Humans created technology to transform and utilise nature to their advantage without fully understanding why and how nature functions. Modern technology gave us the opportunity to optimise these processes. Designers and artists have always been inspired by nature, yet their view of the natural world has been distorted in recent centuries by looking through an anthropocentric lens. Today, low cost, accessible technologies allow for a more meaningful interaction between creatives and the natural materials with which they work. This more intimate connection with nature allows artists to rethink the fashion ecosystem by looking into alternative ways of designing, making, and consuming.

The exhibiting artists interpret and embody nature through digitalisation and biomimicry or collaborate with living matter to develop relevant materials. The works on display exist at the intersection of technology, biology and design. These examples add to an alternative narrative of fashion technology, one that embodies a closer relationship between humankind and nature. Can we move our focus towards biotechnology and digitalisation to develop a relevant scenario for this field? Can these technologies reveal a new potential for sustainable alternatives in the fashion industry?

This event is initiated by the Embassy of the Netherlands in Paris. The programme is realised in collaboration with Waag’s TextileLab Amsterdam.

Cover image:
Title: “Back bone dress”
Designer: Jeanne Vicerial
Photo: Doris Lanzman
Model: Julia Gault
Exhibition Biotech Numérique - Bio meets digital

19-23 June 2018
Open daily from 12.00 to 19.00

The exhibition presents work from artists and designers: Violaine Buet, Clara Daguin, Iris van Herpen, Aniela Hoitink, Maurizio Montalti, Cecilia Raspanti & Noumena, Diana Scherer, Amber Slooten & The Fabricant, Tjeerd Veenhoven, Jeanne Vicerial, and selected materials from Materio.

Masterclass “Fashion tech asks for sustainability”

19 June 2018
From 12.00 to 17.15

The masterclass is given by e-textiles researcher Pauline Vierne for invited students and professionals from AMFI, ArtEZ, EnsAD, ENSCI, IFM.

Panel and Discussions

20 June 2018
From 11.00 to 16.30

The panel will be moderated by artist-designer and professor Valérie Lamontagne, with presentations and interventions by Judith Goyaud-Schiltz, Emma van der Leest, Maurizio Montalti, Tjeerd Veenhoven and Pauline Vierne followed by group discussions.

Presentations “Future Scenarios”

22 June 2018
From 12.00 to 14.30

Future Scenarios brings together different perspectives and presentations by Carole Collet Professor in Design for Sustainable Futures at Central Saint Martins; Fabrice Jonas, founder of Modelab, an independent media platform, which questions the changes in the fashion sector; Ista Boszhard, co-founder TextileLab Amsterdam at Waag; Cecilia Raspanti co-founder TextileLab Amsterdam at Waag and co-founder of Fabricademy; a new textile academy.

The exhibition and presentations are also part of the OFF of Futur.e.s festival.
Look 12 is a soft expandable silver lace that is heat-bonded and moiré lasercut, creating illusive movement.

“Aeriform” examines the nature and anatomy of air, creating negative and positive space with shadow and light. Van Herpen also drew inspiration from the Danish underwater artists, Between Music, who challenge the relationship between the body and its elemental surroundings in a subaquatic environment where air is absent. Air and water are the structural and visual components of the eighteen elaborate silhouettes in the collection. The elements also influenced the development of both the textiles and garment construction, which is reflected in their volumes, rippling patterning and translucent layering. Biomorphic structures include a featherlight metal lace in geodesic floral patterns, made in collaboration with Philip Beesley. Echo waves of mylar bonded cotton ripple across the skin mapping the surface of the body and painting its contours.

Iris van Herpen has been inventing new methods of sartorial expression by combining the traditional and the radical in her materials and garment construction methods since 2007. She calls this design ethos “New Couture.” Van Herpen used 3D printing as a garment construction technique and is comfortable with using technology as one of the guiding principles in her work because of its sculptural nature and unfamiliar form. The designer’s intent is to blend the past and the future into a distinct version of the present by fusing technology and traditional Couture craftsmanship.

