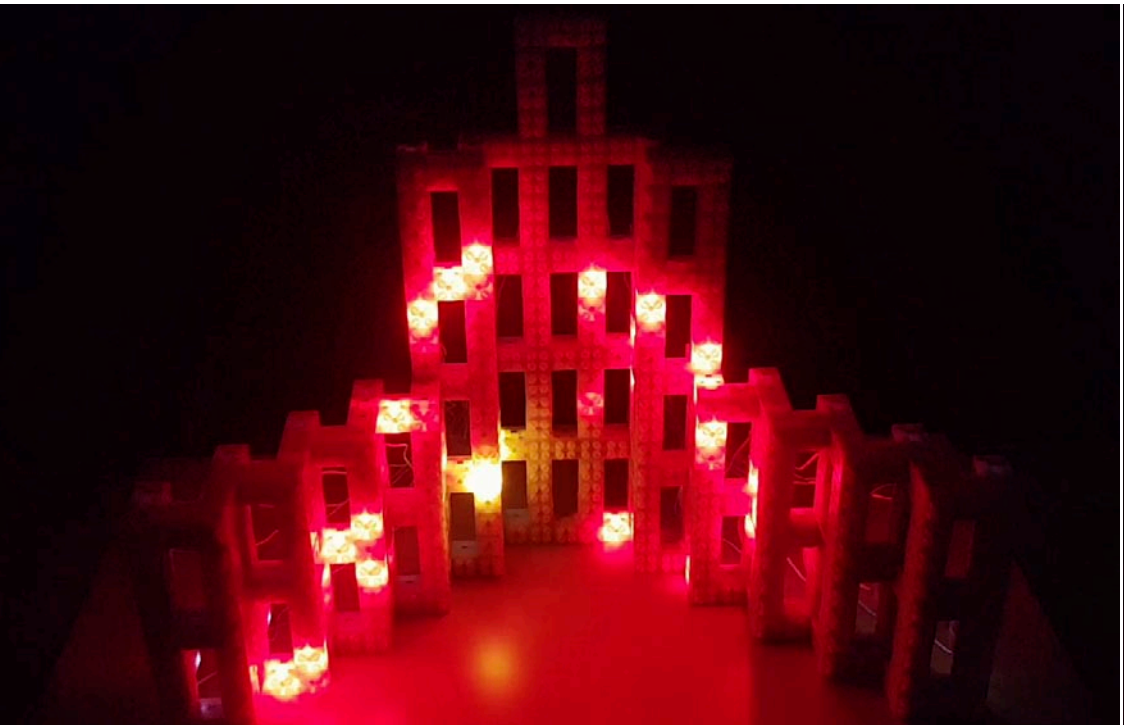
The communications become visible with the chase effect light and sonorous shifting inside the structure.

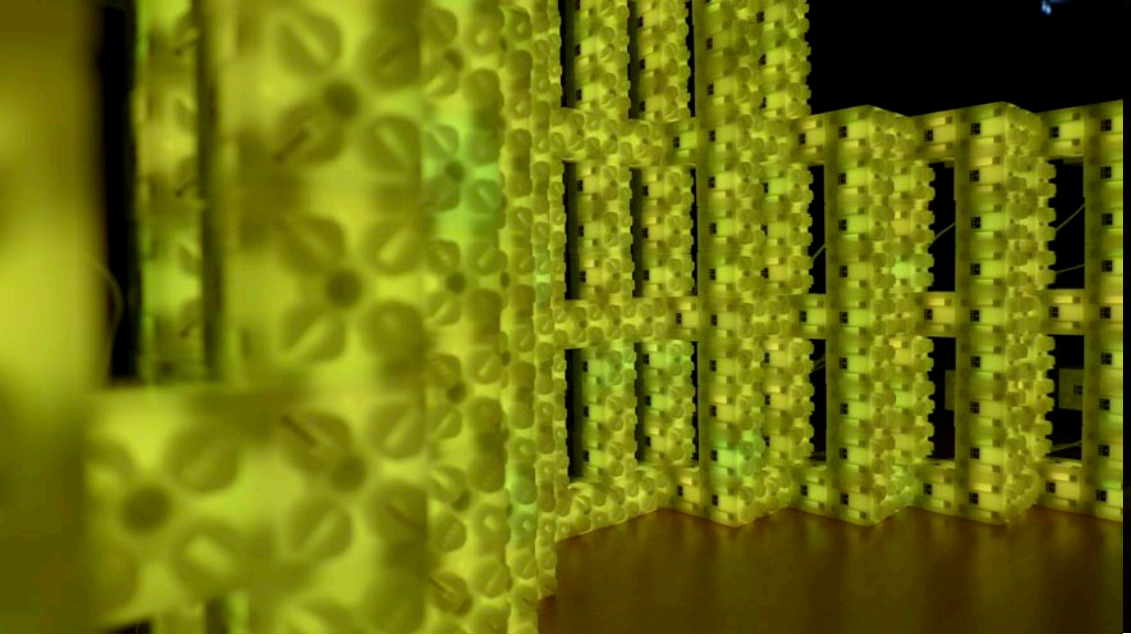
The information is spreading while causing other sounds and colors to appear with certain conditions.
When two informations of the same color energy cross into the same cell, they annihilate themselves.
The self-generation phenomena generated here is inspired by the cellular automatons and algorithmic principles of the «Game of Life» imagined by the mathematician John Horton Conway.

