RE-THINK FASHION

Re

S+T+ARTS

LIGHTHOUSE

RE-FREAM

FOREWORD

Already at the beginning of the last century, the philosopher John Dewey remarked that art is not so much about creating objects, but about triggering experiences, or signals that can trigger change. This is exactly why the arts are a valuable tool to address the sustainability challenge: they can inspire behavioural change, both on on an individual and on a social level.

Grounding change in society and technology in the context of our cultural and artistic wealth is seen as a key distinguishing factor for a 'digital made in Europe'. To show the practical use of an art-driven approach to digital innovation, the European Commission (DG Connect), launched the ***S+T+ARTS program – innovation at the nexus of Science, Technology, and the ARTS***. It combines artistic creativity with today's most advanced digital and biotechnologies to tackle today's urgent challenges.

A further incentive for arts in digital innovation activities is the 'twin transition': that is a combination of digital transition and green transition. We speak now of the New European Bauhaus — referring of course to the 20th century Arts and Crafts movement — and of the need to bring together European technology and European culture to master this twin transition.

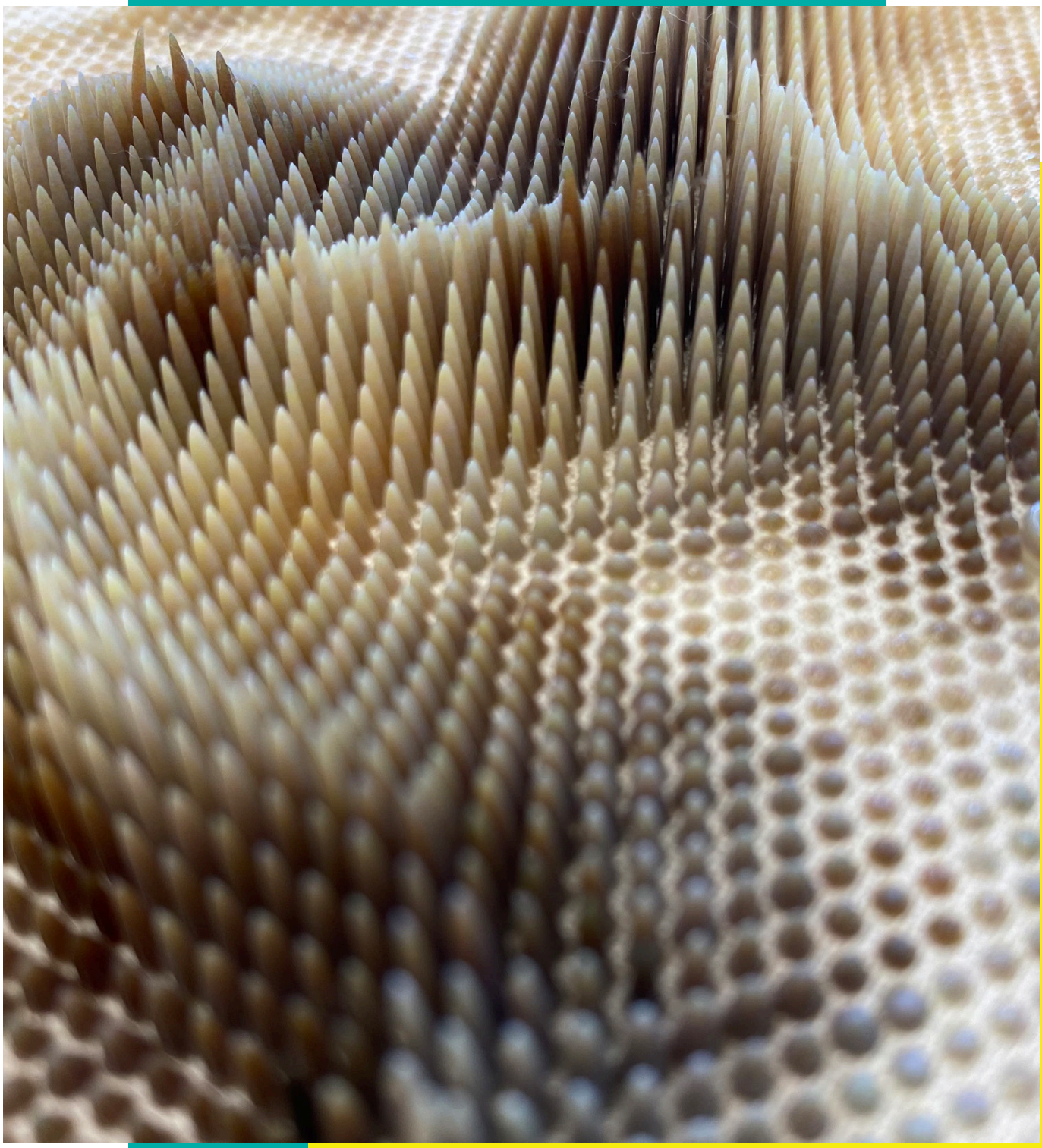
The 20th century Bauhaus brought together crafts, arts, architecture, design and industry with the vision to put the newest technologies — electricity, new materials, new means of transport — to use for alternative social models and to improve living conditions. Naturally, the technologies that were central to 20th century Bauhaus were different from today's core technologies: digital technology and biotechnology.

In this respect, the START-S lighthouse project Re-FREAM is setting the frame in the area of fashion, using it as an example of a sector that can make clear advances towards the goals of the European Green Deal and that roots such activities in the arts.
Re-FREAM will Re-Think the processes and materials of future fashion.
They shall be imagined, designed and produced working on sustainable, inclusive, and urban-produced textiles with designers, artists, experts, and users in biotech, e-textiles, and 3D printing.

Recyclable materials and a circular economy will be facilitated by new biotechnology solutions, and artists in projects like Re-FREAM are paving the way.

Ph.D. Ralph DUM
Senior Expert, STARTS program,
DG CONNECT, European Commission

Gisa Schosswohl
Project Coordinator Re-FREAM



Entering new dimensions, photo: Julia Koerner

1 INTRO & MISSION

Re-FREAM's MISSION

FREAM is a term, established in the US in the 1950s. It used to mean a group of people who rebelled against the norm. In 1997, Apple Computers picked up the term in their famous TV commercial to talk about the crazy ones, the geniuses, those who are the real shapers of a future world.

Re-FREAM supported art-driven innovation in European R&I projects by incorporating artists into scientific research teams with strong support from art-related partners like the Art University of Linz (UFG) and the European Institute of Design (IED).

This STARTS lighthouse pilot for "art-inspired urban manufacturing" engaged industry, technology, end-users, and artists in a broad artistic exploration of technologies with the aim of creating novel products, processes, and services that respond better to human needs. In a co-creative process of arts and technology, we showed how digitalized manufacturing can enable small-scale fashion production in an urban environment.

Co-Creation, photo: Jessica Smarsch & Fraunhofer IZM

2 About Re-FREAM

CO-RESEARCH LEARNING JOURNEY

Over three years, artists, designers, scientists and industry experts entered into the Re-FREAM co-creation processes. They collaborated through lab experiments and Zoom calls, imperfect outcomes and pivots, materials and contemplation, fuelled by brain cells and enthusiasm. Together, they conceived trailblazing solutions for pressing social and environmental needs. Their exchange generated far more than prototypes and products: they are key to defining new narratives.

> *"We need creative visions.*
> *Then, together, creative partners can break them down to materialize them."*
>
> Max Marwede, Fraunhofer IZM

By identifying shared processes and common values, across disciplines and borders, they seeded future practices that could be applied, not only to urban manufacturing, but to many other domains as well. The following manifesto summarizes key learnings and reflections from the Re-FREAM experience in words, collected through group workshops and individual interviews.

Re-FREAM explored urban manufacturing through the categories of 2D to 3D (Linz), sustainable finishings (Valencia), electronics and textiles (Berlin), all integrating the overarching questions of sustainability and customization. Each project revealed the impact of design and manufacturing beyond ephemeral products and economic profit. The practices and processes they generated

contribute to finding new forms of sustainability and community engagement, new and inclusive ways of creating meaningful impact, and new ecosystems. Materials and their manipulation are never neutral: making is the transmission, production and embodiment of knowledge.

> *"We should not focus on new value chains, but on new value networks."*
>
> Leo Schranzhofer, Project Manager
> and Research Scientist at Profactor

Project meeting, photo: Creative Region

Julia Koerner and Guillaume Clément, photo: Florian Voggeneder

The co-creations also explored and questioned connections and assumptions about fashion, technology, and science practices. They challenged participants to develop new multi-disciplinary skills, develop new creative languages and a more nuanced understanding of themselves, of each other, and of the surrounding ecosystems. Our future depends on this new material, ecological and planetary awareness; our social fabric depends on establishing a common understanding of who we are, where we come from, and where we are going.

