

# S + T + ARTS

## RESIDENCIES

**Art as a driver of technological  
innovation:** a short practical guide





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# WHY STARTS?

by Hugues Vinet, IRCAM, Coordinator of STARTS Residencies  
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## Art as a driver of technological innovation: the STARTS initiative

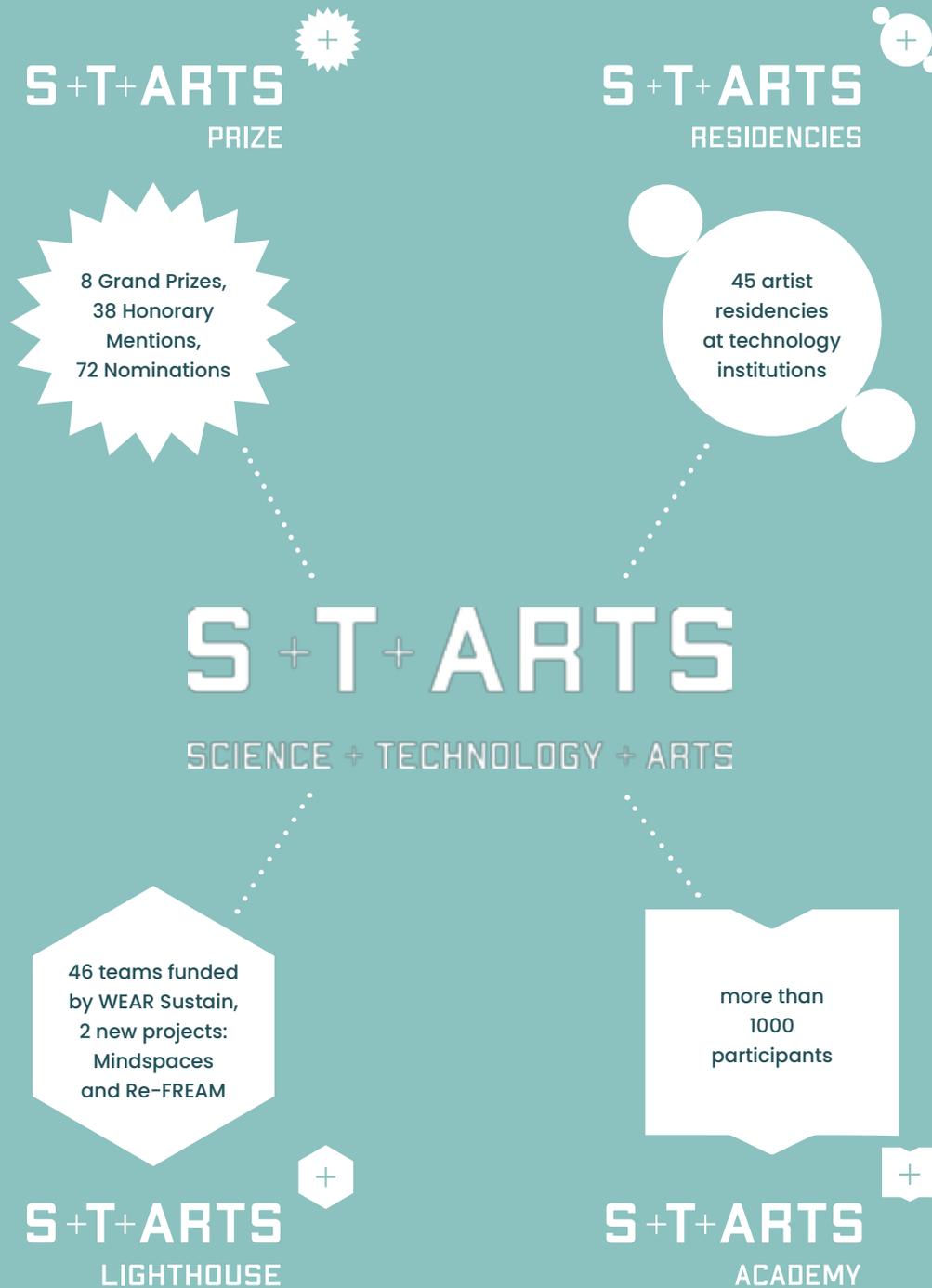
The STARTS initiative – which stands for innovation at the nexus of Science, Technology, and the ARTS – is Europe’s answer to a growing need for social and ecological innovation rooted in digital innovation. STARTS encourages collaborations between science, tech companies, the creative sectors and artists as a means to foster the development of human-oriented technologies.

High-tech companies embrace the Arts for their unconventional, playful exploration of technology and their critical take on the value of technology for society. Renowned art institutions such as Biennale di Venezia, V&A London, Centre Pompidou and ZKM Karlsruhe have harnessed and incorporated STARTS ideas into their activities.

Digital transformation of value to society requires increased emphasis on the human aspects of technology towards a better understanding of human needs and in order to develop technology more gracefully in future societies. The leading example here is Artificial intelligence, its promises and its pitfalls.

“One of the key challenges for future Artificial Intelligence will be what I like to call ‘the human challenge’. How will AI and humans work together? How can AI serve humans best? The role of the Arts will be decisive: Artists bring a human perspective to AI. By tapping into creativity of artists, Europe will lead the way towards an AI with a human touch”.

**Roberto Viola, Director General CONNECT, European Commission**



S+T+ARTS = STARTS promotes inclusive and creative thinking by artists in forward-looking projects funded by Europe and implemented through four pillars:



The annual **STARTS Prize** gives visibility to collaborations between artists and industry for new pathways to innovation, and artistic exploration of technology altering the use, deployment and perception of technology. Since 2016, the STARTS Prize has been awarded annually by Ars Electronica during its Festival Week.



The **STARTS Residencies** finance longer-term stays of artists at technology institutions to support match-making between science or technology projects and artists and to jumpstart collaborations between artists and technologists as part of interesting use-cases.



The **STARTS Lighthouse Pilots** support research seeking radically novel solutions and concrete results to major challenges for industry and society in close collaboration with artists as active members of the project teams. These lighthouse pilots explore novel uses of technologies and guide EU innovation actions towards more systematic inclusion of the Arts.



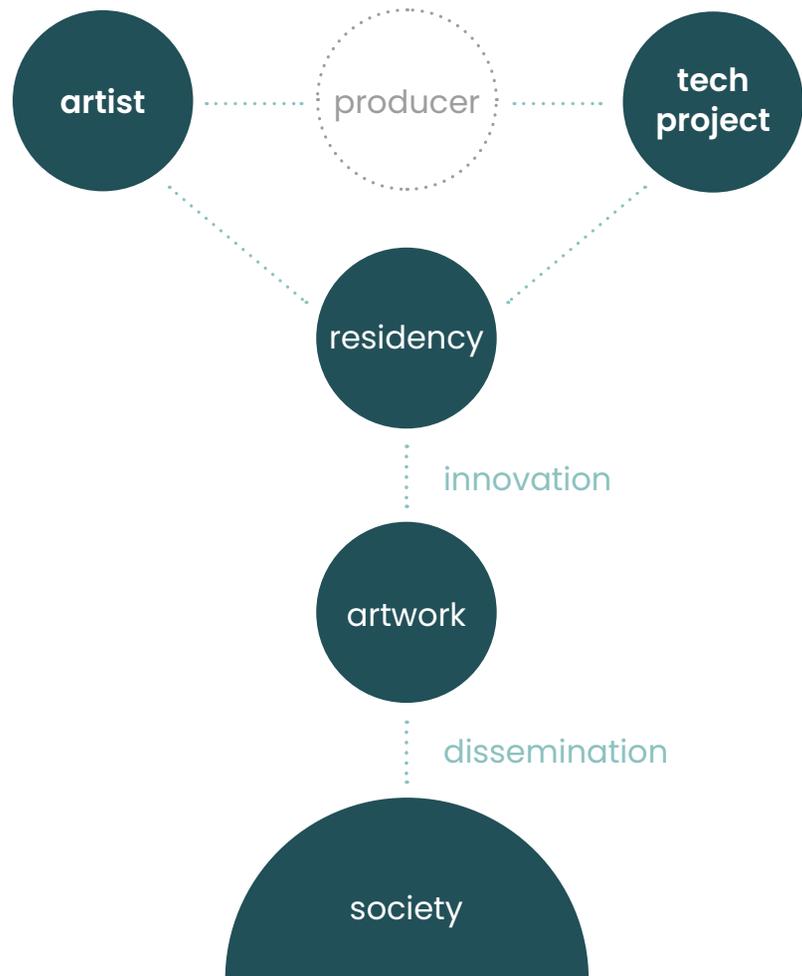
The **STARTS Academies** strive to bridge the gap between art and technology at all levels of education. They unite technologists and artists to teach digital skills to children and young adults in a playful way that also helps raise awareness of the opportunities, limits and potential pitfalls harbored by technology.

