
S+T+ARTS
INNOVATION
IN AND FOR
EUROPE
European
Commission
S+T+ARTS
SCIENCE + TECHNOLOGY + ARTS

Cover photos
Broken Spectre
Richard Mosse
Grand Prize 2023
© Richard Mosse, Jack Shainman and Carlier Gebauer

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INTRODUCTION

It has long been an established fact that innovation is at the core of a competitive economy. Europe has historically focused its attention in engineering on R&D and standardization. In the most recent years, however, an increasing number of high-tech companies, worldwide, have claimed that, in addition to scientific and technological skills, the critical skills needed for innovation to happen and to be of value for society are skills such as creativity rooted in artistic practices. Innovation for sustainability and across sectors, is precisely what is called for if we are to tackle the social, ecological and economic challenges that Europe will be facing in the near future.

Since 2016, the S+T+ARTS Programme (Science, Technology and Arts) draws attention at a nexus at which insightful observers have identified extraordinarily high potential for innovation. In this S+T+ARTS initiative, the European Commission's focus is on projects and people that can make meaningful contributions to this effort.

This brochure is designed to showcase some of the S+T+ARTS Prize's and S+T+ARTS Programme's success stories and most inspiring examples, as well as the impactful methodologies and approaches the Programme has developed over the years to trigger interdisciplinary and collaborative innovation in various fields of society.

S+T+ARTS PRIZE

The European Commission's S+T+ARTS Prize initiative is designed to spotlight people and projects that have the potential to make a sustainable positive impact on Europe's economic, technological, social and ecological future. This competition seeks innovative projects at the nexus of science, technology and the arts, and honors the best of them with the S+T+ARTS Prize.

INNOVATIVE COLLABORATION + ARTISTIC EXPLORATION

The S+T+ARTS Prize competition is stages annually in two categories.
The two S+T+ARTS Prize winners each receive €20,000 and are prominently featured by Ars Electronica and other events organized by partners, including BOZAR, INOVA+, Waag Futurelab, T6 Ecosystems, La French Tech Grande Provence or Frankfurter Buchemesse.

Grand Prize for INNOVATIVE COLLABORATION is bestowed on innovative joint ventures involving industry/technology and the arts, alliances that blaze new trails for innovation

Grand Prize for ARTISTIC EXPLORATION honors artistic experiments and works of art that employ technology in ways that exhibit great potential to influence and change technology and how it is deployed, developed and perceived.

S+T+ARTS Prize framework since 2016

200+ S+T+ARTS Prize projects

100+ Advisors

50+ Jury members

The S+T+ARTS Prize Trophy was designed by Nick Ervinck. The Belgian artist explores the boundaries between various media, fostering a crosspollination between the digital and the physical. He applies tools and techniques from new media, in order to explore the aesthetic potential of sculpture, 3D prints, animation, installation, architecture and design. TAWSTAR, 2016 / © Peter Verplancke.

S+T+ARTS AND INNOVATION

INNOVATION WITH A PURPOSE

The current challenge is to embrace a systemic approach that recognizes the interdependencies and connections among human systems, Earth systems, and technological systems. This involves acknowledging contextual specificities and experiences. Ultimately, our ability to take this comprehensive approach will play a crucial role in ensuring the sustainability of the systems on which humanity relies.

A CATALYST FOR INNOVATION

At its core, S+T+ARTS acts as an innovation catalyst, strategically identifying key stakeholders and forging the connections needed to bring visionary ideas to life. This interdisciplinary approach bridges the gaps between culture and art, research, and industry, driving innovation with unwavering determination. The collaborative spirit of S+T+ARTS encourages fresh perspectives on contemporary challenges. In this unique environment, science and art converge with a shared vision, creating a powerful force for change.

S+T+ARTS also takes the role of mediator and supporter on several levels. It offers artistic, business, and technical support, fostering a holistic environment for innovation to thrive.

TRACEWASTE : Urban Garbage Mobility
Susi Gutsche, Mapbox
S+T+ARTS Prize 2023 Nomination
Courtesy of Susi Gutsche

Broken Spectre
Richard Mosse
Grand Prize 2023
© Richard Mosse, Jack Shainman and Carlier Gebauer

FOSTERING IMAGINATION AND ANTICIPATION A PATH TO BREAKTHROUGH INNOVATION

Central to S+T+ARTS is the recognition of artists as catalysts for change and innovation. The projects within S+T+ARTS explore the potential of artists to inspire a critical examination of the current state, a limitless exploration of its boundaries, and the reimagining of alternative futures.

S+T+ARTS-selected or supported projects are led by artists whose critical, aesthetic, and visionary perspectives transcend technology's boundaries. Artists have a knack for diverting technology from its original path, expanding its potential, and anticipating solutions that have yet to be realized. Working with artists and participating in S+T+ARTS projects provides a unique opportunity for partners to identify uncharted avenues for innovation, potentially reshaping the economy of the future.

The ultimate reward for research, industry or tech partners is the potential to lead breakthrough innovation rather than incremental advances.

In a world where art, science, and technology converge, S+T+ARTS sets the stage for transformative change. It is the nexus where innovation thrives, envisioning a future where progress is both impactful and inclusive.

INSPIRING IDEAS
INNOVATIVE SOLUTIONS

The S+T+ARTS experience showcases and highlights how the framework funded by the European Commission does not only support the communication of specific topics to audiences, but also creates new outputs or research frameworks to address complex issues.

Over the last twenty years new enthusiasm has characterized the interest in the intersection between art and science but with recently growing societal challenges (e.g., climate change, war, disinformation) it is important to re-think our research agendas by deconstructing current theoretical frameworks and by providing new solutions.

In this context, what defines an inspiring story for the S+T+ARTS Programme is a pivotal question. The overview offered in this brochure is articulated alongside two major axes: the visionary nature of the solutions on the first hand, and the applicability of the solution in the industry or in business endeavors, on the second hand.

VISIONARY CONCEPTS AND IMPACTS

Inspiring stories from the S+T+ARTS Prize and more broadly the S+T+ARTS community are deeply rooted in a profound commitment to visionary concepts that boldly challenge established norms. By doing so, these projects give access to new kinds of understanding and knowledge, fostering a collective consciousness that transcends cultural and disciplinary boundaries.

INDUSTRIAL TRANSFORMATION AND TECHNOLOGICAL PROGRESS

Our most inspiring examples within S+T+ARTS also revolve around the transformative influence of art in industrial contexts or business applications. These projects specifically explore the intertwining spheres of environmental and industrial concerns, particularly in areas such as energy, waste, and material research.

The lens through which these projects are examined and selected, extends to initiatives proposing innovative solutions for public spaces and fostering creative do-it-yourself applications. Of paramount importance is the relentless pursuit of alternatives to materials derived from fossil energy or animals, aligning with a broader ambition to create a more efficient and sustainable organizational framework.

The projects highlighted in the following pages exemplify significant developmental potential and embody genuine social innovation, a common thread among selected S+T+ARTS projects.

Even for projects that have not formed partnerships with the industry or ventured into startup creation, there remains a pronounced inclination or enthusiasm for business, even in their early stages. S+T+ARTS recognizes and appreciates projects led by artists who may not necessarily aim for commercial outcomes, acknowledging the diverse motivations that drive creative endeavors.

FACING CONTEMPORARY CHALLENGES NAVIGATING CONNECTED SYSTEMS

Let's now embark on an exploration that challenges conventional norms. The projects introduced in the following pages have been identified from the pool of S+T+ARTS Prize selected projects (Grand Prize winners, Nominations and Honorary Mentions), as well as other demonstration cases from the S+T+ARTS ecosystem.

1 Visionaries Unveiled

ENVIRONMENTAL COMMONS AND DATA VISUALIZATION

In this first category, the narratives put forward invites an examination of how art effectively utilizes tools to amplify information, facilitating a deeper understanding of new perspectives.

Over the recent years, S+T+ARTS Prize has observed a stronger focus and effort on improving our collective digital understanding of the environment, focusing on the art-driven interpretation of environmental challenges, concerns and urgencies, supported by AI, data-driven, computational and media works.

This, in turn, empowers a diverse audience to embrace and engage with these questions and challenges, enabling them to actively participate in social transformation.

Antarctic Resolution
Giulia Foscari, UNLESS
Grand Prize 2022
Exhibition at the Venice Biennale, Courtesy of UNLESS
© Delfino Sisto Legnani

ENVIRONMENTAL COMMONS AND DATA VISUALIZATION

Pollinator Pathmaker | Alexandra Daisy Ginsberg (GB)
Grand Prize 2023 | Artistic Exploration
starts-prize.aec.at/en/pollinator-pathmaker

If pollinators designed gardens, what would humans see?

Pollinator Pathmaker is a growing series of algorithmically-generated living artworks, designed to maximise empathy towards pollinating insects. It is a groundbreaking blend of art, science, and technology that offers sanctuaries for pollinators, nurturing biodiversity and bolstering our ecosystem's resilience. Beyond the living artworks themselves, ***Pollinator Pathmaker*** extends its reach online, empowering citizens by providing a web application interface, allowing them to leverage the power of its algorithm. Through this virtual platform, individuals can actively participate in environmental conservation by designing their personalized pollinator-friendly artworks.

What's conceptually interesting about the challenge is that it presents this fundamental question of what is a garden and who is it for? That's a real mind shift.
Alexandra Daisy Ginsberg, From Disegno, January 2022

Pollinator Pathmaker
Alexandra Daisy Ginsberg
Grand Prize 2023
Photo : The Pollinator Pathmaker online tool, pollinator.art.
© Alexandra Daisy Ginsberg Ltd
Courtesy of the artist

Alexandra Daisy Ginsberg aims to create the world's largest climate-positive artwork. Pollinators, such as bees, butterflies, and wasps are indispensable for the flourishing of ecosystems. However, their populations are rapidly declining at an alarming rate. Whether due to human-made habitat loss, pesticides, invasive species or climate change, the reasons for their deaths are many and the consequences are devastating. The loss of a pollinator species often means the extinction of a plant species that relies specifically on them for pollination.

In response to this, Alexandra Daisy Ginsberg created *Pollinator Pathmaker*. The online platform with its unique algorithm helps to create an "empathetic" planting plan that favors the greatest possible diversity of pollinator species. The algorithm follows a set of rules using the inputs - pollinator species and the plants they forage from - to calculate the planting design. It then selects and arranges plants to suit the different preferences of their visitors.