Because of van Herpen’s interest in multidisciplinary approach to creation that goes beyond fashion, she has often collaborated with various artists. Van Herpen has received numerous awards since 2009. These include the Johannes Vermeer Award, the Dutch state prize for the arts (2017), the ANDAM Grand Prix Award (2014) and the Grand Prize of the European commission – STARTS (2016).

“I want to give new meaning to couture—give it relevance in the age of technology. I see couture as the laboratory of the bigger picture of fashion (the ready-to-wear), and my aim is to show that couture is not about yesterday. [That] it can be the place of innovation and collaboration to help push production, materiality, and sustainability forward. [I hope to] make haute couture the engine of progress in our rapidly changing digital age.
— vogue.com
The work “Seaweed textile”, consists of a series of samples: woven, dyed, sewn, printed, embossed, tufted, engraved, braided, pressed and embroidered. The project embodies a new practice of “seaweed design” at the intersection of design, craft, and research. It invites the inventiveness of nature to converse with human creativity.

Born in Brittany, Violaine Buet studied Science of Education and Sign Language, then Industrial Design at ENSCI before spending seven years in South India. As her passion for textile design developed, she studied the block printing technique and enjoyed a two-year collaboration in a traditional, local workshop. Her close-knit relationships with artisans confirmed her idea that the beauty of each design or material is intrinsically tied to the harmony between each link that unites every hand involved in the creative process. Back in Paris, she spent one year at EnsAD to start her intensive research on seaweed. In September 2016, she set up her studio in her native Brittany for the research and creative development of macro-algae. She collaborates in a network of experts, researchers and artisans.

“Fashion ecology could find its way through a new blend of disciplines, skilled craftsmanship and high technology, audacious choices and local resources, seasonal products, and circular systems. Just as permaculture offers a different vision of farming, focused on nature, fashion could cultivate its sustainability through creating a more biodiverse system.”
"AlgaeFabrics" started in 2015 by Studio Tjeerd Veenhoven as a concept to explore the most ambitious use of algae in the future. For this visionary concept, the detailed technical roadmap and the relevance to the future of fast fashion, Tjeerd Veenhoven was awarded the Global Change Award 2015 initiated by H&M Foundation. Cladophora, an algae species they work with, is rich in cellulose (up to 70% of its content). Cellulose is an excellent material for making yarn and is already commonly used in fast fashion textiles, but it rarely comes from sustainable sources. The sea is, by far, the most renewable and sustainable source for obtaining cellulose for the fashion of the future. On display are the various steps of extracting the cellulose from algae, the first filaments they produced, and an conceptual textile sample.

Tjeerd Veenhoven, is a material and product designer, his aim is to develop methods that generate better outcomes for technological, cultural and sustainable challenges.

This concept moves away from what used to be about aesthetics and functionality, almost becoming its own philosophy. In this quest for meaningful purpose and motivated by a sustainable mandate from the consumer, designers must become more knowledgeable about the entire lifespan of a product: from the growth of the raw materials to how these breaks down after use. Such a complicated task requires projects focused on best practices, to expand this sustainable ‘philosophy’ and halt the race to the bottom. Throughout the years, Veenhoven designed many of these best practice examples in which material innovation, sustainability, cultural diversity and social entrepreneurship are always part of the outcome. In his mind, being a designer is much more than aesthetics or trends. For him, it is closer to activism.

"I believe fashion will carry the next big societal shift towards a more sustainable way of living. We will finally realise that the fashion we wear is part of a circular system and that even our most elaborate use is still just a small step in a larger, circular process."
The materials displayed are selected by matériO to show the complexity of producing ecologically responsible materials and systems, and the contradictions and ethical questions they raise. Producing completely ecologically responsible materials is extremely complex because one must consider the cyclical nature of the process: from a material’s production to the end of its use. For some, taking inspiration from nature means placing mankind at the center of the world using natural solutions to improve human life.