## Boosting innovation processes: the STARTS Residencies program

STARTS Residencies has organized 45 residencies of artists collaborating with technological projects throughout Europe. Its processes include 3 annual selection cycles, the residencies execution framework and support in publicizing the residencies and their results. STARTS Residencies is more generally engaged in supporting the STARTS community as a whole, in particular by developing the starts.eu platform.

The STARTS Residencies project promotes and supports innovation processes involving artists who make original contributions to technology-based projects. Tech projects can take the form of collaborative research, development and innovation projects funded by public programs, or advanced technological projects hosted by a research team or a company located in Europe. A grant (of up to €30,000) is awarded to the artist as a contribution towards her/his participation in and expenses arising from the program. A producer can also provide additional support to the residency, the objective being to confront the artist with an emerging technology from which she/he develops an original artwork, shedding new light, giving new meaning to the technology and conveying this onwards to larger audiences. The production of the artwork is also part of a co-creation process with the tech team. A total budget of €900k has been allocated for the artistic grants, supporting the implementation of 45 residencies between 2017 and 2020 on an as yet unprecedented scale.

## Co-creation process



The program's promotion and selection have been organized into 3 annual calls which took place between 2017 and 2019, each one divided into a call for projects willing to host artists, a call for producers ready to support them, and then a call for artists who were proposed to select one tech project among those available and to draft a residency proposal. Artists of any nationality and artistic field were welcome. The artistic applications were first reviewed by their tech projects and then finally selected by a high-level international jury. In the course of the 3 calls, 127 tech projects were selected and 342 artistic applications submitted for final selection of 45 residencies based on different tech projects. The final selection represents a wide range of technology areas and related application fields.

In addition to its calls structure, the program's methodology defines the legal and organizational conditions for these transdisciplinary collaborations - most of the time between stakeholders who had never met before - through a monitoring process formalized in successive steps. The residency outcomes are promoted leveraging various channels, including by supporting numerous public events and digital communication. The web platform produced for managing the calls is now open to third parties willing to organize their own calls for artistic residencies under the STARTS umbrella. The starts.eu website developed in the scope of the program is the main matchmaking hub of the growing STARTS community.

## 2017 - 2020: key figures

**45 residencies**  
(from 3 to 12 months)

**€900k** awarded  
in artistic grants

**60+ events** presenting  
STARTS Residencies  
Venice Biennale (IT),  
LABoral (ES), SXSW (USA),  
Ars Electronica (AT),  
Aarhus IoT week (DK),  
KIKK Festival (BE), CeBIT (DE),  
Festival d'Avignon (FR),  
Art Center Nabi (KR)...

**Jury members  
from 12 institutions  
and companies**

Ars Electronica (AT), Mikros  
Image (FR), University for  
Creative Arts (UK), Waag (NL),  
City of Barcelona (ES), Victoria  
& Albert Museum (UK), Orange  
(FR), ZKM (DE), CENTQUATRE (FR),  
Bozar (BE), FutureEverything  
(UK), Cisco (FR), Caisse des  
Dépôts et Consignations (FR)

**150+ artists and  
technologists**  
involved in the project

**1 online platform**  
starts.eu

**3 open calls** for tech  
projects and artists

**1 annual public event**  
presenting the results  
at the Centre Pompidou  
and at the CENTQUATRE  
(FR)

**Building on its experience, the STARTS Residencies consortium has defined a methodology paired with tools to successfully set up science, technology and arts residencies. The goal is now to share them with the outside world. This brochure provides readers with the kit necessary to understand and implement science, technology and arts collaborations, illustrated by examples of STARTS Residencies. We hope it will be a valuable tool to all innovation actors.**

# CO- CREATION METHODOLOGY AND ILLUSTRATIONS

How can the global methodology established by STARTS Residencies be turned into action and success? 45 projects and three calls have enabled this European initiative to develop implementation tools. Most of the features have been integrated into a digital platform. Institutions & companies willing to implement artist residencies can now benefit from these instruments.

Launching artist residencies requires facing some constraints. First, the process must be lean to channel as many resources as possible toward the co-creation teams. It must also be perceived as relevant, useful and enjoyable by the participants. Usually, technologists and artists already share one thing before any collaboration: their aversion to administrative tasks! However, a co-creation process that starts with misunderstandings and a lack of information has very little chance of being successful. So after three years of development and testing, the STARTS Residencies project has made its tools available to institutions and companies. Most features have been integrated into a digital platform. It can:

- **Attract tech projects** and encourage them to express their technology as challenges for artists. The experience gathered with the 127 applicants allowed us to design short and simple forms while preserving crucial information.

- **Launch a call for artists** and have clear content assessed by a jury and future partners. Part of this content remains confidential, while the other part serves subsequent communication efforts. The platform manages the flow of information serving the project until the end of the residency.

- **Formalise clear roles and collaboration rules**, including Intellectual Property management, in a co-production agreement signed by all the stakeholders involved at the beginning of the process.

- **Support the jury's work.** Integrating features dedicated to the jury activities allows admin to be streamlined and success to be managed: a high number of applicants becomes much easier to handle.

- **Announce laureates.** Visibility and public recognition are vital for artists' careers. The prestigious jury and public announcement of projects selected by the jury drives motivation and engagement. Thanks to the information flow architecture of the digital tool, content can be extracted from the artists' initial input.

- **Monitor project development** and provide help if needed. Creativity requires freedom and cannot only be driven by tools. The platform does not formally request regular reports through forms, but it does provide a blogging tool to facilitate exchange and follow-up. The inception meeting, midterm review and final assessment should remain physical meetings, implemented by a mediator.

- **Present the results** of the residencies. Most of the artworks combine visual artefacts, but also interactions, concepts, as well as new visions for scientific data and technologies. The capacity to merge video, text, sound and image is key to attaining the visibility expected from artists in this kind of context.

The digital platform also aims to support the development of a community of actors, to raise motivation, mutual understanding and engagement. An evolutionary profile, including tailored social media features is currently under development, while an interactive map allows users to easily identify project opportunities.

**Take your chance: join the STARTS Community and make these tools yours!**

## Print Your City

Thessaloniki, Greece - Lucerne, Switzerland / 2018-2019

Artists: **The New Raw**  
(Foteini Setaki  
and Panos Sakkas)  
Tech Project: **Plastic Twist**

#plastic, #monetization,  
#3Dprinting, #community,  
#codesign

"I really believe we should have science, humanity and the arts in anything we do. At the moment, I think that it's artists that are the most engaged in understanding social issues."

Julie Harboe, PlasticTwist

## WHO?

PlasticTwist is an open platform for plastic lifecycle awareness and monetization that provides crowdsourcing tools, blockchain-based facilities and a marketplace. Their challenge is to establish the link between their tools and the actual resource: how to first re-purpose plastic waste into a valuable trade good, then turn it into a digital currency and finally get physical, useful objects back?

The New Raw is a design studio based in Rotterdam, run by architects Foteini Setaki and Panos Sakkas. It is specialized in closing the plastics lifecycle by harnessing large-scale 3D printing. During the residency, they were looking for ways to enhance their co-design methodologies through community engagement.

## WHAT?

The co-creation team held a first cycle of workshops at HSLU Lucerne to open a citizens' debate on how to move from waste to resource. The focus was on the public space and the urban environment, initiating a process of reflection on what could be done in a common effort for the common good.

The New Raw then used this input to design a unique, scalable module tailored to fit the public space. A second cycle of workshops at AUTH Thessaloniki was then held to finally create a system for the collection of



Print your City @ The New Raw

household plastics using the monetization platform of PlasticTwist. Citizens could bring their plastic waste and were paid back in PTokens, the blockchain tokens of the PTwist platform. With these tokens, they could then buy modules on the platform marketplace and have them 3D-printed locally out of recycled plastics.