From bioplastics to bacterial dyes, from the sensory interaction of human bodies with robotic tools and algorithms, the contemplation of new materialities became central for yielding new and unconventional solutions. Beyond business opportunities, proofs of concept, and market-ready prototypes, the research driven by the intent of social good offers the potential of generating new society ecosystems. Speculative and experimental designs included technology-enabled uses of sound, sight, movement, color, and scent as behavioural triggers. Shared in a convival open-source format via the ReCODE platform, the learnings and interconnection of knowledge networks and skills imbue a potent agency to participants as well as to wider audiences.

3 HUBS

CONNECTED IN HUBS AND COMMUNITIES

Interdisciplinary interaction needs discourse, haptic exploration and togetherness. Re-FREAM set up three physical co-creation spaces, where the approaches of artists and technologists are fused.

Hub Electronics & Textiles Berlin: from analog to connected

The integration of electronics into textiles enables new potentials of how we communicate in the future with each other in the post-smartphone era and to find new ways of interaction between the human body and its environment.

Partners: Fraunhofer IZM, Wear It Berlin, Empa

Participating Designers:
Second skins: Malou Beemer
Ignotum: Jan Wertel
Embroidered Touch: Anke Loh
Alma: Giulia Tomasello
Lovewear: Witsense
Constructing Connectivity: Jessica Smarsch

Hub Additive Manufacturing Linz: from 2D to 3D

Traditionally, the predominant use of textiles as fashion materials has led to the development of 2D pattern-making methods for dressing the complex shape of the three-dimensional human body. Nowadays, digital design tools allow us to easily design and 3D print complex shapes for the human body.

Partners: University for Art and Design Linz (UfG), Haratech, Profactor, Stratasys, Empa

Participating Designers:
Thalassic Masks : Filippo Nassetti & Vincenzo Reale

Footwear Time-Based Design: Assa Ashuach
Needs-based Clothing Design: Silke Hoffmann
Syntropia: Sophia Guggenburger & Eugenia Morpurgo
Re-Think Manufacturing: Yokai Studios
WeAreAble: Ganit Goldstein
Digital Vogue: Julia Körner

> *"We are only now getting to a point in history where design and science can really establish a good language of understanding — especially by using 3D in physical space and 3D generative design"*
>
> Assa Ashuach, Founder Assa Studio Ltd.

Hub Sustainability And Eco-Finishing Valencia: from linear to circular

The objective of this hub was to develop finishing techniques that combine the application of the finishing treatment directly in the end-product or article, allowing the total customization of the garment under the concept 'one person, one garment'. Moreover, to use new finishing technologies that are more environmentally friendly: less water, chemical products and energy consumption.

Partners: AITEX, Care Applications, Profactor, Empa

Participating Designers:
Sustainable Evolution: Loreto Binvignat Streeter
New Blue: Sandra Nicoline Nielsen & Tim Van der Loo
Neo Botanical Tailoring: Alexander Bello
Leather for Vegetarians: Fabio Molinas
Fragments Garments: Elisabeth Jayot
Cooking New Materials: Youyang Song
Marinero: Jef Montes

Ecodesign, photo: Fraunhofer IZM

4 MANIFESTO

CONCLUSION

Fashion defines not only wearable objects but garments as practice, as communication, as a daily ritual, as culture, and as knowledge. Fused with new technologies, these creative projects steer us towards fashion as care, as entertainment, and as societal action. Clothing that questions our habits. Fabrics and fabrication which change our preconceived fashion grammar, and open new possibilities of wearables. A new dawn of business models and production methods which focus on shared understanding and new value systems — at each step of the value chain.

Through their co-creation projects, Re-FREAM artists and designers and their cutting-edge co-creation teams animated the latest technological tools through their collective creative technological expression. Our new fashion futures lie here, at the cusp of new uses of technologies and matter, designed with intent and integrity. Customized and flexible on-demand fabrication, new ecosystems and labor dynamics, local and modular sustainable production based on shared knowledge networks. Technology animated by creative usage. These new visions of interconnected, healing, scented, precisely tailored, inflatable, sensual, bacterial, melodic and responsive hyperwear lead us towards a manufacturing transformation as well the development of of new networks of makers, new agents of resilience, change and exchange.

We, the Re-FREAM community, believe in the collaboration and communal endeavor of designers, scientists, and industry on equal terms and with common goals. We strive to develop fashion based on:

SHARED VALUES

SHARED PROCESSES

SHARED CULTURES

SHARED VALUES

- We aim to stimulate longevity and thoughtful interactions both through the function, beauty and narratives of objects, as well as through their materials and production.
- Our common goals are the promotion of inclusive designs and environments, which reflect diverse creative and scientific approaches - and are adaptable for the needs of users.
- We believe in building bridges across disciplines, by fostering open-mindedness, by establishing trust in equal competences, and by defining our common mission.

> *"We need the intelligence, but we also need the dreams."*

Isabel Berz, Head of IED REC Research and Education Center

- We are committed to exchanges and collaborations based on transparency, honesty, and shared mind-sets. Collaboration and access over competition.

SHARED PROCESSES

- We will pursue design, research, and manufactu-ring which infuses objects with personal values, and which speak to both the wearer and our ecosystems.

> *"Systematic impact means not only questioning how it is working, but who is working on it together. Pro-cesses need to be adaptable in other environments, open for everybody to adapt locally according to needs."*

Sandra Nielsen, co-founder A New Kind of Blue

- Discovery of the new and unexpected is central to our process. Jointly, we encourage fluid and flexible frameworks, without pre-defined outcomes.
- Our explorations and research will encourage enthu-siasm, expression, and inventive play.
- With these new practices of interaction and design, we aim to generate authentic, mutually respectful and generous networks of sharing, empathy, and care.
- With each other, and with technological tools, we aspire to define more holistic fashion futures. These will include spaces which are open for flexibility and negotiation.

SHARED CULTURES

- We are united by what makes us human, and by our shared concerns for our society and our environment. Collaboratively, our intent is to redefine existing business models and to use design and manufacturing as a resource for good.
- Our common thread is our motivation to creatively use new technologies as a tool, including wearers into the conversation.
- Communication and transparency are key to our cooperation across borders and disciplines.
- Collaboratively, we seek new practices of making, to probe new economic models, and to explore a creative commons for sustainable strategies.
- We envision design and manufacturing as the transmission of know-how, of creative vision, and as a catalyst for new ways of knowing and new ecosystems.

> *"For a better world of fashion, we need a model for how to fix ownership, while respecting all ownerships. Both shared and protective. So maybe the answer is: raising the question of co-ownership."*

Gisa Schosswohl, Project Coordinator Re-FREAM

Our discussions opened several paths to develop new and meaningful practices to bond, to collaborate and to impact society: Immersion in each other's surroundings as well as residencies bridging similarities and differences on neutral ground with new tasks; extended matchmaking processes that foster interdisciplinary discourse; integrating external facilitators; the development of new and meaningful practices to bond; as well as non-hierarchical classifications.

Final Meeting, photo: Creative Region Linz & Upper Austria

5 PARTNERS

Re-FREAM Partner Network

The project involved an international consortium of experienced partners regarding technology, research, fashion, and design, as well as art-tech transfer expertise.

FAT
FASHION & TECHNOLOGY

aitex
textile research institute

ar(a)

PROFACTOR®

stratasys

HARATECH
PLASTICS ENGINEERING & SOLUTIONS

Fraunhofer
IZM

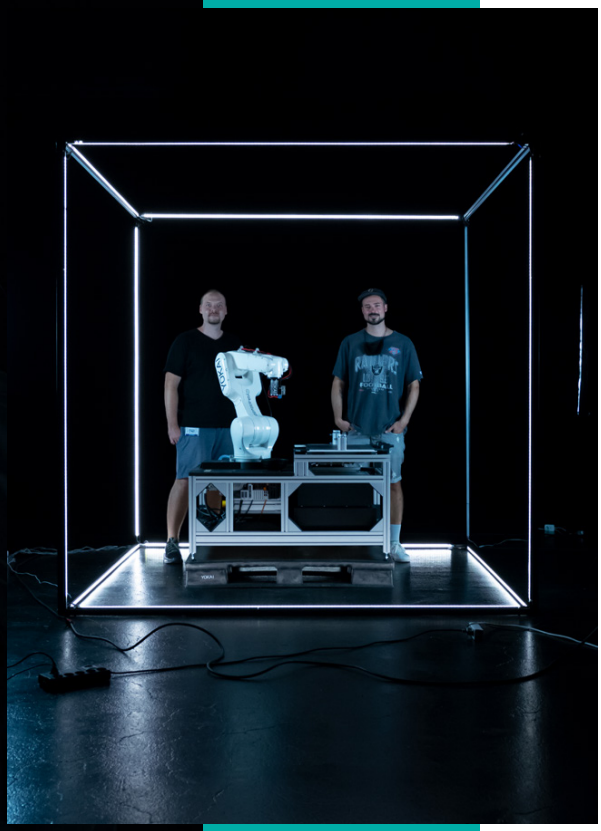
WEAR IT

CARE APPLICATIONS

IED

Empa
Materials Science and Technology

creative region



Performative Robotic Microfactories

Making is mesmerizing. Yokai studio's robotic fashion manufacturing melds design with automation, upcycling – and spectacle. The goal of the founders Michael Wieser and Viktor Weichselbaumer is to build a system for both localized and customized clothing production. Working with robotic arms and software, they transform traditional flat garment production into a three-dimensional and kinetic process. Their unique approach also allows us to watch machines play.