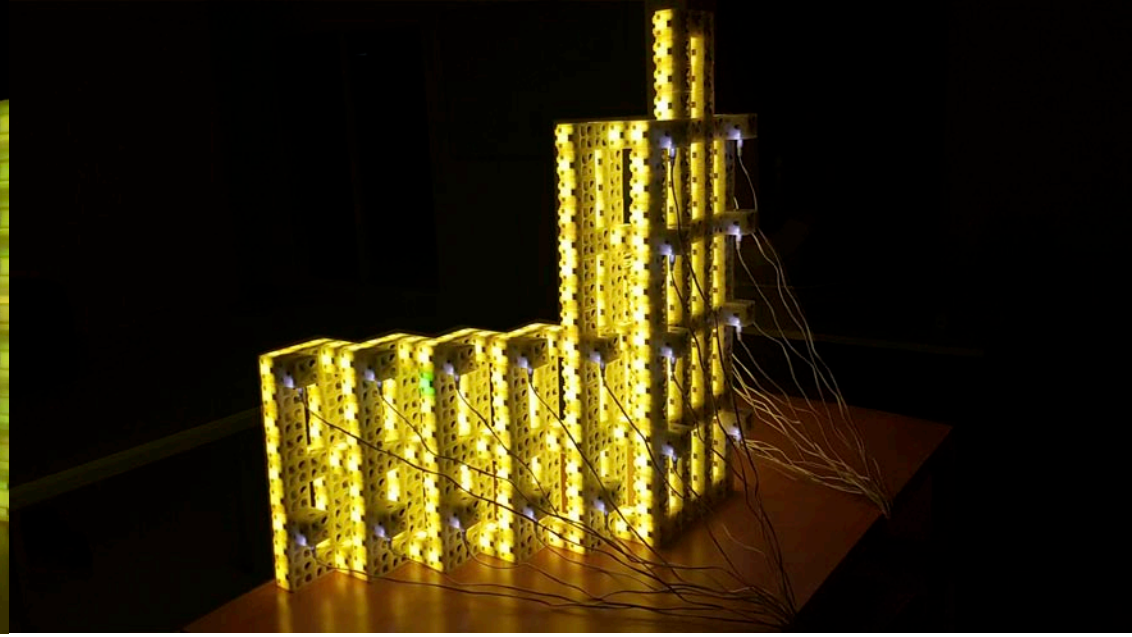
More information and video : Reactive matter : Voxels structure 002 www.scenocosme.com/reactive_matter_voxels_002_e.htm