Alexandra Daisy Ginsberg has exhibited internationally, including at MoMA New York, the Museum of Contemporary Art, Tokyo, the National Museum of China, the Centre Pompidou, The Center for Fine Arts BOZAR Brussels, and the Royal Academy. Her work is held in private and museum permanent collections, including the Art Institute of Chicago, the Cooper Hewitt Smithsonian Design Museum, Therme Art, and ZKM Karlsruhe. Ginsberg is a resident at Somerset House Studios, London, and opened her first American solo exhibition at the Toledo Museum of Art in April 2023.

Artist: Alexandra Daisy Ginsberg
Algorithm developer: Dr Przemek Witaszczyk
Designer and Researcher: Iman Datoo
Horticulture: Colin Skelly
Producers: Hannah Andrews, Ruby Dixon
Studio manager: Freire Barnes
Originally commissioned by the Eden Project and funded by Garfield Weston Foundation
Additional founding supporters: Gaia Art Foundation
Collaborators: Google Arts & Culture
The International Edition Founding Commissioners are LAS Art Foundation

Alexandra Daisy Ginsberg was awarded the World Technology Award for design in 2011, the London Design Medal for Emerging Talent in 2012, and the Dezeen Changemaker Award 2019. Her work has twice been nominated for Designs of the Year (2011, 2015), with Designing for the Sixth Extinction described as "romantic, dangerous…and everything else that inspires us to change and question the world".

ENVIRONMENTAL COMMONS AND DATA VISUALIZATION

Broken Spectre | Richard Mosse (IE)
Grand Prize 2023 | Innovative Collaboration
starts-prize.aec.at/en/broken-spectre

Developed from 2018 to 2022, *Broken Spectre* is a 74-minute immersive film meticulously crafted to document the destruction, degradation, and environmental crimes plaguing the Amazon Basin and its interconnected ecosystems.

The project incorporates the use of powerful scientific imaging technologies. This integration facilitates the communication of a new and impactful experience and serves as a novel force that resonates with viewers' minds and senses, conveying both knowledge and emotions. By tapping into the capabilities of advanced scientific imaging, *Broken Spectre* provides a profound and nuanced insight into the complex, multidimensional, and large-scale issues in the region.

Illegal logging, slash-and-burn agriculture, gold digging, prospecting, and panning, damming of rivers and the resulting floods, theft of indigenous lands, the establishment of vast monocultures, and factory farming - Richard Mosse documents the widespread but often invisible fronts of industrialized ecocide in the Amazon Basin.

His dreamlike, immersive video tells of violent excesses against nature and humans and asks about the responsibility that regional, national and international systems bear in the process. The narration in *Broken Spectre* plays with the iconography of Western films, focusing on a natural paradise and its indigenous population, who are colonized by righteous, hardworking pioneers-cowboys.

Just as scientists use imaging techniques to make processes visible and comprehensible, Richard Mosse, too, relies on technology to shed light on profit-oriented machinations. He uses a multispectral camera for aerial photography to capture the systematic organization and vast scale of the burning forest, UV microscopy to produce reflective and fluorescent ultraviolet macro time-lapse images of the forest biome, and analog S35-mm infrared film to visualize infrared light reflected from rainforest chlorophyll above 720 nm.

Broken Spectre
Richard Mosse
Grand Prize 2023
Film still © Richard Mosse, Jack Shainman and Carlier Gebauer

Mosse's work is highly innovative in many ways: using the world's first multispectral camera for Geographic Information Systems (GIS) to shoot using S35mm B&W infrared film, using x2 anamorphic lenses, films that no film lab would process. He created a film lab in the process of making Broken Spectre, and he broke the boundaries of disciplines and technologies to show the breakdown of the Amazon and our global ecosystem. Finally he worked with photographic technologies based on the European Space Agency's Sentinel 2 multispectral remote sensing program.

Mosse was awarded the Prix Pictet (2017), the Deutsche Börse Photography Prize (2014), and a Guggenheim Fellowship (2011). His work has been exhibited at the Akademie der Künste, Barbican Art Gallery, Hamburger Kunsthalle, Hayward Gallery, Louisiana Museum, National Gallery of Art, National Gallery of Victoria, SFMOMA, and he represented Ireland at the 55th Venice Biennale.

Director, producer: Richard Mosse
Cinematographer, editor: Trevor Tweeten
Composer, sound design: Ben Frost
Digital colorist, post-production: Jerome Thelia
Film processing and studio manager: Matthew Warren
Film processing advisor: Cary Kung
Film processing assistant: Kimin Kim
Film scanning: Metropolis Film Lab
Fixer, translator, driver: Gabriel Uchida
Fixer, translator, driver: Alessandro Falco
Fixer, translator, driver: Marco Lima
Fixer, translator: Gabriel Bogossian
Fixer, translator: Alejandro del Solar Bravo
Production assistant: Diana Morales Ocegueda
Driver: Edimar Tozzo
Helicopter: Aereo Especial
Multispectral camera engineer: Jeffrey Carson Spectral Devices
35mm camera rental: Hand Held Films
Sound engineer: Mike Amacio, Carlos Boix
Advisor: Jon Lee Anderson
Cloud forest guides: Alex Guevara, Arlette Arn
Yanomama translator: Ana Maria Antunes Machado

ENVIRONMENTAL COMMONS AND DATA VISUALIZATION

Antarctic Resolution | Giulia Foscari & UNLESS (IT)
Grand Prize 2022 | Innovative Collaboration
starts-prize.aec.at/en/antarctic-resolution

What happens in Antarctica does not stay in Antarctica.
Antarctic Resolution stands out for its compelling mission: addressing the lack of understanding about Antarctica's fragile ecosystem and its global significance. While Antarctica holds an iconic status in symbolizing planetary change, the project goes beyond mere surface-level awareness. It addresses the root causes and consequences of environmental changes, establishing itself as a pivotal source of information and knowledge for shaping future environmental policies. This unique approach positions the project as one of the most extensive and diverse collaborations ever acknowledged for its innovative efforts.
With a commitment to accessibility, *Antarctic Resolution* also functions as an open access platform, ensuring that its insights reach a wide audience and contribute to a broader understanding of Antarctica's fragile ecosystem and global significance.

Accounting for 10% of the landmass, 70% of the freshwater, and 90% of the ice of Planet Earth, Antarctica is the largest repository of scientific data on our climate history, essential to inform crucial environmental policies, and the greatest menace to global coastal settlements threatened by the rise in sea levels induced by anthropogenic global warming.

Antarctic Resolution
Giulia Foscari, UNLESS
Grand Prize 2022
Exhibition at the Venice Biennale, Courtesy of UNLESS
© Delfino Sisto Legnani

Antarctic Resolution was conceived to catalyse global attention to one of our few Global Commons and create a constituency for our only continent without an indigenous population, with the ambition of contributing to the protection of the Antarctic, and in turn, of our own species. The threat that Antarctic ice thinning poses to our own lives and those of future generations is real. The kilometers-thick ice sheet is currently melting at the alarming pace of 200 Olympian swimming pools per minute, and the total meltdown of Antarctic ice would increase global sea levels by 60 meters, launching the largest migration ever witnessed by humanity.

Developed as a transnational and multidisciplinary collective effort, *Antarctic Resolution* was launched on occasion of the bicentenary of the first recorded human landing on the continent in the format of a 1000-page volume published by Lars Müller Publishers and authored by the 150 leading world Antarctic experts.
Alongside rigorous academic research, the volume presents an unprecedented visual portfolio including photographic essays, data-driven infographics, cartographies, and architectural drawings. The research was presented in homonymous site-specific exhibitions within the Central Pavilion of the 17th International Architecture Biennale (Venice, Italy) and at the Museo Nacional Thyssen-Bornemisza on the occasion of the 30th anniversary of the Protocol on Environmental Protection to the Antarctic Treaty (Madrid, Spain). True to the twofold ambition implicit in its title to construct a high-resolution image of the continent and advocate for *Antarctic resolutions*, on occasion of the 44th Antarctic Treaty Consultative Meeting (ATCM) held in Berlin, the project evolved beyond the walls of cultural institutions, taking over the German capital with a campaign "Speak Up for Antarctica Now."

Antarctic Resolution. Publication
Editor: Giulia Foscari / UNLESS
Authors: 150 interdisciplinary specialists (full list in project URL)
Data/Images: 82 organizations & archives, 27 artists (full list in project URL)
Cartography/Infographics: UNLESS, The Polar Lab, Pomo
Architectural Drawings: UNLESS, The Polar Lab
Publisher: Lars Müller Publishers

Antarctic Resolution. Exhibition in Venice, Italy
Exhibitor: Giulia Foscari / UNLESS
Featured: Arcangelo Sassolino; David Vaughan; D-Air Lab
Collaborators: Lars Müller Publishers, Scott Polar Research Institute #SpeakUpForAntarcticaNow. Campaign in Berlin, Germany
Concept: UNLESS with Carlo Barbante, Alan D. Hemmings, James N. Barnes
Graphic design: Studio Vedet and HaugHaug.
Photographers: Shaun O'Boyle, Sebastian Copeland, Andrea Izzotti, Spencer Lowell, James Morris, Paolo Pellegrin, Emil Shulthess, John Weller, Norbert Wu
With support from: D-Air Lab; Fondazione Giuseppe e Pericle Lavazza; Furthermore: a program of the J. M. Kaplan Fund; Graham Foundation for Advanced Studies in the Fine Arts; Thyssen Bornemisza Art Contemporary TBA21; Ursula Stein.

DIGITAL COMMONS

With digital technologies dominating people's everyday lives, artists and creatives are pointing their efforts toward improving digital literacy, developing ways to share the benefits of digital solutions, and, if necessary, activism.

Holly + | Holly Herndon (US), Mathew Dryhurst, Herndon Dryhurst Studio (GB)
Grand Prize 2022 | Artistic Exploration
starts-prize.aec.at/en/holly-plus

A digital twin *Holly+* that anyone can use to make music, developed by to experiment with. Beyond enabling individuals to easily and rapidly unleash their creativity, *Holly+* provides fresh insights into innovative governance models. With *Holly+* "merges" a new custom voice instrument with a creative platform and a test of a decentralized and cooperative economic model that can have deep implications in changing the power dynamics of copyright and Intellectual Property in the music industry, while raising questions of the interdependencies of a digital economy, digital sovereignty, and digital identity.