In the creation of “Serycine”, silkworms no longer make cocoons, but are placed in a specifically shaped mould to create objects. The “zero waste bunny”, “Orylag”, is a genetically modified rabbit used in the food industry and for its soft fur. “Kangaroo leather” is a “zero ecological damage leather”. “Malai” is a material made from bacterial cellulose “fed” with waste from the coconut industry in south India that is then blended with natural fibres. “Wild Latex” is a faux leather sheet made from tree resin vaporised on cotton fabrics that are then smoked. “Wild Silk” is a product of unwoven silk respectful to the silkworm. “Plasticana”, or hemp plastic, also falls within this approach. “g_pwdr” is used for natural and waterless recycled carbon dyeing.

With varying degrees of eco-responsibility, these materials rethink our impact. There are no good or bad materials, but there are good or bad ways of producing, using and consuming them.

matériO was created in 2000 by a young French team curious about science, industry, materials, design and innovation. Launched thanks to a Santa Claus sponsor (Yvon Poullain), matériO is, above all, a technology watch service that selects specific, atypical and innovative materials. It is dedicated to architects, designers and creative professionals. The teams identify materials all over the world, in complete independence of their manufacturers. Once selected, manufacturers are invited to send samples so members can see and touch the materials in the physical material libraries in Paris, Bruxelles, Prague and Bratislava.

Materials used:

- **Cuir de kangourou / Kangaroo leather**
  Bonaudo, Italy
  bonaudo.com, info@bonaudo.com

- **Wild latex**
  Couro Vegetal da Amazonia S.A, Brazil
  treetap.com.br, w.rei@hotmail.com

- **Wild Silk**
  CPALI Org, Madagascar
  cpali.org, craig@cpali.org

- **Serycine**
  Sericyne, France
  sericyne.fr, contact@sericyne.fr

- **g_pwdr** (dyeing process)
  Alisea, Italy
  gpwdr.com, commerciale@alisea.it

- **Orylag**
  Coopérative des Eleveurs d’Orylag, France
  orylag.com

- **Plasticana**
  André Ravachol
  plasticana.com

“"Our thought about ecology is similar for each industry: We believe that ecology and sustainable material development all depend on the way it’s used. There are no good or bad materials, just an intelligent way of using them. We learn this from nature, every element on earth is perfectly integrated and decomposed.”"
With the work, “Interwoven”, Diana Scherer focuses on the dynamics of underground plant parts. The hidden root system is regarded by plant neurobiologists as the brains of the plant. Inspired by Charles Darwin, who was the first person who looked at the behaviour of plant roots. In his book, The power of movements in plants, he describes the roots not simply as passively growing downward, but characterises them by movement and perception. A root navigates, knows both what is above and below, perceives gravity and can locate moisture and chemicals.

In 2015, Scherer began to apply the ‘intelligence’ of plants in her work, looking at roots as yarn. In collaboration with biologists, she developed a technique to control the growth of plant roots. In “Interwoven”, the natural network of the root system is grown into an artificial material by assimilating underground templates and weaving or braiding the material itself.

At the moment, Diana Scherer develops new, sustainable textile materials made from the root systems of plants. Using this technique, she grew the dress “Rootbound # 2” for the V&A exhibition “Fashioned from Nature”. “Interwoven – Exercises in Root System Domestication” originated as an art project with an intuitive approach. It has now been developed into an innovative material research and pursuit for a new and responsible textile material. Interwoven was honoured to receive the New Material Award Fellow 2016, a biennial prize organised by Het Nieuwe Instituut.

I believe that by searching for unusual or overlooked organic resources, we can develop surprising, bio-fabricated materials for a sustainable future.

www.dianascherer.nl
“Aura Inside” is a hybrid piece, a mix between a garment and an interactive art installation. It intensifies the experience of wearing couture and is a means of showing the effervescence of the aura. The name, “Aura Inside”, refers to the emanation of our invisible energies and is showcased in the way the piece is presented: with the front and back split open, allowing people to stand in the piece itself. “Aura Inside” has a silhouette that refers to the cosmos, is entirely hand-embroidered, and is luminous. The motifs are inspired by the idea of the infinite and constellations, which are both intangible and esoteric. The heat sensors continually measure the temperature of the room, and detect the presence of body heat. The luminous constellations react to each person’s temperature differently.