## HOW?

The co-creation process relied on citizen engagement. The residency provided a framework in which citizens are empowered actors and the subject of study at the same time. By analyzing and understanding their consumption patterns, behaviors, etc., it becomes possible to unlock the potential of a community through tools and education. By bringing the means to the people, the residency aimed to ignite a dialogue and raise awareness, while designing real solutions for real needs.

From the very beginning, PlasticTwist was very aware that artists, by their practice, are very likely to have a social impact. Through the whole residency process, co-creation

partners shared the same vision and were absolutely convinced of the value of artistic and humanities thinking in the context of scientific research, leading to a high-quality co-creation process.

According to Vasileios Psomiadis member of PlasticTwist, the New Raw acted as a vector to allow the PlasticTwist approach to be validated through real-life cases, with citizens: it opened up a sustainable dialogue with the community and boosted the inspiration of the citizens who participated in the experience.

# UNCHAINING INNOVATION AND ART THROUGH RESIDENCIES

Managers know the potential of transdisciplinary innovation, technologists would like to increase the impact of their work, and artists are eager to explore new fields of possibilities. In such collaborations, success means attaining personal objectives by achieving a common goal. STARTS Residencies unveil some key principles for making this happen!

This European initiative is all about innovation. Art is not just a cultural varnish or marketing tool: it is a way to introduce disruptive perspectives, raise critical issues and involve human and emotional dimensions through creative forms of expression. It is also an open field of opportunities for artistic practice. Residencies cannot limit themselves to artists working on their own, nor to well-established common knowledge. The goal is to induce a co-creation process which produces new visions. Here, we take a look at how STARTS Residencies defined and implemented a methodology to achieve this goal.

## Technological Projects: Express your Challenges

STARTS Residencies calls start with technologists, as, through their research, they are the ones to provide the tools and knowledge to explore new fields of innovation. Technologists are asked to explain their proposition as a challenge. In other words, they have to describe their proposition above and beyond its scientific performance by including questions, concerns and perspectives to arouse the interest of artists and open a dialogue. Online forms help them to present their challenge clearly and highlight key issues such as expectations, available resources, location, etc. Editorial support may bring a significant increase in efficiency, especially for teams not familiar with such residencies. A first committee selects the promising challenges, carefully checking that the challenge's expectations can match those

of an artist and liaises with the researchers to enhance their proposal.

## Jam Session: Meet the Technologists

Event where technologists can present their challenge to artists in a free, open and informal way with a view to starting a dialogue and enhancing mutual understanding. This type of event is not mandatory, but can be very productive, especially if it requires only short-distance travel by the participants.

## Artist Projects: Discovering the Proposals

A Call for Artists is then published online, disclosing the selected projects' challenges. Artists can choose a challenge and propose a residency application based on it. A specific online form gathers the essential information for the collaboration: the artwork concept, technical approach, foreseen process, resources needed to produce the work, type of deliverable, etc.

In STARTS Residencies, an independent jury of experts selects the projects with the freedom to make unexpected matches between artists and challenges. It also formulates recommendations for implementation.

## Co-creation: Monitoring the residency process

Literature and the experience from STARTS Residencies both demonstrate the benefits of a mediator. Thanks to a well-defined digital platform with specific forms, the initial inputs from the technologists and the artists provide a solid basis for starting the collaboration. But the mediator remains crucial for three main steps of the residency:
 

- the inception meeting, where all parties sign an agreement and align their goals and expectations;
- the mid-term review to discuss the quality of the collaboration, the partners' commitment, and unexpected results or ideas;
- the closing meeting assessing the outcome, finalizing the knowledge transfer and opening the valorisation strategy.

## Results: Show and innovate

Valorisation is a major driver for all partners and needs to be planned in advance to be successful. Technologists are eager to open up perspectives and explore new visions for their technology, enhancing its impact. Co-created prototypes facilitate mutual understanding and knowledge transfer for both parties, while documentation is instrumental to pushing some ideas forward. For the artist, the usual outcome is to share new ideas with a large audience through the exhibition of an artwork. This requires the production of convincing artefacts and planning their public exposure. A common understanding on valorisation strategies leads to a win-win situation: drive innovation, creativity and awareness for both parties.

The methodology implemented by STARTS Residencies is available for any entities interested in organizing their own call.

## To implement this methodology successfully, the organizer has some key issues to tackle.

- **Ensuring that technologists expect disruptive creative thinking** from the artist and not a work of applied design or communication to improve marketing strategies.
- **Boosting the motivation of participants.** Motivation is mostly driven by the unknown and the existence of challenging tasks toward an overall common goal, while at the same time forwarding personal ambitions.
- **Sharing a common language:** checking the words frequently used by the team and that they mean the same for all members.
- **Checking the resource** made available by the challenge: technologists have to provide not just tools and data, they have also to spend time with the artist to understand and leverage her/his vision.
- **Discussing the co-creation environment:** it should be conceived as an in-between space, allowing heterogeneous identities and mutual access to artefacts..
- **Dealing with time and the unknown:** the different approaches related to the disciplines mean discoveries and the unexpected need to be handled from different points of view. Co-creation in a setting of this kind cannot be rushed.
- **Defining intellectual property and collaboration rules,** funding and principles for return on investment at the launch of the initial call. Making these clear for participants to avoid blocks, frustration and losses at a later stage.

## ATLAS

Oxford, The United Kingdom /  
2017-2018

Artists: **Yann Deval  
& Marie-Ghislaine Losseau**  
Tech Project: **WEKIT**

#mixedReality, #AR, #VR,  
#city, #photogrammetry,  
#interaction, #aesthetics

“Engagement is  
the currency: ATLAS  
is translating complex  
meaning into simple  
engagement through  
a sensible experience.”

Fridolin Wild, WEKIT

## WHO?

WEKIT enhances reality with various mediums (Augmented Reality, wearables), mainly for professional training. Their motto is using “reality as a medium”. In this context, they were looking for aesthetic guidelines and User Interface principles for AR, from which real knowledge could be drawn in order to enhance the user experience.

Yann Deval is an interaction and motion designer based in Brussels. Marie-Ghislaine Losseau, a visual artist specialized in participatory scenography. They were looking for new technological solutions to give a new approach to their work, and for the technical knowledge and mentoring that would allow them to seamlessly integrate this new medium into their work.

## WHAT?

Atlas is the fruit of their collaboration. It is a work at the nexus of digital and visual art, in the form of an interactive exhibition. The user first experiences the landscape of the exhibition made up of dozens of wooden buildings without any technical aids. The spectator is then invited to explore an archipelago of floating islands in VR and, ultimately, to build cities in AR between the digital, dream-like world and the real world. All layers of reality are interconnected. The buildings follow different urbanistic rules depending on where you build them (floating, on a wall...), and are all the results



ATLAS © Hanneke Wetzler

of workshops held in schools in Molenbeek. There is no other goal than building, wandering and alternating between layers of reality...

The final experience is highly illustrative and engaging, as it was conceived as an exhibition setup right from initial ideation. Over the duration of the residency it has been exhibited at renowned venues, such as SXSW, the Venice Architecture Biennale, Ars Electronica, KIKK, etc... and even had its own solo show at Oxford Brookes.

## HOW?

The co-creation process was a success from all points of view. The residency was split into two phases at Oxford Brookes: the first phase of the residency was exploratory, while the second was dedicated to production. The technology was new to Yann Deval: during both phases, WEKIT provided him with all the required technical mentoring and resources, while trustfully giving him total control over the artistic part. The co-creation team implemented an incremental workflow with fast prototyping allowing frequent discussions about the progress of the work.

For her part, Marie-Ghislaine spent a lot of time curating the creation of the raw material (the houses) by the school pupils in Molenbeek and digitizing them through photogrammetry.

The co-creation team achieved tangible results and was able to output knowledge from the produced work in the field of AR aesthetic and interaction principles. For instance, embedding the augmented field of vision on top of the real one through disruptive visual patterns and a transition zone increases the perception of normality for the users and measurably improves their experience. For both partners, the best return on investment was the huge exposure the artwork had, which helped create awareness about the topics addressed by the team, translating complex meaning into simple engagement. The partners have decided to pursue their collaboration beyond the end of the residency.

# DESIGN THINKING OR ART RESIDENCIES?

Innovation is essential and exciting. But it also means dealing with uncertainty and risks. Many strategies and methodologies have emerged over the last few decades. How can you be sure to choose the right one? We cannot provide a crystal ball manual but may be able to help you with some definitions and use contexts! Hackathons, design thinking, artists in residence, ideation and design research have all flourished in cultural, scientific and business communities. But what do they mean, require and deliver? In this section we will focus on three main practices. They can be used independently or can be combined in a project.