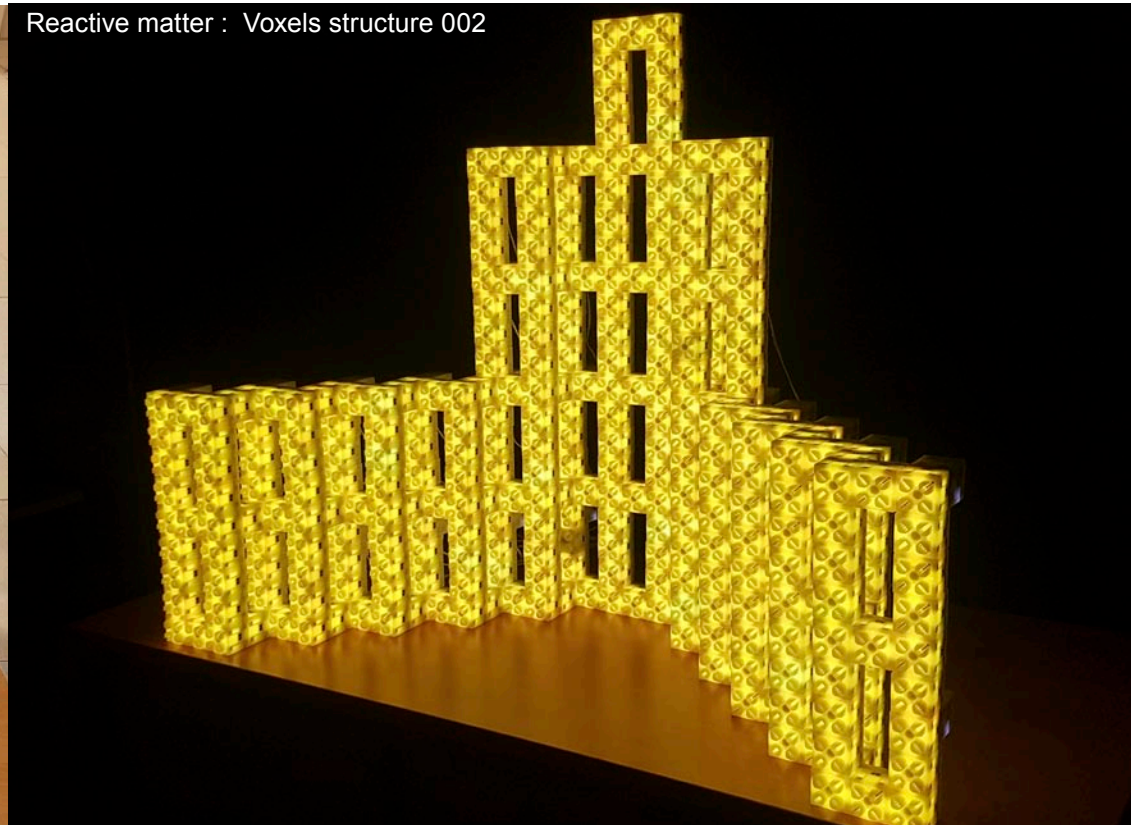


Spread of the datas (sound and lights) inside the structure









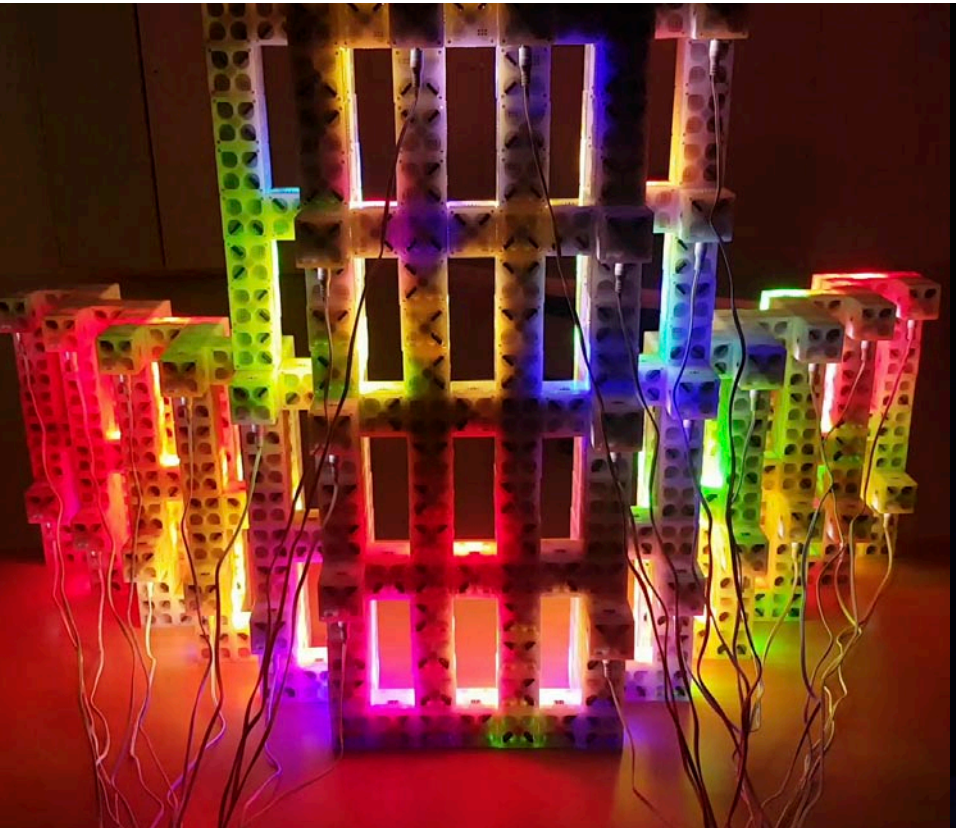
Reactive matter : Voxels structure 002

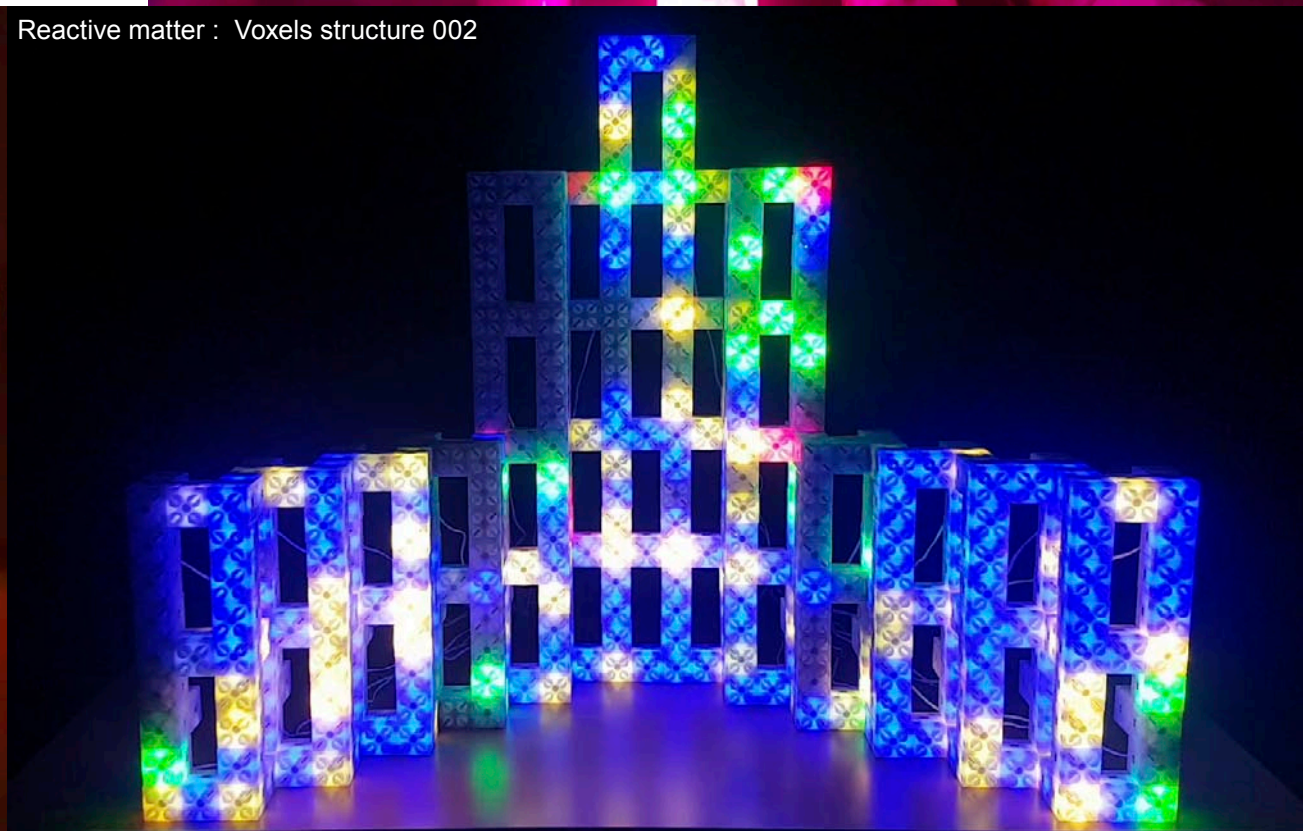
Previous exhibitions of
Reactive matter : Voxels structure 002
(Creation january 2021)

- Numerica | Pôle Numérique de Bourgogne Franche Comté - Montbéliard (Fr)
  MA scène nationale - Pays de Montbéliard