The Partners

Yokai Studios worked with Hub Additive Manufacturing, focused on urban manufacturing. Their manufacturing tech partners were Profactor and Haratech. EMPA in St. Gallen extensively tested samples, while the University of Art and Design Linz facilitated networking and development.

yokai-studios.com
instagram.com/yokaistudios

Re-FREAM is funded by the European Union's Horizon 2020research and innovation programme under grant agreement No 825647.

Thalassic Masks

by Filippo Nassetti & Vincenzo Reale

Manufacturing Reflection

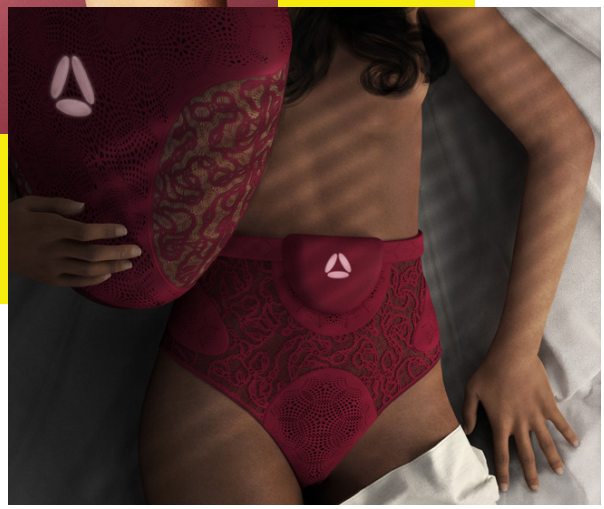
Can we print and wear the intricate filtering processes of underwater coral forests?
The co-creation designs of Filippo Nasssetti and Vincenzo Reale draw on marine organisms to investigate the new visual languages for additive manufacturing. New materials and technologies become a means to augment respiratory masks, fusing functionality with aesthetics. Manufacturing becomes a measure for enhancing both survival and personal expression.

The Partners

Nassetti and Reale worked with Hub Additive Manufacturing, focused on urban manufacturing. They partnered with Stratasys, Haratech and the Fashion & Technology department at the University of Art and Design Linz, using 3D scanning and the latest 3D printing innovation. Empa provided detailed bodily data analysis.

filipponassetti.com
instagram.com/filipponassetti
instagram.com/vincenzoreale

Re-FREAM is funded by the European Union's Horizon 2020research and innovation programme under grant agreement No 825647.



Manufacturing Inclusive Pleasure

Witsense's Lovewear uses soft robotics to stimulate inclusive self-discovery, arousal and joy. The smart undergarments help people of all abilities to experience their bodies. While Emanuela Corti and Ivan Parati's co-creation project aims to enhance intimacy, it also breaks taboos around sexuality. The project interweaves fashion and technology to amplify pleasure for inclusive needs and communities.

The Partners

The project leaders Emanuela Corti and Ivan Parati collaborated with the Hub Electronics And Textiles, including the scientific partner Fraunhofer IZM and Wear It Berlin. Material testing was provided by Empa.

witsense.design
instagram.com/witsense_design

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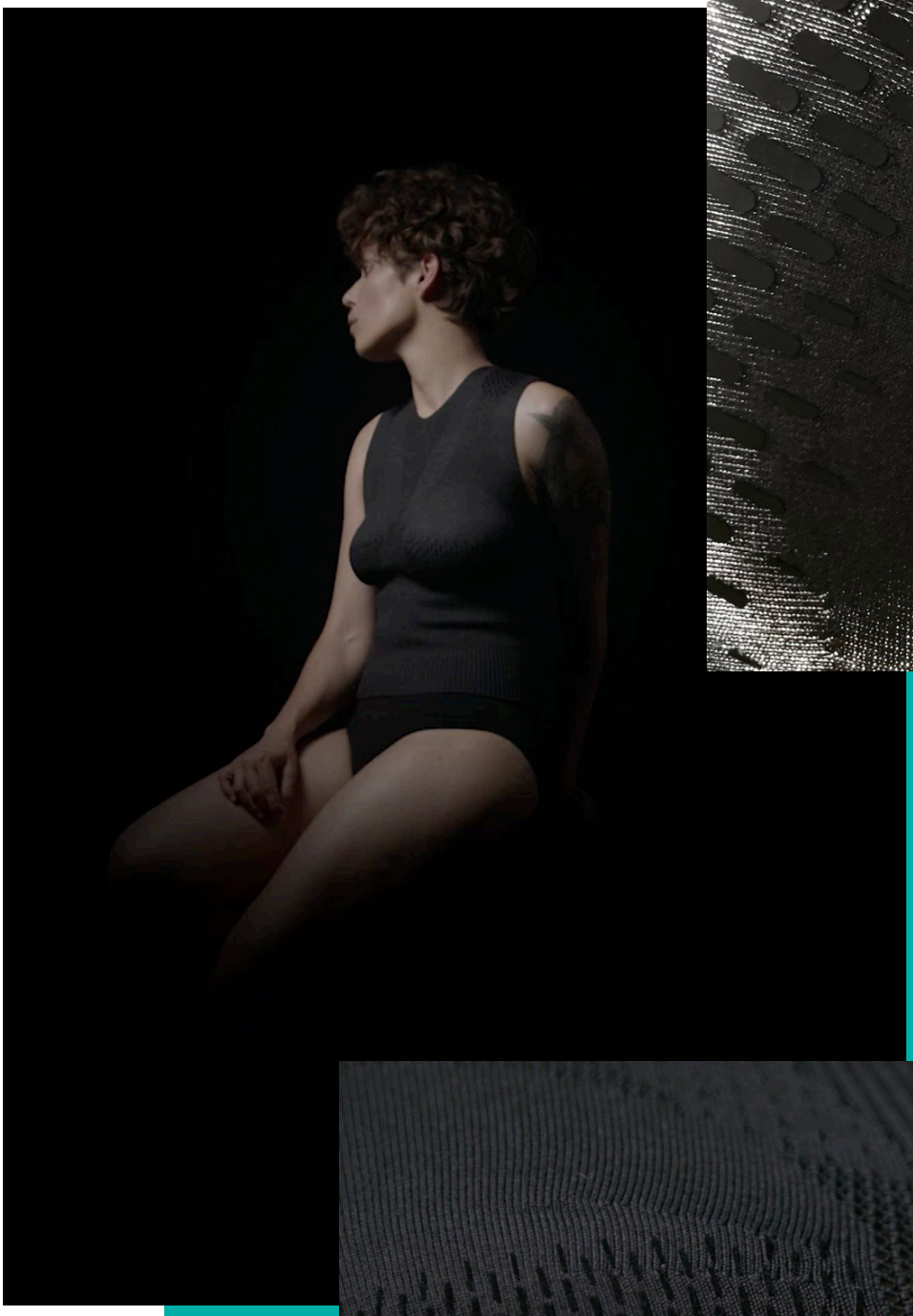
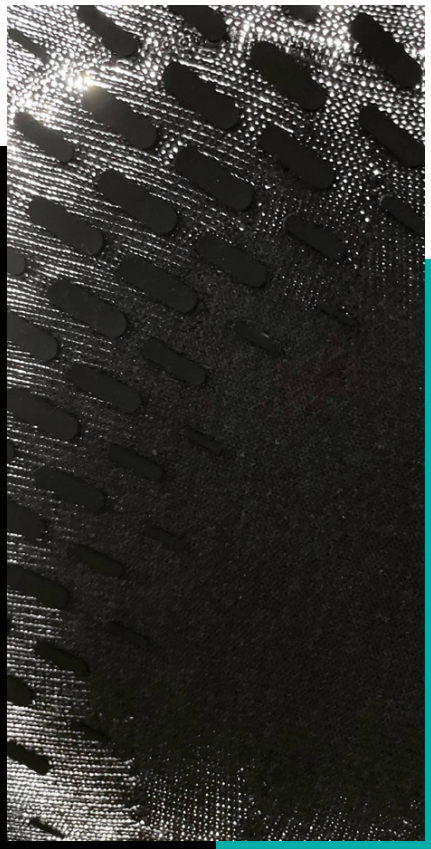
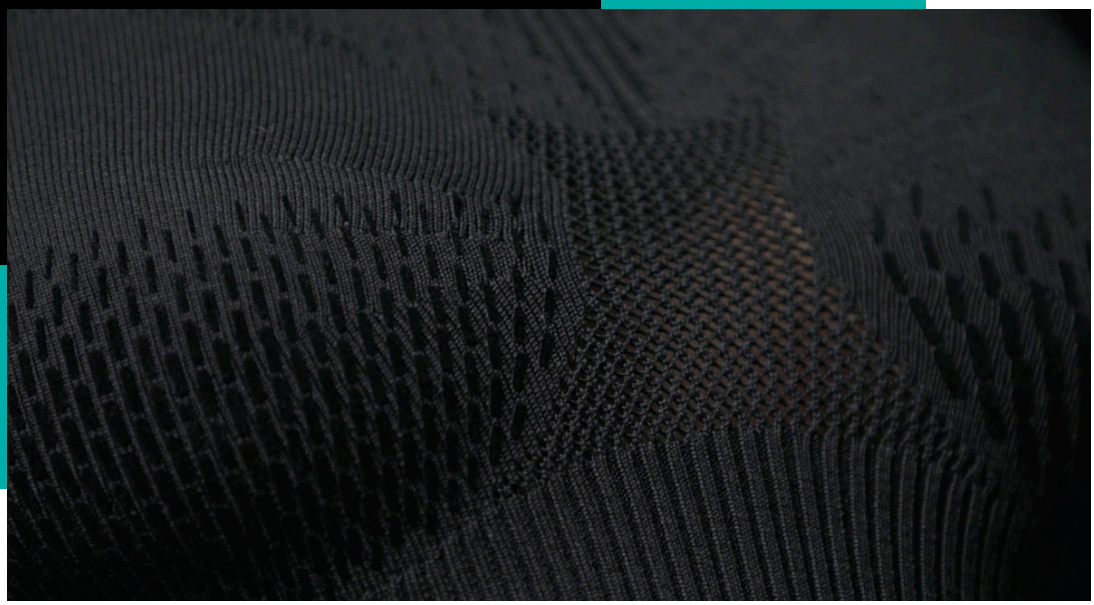
Needs-Based Clothing Design