Holly+
Holly Herndon, Mathew Dryhurst, Herndon Dryhurst Studio
Grand Prize 2022
© Andrés Mañón

The first *Holly+* instrument allowed anyone to upload polyphonic audio to https://holly.plus and receive a version sung back in Holly's voice. Since then, more instruments have been developed collaboratively by Herndon Dryhurst Studio, Never Before Heard Sounds (NYC), and Voctro Labs (Barcelona).

This new model for the stewardship of digital identities challenges common pessimistic narratives around "deepfakes" while addressing relevant concerns. Hundreds of people now hold partial governance of Holly's digital twin as part of *Holly+* DAO (Decentralized Autonomous Organizations), which provides an incentive to vote on appropriate usage. A DAO is a legal structure operating on blockchain technology, that has no central governing body and whose members share a common goal to act in the best interest of the entity. Once approved, any art made with her voice can be verified by tracing its provenance back to the public *Holly+* DAO identity. This means that if a piece of media is created that is offensive or uncharacteristic, it can easily be dismissed unless approved by voting stewards.

Any profits made from the sale of approved works using her digital voice are shared between the creator (50%), the DAO (40%), and Holly herself (10%). Money ingested into the DAO treasury is then used to create more instruments for people to create work as *Holly+*, creating a virtuous cycle and economy around her intellectual property. To date, 70 works have been sold from artists releasing work with *Holly+*, with much more planned in the coming year. Holly sees this as the first example of a permissive approach to IP in the AI era which she refers to as "Identity Play". Rather than prohibiting people from using her digital voice, she instead proposes a positive vision in which anyone may be invited to experiment with someone else's identity in a fair and transparent manner.

The first *Holly+* performance was presented in collaboration with Sonar AI and Music Festival, supported by S+T+ARTS in 2021. This was the first performance of live machine learning *identity play* in history. Holly Herndon has toured her influential musical albums PROTO (4AD) and Platform (4AD) globally, most recently with a choir composed of human and AI voices.

Holly Herndon is an American multi-disciplinary artist based in Berlin. Her work involves building new technologies to experiment with her voice and image, facilitated by critical research in Artificial Intelligence and decentralized infrastructure.

2 Industrial Transformation

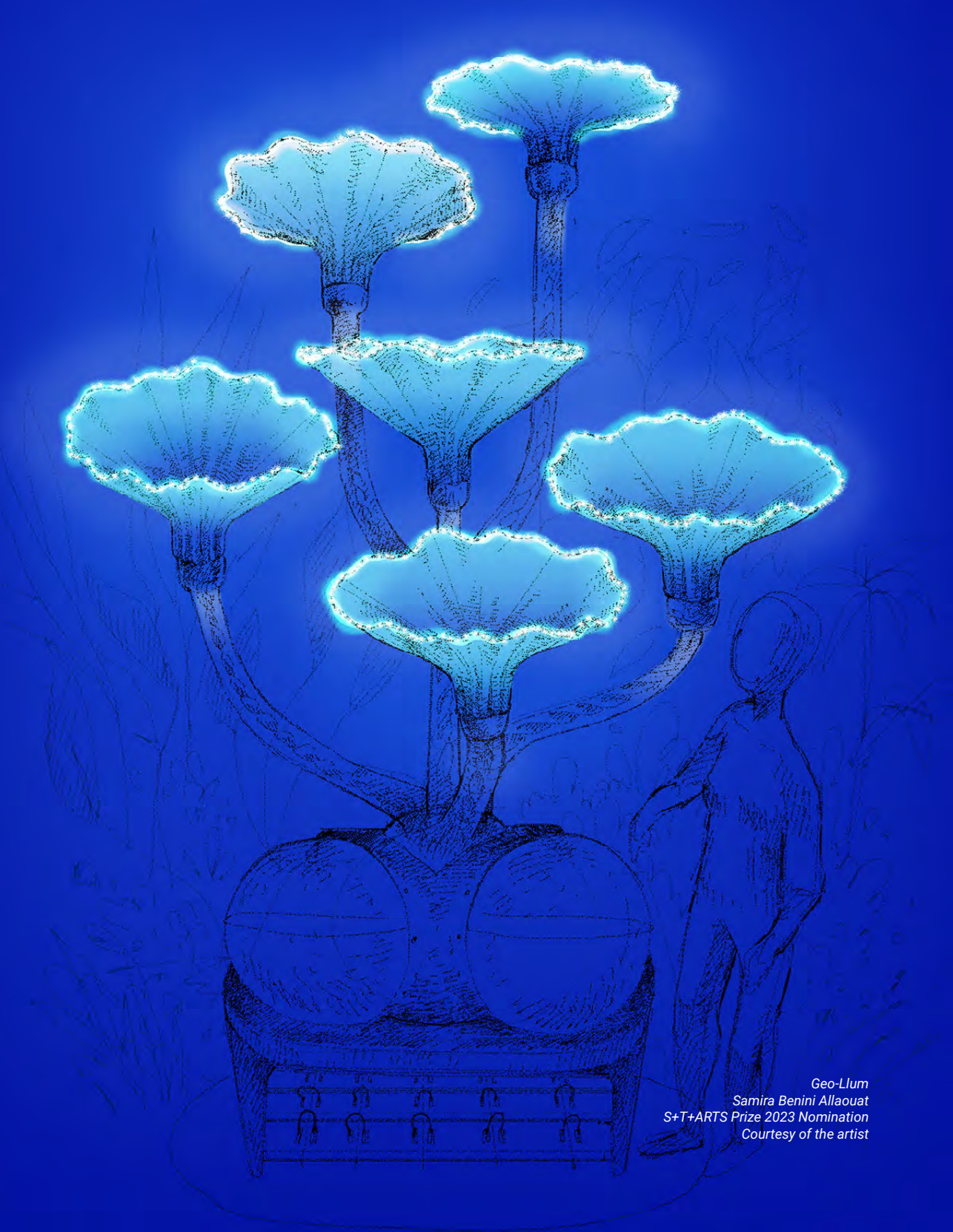
Witness art's industrial metamorphosis addressing the challenge of adopting a holistic approach, this segment directly engages with the business realm, showcasing how artistic applications not only deliver tangible impact but also drive technological progress. This is achieved in a manner that is both environmentally and socially sustainable, contributing to a desirable future.

ENERGY PRODUCTION

In the rapidly evolving landscape of the energy sector, we collectively face challenges that demand innovative solutions. Current concerns include the urgent need for decarbonization, the optimization of renewable energy sources, and the development of efficient energy storage technologies.

The growing demand for power, coupled with the need to modernize aging infrastructure, presents formidable hurdles. Looking ahead, the future holds even greater complexities, such as integrating emerging technologies, enhancing grid resilience, and addressing socio-economic implications of energy transitions. S+T+ARTS holds great potential in navigating these challenges: providing fresh perspectives, facilitating the creation of holistic solutions, inspiring innovative approaches to communication, education, and public engagement, helping to anticipate and frame the multifaceted issues at stake in the energy transition.

S+T+ARTS not only opens avenues for groundbreaking technologies but also ensures that the societal and cultural dimensions of energy transitions are carefully considered, contributing to a more sustainable and equitable energy future.



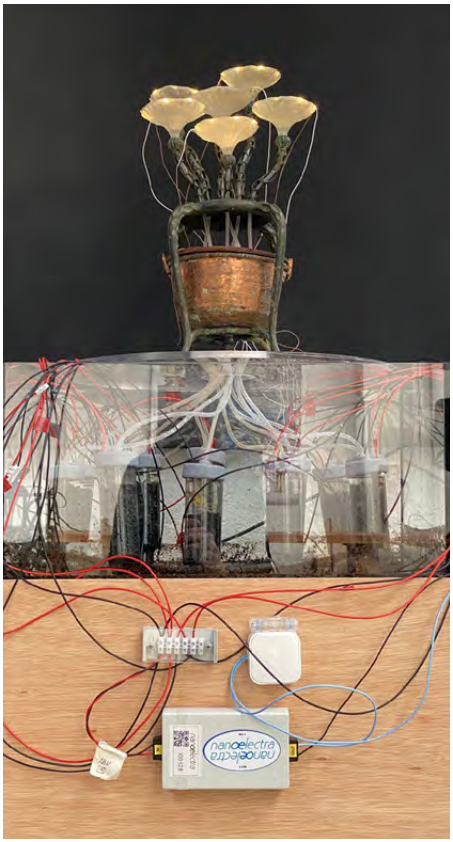
Geo-Llum
Samira Benini Allaouat
S+T+ARTS Prize 2023 Nomination
Courtesy of the artist

ENERGY PRODUCTION

Geo-Llum | Samira Benini Allaouat (IT)
S+T+ARTS Prize 2023 Nomination
samall.org/GEO-LLUM

Geo-Llum aims to reimagine the role of public lighting in green urban areas with a symbiotic relationship between the artificial and the natural world, focusing on a deeper understanding of microorganism community as fundamental collaborators in the city ecosystem.

The project not only offers potential breakthroughs in energy generation but also signifies a shift towards harmonious and resilient urban ecosystems, showcasing S+T+ARTS' dedication to interdisciplinary collaboration and forward-thinking ICT solutions; aligning with the broader global effort to transition towards sustainable and environmentally conscious urban development.



Geobacters are the bacteria we are collaborating with, amongst others, because of their super capabilities of creating free electricity while bio-remediating contaminated soil. Geo-Llum is also included in the first bioremediation pilot program of the city of Barcelona in the Hort del Clot.

The project is an autonomous performative art piece conceived as an organic and growing being, where the role of humans is to take care of it, drawing attention to the different forces that play for its right functioning.

Geo-Llum
Samira Benini Allaouat
S+T+ARTS Prize 2023 Nomination
GEO-LLUM MAXXI Rome 2022
Courtesy of the artist

Geo-Llum
Samira Benini Allaouat
S+T+ARTS Prize 2023 Nomination
GEO-LLUM MAXXI Rome 2022
Courtesy of the artist

Geo-Llum was the winning project of the S+T+ARTS Repairing the Present residency hosted by the CCCB, Sónar and the UPC to find solutions to the challenge "How can we integrate microorganisms to design more sustainable cities?".