- Biennale Arts Sciences - Besançon (Fr)
- Château de Sainte Colombe en Auxois / Arcade Design à la campagne (Fr)
- Pléiades - Festival des arts numériques - Saint-Etienne (Fr)
- DARS 2022 - International Symposium - Montbeliard (Fr)
- Atheneum - centre culturel de l'Université de Bourgogne - Dijon (Fr)

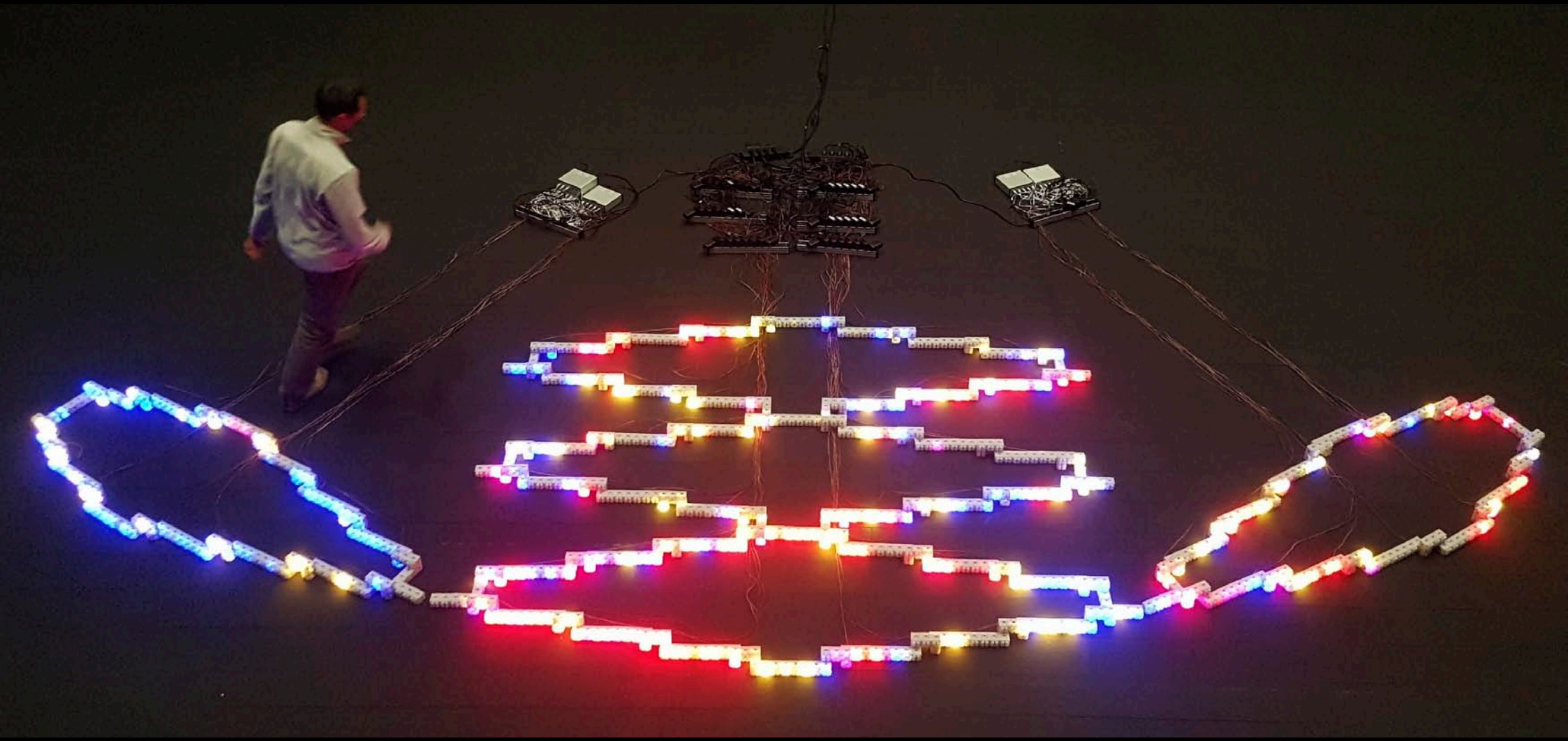
Previous talk about
Reactive matter : Voxels structure 002