by Silke Hofmann







Diversifying Clothing Design through Additive Manufacturing

A friend's breast cancer experience and unmet bra needs sent Silke Hofmann on a design journey striving for inclusion and harmony. Within Re-FREAM, Hofmann developed a speculative, modular garment that questions current bra construction and proposes an alternative breast support structure, reaching beyond the concept of underwear. The creation and manufacture of clothing becomes an empowering and re-energizing experience of the self, supportive and devoid of judgement.

The Partners

Hofmann worked with the Additive Manufacturing Hub. Her collaborations included the Fashion & Technology department at the University of Art and Design Linz and Empa. She also explored 3D printing trials with Profactor. In addition, Hofmann activated a community of experts, including character designers Nedim Šećeragić, engineered knit studio Case Studies, and product design Studio Wint Design Lab.

instagram.com/silk_hofmann

Re-FREAM is funded by the European Union's Horizon 2020research and innovation programme under grant agreement No 825647.

Syntropia

by Sophia Guggenberger & Eugenia Morpurgo

Manufacturing New Ecosystems

Combining 3D fabrication with agronomics, the Syntropia Re-FREAM project initiated by Sophia Guggenberger and Eugenia Morpurgo investigates circular manufacturing from seed to shoe. The material components for their bio-based footwear can be harvested from one polycultural field. Flexible and modular, the design framework adapts to seasonal yields and differing plant combinations. As Guggenberger explains, their shoes do not only dress feet: “a product can be a tool for achieving other things”; a holistic manufacturing approach, which encourages the regeneration of ecosystems.

The Partners

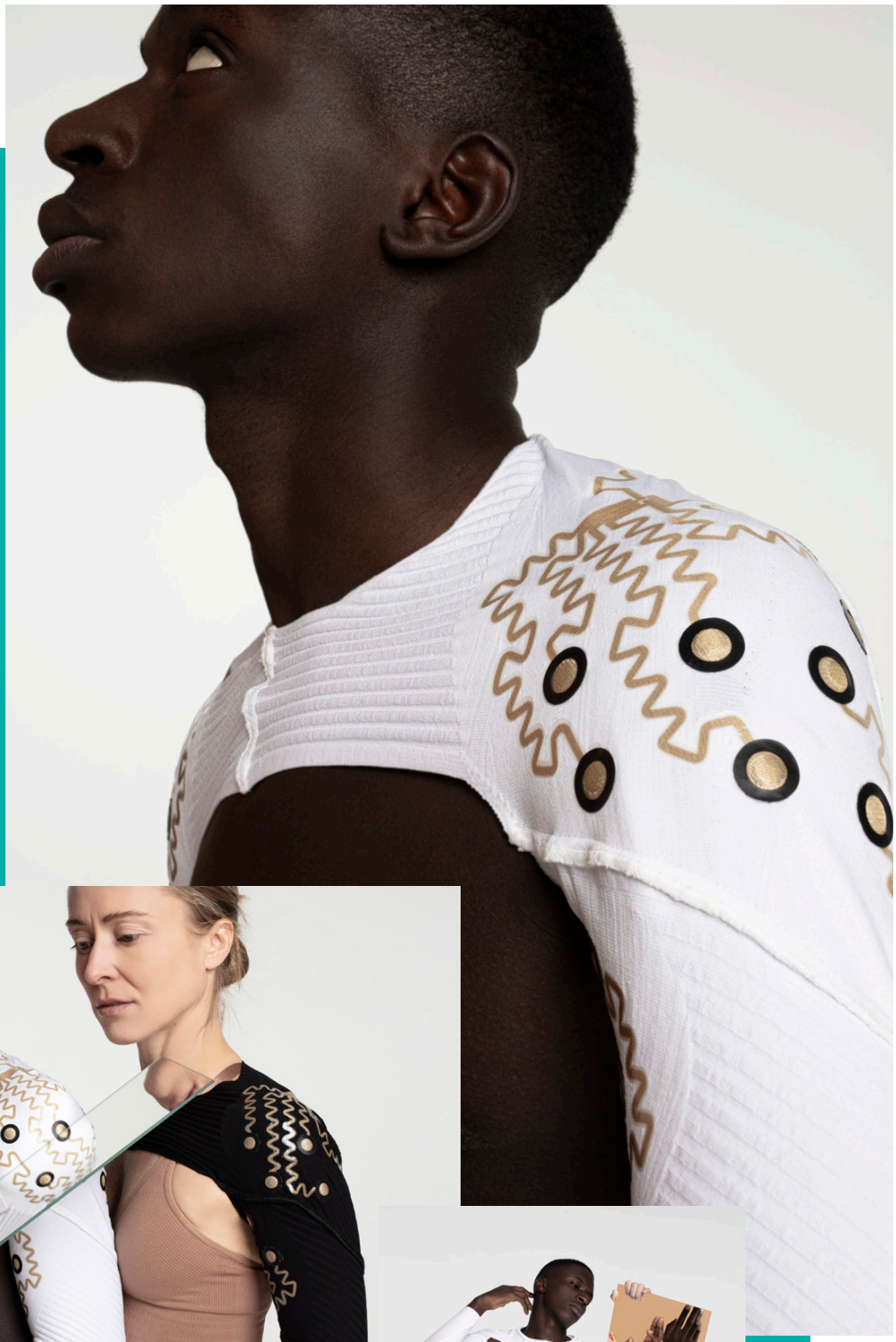
The team worked with Hub Additive Manufacturing. The Re-FREAM partners Haratech and the Fashion & Technology department at the University of Art and Design Linz collaborated on 3D printing techniques, and material development to produce the 3D-printed components of the shoes. Empa provided consulting on material properties and testing.

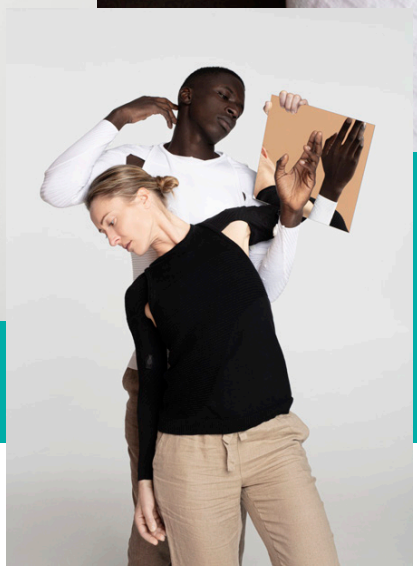
eumo.it
sophiaguggenberger.com
instagram.com/anothersyntropia

Re-FREAM is funded by the European Union’s Horizon 2020research and innovation programme under grant agreement No 825647.