Clara Daguin fuses the hand crafted and artisanal with emerging technologies. Daguin believes that it is extremely important to keep manual and traditional know-how alive in a world increasingly dominated by technology, but without compromising or shying away from innovation. Her experiments with embroidered light and biometric sensors question our relationship with technology to provoke an emotional response. Her process exists in a space between art and fashion. She has exhibited her work along with her ready-to-wear collection at Palais de Tokyo, during design week in Milan, and has showcased “Reveal the Invisible,” a solo show at Première Vision.

The life cycle of an object is a reflection of our relationship with it. Every fashion or design piece needs to have an impact on an emotional level. Rare, intimate, beautiful pieces will have a much longer life span or even multiple lives if people feel emotionally attached to them. They can be reused or restored, and will be a positive addition to cultural development in the way we relate to objects we own.
What will be left of our dreams after computers learn to dream? Venturing into unknown territory, “DEEP” explores the Wild West, combining fashion design with automated exploration. The result is a collaboration between human creativity and machine learning. The images from the computer’s dream served as inspiration for a new 3D digitally crafted collection. It made the creators consider what the digital revolution could ultimately mean for fashion design, the industry, and the people working in it. The collection is made entirely on the computer, using the latest technological developments, which resulted in a hypnotising animated video presentation taking the viewer through endless digital environments. Remnants of the fashion industry float through the scenes as the avatar moves forward into places that are familiar yet alien. Can an algorithmic process of trial and error lead to creativity?

Across disciplines, Amber Jae Slooten works with the body, animation and digital fashion design. Her work focuses mainly on how we will wear clothing in the future, and how our digital identity will take shape in virtual and augmented reality. She graduated with a full digital portfolio and her collection was the first digital holographic collection to show on a live model during Amsterdam Fashionweek in July 2016. She collaborates with people from all kinds of industries to realise future visions, this specific project is realised in collaboration with The Fabricant.

This startup produces photo-real digital fashion experiences for fashion brands and designers. Combining the conceptual and detailed vision of fashion designers together with technical knowledge of 3D artists, they aim to create engaging and hypnotic hyper-real digital fashion experiences. They want to make their viewers aware that digitisation of fashion is the inevitable future of the industry.

If we listen to nature, the best thing would be to no longer make any clothes. Virtual prototyping could be a solution, however, at the speed the digital world is evolving, only wearing our clothes in virtual reality does not sound so crazy anymore. What will we look like when we are not bound by physical space?

www.amberjaeslooten.com
www.thefabricant.com
“The Growing Lab / Mycelia” (TGL/M) is a process-based research project, investigating and assessing methods for implementing fungal mycelium as a cohesive agent and transforming organic waste and by-products to develop novel, functional and performative materials; production methodologies; and applications in design, fashion and architecture. The project tackles an urgent issue in communities worldwide: waste generation and environmental impact caused by disposable, synthetic compounds. “TGL/M” shifts the paradigm surrounding the objects (and the materials they consist of) occupying our everyday life. By moving beyond traditional production methods, a new universe of ‘cultivated’ products materialises. MOGU, a company developed from “TGL/M”, has consolidated processes and protocols to standardise and scale up experimental activities within the industry. MOGU materials are the result of the fully natural processes of microbial growth and cultivation, which results in 100% renewable, recyclable, and compostable solutions.

Maurizio Montalti’s work explores the design discipline, investigating and reflecting upon contemporary (material) culture. He has a creative trans-disciplinary approach rooted in a collaborative, research-based experimental practice. His studio’s work (Officina Corpuscoli) explores themes relating to biotechnology, anthropology, biodiversity, humanity’s impact on the ecosystem, recent production technologies, and the importance of a symbiotic relationship between life-systems. The multidisciplinary studio provides creative consultancy and develops both commissioned and self-initiated research and projects, with a focus on fungal mycelium.