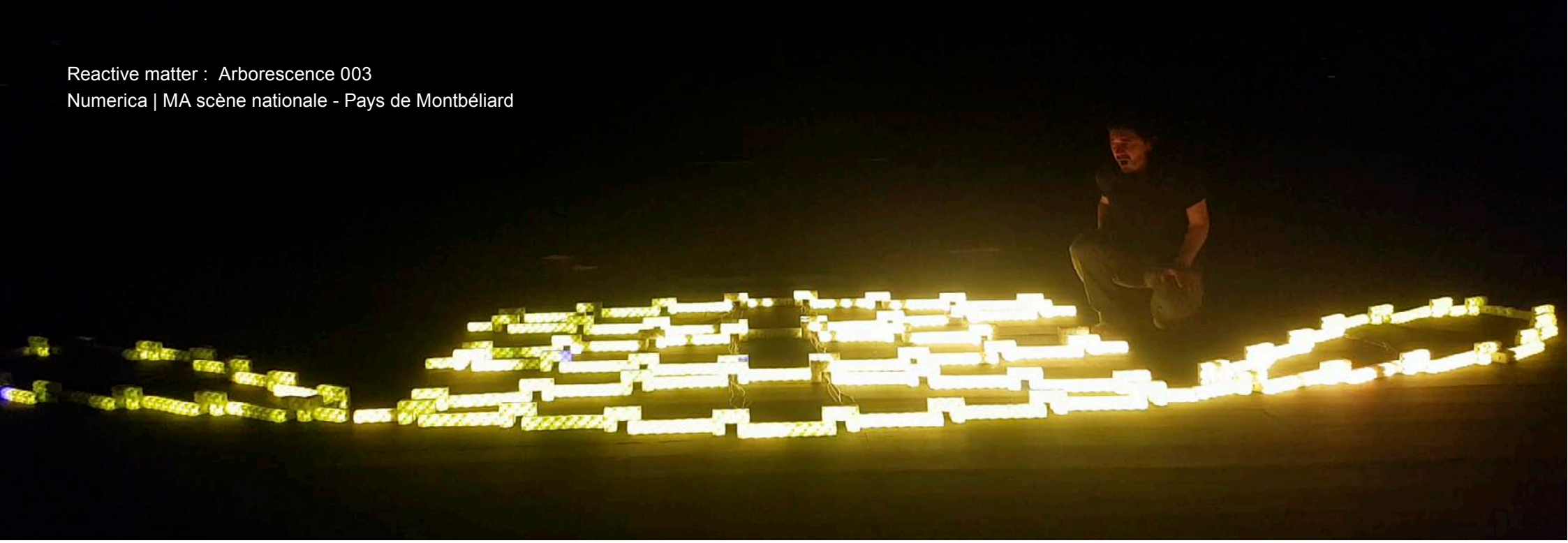
- Biennale Arts Sciences - Besançon (Fr)