Constructive Connectivity

by Jessica Smarsch





Mind-Body Connection as Remedy

The Connextyle “techstyle” sleeves Smarsch designed during her Re-FREAM collaboration reach far beyond fashion design — they function as a tool for mind-body healing. Stroke is a neural affliction that often impairs physical abilities. Smarsch’s garments are designed to improve upper body mobility for recovering stroke patients through engaging and creative exercises. Their embedded sensors connect to an app, which transforms movement data into artful designs. The visual outputs stimulate creativity in the recovery process and increase neural attention during the exercise. The additional sensory feedback and heightened neural attention help the brain to create new neural pathways. These innovative design and manufacturing processes contribute to a holistic approach to healthcare.

The Partners

Jessica Smarsch worked with Hub Electronics And Textiles and focused on e-textiles. Her partners were Fraunhofer IZM (Berlin), IED Madrid, Wear It Berlin and Stratasys.

jessicasmarsch.com
instagram.com/thesmarsch

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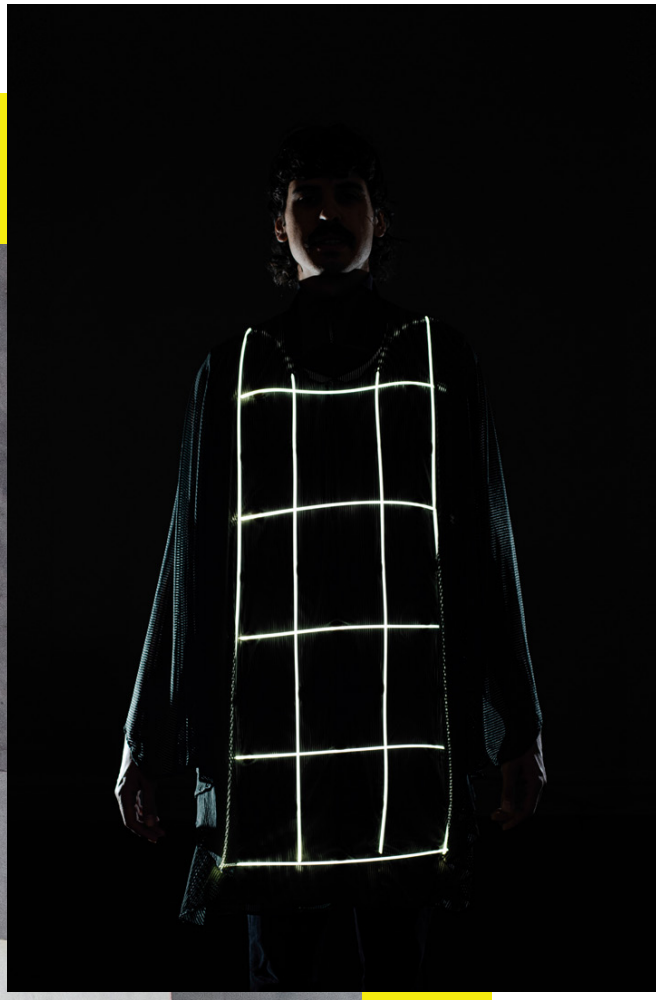
Ignotum

by Jan Wertel



Manufacturing Awareness

Using a glowing poncho, WertelOberfell address the right for privacy as a design challenge: how can garments help us to remain inconspicuous in a world of ubiquitous surveillance? The Re-FREAM co-creation project's creative use of LED innovation helps wearers disappear, while raising the visibility of privacy issues. Ignotum addresses algorithmic opacity through wearable luminosity.

The Partners

WertelOberfell are based in Berlin and worked with the Electronics And Textiles Hub. They collaborated with the Re-FREAM partners Fraunhofer IZM, Stratasys, Profactor and Wear It Berlin. Other collaborators included Markus Mau, Mira Thul-Thellmann, and Tim Schütze.

werteloberfell.com
instagram.com/werteloberfell

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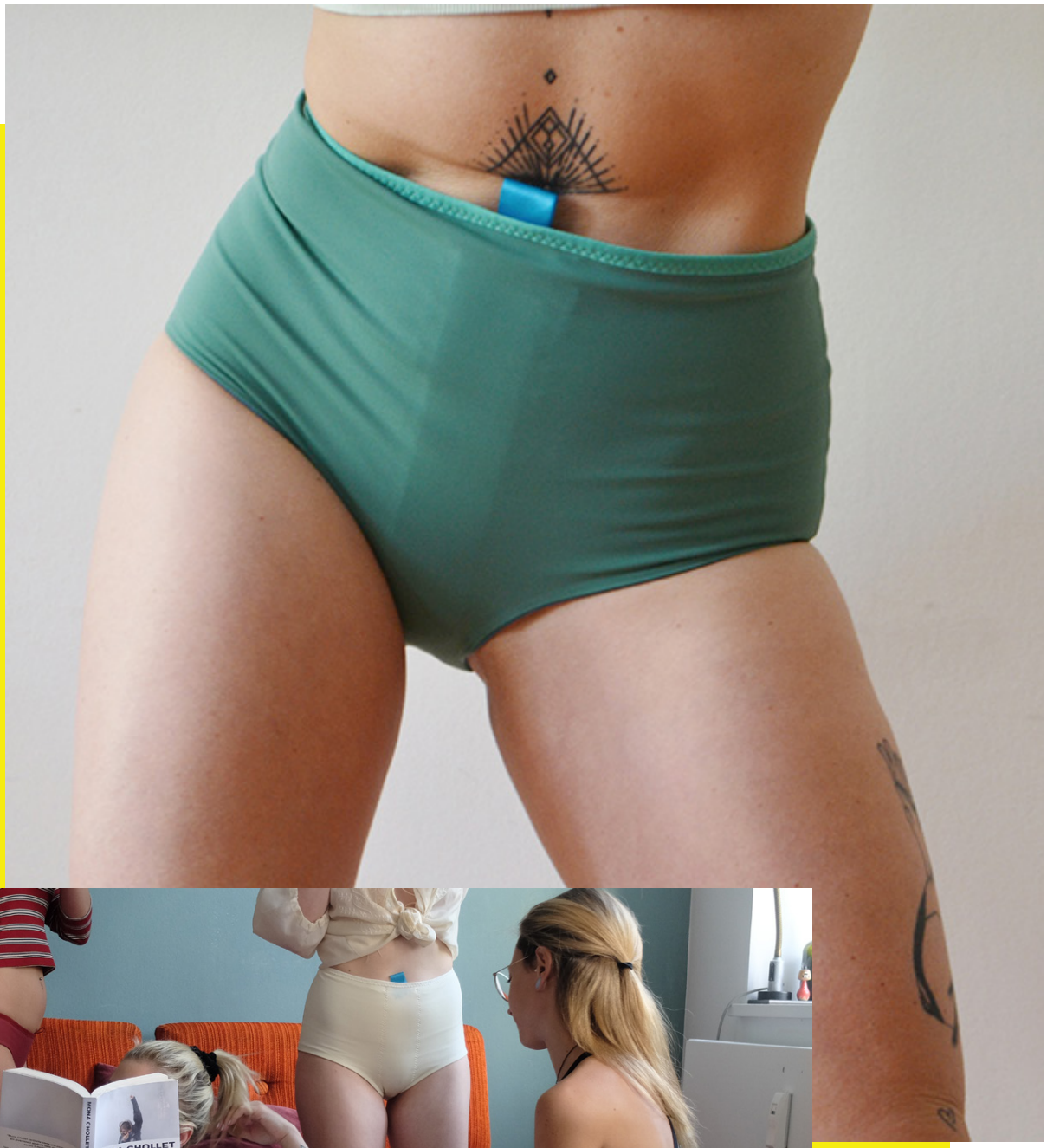



MONA CHOLLET
STREGHE

Manufacturing as Empowerment

ALMA underwear unlocks the power of seams and e-textiles to expand awareness, shape female health confidence, and transmit autonomy.
The project combines design technology and anthropology to co-create tools for both female intimate care and cultural change. Technological tools include biosensors embedded in underwear which measure vaginal fluid pH. Educational tools include a community platform to educate women about self health. Both aim to empower citizens to become active participants in their personal health, overcoming concepts of shame and silence surrounding female bodies.