Credits
Derek Lovley
Abraham Esteve Nuñez
Bioe Group
Miguel Alegre
Akasha Hub
Green City Lab

Samira Benini Allaouat is a transdisciplinary artist fascinated by fusing old technologies and knowledge with new contemporary applications. She is into maker and DIY philosophy, questioning stereotypes, taken-for-granted social behaviors, and systems, and researching and testing low-tech solutions with complementary high-tech applications to build a more resilient future perspective.

CIRCULAR ECONOMY AND SUSTAINABLE MANUFACURING

Environmental and industrial worlds intertwine through topics of energy, waste and material research. Both industry and consumers aspire to alternatives to materials derived from fossils energy or animals, with the view to using technology in new ways to create a more efficient and sustainable organization and improve alignment between technology initiatives and business opportunities.

I'm particularly interested in the projects that, by showing what is possible, push us to rethink the usual way of doing things, such as "Rock Print," developed by ETH Zurich and MIT. They built huge structures out of stone-without concrete or glue, but with a robot placing layers of string. It was such a mind-blowing and thought-thriving prototype. Instead of using robots to make buildings out of ordinary materials, these guys created a prototype questioning all the concepts we had-how to build houses and bridges, how to tear them down, how to recycle them, and how to use robotics, computers, and engineering in a clever way.

Gerfried Stocker, Artistic Director at Ars Electronica

Rock Print a Manistone
Gramazio Kohler Research, ETH Zurich
Grand Prize 2017
© Florian Voggeneder

Remix el Barrio, Food Waste Biomaterial Makers
Anastasia Pistofidou, Marion Real and The Remixers at Fab Lab Barcelona, IaaC
Grand Prize 2021
Squeeze the Orange project
Elisenda Jaquemot, Susana Jurado Gavino y Nuria Bonet Roca
© Fab Lab Barcelona

CIRCULAR ECONOMY AND SUSTAINABLE MANUFACTURING

Remix el Barrio, Food Waste Biomaterial Makers | Fab Lab Barcelona (ES)
Grand Prize 2021| Innovative Collaboration
starts-prize.aec.at/en/remix-el-barrio

The burgeoning development of biobased materials through laboratory biofabrication, involving microorganisms, bacteria, and biopolymers, is a transformative trend in industrial design, fashion, and art. The selection of Remix el Barrio demonstrates S+T+ARTS' keen interest in these innovative materials, recognizing their potential not only for creative disciplines but also for driving advancements in ICT innovation and impacting the industrial sector with sustainable and technologically advanced solutions, embedded in a circular economy.

Over the last 30 years, plastic production has increased by 620%. In Catalonia alone, every day, 720,000 kg of food is thrown away. This wasted food, totaling 260,000 tons per year, is equivalent to the food needs of 500,000 people for one year. *Remix el Barrio* was born with the ambition to propose a learning space to encourage and nurture new practices based on food-waste crafts. It is the result of a pilot program where various designers learn about biomaterial design and explore projects with food scraps using artisanal techniques and digital fabrication.

Squeeze the Orange project
Elisenda Jaquemot, Susana Jurado Gavino y Nuria Bonet Roca
© Fab Lab Barcelona ©Tom Mesic

In the district of Poblenou, more specifically in the ecosystem of Fab Lab Barcelona, each designer has initiated a creative design driven material innovation approach, where they identify a recurrent local food waste case, learn about its characteristics, investigate how to best collect and process it, and imagine future applications: from coffee husks, soap from used cooking oil, to furniture from olive pits and garments from orange peels.

Remix el Barrio, Food Waste Biomaterial Makers
Anastasia Pistofidou, Marion Real and The Remixers at Fab Lab Barcelona, IaaC
© Dihue Miguens Ortiz

Fab Lab Barcelona is an innovation center rethinking the way we live, work, and play in cities. Located at the Institute for Advanced Architecture of Catalonia (IAAC), it provides access to the tools, knowledge and means to educate, innovate and invent using technology and digital fabrication to allow anyone to make (almost) anything.

Credits
Fab Lab Barcelona at IAAC represented by the project team Anastasia Pistofidou, Marion Real and Milena Juarez Calvo. The institution supports contemporary educational and research programs related to the multiple scales of the human habitat. Fab Lab Barcelona is also the headquarters of the global coordination of the Fab Academy program in collaboration with the Fab Foundation and the MIT's Center for Bits and Atoms.

CIRCULAR ECONOMY AND SUSTAINABLE MANUFACTURING

Rock Print | Gramazio Kohler Research, ETH Zurich (CH)
Grand Prize 2017 | Innovative Collaboration
starts-prize.aec.at/en/rock-print

The construction industry is responsible for roughly one-third of all carbon emissions. *Rock Print* is an investigation into the constructive principle of physical phenomena of jamming, in which granular matter can change from liquid to solid and back again. The incorporation of robotic systems and automation technology enhances the efficiency of the construction process and opens up new avenues for creative expression and innovative design possibilities. The prospect of reconfigured architectural structures, assembled as needed and returned to their original raw state, or easily moved and reshaped for diverse locations, presents an intriguing opportunity for S+T+ARTS and reflects a convergence of creativity and technology, showcasing interdisciplinary innovation possibilities.

Rock Print was developed to investigate methods and techniques for design and robotic aggregation of low-grade building material into load-bearing architectural structures that are fully recyclable and re-configurable with high geometrical flexibility and minimal material waste.

Rock Print: a Manistone
Gramazio Kohler Research, ETH Zurich
Grand Prize 2017
© Gramazio Kohler Research

S+T+ARTS PRIZE

This is made possible through granular materials and physical phenomenon of jamming. By decreasing the free volume per particle and thereby increasing the strain between the aggregates, they become more and more constrained until they jam and increasing the confinement volume again reverses the jammed structure.

This can be achieved by introducing tensile reinforcement, such as string, to confine the gravel. A robotic arm enables the precise placement of string according to a digital blueprint and as such informs the shape and performance of a specific architectural artefact. To reverse the construction, the string is pulled, leading to a chain reaction restoring the gravel and the string to their initial state.

The project gave rise to another project entitled *RP3DPSE*. The new team has taken part in the S+T+ARTS Cross-fertilization Programme, which provides support from different types of mentors, challenges the teams to explore and test their projects in different environments and co-organize masterclasses to share their experience with other individuals or organisations interested in sci-tech-arts projects. The new RP3DPSE team aims to bring the technology demonstrated in the awarded Rock Print project from a proof of concept to a construction system for infrastructure. The team explores the combination of Rock Printing with 3D printed shot-earth, a technology developed by Terrestrial. The goal is to overcome the challenges related to limited life span of Rock Printed structures.

Credits
Gramazio Kohler Research, ETH Zurich (CH), since its inception in 2005 the research group at ETH Zurich led by Prof. Matthias Kohler and Prof. Fabio Gramazio has been at the forefront of robotics and digital fabrication in architecture. With their robotic laboratories and work that ranges from prototypes to building elements, they have inspired architects and researchers alike to explore the capacities of the industrial robot as a universal tool of the digital age.
Self-Assembly Lab, MIT (US), Asst. Prof. Skylar Tibbits is the founder and co-directs the Self-Assembly Lab with Jared Laucks, housed at MIT's International Design Center. The Self-Assembly Lab focuses on self-assembly and programmable material technologies for novel manufacturing, products and construction processes.
Collaborators: Prof. Fabio Gramazio, Prof. Matthias Kohler, Prof. Skylar Tibbits, Andreas Thoma (project lead installation), Petrus Aejmelaeus-Lindström (project lead research), Dr. Volker Helm, Sara Falcone, Jared Laucks, Lina Kara'in, Michael Lyrenmann, Carrie McKnelly, George Varnavides, Stephane de Weck, Dr. Jan Willmann.
Selected experts: Prof. Dr. Hans J. Herrmann and Dr. Falk K. Wittel (Institute for Building Materials, ETH Zurich), Prof. Dr. Heinrich Jaeger and Kieran Murphy (Chicago University).
Selected consultants: Walt + Galmarini AG
Supported by ETH Zurich, ETH Zurich Foundation Grant, MIT's Department of Architecture, the MIT International Design Center, MIT (MISTI) Grant, Pro Helvetia Swiss Arts Council, swissnex, MISAPOR Beton AG.

CIRCULAR ECONOMY AND SUSTAINABLE MANUFACTURING

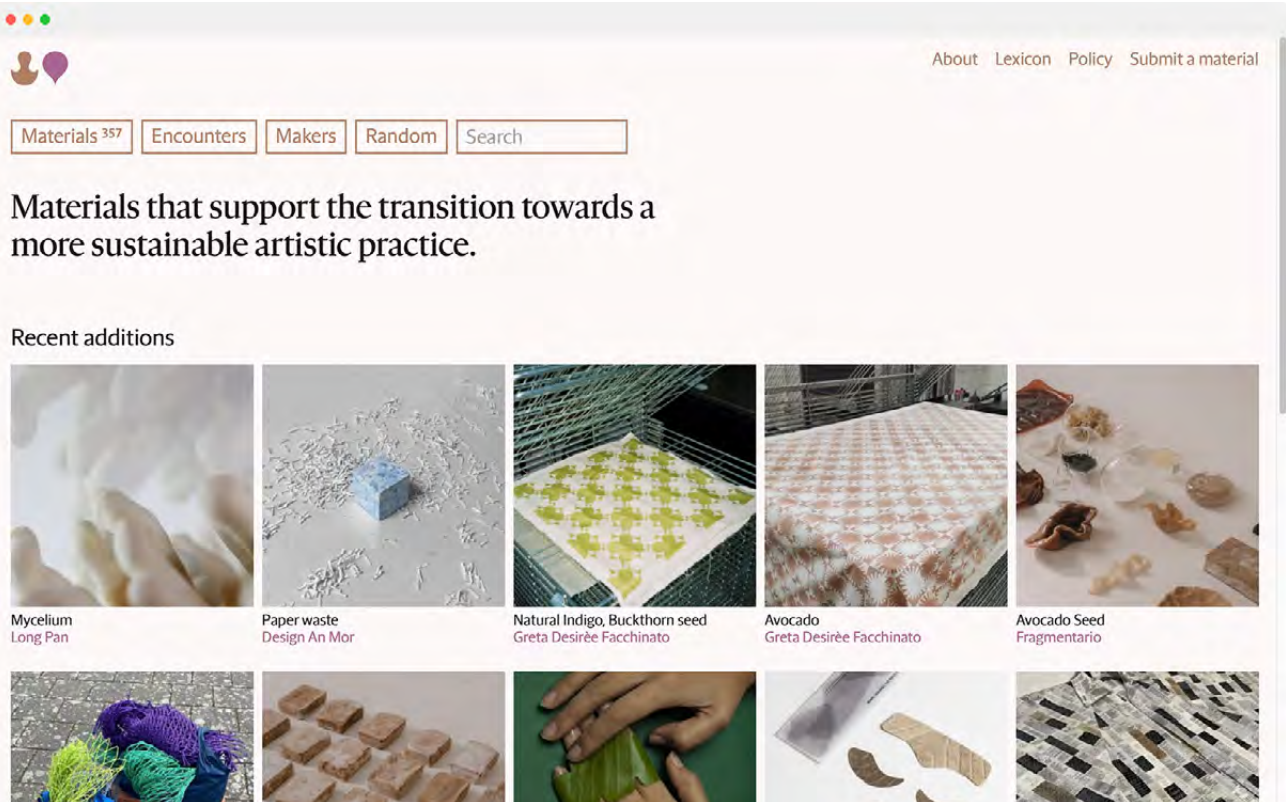
Future Materials
S+T+ARTS Prize 2023 Nomination
starts-prize.aec.at/en/future-materials