Reactive matter : Arborescence 003





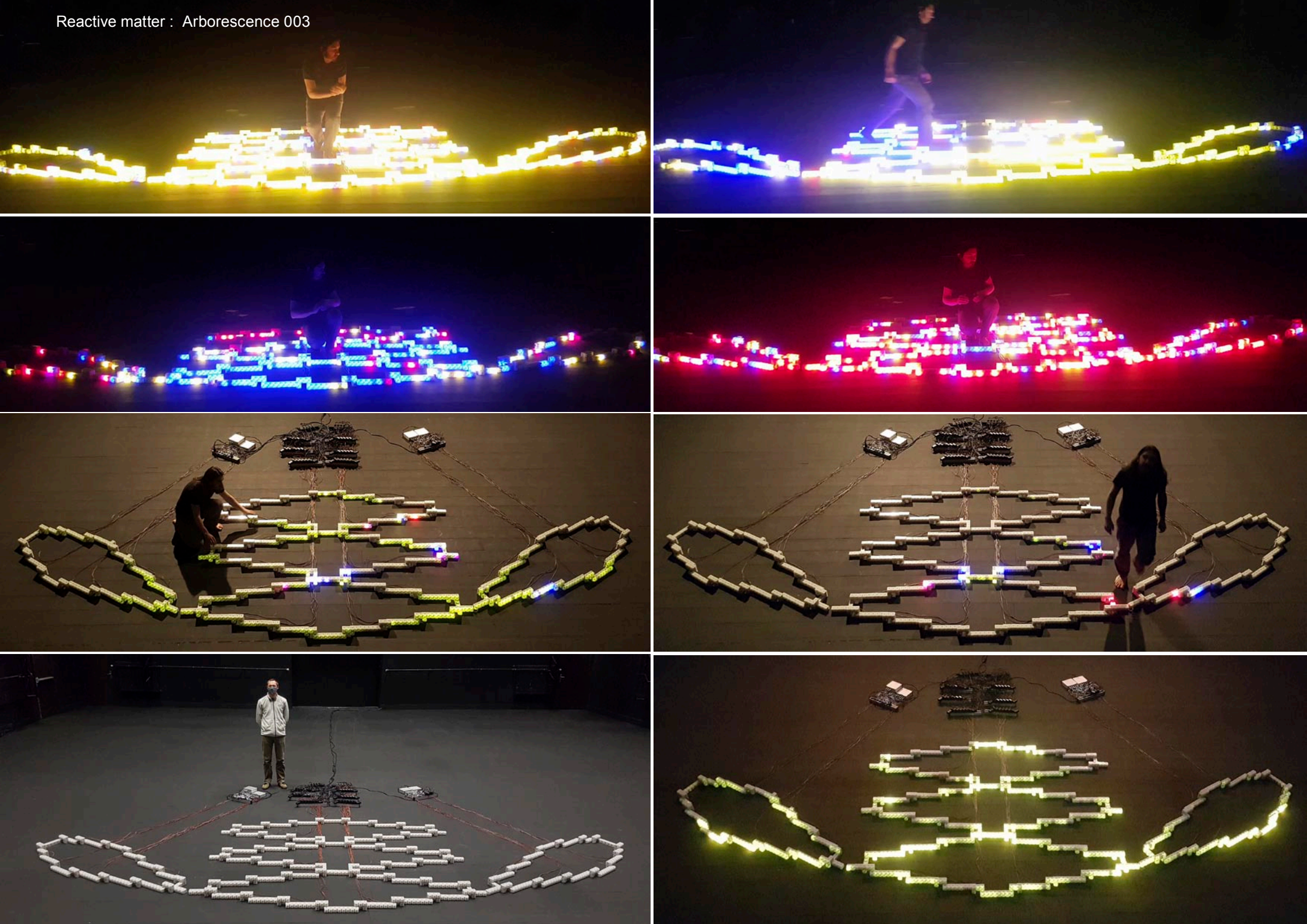
Reactive matter : Arborescence 003

«Arborescence 003» is a sculptural and interactive work composed of 1000 independent cellular robotic structures that are linked together. The bricks of the structure are like voxels with artificial intelligence in a real physical space.
The sculpture reacts like a living organism.
Each electronic cell perceives sounds and reacts according to the intonations of the voices and the duration of the vocalizations. Each of the 1000 electronic cells is retroactive. The artwork surface is made of 1000 micro-controllers, 1000 independent micro-speakers, 1000 light sources, 1000 x 6 - 6000 serialconnectors .. Etc..
They emit different sound behavioural scenarios, rhythms and bright colors in response to stimuli from audiences and neighbouring cells.
A sound stimulus influences the robotic bases between them, between neighbouring cells, like cooperative living organisms.

The communications become visible with the chase effect light and sonorous shifting inside the structure.