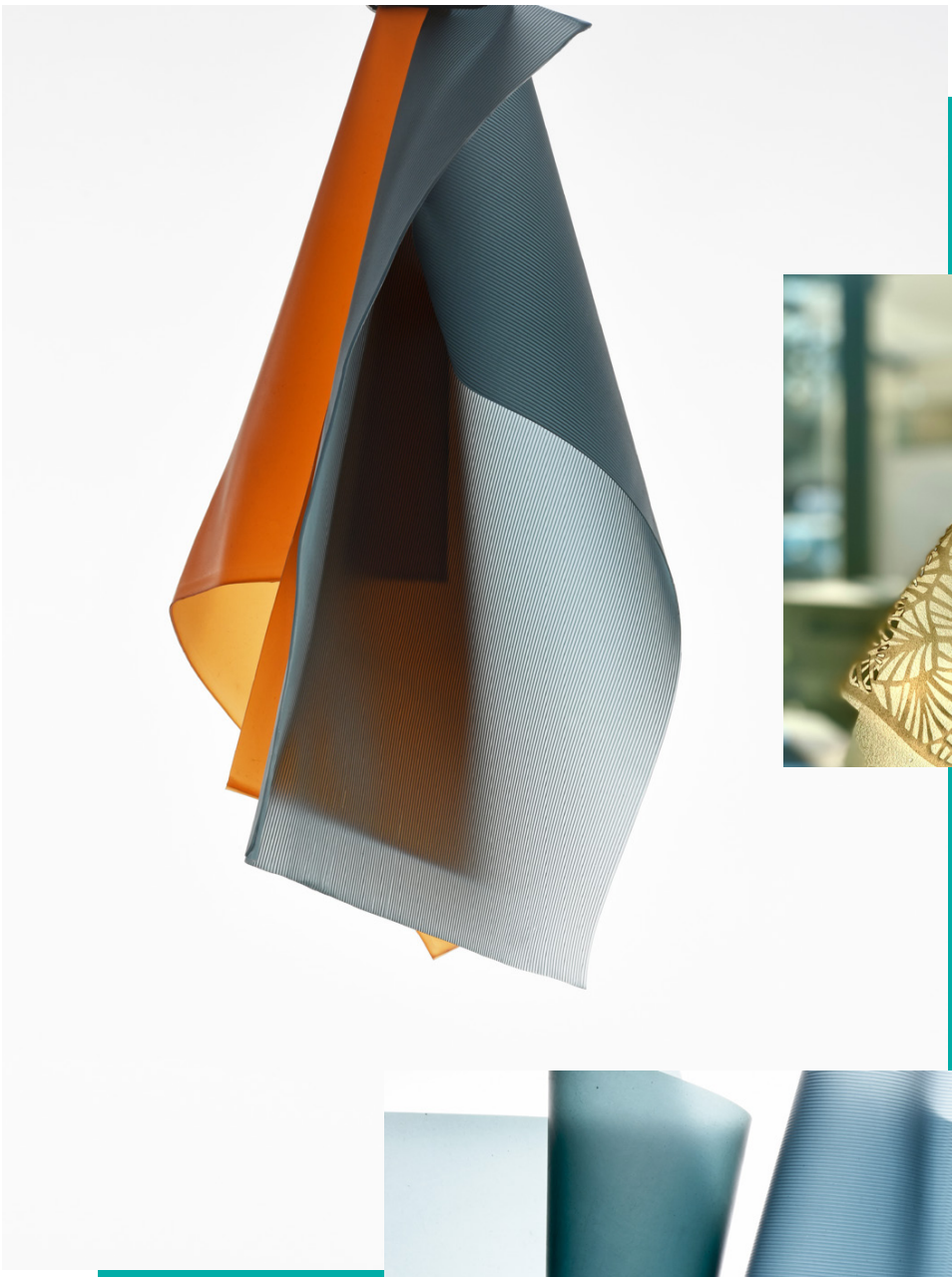
The Partners
ALMA collaborated with the Electronics And Textile Hub of Re-FREAM, specifically with Fraunhofer IZM. Empa provided consulting.

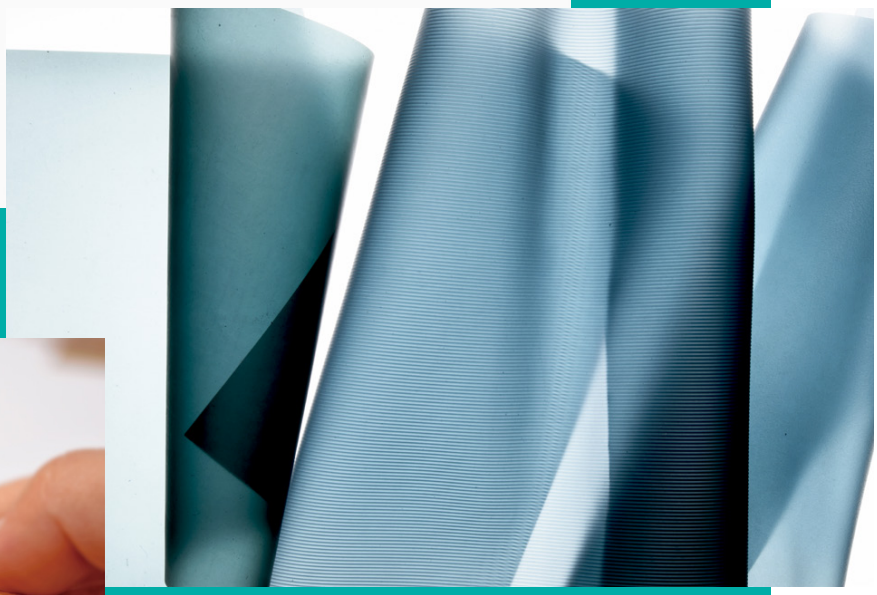
gitomasello.com
instagram.com/gitomasello

Re-FREAM is funded by the European Union's Horizon 2020research and innovation programme under grant agreement No 825647.

Cooking new materials

by Youyang Song





Manufacturing Sustainable Aesthetics

Inspired by fruit flavors, textile designer Youyang Song developed a fully biodegradable leather by simmering orange and banana peels. The resulting PEELSPHERE fabric offers an alternative to animal skins and their toxic tannery treatments, while also transforming food waste. Her Re-FREAM co-creation process explored cutting-edge manufacturing options for the material, such as computer-aided laser cutting, paving the way for future products ranging from fashion to vases and textured lamp shades.

The Partners

Youyang Song is based in Berlin, and worked with the Hub Sustainability And Eco Finishing. She explored laser-cutting options with the Re-FREAM partner Aitex.

youyangsong.com
instagram.com/youyang_song

Re-FREAM is funded by the European Union's Horizon 2020research and innovation programme under grant agreement No 825647.

Sustainable Evolution

by Loreto Binvignat

Manufacturing with Nature

The search for alternatives to petrochemical-based dyes led Loreto from the hills of Vietnam to working with laboratory scientists and bacteria strands in Spain. Her Re-FREAM co-creation project centered on the colorization of garments through biotechnology and application processes which are gentler on the environment. It envisions more sustainable fashion futures which blend cutting-edge machinery with microorganisms and embrace the beauty of natural dyes. Loreto's designs flourished with the help of natural ingredients, petri dishes, microbiologists in white lab coats, and the pounding drums of nebulization machines. The team worked with two strands of bacteria, chromobacterium and serratia, as well as with plant dyes. Different shades – including pale violet, warm marigold and bright lime – resulted from distinct processes.

The Partners

Loreto worked within the Sustainable And Eco Finishing Hub of Re-FREAM. She collaborated with Aitex and Care applications to research new methods in textile dyeing.

loretobinvignat.com
instagram.com/animabyloreto

Re-FREAM is funded by the European Union's Horizon 2020research and innovation programme under grant agreement No 825647.

Marinero

by Jef Montes

Shaping flexible futures with responsive materials

Fashion manufactured by rain. The poetics of this novel design approach by Dutch designer Jef Montes are so captivating, that it is easy to miss his reinvention of the fashion system. While his Re-FREAM research started as a fashion collection, the process propelled Montes towards the development of a new fashion business model. The resulting Adaptive Archi-Filament radically redefines entrepreneurial strategy for fashion designers. Rather than simply using fibers to produce fashion, his signature creative filaments both shape and financially sustain his creative collections, becoming the foundation for his brand.

The Partners
Aitex and the Fashion & Technology department of the University of Art and Design Linz, as well as Empa and Haratech

studioadaptiveskins.com
instagram.com/jefmontes

Re-FREAM is funded by the European Union's Horizon 2020research and innovation programme under grant agreement No 825647.