**Design thinking** is mostly a management tool for ideation. It helps to bring people together from different disciplines in order to generate disruptive thinking. The methodology puts the end users at the core of the creative process. Over the years, the principles established by Rolf Arne Faste have often been simplified and turned into short creative sessions. Multiple tools and methodologies have flourished under this denomination. Usually, the notion of prototype refers to mock-ups built quickly with some common everyday materials in a meeting room. It allows any participants to sketch multiple ideas. User observations are mostly limited to a few interviews: empathizing at the beginning and then the performance of short qualitative testing with the mock-ups. The methodology pushes for ideas and dialogue beyond expertise and hierarchy.

**Design research.** While some researchers associate this with theoretical reflection on design practices, we will focus here on the definition related to innovation. Designers use their artistic skills to nurture the creative process and involve human and social dimensions. But they are expected to deliver innovations. In other words, products or services useful for a specific audience. Projects require close collaboration between engineers and designers, including prototyping. The notion of research includes the capacity to understand key adoption factors among real users, in real conditions, with qualitative and quantitative data. Design research is suitable for disruptive innovation aiming to be sustainable. It typically ranges from 18-24 months to deliver functional prototypes and sound knowledge on their impact.

**Artist residencies.** As explained in this publication, here the aim is to perform an artistic exploration in a specific context. The artist brings in a different background and creative process: cultural references, social observation, intuition and specific knowledge all provide the capacity to generate new perspectives encapsulating social and human dimensions. The different types of expertise the artist and the technologist have are recognized as a major ingredient for the co-creation work. Residencies usually last 3-6 months. Free thought is instrumental to generating disruptive perspectives. These perspectives are usually expressed through an artwork and built on collaborations with the technologists. Manufacturing the artwork plays an important role in the exchange between disciplines. However, it does not require a working prototype to be ready for user testing. Several STARTS Residencies projects developed in this publication show the impact of a practice of this kind.

## By the Code of Soil

Dundee, The United Kingdom /  
2017–2019

Artist: **Kasia Molga**  
Tech Project:  
**GROW Observatory**  
Producer:  
**FutureEverything**

#soil #environment  
#community #sensors  
#satellites

“We do not want our piece to be just a pretty thing on the white wall gallery space, we really are looking to create something giving a “visible” presence to individual growers and their efforts.”

Kasia Molga

### WHO?

GROW Observatory is a European-wide project engaging thousands of growers, scientists and others passionate about the land. Their objective is to use simple tools to discover together how to better manage soil and grow food, while contributing to vital scientific environmental monitoring.

Kasia Molga is a designer, artist and creative technologist. She reimagines our relationship with nature, while questioning our technologically mediated perception of the environment. During this project she collaborated with sound artist Robin Rimbaud aka Scanner.

### WHAT?

The artists used the soil data collected by the growers as raw material: through algorithms. They translated dynamic data from soil sensors into a system of virtual noise. Driven by the will to create a meaningful data visualization tool for the growers, two artworks were born out of this approach.

“By the Code of Soil” is a data-driven artwork on a computer. When a specific satellite (Sentinel-1A) passes above its location, it displays an artistic representation of soil moisture, temperature and light data, retrieved from the closest GROW Observatory cluster of sensors.



By the Code of Soil © Kasia Molga

The second “(de)COMPOSITIONS” is a multisensory work inviting the audience to observe how soil changes thanks to earthworms. These small animals work tirelessly to mix different types of soil, reviving and fertilizing it while at the same time recycling the remains of organic matter.

### HOW?

The only way for Kasia Molga to innovate was to destroy her own preconceptions and leave her comfort zone. This is what she did, first by reading documentation and talking to scientists, growers and technologists to understand “what is soil?”. Then she started to play with the data collected by the growers. She designed a software allowing her to look at various soil parameters, their correlations and dependencies. At this point, the team realized that this software was also lacking for GROW’s interface. As a result, it was integrated into the platform, allowing all the growers to use it.

While working with earthworms, she developed a new soil fertility test in collaboration with scientists. A vibration sensor allows you to detect the number of earthworms based on the movements and volume. Combining this reading with other data allows you to assess soil fertility. According to the GROW team, the artist succeeded in creating a powerful engagement tool to expand the community of growers and to learn about new sustainable practices in generating data. She built an embodied understanding both digitally and physically of the vital importance of soil and how it sustains our life on earth.

# UNDERSTANDING THE INFLUENCE OF ART

Art has had a strong influence on our perception of science and technologies for centuries. Artist residencies place art at the core of the innovation process. Implementing them as a common and fruitful practice requires a better understanding of co-creation between different disciplines. STARTS Residencies contribute to this: they establish the concept of a global framework in a peer review article and support researchers in this field.

In the early sixties, the idea of residencies in a scientific context emerged as a way to capitalize on artists' disruptive thinking on new technologies. Whilst Palo Alto Research Center's Artist-in-Residence program is usually cited as a reference, Europe has been considered a driving force since the 90s, with initiatives like Ars Electronica, Zentrum für Kunst und Medien (ZKM), or Institut de Recherche et Coordination Acoustique / Musique (IRCAM), which has developed practices and knowledge relating to the art and science interface over the past 40 years.

To understand both the residencies process and their impact, researchers have studied co-creation between artists and scientists. Findings outline the critical dimensions of such collaboration, such as the very notion of common understandings, the location and context of the co-creation, the relationship between the technical competences of the artist and their creative freedom. They have raised major questions, such as the capacity to recognize artistic contribution as a valid practice in the production of knowledge or the tension between problem solving and personal criticism.

These research efforts on artist residencies open up new thoughts on the way we generate discoveries and handle unexpected inputs from diverse points of views. They have a deep impact on the way we collaborate across different disciplines.

After three years of activities, the STARTS Residencies project turned its experience into knowledge. The article "Artist Residencies for Innovation: Development of a Global Framework" provides a first academic synthesis combining existing literature and STARTS Residencies outcomes. It focuses on how to bridge the gaps identified in existing co-creation methodologies and how to generate innovation impact. The article was presented at SIGGRAPH 2019 and has been published by Leonardo/MIT Press. It underlines the role of mediators, expresses how different forms of creativity can define common ground and joint objectives, while preserving individual commitment. It also illustrates the role of digital tools.

**STARTS Residencies has also collected and organized the references, observations and data from 45 art-science residencies in Europe. This will be made available for researchers fostering art-science co-creation, with the ambition of further developing knowledge in this field and a new culture of innovation.**

## Froth of the Daydream

Marseille, France / 2018–2019

Artist: **Julie Desmet Weaver**  
Tech Project: **LE CUBE**

#immersion #interaction  
#poetry #3D #scanner

“It is really an exciting opportunity for us to mix the ambition of Julie and the craziness of our developers to create this innovative experience”

Mathieu Rozières, LE CUBE

### WHO?

Black Euphoria is a communication consultancy agency and a creative digital studio. They developed LE CUBE, an 8-meter-diameter cylinder with a circular screen and spatialized sound dedicated to collective virtual reality.

Julie Desmet Weaver is a stage director, also trained in dance. She explores digital language, creates new experiences and initiates encounters between literary, sound and interactive stories.

### WHAT?

For the centenary of the birth of Boris Vian in 2020, Julie Desmet Weaver decided to stage the French author's famous jazz novel "Froth of the Daydream". The team is reproducing the hero's bedroom inside the technical setup of LE CUBE, creating an immersive participatory experience where the audience becomes an actor in the story. The scenario evolves depending on the interactions of the people inside the cylinder. Together, the team created a 12-minute immersive and interactive collective experience. The audience of up to 6 people can experiment with iconic inventions from Boris Vian's novel: they can play music on the pianocktail, learn to dance the biglemoi, and even throw antiwaterlily flowers on the wall.



Froth of the Daydream © Alain Lagarde

One of the technical setup's strongest assets is its transportability. It is possible to present *Froth of the Daydream* in various places, and reach a wide audience. With this work, Julie Desmet Weaver sheds new light on Boris Vian's work and invites people to rediscover it through an innovative setup.