This artwork was realised during a period of residency at Numerica / MA scène nationale - Pays de Montbéliard
Support and co-production : MA scène nationale - Pays de Montbéliard

More information and video : Reactive matter : Arborescence 003 www.scenocosme.com/reactive_matter_arborescence_003_e.htm

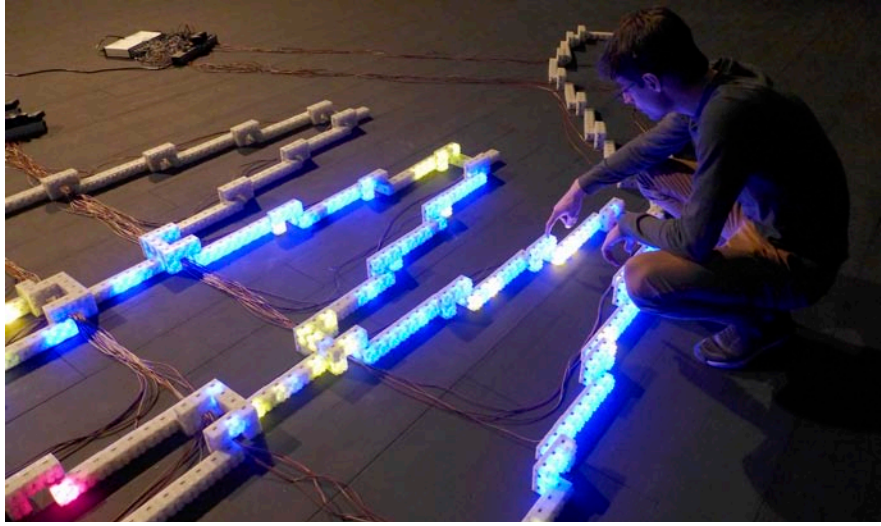

Reactive matter : Arborescence 003

Previous exhibitions of Reactive matter : Arborescence 003
(Creation avril 2021)

- Numerica |
  Pôle Numérique de Bourgogne Franche Comté - Montbéliard (Fr)
  MA scène nationale - Pays de Montbéliard

Previous talk about Reactive matter : Arborescence 003

- Biennale Arts Sciences - Besançon (Fr)



Reactive matter : Arborescence 003
Numerica | MA scène nationale - Pays de Montbéliard

Scenocosme : Grégory Lasserre & Anaïs met den Ancxt : www.scenocosme.com

Artistic process: hybridizations between nature and digital technology

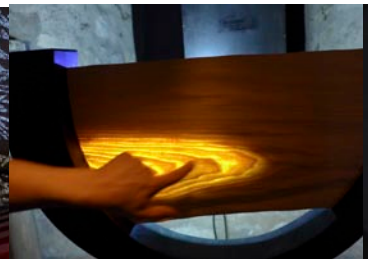
As media artists, Scenocosme: Grégory Lasserre & Anaïs met den Ancxt, explore capacities of technologies in order to draw sensitive relationships through specific stagings where senses are augmented. Their works came from possible hybridizations between the living world and technology which meeting points incite them to invent sensitive and poetic languages.

They suggest to sound out, to feel elements of reality which are invisible or to whom we are insensitive. They use the idea of the cloud as a metaphor of the invisible. Because it has an unpredictable form, it is in indeterminate metamorphosis, and his process escapes to our perception. Various natural and artificial clouds surround us (climatic, biological, energetic or electromagnetic). Through their artworks, they evoke invisible energetic clouds (electrostatic) which follow living beings like unpredictable shadows.

Sometimes, these clouds cross together and exchange some information. In a poetic way, they interpret these invisible links through sonorous and visual stagings. Then, when they imagine the energetic clouds of living beings, the limits of the body become permeable, and with their technology, in a way they design extraordinary relationships, between humans, and between humans and environment too. Interactions they offer in their works make invisible exchanges sensitive. Rather than revealing clearly their complexity, they open everyone’s imagination. Between the reality and our perception, there is always a «blind point» which stimulates the imagination.

When they create interactive works, Scenocosme invent sonorous or/and visual languages.

They translate the exchanges between living beings and between the body and its environment. They suggest interrelations where invisible becomes perceptible. Materialized, our sensations are augmented. Through a poetic interpretation of invisible mechanisms, technologies allow them to draw sensory relationships, and to generate unpredictable living interactions. Their hybrid artworks play with their own augmented senses. They live with technology and have reactions which escape deliberately to their control.



Scenocosme : Grégory Lasserre & Anaïs met den Ancxt : www.scenocosme.com

The couple artists Gregory Lasserre and Anais met den Ancxt work under the name Scenocosme. They live in the Rhone-Alpes region in France.
Their singular artworks use diverse expressions: interactive installations, visual art, digital art, sound art, collective performances etc.... Scenocosme mix art and digital technology to find substances of dreams, poetry, sensitivity and delicacy. These artists overturn various technologies in order to create contemporary artworks. Their works came from possible hybridizations between the technology and living world (plants, stones, water, wood, humans.,..) which meeting points incite them to invent sensitive and poetic languages. The most of their interactive artworks feel several various relationships between the body and the environment. They can feel energetic variations of living beings and design interactive stagings in which spectators share extraordinary sensory experiences.
Their artworks are exhibited in numerous museums, contemporary art centres and digital art festivals in the world.