The studio’s work has been widely shown in museums, galleries, exhibitions and festivals. Maurizio is also co-founder of MOGU, an environmentally-conscious company, dedicated to developing and scaling-up a range of mycelium-based technologies for the production of sustainable biomaterials and products. Involved in education, he currently holds a research position at Design Academy Eindhoven.

Introducing responsible materials based on microbial lifesystems could represent an ideal path forward in terms of sustainability, performance and innovation. Using naturally grown materials that utilise and transform by-products of other sectors to reach the highest quality standards could limit the fashion industry’s high waste production. This method respects animal/human welfare and positively affects the environmental impact of material flow and production.
Jeanne Vicerial (FR)

Clinique Vestimentaire | SACRe PSL Research
University Paris | Soft matters Ensad_lab
www.ensadlab.fr/jeanne-vicerial/

BACK BONE DRESS

From the collection: 446 km of thread | 2016

The collection, “446 km of thread”, was based on stylistic considerations and on the idea of moving away from contemporary industrial constraints into a new method of garment production. Jeanne Vicerial’s research focused on the development of an artisanal process that makes clothing comparable to 3D printing. To re-think the construction of clothing, Vicerial built her research on the anatomy of the human body and approached the body and clothing as an analogy. Each piece is created from a part of the recycled 446 km thread and is made exclusively by hand without the use of a sewing machine. Vicerial, who is currently continuing her research alongside engineers, wants to digitise this experimental, artisanal method and build a machine that is capable of sewing customised clothing based on a 3D scan of the body. The development of this method and machine both eliminate textile waste and proposes a different form of industrial customised clothing production.

Currently completing her Ph.D. at SACRe EnsAD - PSL Research University, fashion designer, Jeanne Vicerial, co-founded the design, research and innovation studio, Clinique vestimentaire, together with fashion designer Jennifer Chambaret in 2016. They produce clothing collections, where Jennifer focuses on product design whereas Jeanne researches at the intersection of textile and robotics. Vicerial questions the potential of technology in the field of fashion and production and is now engaged in the mildly self-sabotaging project of creating a robot to replace herself. She makes a high-tech version of couture, always focused on mimicking the anatomical structure of the human form, using strings to imitate sinews to create a new, wearable skin.

Digitalisation and an efficient robotic sewing tool have the potential to eliminate textile waste and stimulate a different form of industrial customised clothing production. The resulting materials are inspired by muscle tissues with the aim of building a cloth like a second improved skin.
There are seven billion people on this planet who all need to be dressed. Many of us enjoy fashion and trends, but the clothes that we get rid of along the way are a big problem. For “MycoTEX”, Aniela Hoitink got to the root of the issue. “MycoTEX” creates sustainable fabric from mycelium, the roots of mushrooms. Combined with 3D modelling, they create garments from this material that perfectly fits your body without the need to cut and sew. The material is grown in petri dishes and assembled on 3D moulds based on real body measurements. The shorter supply chain eliminates the need for chemicals and pesticides. Water usage is reduced by 99.5% compared to cotton and local production is reducing transport. Labs only grow what we need and have no waste during the production phases. After wearing the garment, people can simply bury it in the ground and it will naturally decompose.

Aniela Hoitink worked for various fashion companies which allowed her to get to know the industry from the inside out. In 2008, she launched NEFFA to focus on textile innovation. NEFFA, or “net effe anders”, is Dutch for wanting to do things just a bit differently. Personalisation and distinctiveness are the main drivers for Hoitink. Hoitink focuses on changing material and production techniques, combining emerging technologies with research on old materials, dyeing and production techniques. With her solutions at the intersection of technology and microbiology, she re-thinks the future of fashion and develops personalised fashion and textile products based on newly developed materials and production techniques.

She was the winner of the H&M Global Change Award 2018; a grant to further research on Fungi Fashion using 3D technology.

We see our consumption behaviour as a problem, but if we look at the trees we can see that they get a new set of leaves every year. We can learn from nature, grow decomposable materials and improve the fashion system.