Leather for vegetarian

by Fabio Molinas

Conscious Manufacturing

There is a warmth to cork, a tactile echo of its origin as a protective layer around trees.
A sense of comfort which Fabio Molinas has made wearable by giving a fashionable new life to cork waste. His Re-FREAM co-creation project demonstrates the opportunities of new ecological finishings for the fashion industry, reviving the material with new purpose. The research confers renewed value to the heritage of cork manufacturing itself, a tradition whose knowledge and communities have shaped local rural economies of the Mediterranean through generations.

The Partners
Molinas is based between Sardinia and Madrid, and worked with the Sustainability And Eco Finishing Hub partners Aitex and Care Applications.

lebiudesign.com
instagram.com/lebiu.design

Re-FREAM is funded by the European Union's Horizon 2020research and innovation programme under grant agreement No 825647.

New Blue

by Tim Van der Loo & Sandra Nielsen

Re-Manufacturing Waste

On the surface, New Blue is a very fashionable recycled denim collection, yet its ambitions reach much further. The co-creation project initiated by Tim Van der Loo and Sandra Nielsen aims to transform our relationship with waste, to interconnect not just fibers, but systems and people in new ways. For Van der Loo and Nielsen, material innovation is rooted in infrastructures and value systems.

The Partners

The duo is based in Berlin and worked with the Sustainability And Eco Finishing Hub. Partners Care Applications and Aitex. They also collaborated with fashion designer, Sophia Wameling, and to finalize the patterns and sew the final prototypes, with Gravitex (Silvia Wald) for patterns and Tino König for sewing, and Textilhafen Berlin for waste resources.

anewkindofblue.com
instagram.com/sandranicoline
instagram.com/tim_van_der_loo

Re-FREAM is funded by the European Union's Horizon 2020research and innovation programme under grant agreement No 825647.

Fragments garments

by Elisabeth Jayot

Manufacturing Transformation

Elisabeth Jayot conceives fashion with the flexibility and pleasure of a puzzle. Modularity is central to her customized, on-demand clothing concept. While garment longevity has often been approached through classical and timeless designs, Jayot believes in extending fashion lifespans through an integrated “ability to morph”. Her Re-FREAM co-creations engage the wearer with the assembly of parts and on-demand colorization: sustainable fashion becomes interactive play.

The Partners

Jayot is based in Paris and worked with the Sustainability and Eco Finishing Hub. She collaborated with the Re-FREAM partners Care Applications and the Aitex facilities on three modular concepts. She also worked with Profactor and Haratech in Linz to develop 3D-printed customizable and reusable clothing fasteners, which were also color-customized using the micro-nebulization process of Care Applications and Aitex facilities.

instagram.com/elisabeth.jayot

Re-FREAM is funded by the European Union's Horizon 2020research and innovation programme under grant agreement No 825647.

Neobotanical Tailoring

by Alexander Bello

Manufacturing Sensory Wellbeing

Bursts of soothing lavender, refreshing rosemary or sweet eucalyptus — Alexander Bello's tailored collection contains invisible ingredients which completely alter garment experiences. The Neo-botanical research project interweaves nature, science, craftsmanship and wellbeing. Through micro-encapsulation and diffusion technologies, a corduroy jacket or a linen suit become scented mood-enhancers, naturally dyed and personalized with the ingredients and aromas of local fields.

The Partners

Bello worked with the Sustainability And Eco Finishing Hub. He collaborated with the Re-FREAM partners Care Applications and the Aitex facilities. He also worked with Profactor and Haratech in Linz to develop scented 3D-printed buttons and a portable clothing stand.

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Multidimensional Couture Workflows

Ganit Goldstein navigates multiple dimensions at all times: transitioning between 2D and 3D, then dipping into virtual reality. The ornate surfaces of her designs reflect her deep concern with craft, scale, and volume. In collaboration with her Re-FREAM partners, she developed highly customized new design workflows, creating both upcycled low-tech and high end multi-color Polyjet printed garments. Along the way, pandemic travel restrictions also pushed her towards entering the territory of virtual fashion display — in couture splendor. Her 3D-printed garments appear in virtual space in all their precious detail: a highly tactile display of digital manufacturing, eager for its closeup.

The Partners

Goldstein worked with Hub Additive Manufacturing. The Re-FREAM partners Stratasys, Haratech, Profactor, and the Fashion & Technology department at the University of Art and Design Linz supported Goldstein using 3D scanning and 3D printing techniques to produce 3D-printed garments and a virtual display.

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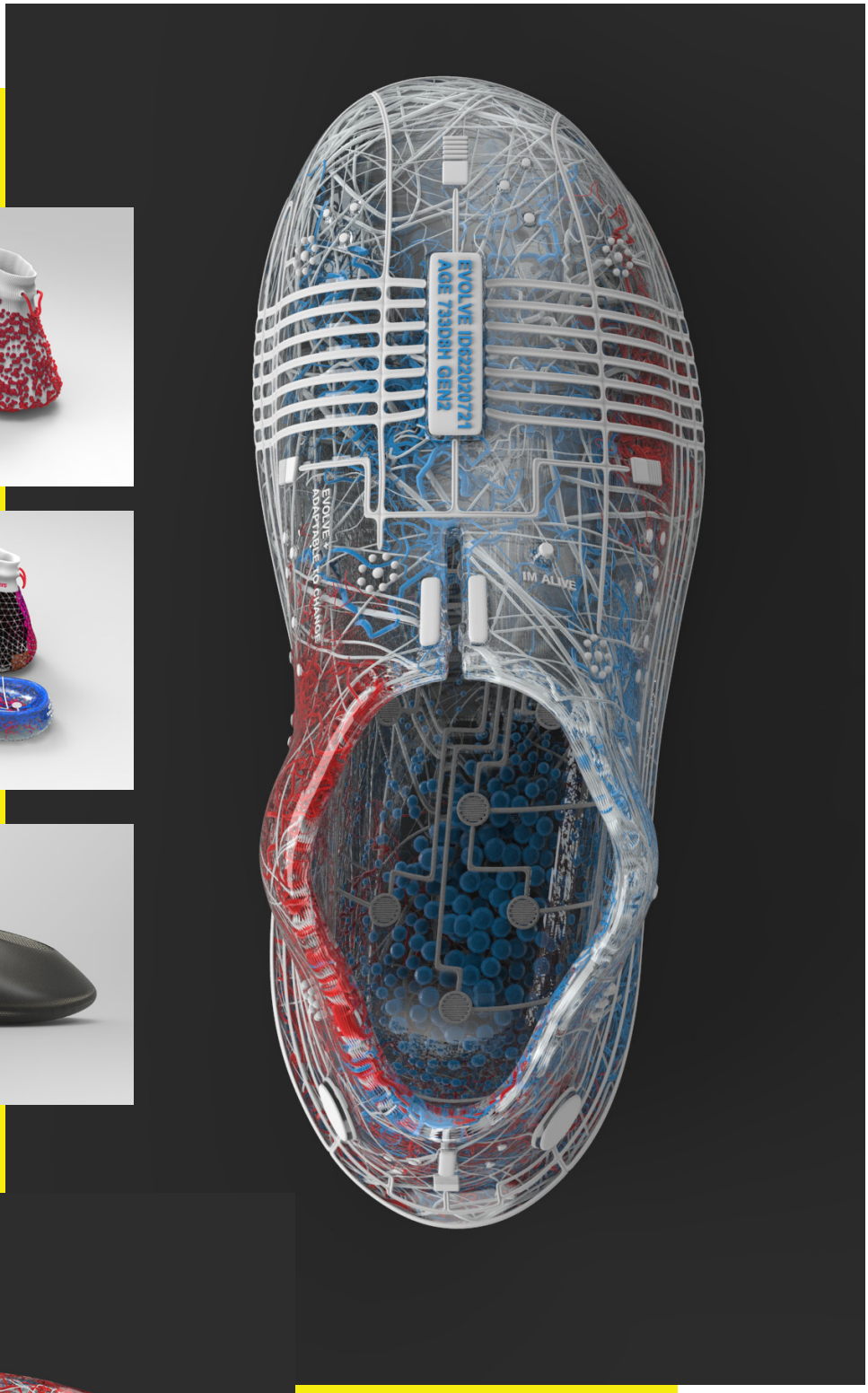
Re-FREAM is funded by the European Union's Horizon 2020research and innovation programme under grant agreement No 825647.

Footwear Time Based Design

by Assa Ashuach



Building Lasting Relationships with Additive Manufacturing

How can we produce not just fashion and accessories, but sustainable use? How can we make fashion items less disposable and make longevity more fashionable? Additive manufacturing has allowed Assa to steer footwear into several new directions: a flat-printed biodegradable shoe with replaceable parts, a repairable shoe in one piece, an evolutionary shoe with integrated sensors, which adapts to the user's needs over time, and shoe skins printed on fabric. Each design uses manufacturing innovation to redefine consumption.