They have exhibited their interactive installation artworks at ZKM Karlsruhe Centre for Art and Media (Germany), at Daejeon Museum of Art (Korea), at Museum Art Gallery of Nova Scotia (Canada), at National Centre for Contemporary Arts (Moscow), at Contemporary Art Museum Raleigh (USA), at Bòlit Centre d'Art Contemporani (Girona) and in many international biennals and festivals : Art Center Nabi / INDAF (Seoul), BIACS3 / Biennial International of Contemporary Art of Seville (Spain), Biennial Experimenta (Australia), NAMOC / National Art Museum of China / TransLife / Triennial of Media Art (Beijing), C.O.D.E (Canada), Futuresonic (UK), WRO (Pologne), FAD (Brasil), ISEA / International Symposium on Electronic Art (2009 Belfast, 2011 Istanbul, 2012 Albuquerque, 2013 Sydney), EXIT, VIA, Lille3000, Ososphere, Scopitone, Seconde nature (France)… during important events : World Expo (Shanghai), Nuits Blanches (Toronto, Halifax, Bruxelles, Brighton, Amiens, Segovia, Bucharest), Fête des lumières (Lyon)... and in various art centers : MONA (Australia), MUDAC, Fondation Claude Verdan (Lausanne), Musée Ianchelevici (Belgium), Kibla (Slovenia), Banff Centre (Canada), Villa Romana (Firenze), Utsikten Kunstsenter (Norway), Watermans (UK), Centre des arts d'Enghien-les-Bains, Gaîté Lyrique (Paris) etc.

Full biography : www.scenocosme.com/PDF/scenocosme_BOOK_EN.pdf

Wikipedia : https://en.wikipedia.org/wiki/scenocosme

Previous exhibitions of the different opus of Reactive matter

Creation 2020

- Le Centquatre / établissement artistique - Paris (Fr)
  STARTS Residencies / «Art X Technology X Innovation»

- Biennale Experimenta / Arts Sciences - Grenoble (Fr)

- Biennale Arts Sciences - Besançon (Fr)

- Numerica | Pôle Numérique de Bourgogne Franche Comté - Montbéliard (Fr)
  MA scène nationale - Pays de Montbéliard

- Festival des arts numériques Pléiades - Saint-Etienne (Fr)

- Atheneum - centre culturel de l'Université de Bourgogne - Dijon (Fr)

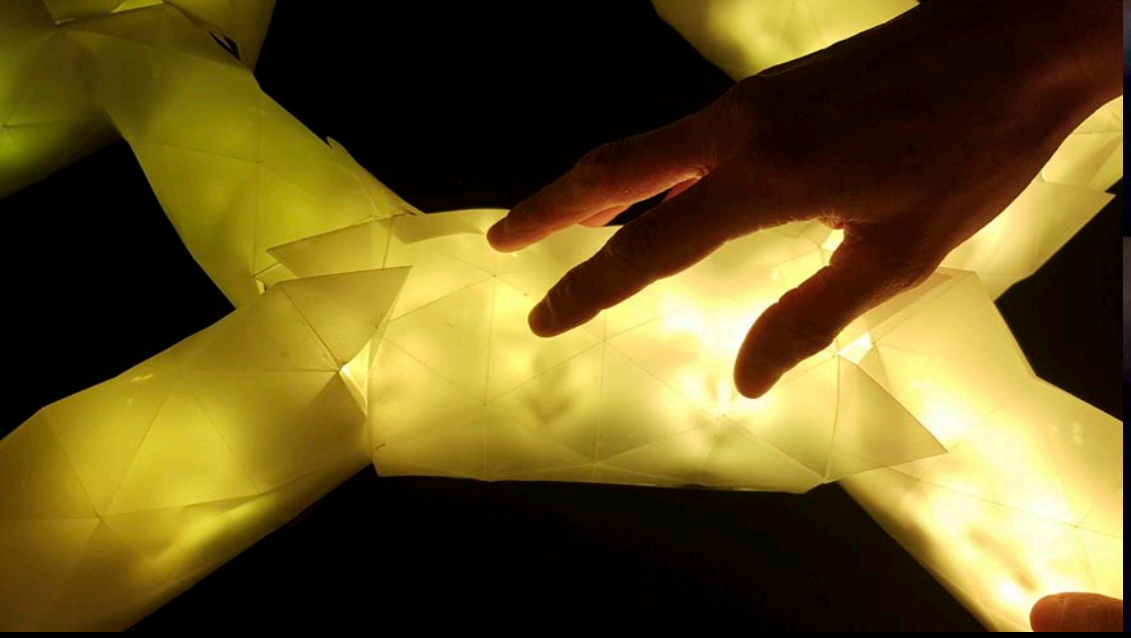
- Château de Sainte Colombe en Auxois / Arcade Design à la campagne (Fr)

Previous talk about Reactive matter

- Biennale Arts Sciences - Besançon (Fr)

- Festival Scopitone - Nantes (Fr)
  Starts :Innovation at the nexus of science, technology and the arts

- Centre Pompidou - Paris (Fr)
  Festival Manifeste / IRCAM / Curated by IRCAM and VERTIGO
  Starts Residencies / Science Technology and the ARTS



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IPPT PAN Institute of Fundamental Technological Research Polish Academy of Sciences

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