Future Materials is a multidisciplinary knowledge platform that promotes and disseminates knowledge about sustainable materials. Its core aim is to support the transition towards ecologically-conscious art and design practices. The industrial potentials of *Future Materials* lie in its capacity to catalyze a shift towards sustainable and ecologically-conscious practices within the industrial sector. By promoting knowledge about sustainable materials, the platform contributes to the development and adoption of eco-friendly materials and processes. This, in turn, can lead to the creation of more environmentally sustainable products across various industries. The integration of sustainable materials in industrial processes not only addresses ecological concerns but also aligns with the principles of circular economy, fostering a more efficient use of resources.

At the heart of the project is the *Future Materials Bank*, an online archive of sustainable materials developed by artists and designers from all over the world. The website aims to democratize available knowledge and trigger inspiration for future research. *The Future Materials Lab* complements the online archive with a physical collection of material samples. In this space, practitioners can check the material samples and ask for specific advice concerning their applications and possible developments.

The online and offline dimensions of *Future Materials* are bridged through the *Future Materials Encounters*, a program of workshops that aims to connect the different communities of the program and to foster dialogues about, through, and with materials.

To support material experimentation, the program has also started the *Future Materials Fellowship*, a short-residency program that offers artists and designers time, space, and infrastructure to further their material research. The project resonates with ongoing trends in consumer preferences as an increasing number of individuals prioritize environmentally friendly and socially responsible products. Industries that embrace these sustainable practices are likely to enhance their market competitiveness and meet the evolving demands of environmentally conscious consumers.



Future Materials Bank
S+T+ARTS Prize 2023 Nomination
Courtesy of the Jan van Eyck Academie

Future Materials is a project by the Jan van Eyck Academie and first launched in October 2020. While starting with a small collection of materials in the online Bank, the project has now diversified into a hybrid program consisting of a physical sample collection, a series of workshop, educational initiatives, and fellowship. With a large network of partners, collaborators, freelancers, and fellows, the current core team includes Giulia Bellinetti as coordinator, Pleun van Dijk as curator, Jaap Knevel as designer, and Rhett Leinster as researcher.

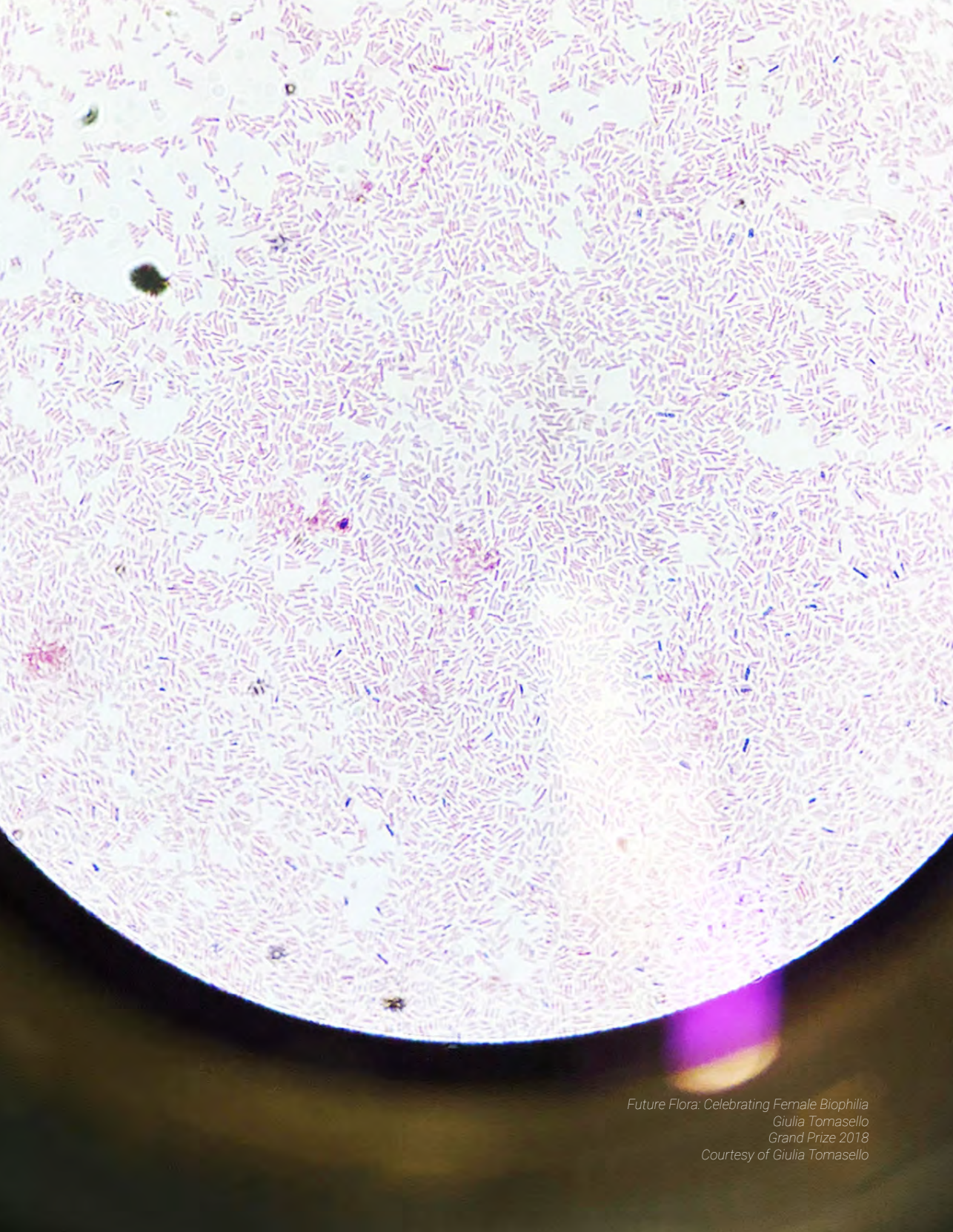
Future Materials receives support from Innovationlabs, a program on behalf of the Dutch Ministry of Education, Culture and Science, the Creative Industries Fund NL, and CLICKNL. Previously supported by the DOEN Foundation.
Future Materials is part of GALA - Green Art Lab Alliance and collaborates with the MA program Material Futures at Central Saint Martin (UK) and with CHILL - Chemelot Innovation and Learning Labs, at the Brightlands Chemelot Campus (NL).

HEALTH AND HEALTHCARE SYSTEMS

Some of the standout projects within the S+T+ARTS Prize underscore the transformative potential of ICT innovation in revolutionizing the production and utilization of data, particularly in the context of advancing healthcare systems. These initiatives not only push the boundaries of technological capabilities but also address the imperative of humanizing a technology that is sometimes viewed with skepticism or negativity. By placing a strong emphasis on improving patient experiences, these projects navigate beyond mere technological advancements and seek to enhance the human dimension of healthcare.

This paradigm shift ensures that ICT innovations not only meet the technical demands of healthcare but also align with the broader goal of improving overall patient well-being and engagement with healthcare services.

Avatar Robot Café DAWN ver.β
Ory Yoshifuji
S+T+ARTS Prize 2022 Honorary Mention
© Myography



Future Flora: Celebrating Female Biophilia
Giulia Tomasello
Grand Prize 2018
Courtesy of Giulia Tomasello

HEALTH AND HEALTHCARE SYSTEMS

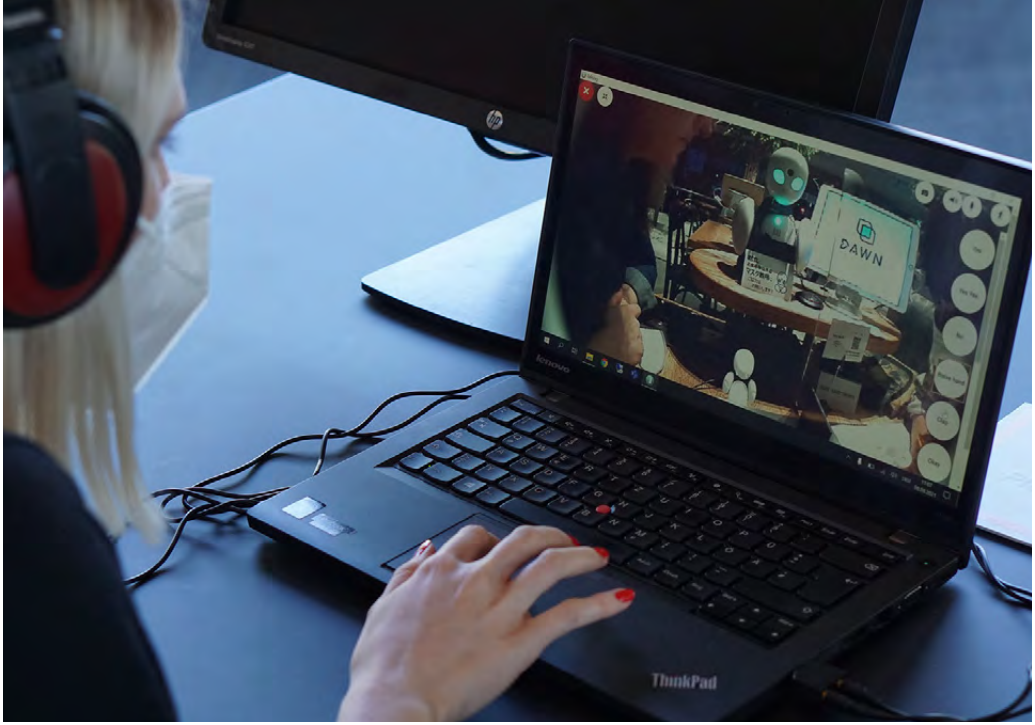
Avatar Robot Café DAWN ver.β | Ory Lab Inc., OYAMATSU Design Studio, TASUKI Inc.
S+T+ARTS Prize 2022 Honorary Mention
dawn2021.orylab.com
orylab.com
youtu.be/vj1z6HEAkYY