The Partners

Ashuach worked with Hub Additive Manufacturing, focused on urban manufacturing. He partnered with Stratasys, Haratech, and Profactor, using 3D scanning and the latest 3D printing innovation. The Hub and the Fashion & Technology department at the University of Art and Design Linz provided a framework of networking opportunities and guidelines. Additional consulting was provided by Maximilian Müller from Moticon and footwear expert Camilla Petrocchi.

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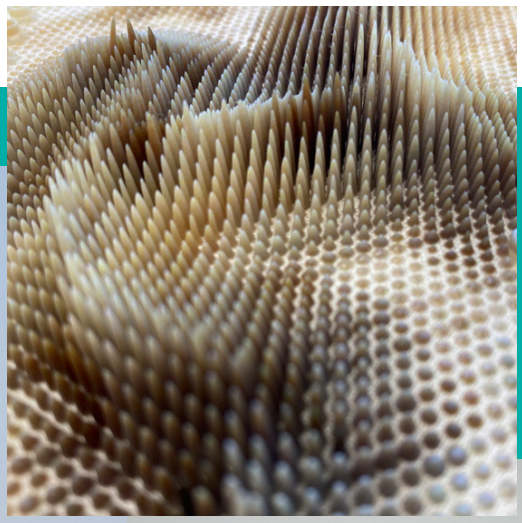

Crafting New Workflows Through Digital Savoir-Faire

When the highly acclaimed designer Julia Koerner asked herself how computational design can improve fashion fabrication, she searched beyond 3D code. She sought and found answers in seams and muscle tissues, in sea crystals, and in the hot desert air. Her striking computational designs are the results of taking workflows apart to reconfigure more sustainable production processes. Highly specialized in the domain, she was able to create structures which reduce printing waste. Researching mass personalization through body scanning also led her to reconsider the joining of garments. How can clothing morph to remain adjustable – not only to each wearer, but also to the wearer's changing bodies ? Can new forms of digital couture respect our environment – and allow for adaptation to both our bodies and to our surroundings ? Her multi-functional Arid collection provides us with first solutions.

The Partners

Koerner worked with Hub Additive Manufacturing, focused on urban manufacturing. She partnered with Stratasys and Profactor for the latest 3D printing innovation, while Haratech and University of Art and Design Linz consulted for 3D scanning.

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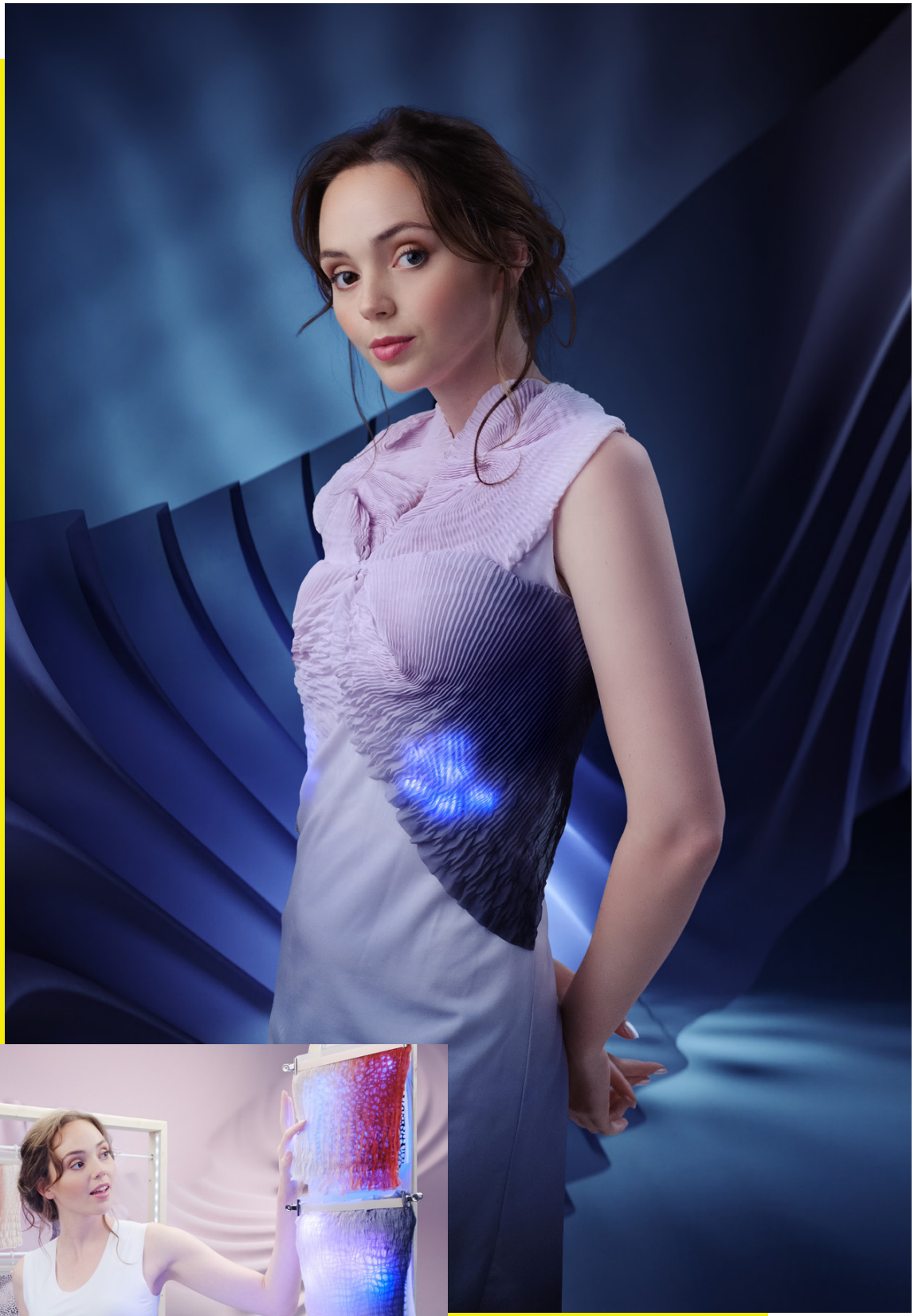
Second Skins

by Malou Beemer



Animating Garments and Behaviour

The shimmering interplay of layers in Malou Beemer's Re-FREAM project shine a light on our desire for change in fashion. Beemer approaches garment sustainability though her deep understanding of the social functionality of garments. Her research reflects on how design can change the way we want, wear, and discard fashion. Could smart garments be equipped to improve and maintain their desirability? Her modular Second Skins garment system combines adaptive parts which create a personal light symphony. Its composition responds to the aesthetic need for novelty, for interaction, and for standing out.

The Partners

Beemer is based in the Netherlands and worked with the Electronics And Textiles Hub. She collaborated with the partners IZM Fraunhofer, Profactor, EMPA and Wear It Berlin.

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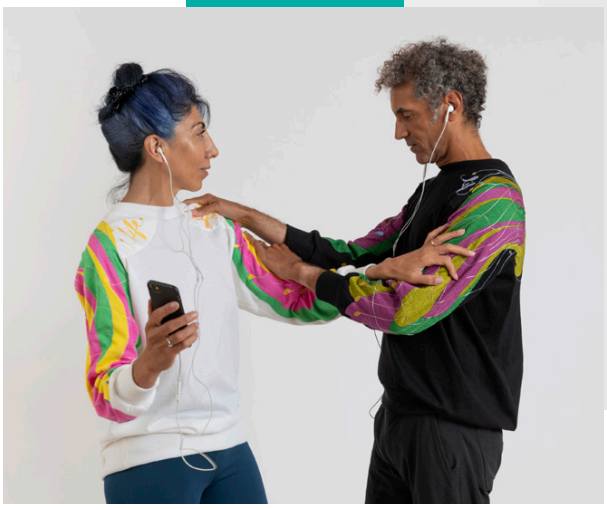
Embroidered Touch / Life Space

by Anke Loh



Manufacturing Sensory Connections

For Anke Loh, garments can be instruments. By creating sound through touch and gestures, her Re-FREAM designs encourage movement and joy. Deeply concerned about the loss of human tactile interactions during times of social distancing, Loh embeds technology into clothing to foster psychological wellbeing. Her Life Space sweaters enable us to listen to our own bodies, and to those of others.

The Partners

Anke Loh worked with the Electronics And Textiles Hub in collaboration with the Re-FREAM partners Fraunhofer IZM, as well as Wear It Berlin and the flat-knitting experts at Stoll in Reutlingen. Christine Shallenberg contributed software design, field and voice recordings.

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S+T+ARTS LIGHTHOUSE Re-FREAM

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