### HOW?

At the beginning of the project, the tech project wanted to provide the artist with the technical setup in order to produce a new kind of performance. At that time the technology inside LE CUBE was quite simple and hardly interactive. They were considering interaction using devices like remote controls. They had many discussions with the artist. When she was in Marseille they tested it and realized it was not working. They were looking for something "magic". So, together they decided to totally re-invent the technology. They wanted the audience to enter LE CUBE and collectively interact without any device. This resulted in a combination of 360° mapping projection and collective

interaction. The easiest way to mix these technologies would be to use motion capture. As they did not want the audience to wear sensors because they found it too intrusive, they rejected this option.

This is when they came up with their disruptive innovation: a new kind of volumetric capture. The idea is quite simple, it reads volumes and the people inside these volumes, in real-time. This reading is used to create a narration that opens up a new kind of live performance. For now, the technology is still under development, but the tech team is already testing it for other projects.

This residency has been highly beneficial to both parties. Julie Desmet Weaver has found a way to create magic-like interactions, and Black Euphoria an innovative technology to use on new projects. Apart from the technology, it was a great human experience that allowed Black Euphoria's coders to express their creativity and a touch of craziness.

# INDUSTRY PERSPECTIVES

TESTIMONIES OF TWO ACTORS INVOLVED IN ART-TECHNOLOGY COLLABORATIONS

**Lisa Przioda,**  
Innovation Management Global, Robert Bosch GmbH



## For you, as part of Robert Bosch GmbH – Corporate Research what are the benefits of working with artists?

We aim to support the process of early idea generation by stimulating and inspiring people to change how they look at things in a variety of different ways. The presence of the artists takes the researchers out of their daily work routine and encourages them to deal with unusual working structures and ways of thinking.

## How do you implement the collaboration with artists at your organization?

Within the framework of what we call the “Wimmel Research Fellowship”, artists work for three months each as indirect observers and initiators in order to exchange ideas with Bosch researchers and to work on their own and joint artistic projects. The stipend has been awarded since 2015 and is organized by the Akademie Schloss Solitude, in cooperation with Wimmelforschung and financed by Robert Bosch GmbH. The most important unique feature that sets this project apart from traditional artist-in-residence programs at companies is that the artists do not develop works of art that refer to specific in-house research content during the stipend period. On the contrary, the open-minded encounter and the process of dialog between the artists and researchers are the whole aim of the joint experiment.

## Can you give us an example of a successful art, science and technology collaboration?

The main purpose of the joint dialog is to exchange views and learn new ways of thinking. Since 2015, many internal projects have profited from the participation of artists at workshops, meetings and discussions. Some examples of work done by previous artists are “Local Sensing” by Alexander Werle (DEU), “Biocoin” by Antoni Rayzhekov (BGR) and “Deep Time Machine Learning” by Jol Thomson (CAN).

**Esra Aydin,**  
Spokesperson for Cultural Engagement, Volkswagen Communications



## For you, as part of Volkswagen Group, what are the benefits of working with artists?

Artists know no bounds to their creativity, enabling them to come up with unexpected results, ideas and innovations. Ideas and concepts like these can be of groundbreaking importance to our future. Volkswagen believes that art and culture are crucial pillars of an open and future-oriented society. They create platforms to critically examine issues affecting societies and individuals, and act as a guiding light for innovation. We believe that access to culture helps ensure a basis that enables it to thrive.

## How do you implement the collaboration with artists at your organization?

Volkswagen aims to bring individual mobility to as many people as possible. Similarly, when collaborating with its cultural partners, Volkswagen seeks to bring as many people as possible into contact with art and culture. Programs which deal with new technologies and changing social needs are especially valuable projects that we aim to support: in addition to engaging participants with these topics, they drive evolution and innovation as much as solidarity and integration.

## Can you give us an example of a successful art, science and technology collaboration?

Last year we supported the exhibition “The Future starts Here” at the Victoria & Albert Museum in London. For us, support always means actively contributing. During the preparation of the exhibition we enjoyed a productive exchange of ideas with the curators and the team at the V&A. They told us about the goals the project was pursuing and we sat down and discussed some options for achieving them. This led to the idea of bringing the curators together with experts from the Volkswagen Group Innovation Center in Potsdam, so that they could collect first-hand information about future mobility concepts and autonomous driving. Volkswagen offered access to specific visions for tomorrow’s world which in turn helped to further broaden the idea of the exhibition. This meant that the visitors of the exhibition could enter the autonomous concept car SEDRIC, which was tailored to the needs of the exhibition. Including SEDRIC offered a new experience of future mobility and human-machine interaction.

Another example of strengthening the exchange and dialogue between cultural institutions and our company is the “Art & Tech” symposium that took place in Beijing and Salzburg. At the conference, representatives from the Eliette and Herbert von Karajan Institute, researchers from the Volkswagen Group Innovation Centers in China and Germany, musicians and digital experts all discussed the question of how the experience of art and culture is changing in technologically-changing living environments.

## The Plants Sense

Lubeck, Denmark, 2017–2018

Artists: **Maria Castellanos & Alberto Valverde**  
 Tech Project: **Flora Robotica**  
 Producer: **LABoral**

#plants #devices #sensor  
 #garden #biochemical

“We benefited a lot from working with Maria and Alberto because at that time we were too focused on trying to control the natural plants. Their work and enthusiasm helped us to step out of our engineering box.”

Heiko Hamann, Flora Robotica

### WHO?

María Castellanos and Alberto Valverde have been working together since 2009 on a variety of projects addressing the relationship between technology and human senses through different mediums such as interactive installations, sound interventions and multimedia works.

Flora Robotica develops and investigates the potential relationships between robots and plants, toward the idea of a plant-robot society able to produce architectural artefacts and living spaces.



The Plants Sense © Maria Castellanos



The Plants Sense © Maria Castellanos

### WHAT?

The Plants Sense is an installation that allows the audience to better understand and experience the secret language of plants. It is a smart garden enabling communication between humans and plants. Sensors measure electric oscillations from the connected plants and exhibit their biochemical reactions to human presence and to the environment. All the information is processed and translated into vibrations and low frequency sounds that allow you to perceive the plants through a wearable. Furthermore, different interfaces in the garden allow the public to experiment and feel with their own hands the reactions of the plants. This is possible thanks to an intelligent interface that receives their sensations when they are located in a small garden. This device translates and transmits precisely those signals that humans, due to our limited perceptual system, cannot receive in any other way.

### HOW?

When the artists started the project, they wanted to create a wearable device enabling you to feel the plants throughout your whole body. However, after several stays in Copenhagen and Lübeck they realized the depth of this research. As a result, they decided to design a bigger artistic installation. As Flora Robotica's idea is to control plants and allow them to expand on specific surfaces, the artists decided to build a garden in which the biological plants control the whole garden and the devices displayed on it. This was possible by connecting all the sensors to a server and processing all the information received from the plants. In other words, the plants became the main brain of the garden.

When the artists started the residency, the research team was really focused on controlling the plants. The artists taught the Flora Robotica team how to listen to plants and allow humans to experience a plant's internal state. This allowed the researchers to change their way of thinking. Now the robots and plants operate in equal roles in Flora Robotica's project and plants seemingly communicate with the human user.

# 2017/2020

## 45 RESIDENCIES

Melting art, science and technology is a way to think outside the box. This is what the 45 STARTS residencies did. They reflected on how humans can harness technologies to:



**INCREASE OUR CAPACITIES**



**CARE FOR THE ENVIRONMENT**



**SHED LIGHT ON THE INVISIBLE**



**IMPROVE LIVING CONDITIONS**



**AUGMENT THE POSSIBILITIES OF ARTISTIC CREATION**



**COUNTERACT SOME OF THE LIMITS TECHNOLOGIES ARE SUBJECT TO**



*My Robot Companion Anna Dumitriu and Alex May © Francesca Moore*



**INCREASE OUR CAPACITIES**

**INSIDER X ZORAN SRDIC JANEZIC BIOBOT**

The opus Biobot consists of a series of projects in which the artist and his group work on developing the mechanics that allow the bionic composition to be moved with the help of a laboratory grown muscle. They are also developing neural tissue on the microelectrode array, which is actively connected to the mechatronics of the membrane. The membrane moves in accordance to the activity of the neurons. The Kambič company is developing a modular incubator for growing tissues with video monitoring for artistic purposes.