Aniela Hoitink (NL)
NEFFA | neffa.nl

MYCOTEX

2016 - ongoing
CORALIA 2.0

“Coralia 2.0” is an ongoing collaborative project that explores how generative design can explore new realms at the intersection between nature, the human body and digital technologies. “Coralia” brings together hi-tech 3D printing technologies, fashion, textiles and craftsmanship. The project demonstrates how these two can complement and enhance each other’s main features and limitations through the digitalisation and understanding of nature’s growth patterns together with geometries generated from the human body. The 3D printed elements of the garment are generated through the study of growth patterns from the Schizophyllum fungi. The technique used allows for precision in emulating the mushroom’s shape, behaviour and textures, which is unachievable with other techniques. The textile enhances these features, through its lightness on one side, and it’s injected abstract patterns on the other.

Cecilia Raspanti is a creative researcher in fashion & textiles and digital fabrication expert. She is the co-founder of the educational world wide distributed programme, Fabricademy; a new textile academy, and co-founder of the TextileLab Amsterdam at Waag. Here she leads the creative research and technological development of new concepts and alternatives for the textile and clothing industry. Experienced in fashion, knitwear and textiles, she focuses on translating traditional craftsmanship techniques and production processes into digital fabrication opportunities to facilitate the access of these technologies for a broader public. Always inspired by human’s connection to nature and technology, her latest works are developed in collaboration with Noumena.

Noumena is a multidisciplinary research practice developing innovative solutions in a wide range of fields such as wearable technology, architecture, robotics and advanced construction. Combining computational design, digital manufacturing, robotics and virtual reality, they operate through a data-informed workflow, revealing patterns to inform design solutions.

“...If we aim at a future of sustainability and innovation in the fashion industry, the only way I see this moving forward, is by bringing together technology, digitalisation and craftsmanship techniques coming from our heritage. To create new possibilities in design and manufacturing we must look at production processes through the lens of the knowledge of yesterday and the chances given by the technologies of today...”

Cecilia Raspanti (NL) & Noumena (SP)
Waag TextileLab & Noumena
www.waag.org / noumena.io

2017 / 2018
The Atelier Néerlandais, part of the Embassy of the Netherlands in France, serves as a platform for the Dutch creative and cultural sectors. Dutch individuals, organisations and agencies who want to discover new opportunities in France and are active in the cultural and creative sectors can become a member of the Atelier Néerlandais. Among the current (more than 100) members are designers, architects, artists, and researchers. They can use the spaces for co-working, meetings and presentations. This bottom-up approach makes it a unique instrument for international cultural policy of the Embassy. It has proven to be a perfect place for fashion shows and product presentations and it hosts seminars and networking events in close collaboration with French and Dutch partners.

This event is part of Oh! Pays-Bas: the Dutch cultural season in France 2017-2018, initiated by the Embassy of the Netherlands in Paris. The program is realised in collaboration with Waag’s TextileLab Amsterdam.

Team Atelier Néerlandais: Carolien van Tilburg, Joan Mols, Resi van Holderen and Elise Baeriswyl

paysbasetvous.nl/votre-pays-et-les-pays-bas/france/cultuur
atelierneerlandais.com

Waag operates at the intersection of science, technology and the arts. Our work focuses on emergent technologies as instruments of social change, and is guided by the values of fairness, openness and inclusivity. Waag’s dedicated team of sixty thinkers and makers empowers people to become active citizens through technology.

'Making technology & society more open, fair and inclusive.'

Waag is a middle-ground organisation composed of research groups that work with both grassroots initiatives and institutional partners across Europe. The collective has a shared attitude of public concern and civic activism, which is manifested in our public research agenda. Working with emergent technologies, Waag conducts research in both imaginative and practical terms, addressing its fellow citizens from a position of equality and collaboration.

The Waag team: Ista Boszhard, Cecilia Raspanti, Paulien Melis, Jurre Ongering, Thijs van Himbergen, Ron Boonstra, Merel Boes & Tessel van Leeuwen
waag.org
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