Ory Lab created the *Dawn Avatar Robot Café*, where users work and visit via robots.
The project introduces a novel approach to work and social interaction by integrating assistive devices and avatar communication robots, exemplifying a commitment to social impact and physical augmentation for individuals with disabilities. Through the use of these technologies, users can actively participate in society, seeking employment and engaging with others via robots. This unique initiative aligns with the human-centric focus of S+T+ARTS and ICT Innovation, showcasing the transformative potential of technology in creating inclusive and interconnected communities.

A wheelchair for the soul…carrying your soul wherever you want to go.
Ory Yoshifuji

For those who cannot go outside due to the physical/psychological challenges of diseases, past accidents, or the likes OriHime creates another means of physical expression and action. OriHime is operated remotely by "pilots", who interact with the world outside through the robots' cameras, speakers, and microphone. In this way, the robots offer virtual outings even for paralyzed pilots, who use a line-of-sight input device to speak with others.

The creation of *OriHime* was largely motivated by the personal experiences of Ory Yoshifuji, CEO of Ory Lab. Health issues kept him away from elementary school for 3 ½ years, making it so unbearably lonely that life hardly seemed worth living. Ory Yoshifuji, who designed a wheelchair while in high school, sees avatar robots as wheelchairs for the user's heart.



Avatar Robot Café DAWN ver.β
Ory Yoshifuji
S+T+ARTS Prize 2022 Honorary Mention
© Myography

The project aims to promote a vision of how the world can be without loneliness, through an innovative and socially inclusive way of using robots to combat social isolation. The business model of the project and its success in Japan, along with the fact that it can be replicated, shows the viability and potential of exploitation of this project at a European level. The team emphasizes the social aspect of the project over the technological one and the education that is necessary in order to create the platform for the users, to educate them and to show them that there is a possibility outside of their confinement of their homes.

Credits
Ory Lab Inc. https://orylab.com/en/#about
OYAMATSU Design Studio https://oyamatsu.co.jp/en/index.html
TASUKI Inc.
Sponsored by
NTT Corporation https://group.ntt/en/corporate/overview
Biogen Japan Ltd. https://www.biogen.co.jp
Mitsui Fudosan Co., Ltd. https://www.mitsuifudosan.co.jp/english/corporate/about_us/outline
charity by crowdfunding "CAMPFIRE" by 2156ppl ¥44,587,000 https://camp-fire.jp/projects/view/405051

HEALTH AND HEALTHCARE SYSTEMS

Future Flora | Giulia Tomasello (IT)
Grand Prize 2018 | Innovative Collaboration
gitomasello.com/Future-Flora

Following Do-It-Yourself procedures and merging biology with health-tech, *Future Flora* addresses women who are taking control of their own bodies as a precious and intimate practice of self-care, becoming a participant in the culture and the knowledge of science.

Future Flora holds dual significance - capturing the imagination of S+T+ARTS for its innovative collaboration and offering a promising avenue for healthcare systems in line with the paradigm of patient empowerment and personalized healthcare experiences.

The kit has been designed to allow women to establish, nurture and harvest their very own personal skin flora at home, becoming not only consumers but also active participants in their own health and wellbeing.
Giulia Tomasello

We are not just single individuals walking the planet: we are walking ecosystems made of microbes. Microbes are in the soil, in the water, and even in our bodies. The average human body is made up of trillions of cells: therefore, we can easily say that we are only 10% human. We live and co-exist with them.

The other 90% of the human body is composed of different microorganisms, most of which are beneficial to their host. Microbes as bacteria, fungi, and viruses are part of our Skin Microflora, covering both the inside and the outer surface of the body. Even though invisible to our eyes, our microflora has a symbiotic relationship with the interface between our body and the environment - our skin.

By empowering women to take control of their bodies through a practice of self-care, the project not only contributes to cultural and scientific knowledge but also resonates with a broader shift in healthcare. This intimate and personalized approach aligns with the evolving trend of individuals actively participating in their health journeys, emphasizing empowerment and the integration of cutting-edge technologies.

Future Flora: Celebrating Female Biophilia
Giulia Tomasello
Courtesy of Giulia Tomasello

Future Flora gave rise to the ALMA Toolkit project (Giulia Tomasello, Isabel Farina, Ryo Mizuta and Tommaso Busolo, a team of designers, medical anthropologists and technology researchers), participant in the S+T+ARTS Cross-fertilization programme. The ALMA Toolkit aims to revolutionize conversations around female intimacy and empower individuals to self-manage their bodies, adopting a participatory approach to address taboos and knowledge gaps in vaginal health. The kit includes a card game (*Speaking Bitterness*), a self-exploration experience, and the *Biofilie Educational Lab* to educate about the vaginal microbiome.

Credits
Designer and creator: Giulia Tomasello
Graduate project from Material Futures Master Course
Central Saint Martins College of Art & Design
External expert: Biologist Arian Mirzarafie-Ahi

EXPLORING THE S+T+ARTS ECOSYSTEM OF PROJECTS

S+T+ARTS is sustained by its pillars that represent all the dimensions S+T+ARTS works with. Different funded projects offer complementary opportunities and services:

Residencies
supporting and funding artistic residencies that bring original artistic contributions to technology-based projects.
https://starts.eu/what-we-do/residences/

Thematic Pilots or Lighthouses
supporting research seeking radically novel technology solutions to major challenges for industry and society, in close collaboration with artists.
https://starts.eu/what-we-do/lighthouses/

Academies
bridging the gap between art and technology at all levels of education.
https://starts.eu/what-we-do/academies/

Regional Centers
expanding the S+T+ARTS initiative on local level towards a number of European regions.
https://starts.eu/what-we-do/regional-centers/

Digital Innovation Hub
one-stop-shops where companies – especially SMEs, startups and mid-caps, can get help to improve their business production processes, products and services by means of digital technology.
https://starts.eu/what-we-do/digital-innovation-hubs/

In the following pages you will discover and learn about other exemplary projects we had the privilege to support within S+T+ARTS. All these projects and initiatives demonstrate both the innovativeness and applicability of the S+T+ARTS methodologies. They offer creative and innovative solutions, while holding promise in enhancing our understanding of the interdependencies among the networks we depend upon: the human system, the environmental system and the technological system.

TRACEWASTE
Susi Gutsche
S+T+ARTS Prize 2023 Nomination
© Susi Gutsche, mapbox

1 Better Factory

S+T+ARTS DIH

starts.eu/what-we-do/residences/better-factory

This project is significant because it is one of the very first innovation actions supported by the European Commission which acknowledges artists are motors for industrial innovation.
We want to make sure they were right.
Rodolfo Groenewoud van Vliet, of In4Art, Better Factory partner

Better Factory supports manufacturing SMEs to collaborate with artists (from the S+T+ARTS network) and technology providers, to develop new and personalized products. It supplies technology for SMEs to become cyber-physical systems, transforming them into lean-agile production facilities capable of manufacturing new and personalised products along with existing ones.

Better Factory is run by 28 partners from 18 European countries representing the arts ecosystem, technology competence centers, industrial clusters, technology suppliers, open call management, legal framework, and communication and dissemination. These key actors in the European technology, art and innovation landscape, support the Better Factory teams in their experiments.

Better Factory has selected a total of 16 teams (SME, artist and technology provider), to work on transforming the SMEs to become cyber-physical systems, overall becoming lean-agile production facilities.

The teams were chosen through a rigorous selection and matchmaking process. After acceptance, the teams (called KTE, Knowledge Transfer Experiments), received: access to the Robotics and Automation MarketPlace (RAMP), training to re-skill staff, business support and mentoring, and to get up to €200,000 funding, to conduct their experiments.

3DARTDESIGN
betterfactory.eu/3dartdesign

The Artistic Innovation by Titanium 3D Printing (3DARTDESIGN) project will evolve around exploring possibilities for overused titanium through the development and introduction of a robotic station for post-processing.

The role of the artist in this project is to creatively explore the possibilities of overused medical-grade titanium powder, which is a challenging resource to repurpose. Working alongside the tech provider, the artist aims to find innovative uses for this material. This collaborative effort involves the development of a robotic station for post-processing, which not only addresses technical challenges but also offers opportunities for artistic exploration.

PREMET, the manufacturer in this project, is a factory based in Hungary, which uses and recycles medical grade titanium metal powder various times until the powder is considered overused, meaning it cannot be used in medical purposes any longer. The main question then becomes, what to do with this material? This is the focus of the project, and the challenge of tech provider Lasram Engineering Kft and artist Studio Nick Ervinck.

The expected outcome will be a series of objects which can be produced by the manufacturing SME in their factory to give value to titanium powder after it has lost its medical grade.

Credits
Manufacturing company: PREMET (Hungary)
Artist: Studio Nick Ervinck (Belgium)
Technology Provider: Lasram Engineering Kft. (Hungary)

STARIOT
betterfactory.eu/stariot

The Sustainabile Transition to Automation, Robotics and the Internet of Things (STARIOT) project will focus on professionalising the production of the wheat stems and expanding the product possibilities with straws made out of wheat stems.