**RESIDENCY FROM APRIL, 2019 TO MARCH, 2020 – SLOVENIA**

**WE DRAW X LIAT GRAYVER TRANSHUMAN EXPRESSION**

Transhuman Expression is an interactive room installation created by Liat Grayver in collaboration with the Casa Paganini InfoMus. Data captured through motion detection of visitors is analyzed, processed, and projected onto large screens positioned in the exhibition area. The collaboration was built on ongoing work exploring convergence of artistic and scientific practices: Grayver's work in robotics-assisted painting secured new tools,

whilst Casa Paganini - InfoMus acquired new perspectives on the range, scope and scale of real-time, automated movement analysis.

**RESIDENCY FROM SEPT, 2018 TO DEC, 2018 – ITALY**

**MAGIC SHOES X KRISTI KUUSK MAGIC LINING**

Magic Lining is a collaborative project between an artist and scientists from the disciplines of human-computer interaction, psychology and neuroscience. The team is working on a prototype that focuses on the possibilities for altering the perception people have of their own body using the lining of the garment. The project focuses on e-textiles to integrate sensory feedback close to the body. The work proposes a garment that allows the user to feel as if their body were made of a different material: cloud, water, rocks.

**RESIDENCY FROM NOV, 2017 TO NOV, 2018 SPAIN**

**GOPROSOCIAL X ELLEN PEARLMAN AIBO**

AIBO is an emotionally intelligent Artificial Intelligence (AI) brain opera. A performer wears an Emotiv brainwave headset connected to a bodysuit of light displaying her emotions as she interacts with an AI entity about their perceived intimate relationship, triggering sound, text, visuals, movement, and audience interaction. It depicts a story with implications for the future of AI, brain-computer interfaces (BCIs), biometrics and human-computer interaction.n.

**RESIDENCY FROM JUL, 2019 TO MARCH, 2020 – ESTONIA**

**HUMAN ROBOT CO-MOBILITY BY SCHINDLER X ANNA DUMITRIU & ALEX MAY**

**CYBER-SPECIES PROXIMITY**

Anna Dumitriu and Alex May are developing explorations of robotic movement through collaboration with the Human Robot Co-Mobility project developed by Schindler. The goal is to

investigate what our future co-existence with intelligent embodied robots might be, based on a deep investigation of human and robot interaction and movement, focusing on proximity, touch, body language and interactivity with socially-aware robots.

**RESIDENCY FROM MAY, 2019 TO MARCH, 2020 – SWITZERLAND**

**MOVING DIGITS X KA FAI CHOY TECHNOLOGICAL FLESH**

Technological Flesh is a digital dance experience by Berlin-based Singaporean artist Choy Ka Fai. His multidisciplinary art practice situates itself at the intersection of dance, media art and performance. Inspired by the concepts of post-human choreography, the project speculates on choreographic expressions of Trance culture in dance, movement and music. Ka Fai is collaborating with the Moving Digits project in the scope of a 6-month residency hosted by Hochschule Düsseldorf.

**RESIDENCY FROM JUN, 2019 TO JAN, 2020 – GERMANY**

**3D PRIME X VALERIA ABENDROTH EMBRYONIC**

3D printed objects create a tactile room installation. The physical and mental cognitions and connections inside the installation produce a new point of view and by harnessing haptic, audio and visual means bring the viewer into the dimension of an advanced way of life, reflecting on the developmental process of human nature with technology in our time and exploring the relationship between fiction and reality while overcoming usual form and reality.

**RESIDENCY FROM JAN, 2019 TO SEP, 2019 – GERMANY**



O.R.S © HeHe



## CARE FOR THE ENVIRONMENT

### PTWIST X THE NEW RAW PRINT YOUR CITY

In the project Print Your City, urban dwellers transform their plastic waste into raw materials for the public space, creating a circular stream inside the city. This is achieved by recycling household plastic waste with robotic 3D printing, producing components that upgrade the built environment through citizen involvement and the principles of the circular economy.

**RESIDENCY FROM AUG, 2018 TO JULY, 2019 – SWITZERLAND & GREECE**

### HACKAIR X LING TAN POLLUTION EXPLORERS

Pollution Explorers is a participatory air quality initiative in which people make sense of the quality of air in their environment through their innate subjective perception in combination with wearable tools and air quality sensors. The aim is to explore our collective responsibility and capacity and to improve air quality in neighborhoods through collective actions. The team worked with a total of 195 participants in the UK and Europe to activate communities to change their behavior and improve the quality of air.

**RESIDENCY FROM OCT, 2017 TO DEC, 2018 THE UNITED KINGDOM**

### GROW X KASIA MOLGA BY THE CODE OF SOIL

By the Code of Soil is a computer application (harmless virus) based on IoT and data from GROW Observatory sensors. When satellite Sentinel 1A passes the user location, it appears on users' computers as an a/v performance dictated by data from sensors nearby the user's location. (de)Composition is a multisensory time-based work inviting the audience to observe how soil changes thanks to living technology, bioindicators and "non-human" makers – earthworms, using GROW's digital tools to amplify and record soil transitions.

**RESIDENCY FROM NOV, 2017 TO JUN, 2019 THE UNITED KINGDOM**

### DANCE X HASEEB AHMED WIND AVATAR

Our minds are limited to the corporeal form of our bodies which have distinct capabilities and limitation. Working with the DANCE Lab, the project Wind Avatar directly links a person to the wind. The movements and emotions of a subject are translated into expressions of a character composed of a wind turbulence pattern visualized in a wind tunnel. By allowing a person to literally inhabit the wind, this project encourages new forms of emotional expression with all the freedom of the wind.

**RESIDENCY FROM SEPT, 2017 TO FEB, 2019 – BELGIUM**

### FLORA ROBOTICA X MARIA CASTELLANOS & ALBERTO VALVERDE THE PLANTS SENSE

The Plants Sense is an installation that allows the audience to learn and experience the secret language of plants. This is a transdisciplinary work connecting art, science, technology and society. The work consists of an interactive garden equipped with different sensors measuring the electrical oscillations of the connected plants, showing their

biochemical responses to the presence of humans and the environment that surrounds them.

**RESIDENCY FROM SEPT, 2017 TO FEB, 2019 GERMANY**

### NANO2WATER X HEHE O.R.S

O.R.S. (Orbital River Station) is a large-scale floating sculpture. Its form and color resemble an oversized life ring used to rescue people from the water. O.R.S. is an "observatorium", a vehicle for collecting and analyzing environmental information. Observation of the water happens directly in the river itself. O.R.S. collects data on the velocity of the river current, monitors water quality and identifies pollutants with analog and digital devices.

**RESIDENCY FROM NOV, 2018 TO SEPT, 2019 – PORTUGAL**

### APPLIED PHOTOSYNTHESIS X ANNE MARIE MAES SENSORIAL SKIN

Together with the biophysics lab at VU Amsterdam, AnneMarie Maes is developing a biotech/artistic device that will produce algal biomass and power sensors to monitor bee colony development inside the Intelligent Guerrilla Beehive. The hybrid device will be experimental, a proof of concept and its organic design will become an integral part of the Intelligent Guerrilla Beehive installation.

During the R&D a range of objects and artefacts based upon qualities of algae will be produced.

**RESIDENCY FROM MAY, 2019 TO MARCH, 2020 – THE NETHERLANDS**

### ARCTUR X MIHA TURSIĆ & SPELA PETRIĆ BECOMING.ECO(LOGICAL)

In a partnership with Arctur, CHE and Kersnikova Institute, the artists are attempting to picture the world of climate change composed with supercomputing capacities and enormous

quantities of data, while providing an opportunity to the non-represented environmental actors to contribute to this iconic image of the 21<sup>st</sup> century. The project demonstrates how human agency is embedded in the environmental condition and in turn a transition from the technological to the ecological world.

**RESIDENCY FROM MAY, 2019 TO MARCH, 2020 – SLOVENIA**



SMART&gt;SOS © Tim Otto Roth



## SHED LIGHT ON THE INVISIBLE

### CRITCAT X JOÃO MARTINHO MOURA SCI-FI MINERS

Sci-fi Miners is an audio-visual exploration of the possibilities generated by the nanotechnological advances in research on the replacement of critical materials which are very rare on planet earth by improved nanoparticle control. These materials, – critical metals, especially rare platinum group metals (PMGs) – are essential and used for heterogeneous and electrochemical catalysis. The artwork adopts two separate presentation approaches: participatory and performative. In both cases vision, audio and interaction are center-stage.