The artist in the project will look at how algorithms can contribute to exploring the edges of the possible for this agricultural residue stream, taking as a starting point the constructional qualities of the stem. The algorithm the artist develop will investigate how polyhedral mathematical forms can serve as blueprints for wheat stem product models.

The STARIOT project's expected outcomes are a factory fit for scaling, through data-driven production and algorithm-driven product development of wheat stem agricultural waste products.

Credits
Manufacturing company: Staramaki (Greece)
Artist: Gilbert Sinnott (Germany)
Technology Provider: CommonsLab (Greece)

FOLD
betterfactory.eu/fold

The FOLD project explored and pushed the boundaries of the use of stone paper for a paper packaging manufacturer in Bulgaria.

BETTER FACTORY'S FUNDED PROJECTS

Isaac Monte conceived a series of prototypes ranging from stone paper made lamps, to wallets, and even trench coats. He also developed a proof-of-concept process for stone paper 3D printing, demonstrating the possibilities to turn the paper into printable paste. The *FOLD* project led to increased production capacity, an improved existing and a completely new product, for the world's first stone paper 3D printing system and won the I4MS Award.

In 2023, the artist's participation in the *FOLD Knowledge Transfer Experiment* has propelled the project into new realms of exploration. Initial research and artistic endeavors with Stone Paper have evolved into a sophisticated printing installation. These innovative objects have been showcased at the Dutch Design Week 2023. Isaac Monte has not only expanded the applications of bio-based materials in additive manufacturing but also pioneered the development of novel extrusion techniques to handle the unique viscosity of Stone Paper.

Credits
Manufacturing company: Europack (Bulgaria)
Artist: Isaac Monte (Netherlands)
Technology Provider: Oviso Robotics (Romania)

2 REPAIRING THE PRESENT

(June 2021 - Decembre 2022)

12 Regional S+T+ARTS Centers came together from 11 different countries with a common mission: Repairing the Present. To address the unintended consequences of steadfast technological development resulting in the European continent's present social, economic, and environmental challenges, the Regional S+T+ARTS Centers hosted 21 artist residencies and tapped into the potential of artists to act as catalysts for change and actively contribute to innovation.

The programs explored the possibility of Repairing the Present through resource, urban, ICT and art-powered transformations encouraging a critique of the present, the exploration beyond its current limitations and the reimagination of other possible futures.

While the challenges addressed are pan-European or global, the solutions required a focus on specific local problems. In Repairing the Present, the Regional S+T+ARTS Centers thought globally but acted locally by defining challenges that need to be urgently addressed within their localities.

TRACEWASTE
Susi Gutsche
S+T+ARTS Prize 2023 Nomination
© Musacchio, Ianniello, Pasqualini & Fucilla
Courtesy of Fondazione MAXXI

TRACEWASTE: Urban Garbage Mobility | Susi Gutsche (AT) (MAXXI & Sony CSL)
starts-prize.aec.at/en/tracewaste

The project TRACEWASTE observes and visualizes garbage movements from a citizen's perspective to explore future urban life in the context of waste management.

S+T+ARTS REPAIRING THE PRESENT RESIDENCY PROJECTS

TRACEWASTE tracks discarded objects using geolocation methods, providing insights into waste whereabouts, transport durations, distances, and emissions. IoT devices (0G) in a low power wide area network track various types of waste across Italy, with a special focus on textiles and plastics. Monitoring rubbish collection vehicles within Rome additionally captures urban waste collection dynamics.
TRACEWASTE was nominated by S+T+ARTS Prize 2023.

TRACEWASTE
Susi Gutsche
S+T+ARTS Prize 2023 Nomination
© Musacchio, Ianniello, Pasqualini & Fucilla
Courtesy of Fondazione MAXXI

Grow Your Own Cloud | Monika Seyfried (PL) and Cyrus Clarke (UK), In4Art
growyourown.cloud

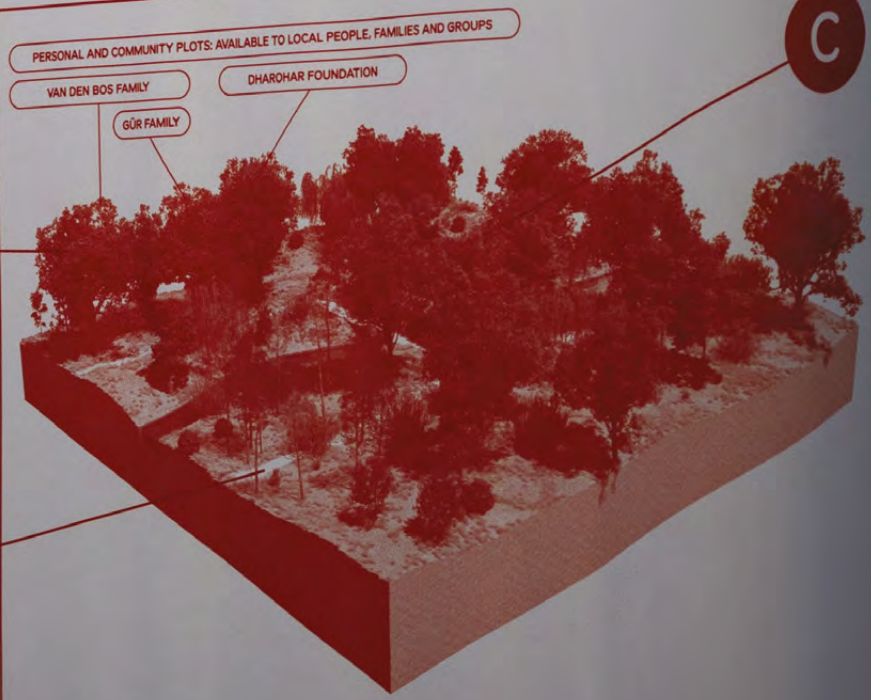
Grow Your Own Cloud is an artistic scientific exploration that draws inspiration from biology and natural systems to reshape human connections with data.

Grow Your Own Cloud redefines the concept of the cloud by adopting nature's storage approach, using the DNA of plants. This innovative initiative aims to establish an organic cloud, powered by biological elements, emitting oxygen rather than CO_2. Leveraging cutting-edge DNA data science, the technology has the potential to condense the world's data into just 1 kg of DNA. By embracing this natural storage method in plant DNA, the project explores the possibility of truly environmentally friendly, carbon-absorbing data storage that is publicly owned, breaking away from the dominance of monopolistic corporations.
Data Garden developed by Cyrus Clarke, Monika Seyfried, and Jeff Nivala, and Urban Data Forest, developed by Monika Seyfried and Cyrus Clarke, received a S+T+ARTS Prize Honorary Mention in 2021 and a S+T+ARTS Prize Nomination in 2023, respectively.

Data Garden
Cyrus Clarke, Monika Seyfried, and Jeff Nivala
S+T+ARTS Prize 2021 Honorary Mention
© Grow Your Own Cloud

organism preservation, citizen

These regenerative spaces for data storage and workers collaborate to preserve data and the living organisms which Education is important here, with people trained to use tools and maps to care for the flora and fauna of the forests. This all contributes to bringing biodiversity and data back to the city, involving people of all ages and creating new meeting places for local residents.



A RECREATION SPACES — Opportunity for sports and activities with outdoor gyms, running paths and picnic areas

B PERSONAL AND COMMUNITY PLOTS — Available to local people, families and groups: van den Bos family, Gür Family, Dharohar Foundation

C BIODIVERSITY — Brings hundred of species back to the city including

Urban Data Forest
Monika Seyfried, Cyrus Clarke
Grow Your Own Cloud
S+T+ARTS Prize 2023 Nomination
© Aleksander Znosko Studio

IN THE URBAN DATA FOREST

Like all Urban Data Forests, Living Archives contribute to the creation of jobs. Bio-archivists know

3 VOJEXT (July 2020 – December 2023)

S+T+ARTS DIH

starts.eu/what-we-do/residences/vojext

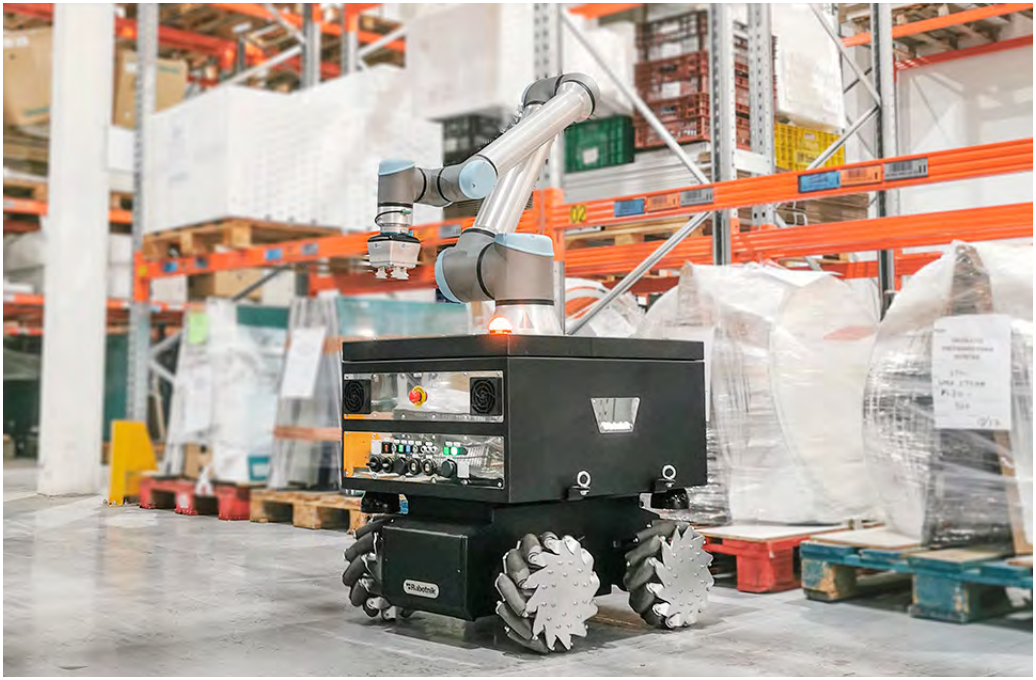
This project inaugurated the collaboration between S+T+ARTS initiative and the Digital Innovation Hubs (DIH), in July 2014. VOJEXT encourages producers and SMEs to adopt cognitive autonomous systems for human-robot interaction and dynamizes science-driven industry approaches engaging human and Cyber-Physical Systems (CPS) in the same loop.

VOJEXT brings new scenarios to the project, fostering creative, scientific and business-driven innovation by engaging with artistic research. The project demonstrates its value through 5 different experimental pilots, in four EU countries (Spain, Hungary, Italy and Turkey) and five different sectors (plastic textile, electronics, automotive, construction and creative architecture for urban regeneration); integrating traditional and non-traditional areas for AI-robotics and cognitive ICT developments.

Robotics in Construction | Robotnik (ES)
robotnik.eu/projects/vojext-en-2

Hosted and tech-provided by Robotnik

This challenge focuses on developing critical, creative and new approaches to human-robot collaboration in construction. The main goal is to design safe and efficient interaction between human and robots for handling wide surface objects (such as plaster boards or walls). Specific topic of interest would be experimenting with gripping, manipulating, mimicking hand-type end-effector that can support different surface treatment techniques. Understanding creative and intuitive movement, how such movement and patterns can be explored and modelled as interaction language between the robot and the human collaborator are some of the artistic and design research questions which might be of interest in this challenge.



4 MediaFutures (September 2020 – August 2023)

S+T+ARTS DIH

mediafutures.eu

Supported by the European Union's Horizon 2020 research and innovation programme, the project aimed at contributing to high-quality media activities. MediaFutures established a data-driven innovation hub to offer grant funding and support for startups and artists through three Open Calls.

The 1st cohort graduated in September 2021, the 2nd cohort ended with the DemoDays in Paris in October 2022, and the 3rd cohort graduated in June 2023.

Throughout the programme MediaFutures supported 51 startups or SMEs and 43 artists.

Hammer&Egg | HELLA LUX (DE)
https://hellalux.de/projekte/hammerandegg/

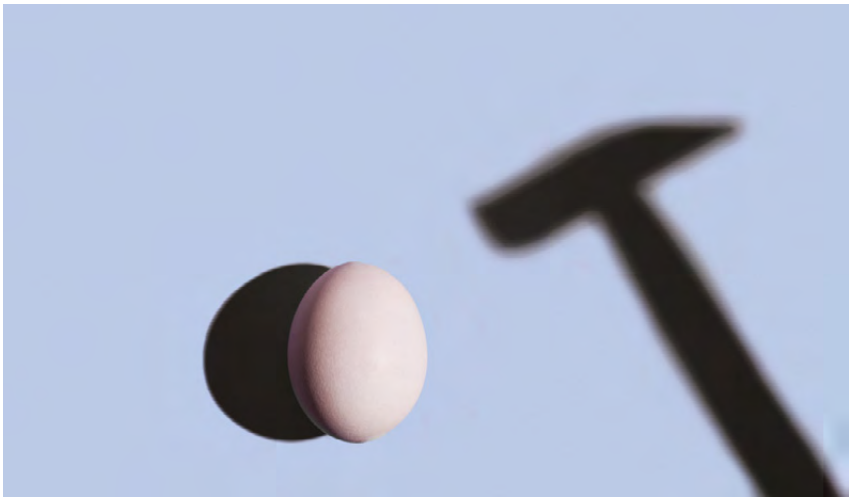
Interactive audio walk and cognitive biases

MEDIAFUTURES
FUNDED PROJECT

Hammer&Egg (previously Blind Spots) is an interactive audio walk which adapts dynamically to changing real world parameters. It focuses on cognitive biases and how they make us vulnerable to misinformation and manipulation.

The audio walk draws the audience's attention to the extent to which cognitive biases shape their everyday lives. It also addresses how trust and a sense of belonging can be built and abused based on seemingly shared experience. Thus, Hammer&Egg becomes a reflection on the preconditions of one's decision-making and to what extent they literally determine our path.

Audio walks invite listeners to playfully interact with a story. The real world environment becomes the setting for a fictional narrative which addresses topics where they are particularly relevant - and thus tangible. The integration of real world parameters into the audio walk medium opens up a range of topics such as data literacy, the design of public space and the local impact of global crises such as climate change.



S+T+ARTS PRIZE

S+T+ARTS PROJECT DESIGN: A GUIDE TO

As we progress through this brochure, you will gain access to a wealth of insights distilled from our extensive experience within S+T+ARTS over the years. These invaluable lessons, meticulously gathered and curated, are encapsulated in a range of publications that include brochures, guides, and toolkits, as well as entire methodologies. These resources have been strategically developed to serve as a reservoir of knowledge, providing not only a retrospective examination of our journey but also serving as practical and informative tools for navigating the dynamic intersection of art, science, and technology.

S+T+ARTS Prize Policy Brochure, November 2023

https://starts.eu/wp-content/uploads/STARTS-Prize-policy-recommendations.pdf

This policy brochure summarises the work conducted within the S+T+ARTS Prize project, funded by the European Commission, aimed at identifying the strengths and weaknesses of the ecosystem around the S+T+ARTS framework in order to derive concrete recommendations for policy makers.

The publication offers recommendations for policy makers that aspire to learn more on the experience launched in 2016 by the European Commission or are willing to implement national, regional and local strategies supporting the intersection of art, science and technology as a powerful tool for innovation, economic growth and response to societal challenges.

Art-driven Innovation Method (ADI) by In4art, 2021

https://www.in4art.eu/about/#method

In4Art has developed the art-driven innovation method to investigate, and prototype ideas. The approach includes the insights from artistic experiments on technological and social domains into proposals for more responsible innovations through our PESETABS analysis. It is based on the view that economic and social progress should be regenerative and distributive to contribute towards a more green or care path for innovation.

This database-driven methodology can be used for identifying promising directions at the intersection of art & technology as drivers of ethical, inclusive, and equitable innovation. It is about combining breakthrough technologies, sustainable development goals and artistic point of entries, thereby creating another playing field – one which finds synergy between the R&D value of experimenting with new materials, technologies, and structures, and the propensity of artists to conduct such experimentation in their own work.

Repairing the Present Brochure, 2021

https://starts.eu/wp-content/uploads/Repairing-the-Present_brochure.pdf

This publication is the collaborative effort of the Regional S+T+ARTS Centers engaged in the initiative titled *Repairing the Present*. It serves as a comprehensive compendium, encapsulating the project's methodology, processes, key learnings, and conclusions. Its primary purpose is to function as a guiding resource for future Regional S+T+ARTS Centers, providing them with valuable insights garnered from the project's experiences.

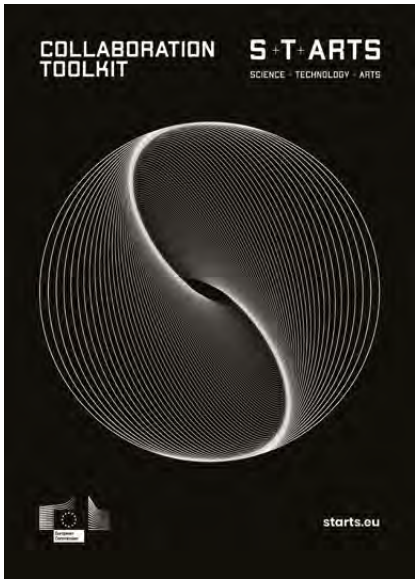
This publication aspires to extend its influence beyond the immediate project scope. It endeavors to inspire policymakers by advocating for the design and implementation of initiatives that harmoniously integrate science, technology, and the arts. By showcasing the tangible impact of such interdisciplinary collaborations, this resource aims to contribute to the broader discourse on fostering innovation at the intersection of creativity, technology, and societal advancement.

Collaboration Toolkit / S+T+ARTS Ecosystem, 2020

https://starts.eu/wp-content/uploads/starts-toolkit-13july2020.pdf

This toolkit serves as a practical guide for artists, researchers, technology experts, and companies seeking to establish successful collaborations. It emphasizes the importance of clear goals, effective communication, and a shared language to maximize the impact of collaborative projects. While expressing a desire to collaborate is a starting point, building a fruitful interdisciplinary partnership requires thorough preparation, willing participants, and a suitable methodology.

The toolkit specifically assists artists in approaching researchers or companies based on their artistic interests, focusing on establishing collaboration grounds that offer sustainable returns for both parties. Drawing from experiences in the European S+T+ARTS initiative and related projects, as well as insights from diverse collaborative practices and literature, this toolkit utilizes numbered references for citations and lettered references for glossary explanations, offering comprehensive support for potential collaborators on their collaborative journey.



Regional STARTS Centers: Harnessing the power of European regions through S+T+ARTS, 2020

https://starts.eu/wp-content/uploads/starts_regional_centers_harnessing_power.pdf

This publication compiles the experiences and insights gained from cultivating local S+T+ARTS communities by the inaugural S+T+ARTS Regional Center. S+T+ARTS Centers operate on the premise that artists' creativity catalyzes innovation in the digital industry, aligning with the Green Deal objectives and the ambition for a carbon-neutral continent by 2050.

Against the backdrop of profound systemic upheavals in 2020, including the COVID-19 pandemic and democratic ruptures, our reliance on technology for solutions to global challenges becomes more pronounced. Emphasizing a human-centered approach to innovation is paramount in this context. Implementing methodologies like *Art Thinking* is particularly relevant at the local level when introducing S+T+ARTS concepts to potential regional partners, local industries, and policymakers. Building a robust toolbox based on successful strategies from Regional S+T+ARTS Centers can facilitate the cultivation of a new culture of human-centered innovation.

STARTS Residencies Brochure - A short practical guide, 2020

https://starts.eu/wp-content/uploads/brochure-starts-residencies.pdf

This brochure focuses on the S+T+ARTS Residencies projects. S+T+ARTS Residencies contribute to the broader S+T+ARTS community by promoting and supporting innovation processes wherein artists make original contributions to technology-based projects, receiving grants of up to €30,000.

The methodology, tools, and outcomes of these transdisciplinary collaborations are detailed, emphasizing the legal and organizational conditions for successful partnerships. The brochure aims to be a valuable resource for all innovation actors, offering insights into implementing science, technology, and arts collaborations through examples of S+T+ARTS Residencies. It represents a significant contribution to the growing S+T+ARTS community, fostering the exchange of knowledge and collaboration.

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