**RESIDENCY FROM SEPT, 2018 TO APR, 2019 – PORTUGAL**



## BIO4COMP X TIM OTTO ROTH SMART>SOS

SMART>SOS is a video and sound installation revealing a new paradigm of computation: a living calculation process on a sub-sub-microbiological level. The visitor watches a floor projection of a flower-like pattern of blue channels with white "worm"-like molecules - or "microtubules" - moving in. Over the projection hangs a ring of thirty loudspeakers reacting to the activity in the projected video from the microscope.

**RESIDENCY FROM SEPT, 2017 TO APRIL, 2018 – SWEDEN**

## HOT X STEFANE PERRAUD LIGHT MATTERS PROJECT

In this project, the team is developing an experimental installation combining art and science. It reveals research into advanced technology for optomechanics. This new research aims to develop a work on the interaction of light and matter. This approach entails conducting a series of laboratory experiments with a view to deepening these interactions, while questioning the philosophical scope of these exchanges and the potential impact on our apprehension of the world.

**RESIDENCY FROM DEC, 2018 TO DEC, 2019 – MALTA & FRANCE**

## IMMERSIFY X THERESA SCHUBERT IMMERSIVE MINIMALISM

Immersive Minimalism is a UHD video environment for a custom-developed Cellular Automata System. The project investigates modes of perception by creating minimalistic video scenarios that challenge our awareness of time and space. By implementing CA rules, the artist combined her research on the evolution of patterns in nature and self-organisation of forms with generative video. Surprisingly complex behaviours appear when all 33 million pixels on screen come alive as individual interacting cells.

**RESIDENCY FROM NOV, 2018 TO NOV, 2019 – POLAND**

## ART ATOM X EVELINA DOMINITCH & DMITRY GELFAND ATOM CHASM

Might it be possible for the weirdness of the quantum world to be directly perceived by our senses?

After being submerged into complete darkness to maximize optical sensitivity, viewers peer inside Atom Chasm, a laser-cooled ion trap where floating atoms emit light. Certain atoms suddenly disappear and reappear as their electrons make quantum leaps - an effect without a cause which still eludes explanation. Atom Chasm probes the limits of human perception at the origins of physical reality.

**RESIDENCY FROM OCT, 2018 TO MAR, 2020 – THE NETHERLANDS**

## CHROMDESIGN X CAROLIN VOGLER INSIDE-OUT

Inside-Out combines science, fashion & technology to make the blueprint of life visible to the human eye. The project uses research data from ChromeDesign to create knits and fashion designs. By visualizing chromatin structures and gene mutation as textiles, these complex topics assume a tangible, more approachable form and become easier to understand. Visitors are invited to explore the beauty of the human genome by touch and visuals - creating a bi-sensory experience.

**RESIDENCY FROM JUN, 2019 TO JAN, 2020 – SPAIN**

## EYES ON MARS X FELICIE D'ESTIENNE D'ORVES CONTINUUM

The Continuum project is a visual simulator of the Martian sunset based on scientific data collected alongside researchers specializing in Mars and its atmosphere. The collaboration with the Dynamic Meteorology Laboratory of Jussieu is a wonderful opportunity to integrate, real-time environmental data provided by The Mars Climate Database Projects into a visual simulator. The main outcome of the collaboration

is the integration of atmospheric scientific data to reproduce and animate the aura of the Martian sky..  
**RESIDENCY FROM JUL, 2019 TO MARCH, 2020 – FRANCE**

## LEVITATE X DOMINIQUE PEYSSON SUSPENDED MOMENT

Suspended moment is a zero-gravity meeting of two drops of inert matter, giving birth to living matter. A small-scale object theater, whose image will also be vastly enlarged and projected onto the ceiling by means of an optical process.

A dance of spiral mists that defies the laws of gravity, leaves its part to time, back and forth, chaotic hesitations, then the meeting, finally... One plus one is more than two, this is also our own story, replayed before our very eyes, in the simplest way.  
**RESIDENCY FROM MAY, 2019 TO MARCH, 2020 – SCOTLAND**



Chatroom of Things © So Kanno



## IMPROVE LIVING CONDITIONS

## WEKIT X DEVAL & LOSSEAU ATLAS

ATLAS is a work situated between digital and visual arts, taking the form of a scenographic exhibition hosting a mix of real models and an interactive virtual world, explored using Virtual Reality and Augmented Reality. Marie-G. Losseau begins by building imaginary cities by hand alone or with adults and children during workshops. Then Yann Deval proceeds to scan the houses in 3D as a way to immerse the audience through virtual experiences.

**RESIDENCY FROM DEC, 2017 TO NOV, 2018 THE UNITED KINGDOM**

## CREATE-IOT X SO KANNO CHATROOM OF THINGS

Chatroom of Things is an interactive installation which sheds light on the perceptual change to the post IoT era.

What looks like an ordinary living room on closer inspection reveals that the pieces of furniture have social media accounts and are having conversations with each other on the display. Sometimes they interact with visitors, sometimes they engage in discussions - questioning how objects see and perceive the world and can actually become active agents.

**RESIDENCY FROM JAN, 2018 TO DEC, 2018 NORWAY**



**AARHUS CITY LAB X WALID BREIDI  
& VIRGILE NOVARINA**  
**SLEEP IN THE CITY**

The aim of the project is to sensitize people to the profound importance of sleep through performance, interactive art and networks. The idea is to connect city sleep with networks and open data in order to create interactive poetic videos projected all around the city in real time while the participants sleep.

**RESIDENCY FROM OCT, 2018 TO JUN,  
2019 – DENMARK**

**CONTENT4ALL  
X CHRISTOPHE MONCHALIN**  
**MUTED**

Muted is a virtual reality experience that poetically tackles the subject of abandonment through childhood memories and sign language. On stage, two dancers tell the user a childhood memory in sign language. From their gestures and movement, poetic illustrations and animations (2D & 3D) appear in space. The whole experience weaves a small story, rendered understandable without words.

**RESIDENCY FROM SEPT, 2019 TO MAR,  
2020 – GERMANY**

**SOUNDS FOR COMA  
X JOE ACHESON & ALI TOCHER**  
**RANDOM BEAUTY**

Sounds For Coma is a multidisciplinary collaboration between cognitive neuroscientists from IRCAM's CREAM Team, Saint-Anne's Hospital ICU staff and sound artists Joe Acheson & Ali Tocher. The project has three aims; designing and using sounds as a way to explore states of consciousness in a coma, improving the soundscape of the ICU environment with the aim of reducing anxiety in patients, designing more informative and less anxiety-inducing alarms.

**RESIDENCY FROM APR, 2019 TO FEB, 2020 – FRANCE**

**LUCA X REIKO YAMADA**  
**BEYOND ABSOLUTE**

Beyond Absolute is the creation of personalized acousmatic soundscapes based on the data generated by the LUCA diagnostic device in conjunction with sonic alterations that represent the subjective mindset of thyroid cancer patients. The title of the project refers both to the representational character of the work (as opposed to absolute music), but also to the effort it makes to transcend, without denying, the objective physiological measurements at the root of modern scientific medicine.

**RESIDENCY FROM MAY, 2019 TO MAR, 2020 – SPAIN**

**PROGRAMMABLE MATTER  
X "SCENOCOSME:  
GREGORY LASSERRE  
& ANAIS MET DEN ANCXT"**  
**REACTIVE MATTER**

The Reactive Matter is made of small robots: "the Blinky Blocks" based on claytronic atoms (or catoms). The principle is to create small interactive objects that can be assembled to create large structures. They can be assembled like cells and have the ability to function in interdependence but can communicate with each other. Our artistic aim is to use the Blinky blocks to create several sculptural and interactive artworks with organic behaviors.

**RESIDENCY FROM MARCH, 2018 TO OCT,  
2019 FRANCE**



Constella(c)tions © all rights reserved



**AUGMENT  
THE POSSIBILITIES OF  
ARTISTIC CREATION**

**VIRTUAL CLOSE UP  
X LAURENT BAZIN**

**MY FEARS MURMURED TO YOU**  
By working with Virtual Close Up by Gengiskhan, Laurent Bazin hopes to demonstrate that it is possible to shoot simple yet overwhelming things in immersive filmmaking, if and only if we have the technological means to capture them. If these details can be captured using a 360° camera, then it will be possible to tell very delicate stories, filled with unsaid things, without resorting to dry emphasis.  
**RESIDENCY FROM OCT, 2018 TO JAN, 2020 – FRANCE**

**LE CUBE X JULIE DESMET WEAVER  
FROTH OF THE DAYDREAM**

The challenge facing the project is to prototype immersive and interactive content for collective virtual reality based on the artist's scenarios of *Froth of the Daydream* by Boris Vian: imagining and staging a collective experience using 360° projection and both individual and crowd interactive technologies to serve the artistic project and create a sensitive and emotional experience for the public.  
**RESIDENCY FROM JULY, 2018 TO JULY, 2019 – FRANCE**

**VVVV X NATAN SINIGAGLIA  
STILL**

Still is an audio-visual work performed by electro-acoustic instruments, dancer and custom software. During the performance, these multiple components join together to generate real-time visuals projected in the space, together with an immersive soundscape. The project is the result of the collaboration between Natan Sinigaglia and the vvvv software development studio. The vvvv team is supporting the artist in shaping the technical tools that he needs to create the final artwork.

**RESIDENCY FROM APR, 2019 TO DEC, 2019 – GERMANY**

**BECOME X MICHELLE AGNES  
MAGALHAES  
CONSTELLA(C)TIONS**

In close collaboration with the Interaction Sound Music Movement team (IRCAM), this project proposes the creation of a sonic environment out of which an interactive and collective musical work emerges. Configured as a mix of musical set and installation, this musical space harnesses cell phones as its interface. It proposes to shift towards a new paradigm for musical scores through the appropriation of web audio tools, mobile technologies and musical instruments.  
**RESIDENCY FROM MAY, 2019 TO FEB, 2020 – FRANCE**

**OM7/OM-SPAT X AARON EINBOND  
COSMOLOGIES OF THE CONCERT  
GRAND PIANO**

Cosmologies explodes the space inside a concert grand piano out into the space around the concert hall audience. In collaboration with OM7/om-spat, the team will develop novel approaches to artificial intelligence and machine learning to decipher the intricate interdependencies of timbre and space that bring the instrument to life. The resulting work will delve into the musical microcosm of the piano interior to situate the listener in a flickering filigree of its real and imaginary sounds.  
**RESIDENCY FROM MAY, 2019 TO FEB, 2020 – FRANCE**



**FUTURELAB X RAFAL ZAPALA  
SENSORIUM AUDIO THEATRE**

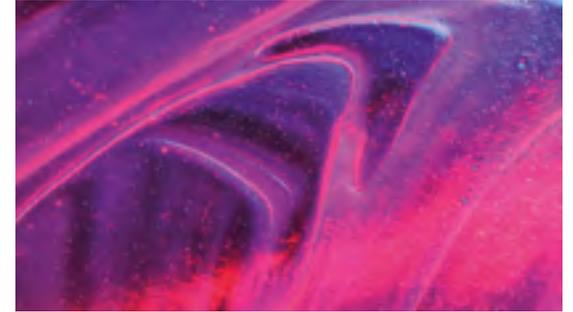
Sensorium Audio Theatre consists of transposing the structure and dynamics of visitors' emotional reactions onto musical structures in a direct "live" experience. The objective is to create an environment which lets visitors hear their psycho-physical reactions through composed music. The idea of an immersive sound theatre, operated by the brain, skin and heart is imbued with the spirit of holistic and integral perception of human emotions, intellect and physiology.  
**RESIDENCY FROM JUL, 2019 TO FEB, 2020 – POLAND**

**3DMP LIVING  
X SEBASTIEN WIERINCK  
ONSITE\_LIVING\_3D**

The main goal of the OnSite-3DMP project is to develop a new work-flow for both designing and producing variable and customizable functional sculptures with metal printing at 3DMP acting as the main technological innovation factor. The production of a series of artworks should allow us to show the multiple possibilities of this new design and production system and this on several scales, from small objects to larger environmental and architectural integrations.  
**RESIDENCY FROM SEPT, 2019 TO MARCH, 2020 – GERMANY**

**DATA PITCH X EGOR KRAFT  
CONTENT AWARE STUDIES**

The project initiates an inquiry into the possibilities of Artificial Intelligence (AI) and particularly Machine Learning (ML) to reconstruct and generate lost antique Greek and Roman friezes and sculptures by means of algorithmic analysis of 3D scans of antiquity. It concerns the potentialities of methods involving data, ML, AI and other forms of automations turning into semi- and quasi-archeological knowledge production and interpretations of history and culture in the era of ubiquitous computation.  
**RESIDENCY FROM JUL, 2019 TO MARCH, 2020 – THE UNITED KINGDOM**



Spelaion © Collectif Toast



**COUNTERACT  
SOME OF THE LIMITS  
TECHNOLOGIES  
ARE SUBJECT TO**

**DECODE X LARISA BLAZIC  
DATA UNION FORK:  
TOOLS FOR DATA STRIKE**

Data Union Fork – Tools for Data Strike is an art project building on Decode OS and nodes for decentralized ownership and control of data, a software infrastructure developed by Dyne.org as part of the DECODE project. Data Union Fork aims to develop a collective, creative and democratic response to the social, economic and cultural implications of mass data harvesting through public engagement and artistic intervention.  
**RESIDENCY FROM SEPT, 2018 TO JAN, 2020 – THE NETHERLANDS**

**CONFIRM X MIKA SATOMI  
ARTIFICIAL INTELLIGENCE  
AND ITS FALSE LIES**

"What do you do?" We tend to identify ourselves with the jobs we do. It is more than something we do for a living. The introduction of AI to our workplaces is something that is often discussed with a slight degree of anxiety. Even with the promise



of shorter working hours and economic benefits, we feel uneasy about giving up our work to AI. The project is a workwear series equipped with AI to make decisions. The workwear turns the wearer into an executor, a body for AI. Will we still identify with the jobs we execute for AI?

**RESIDENCY FROM MAY, 2019 TO MARCH, 2020 – IRELAND**

### **AMORE X THEO BLUEPRINTS FOR AN EMERGENT PERSONALITY**

As the AMORE lab honed a cutting-edge computational algorithm, a form of self-learning artificial intelligence, artist Theo explored whether an evolving intelligence of this kind could be treated like a developing infant mind, ultimately probing our (in)ability to empathize with non-human intelligence. Confusion, disembodiment and anxiety characterize the six large, mixed media pictures and the 140-page research sketchbook that emerged from this synthesis of subjective and objective analysis into the AMORE model's worldview.

**RESIDENCY FROM MARCH, 2017 TO DEC, 2018 SPAIN**

### **DEAN X COLLECTIF TOAST SPELAION**

It is difficult to anticipate the side effects a technology may produce in the future. We often have to solve problems that we created ourselves once it is almost too late. Plastic, and our difficulty in properly handling it after its use, illustrates this phenomenon perfectly.

SPELAION is an installation that points to the absurdity of the way we develop technologies. It uses brand new research in polymers to question the meaning of fast-paced technological advancement.

**RESIDENCY FROM SEPT, 2018 TO MAR, 2020 – FRANCE**

### **CHIPAI X MATTHEW BIEDERMAN MARK II SPIKING PERCEPTRON**

The ChipAI project at INL reimagines computing at its most basic level by using light and sensors to create a neuromorphic architecture rather than electronic gates (transistors) as used in classic von Neumann-based systems. The earliest artificial intelligence computer, the Mark I Perceptron, built by Frank Rosenblatt in 1958 was also inspired by nature – in this case a fly's eye. The team's research explores the concepts of natural technologies and their relationship to pioneering technologies.

**RESIDENCY FROM JUL, 2019 TO FEB, 2020 – PORTUGAL**

### **ART ANTENNA X STANZA INVISIBLE AGENCY**

Invisible Agency. Alternative Visions of Reality. Investigating the ethics of data manipulation and trust in the area known as the Internet Of Things across distributed networks to create aesthetic experiences facilitating a new understanding of networked space. Invisible Agency might therefore potentially become an artistic data visualization interface connecting real time city spaces to produce a dynamic co-creation artwork.

**RESIDENCY FROM JUN, 2019 TO DEC, 2019 – PORTUGAL**

### **DATA STORIES X FANSHEN SMOKING GUN**

Smoking Gun takes a playful approach to exploring the power of data in a post-truth world. It's a thriller which unfolds via your phone, placing you at the heart of a potential whistleblower scandal. Over five days, you must solve puzzles, scrutinize documents and wrangle datasets to uncover what is really going on at the heart of government. But as your investigations take you deeper, nothing seems as clear-cut as the whistleblower is making out. Maybe it's time to go back to the data...

**RESIDENCY FROM JUL, 2019 TO MARCH, 2020 – THE UNITED KINGDOM**

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