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The interaction between design, art and technology

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It is the pragmatist model of what Richard Shusterman calls “the transactional experiential inquiry” that guides his philosophical research and highlights the integration of theory and practice and the interdisciplinary goal that is central to somaesthetics.¹ This interdisciplinary research project is “devoted to critical and meliorative cultivation of the experience and use of the living body (soma) as a site of sensory appreciation (aesthetics) and creative self-stylization”. It has created many different applications to the arts, science, ethics and daily life.²

Both Richard Shusterman and the many other researchers working with various aspects of somaesthetics have always been aware of the many transformations that take place in the spheres of culture, society and science and which are important to interpret. It is through work of this kind that somaesthetics has been able to maintain its actuality, ask new questions and therefore been able to include new fields and provide new answers to the often complex problems that constantly emerge.

It has become increasingly obvious that the many new digital tools and other new technologies, which constantly create dramatic changes in our society, have taken over the fields of art and design and will continue to do so in the future. What impact do the new technologies have on visual art and design? And how do artists and designers respond to the new technologies’ powerful and creative tools but also to their possible risks?

The inroads made by these new technologies have also meant that they influence our ways of thinking and experiencing, even to the extent of our experience of our own bodies. How can somaesthetics help to highlight and perhaps answer these questions?

¹ Shusterman, Richard, “On Pragmatism, Somaesthetics and Contemporary Art, Lecture at the Danish Royal Academy of Fine arts, Jan 10, 2014 and Pan Gongkai: Dialogue with Richard Shusterman on Philosophy, Art and Life”, *Journal of Somaesthetics. Somaesthetics and Visual Art*, vol. 1, no 1, 2015, p. 67.

² Shusterman, Richard, “21. Somaesthetics”, *The Encyclopedia of Human-Computer Interaction*, 2nd Ed. <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/somaesthetics>, 22002 See also Shusterman, *Thinking through the Body. Essays in Somaesthetics*, Cambridge University Press, New York, 2012, p. 27.

To attempt to clarify some of these questions, I will be highlighting a few projects in the field of art, design and architectural design that are based on various forms of new technology and are inspired by somaesthetics or contain parallels to its general ideas. Like somaesthetics, these projects show an understanding of the body's role in the arts, viewing it as a resource for working not only on the problems of creating and interpreting art but also on benefiting life, society and nature in general. But many of the artists and designers using new technologies reveal not only their creative potential, but also their possible risks.

The renowned and multifaceted Danish-Icelandic artist Olafur Eliasson is one of the few contemporary artists who has made a breakthrough both in the art world and in the field of design as well as creating surprising crossovers between them. He has been “fluent in the language and tools that technology offers to artists” and designers for a long time.³ As a judge on *Space Wired Creative Fellowships* he has the best opportunity to make new bridges between art and technology. In his studio in Berlin he has about a hundred engineers, programmers, technicians, scientists, architects and craftsmen who assist him in realising his multifaceted projects in art and sustainable design. They have also broadened the possibilities of what digital technology can do for the arts, and vice versa. For Olafur Eliasson it is always the artistic interpretation that is predominant. He stresses that it is exciting for him to be able to reach “the moment where the fact that it is digital will go unnoticed, and the fact that it is art will be the focus”.⁴ In his interactive projects it is thus always the artistic questions that are paramount.

The technological tools are also not merely part of creating the artworks, but also include the viewers as an organic element in the projects. For Olafur Eliasson, it is very important that the experiences of the viewers and the artists of the surrounding world constantly encounter and enrich one another.

³ Turney, Eleanor, ” Profile: Olafur Eliasson On Art and Technology”, 02/05 2015, p. 1.

⁴ Turney, Eleanor, op. cit., p. 2.

He is a good example of an artist who – in the words of Richard Shusterman - “thinks through the body” (..) because he has seen “that all perception, cognition and action is crucially performed through the body.”⁵ In extension of this view, which is connected to the highlighting of the viewer’s active participation in the creation of the work, Olafur Eliasson is inspired first by Merleau Ponty’s phenomenology of perception and later also by somaesthetics. Because, he says:

I like Shusterman’s idea of connecting the notions of *soma* and *aesthetics*. It reflects my view of the body as well. As I understand it, somaesthetics implies that you are not only capable of shaping but that you are also being shaped. The body learns from different layers of experience, both constituting and being constituted, as we know from phenomenology.⁶

In *Your Rainbow Panorama* (2011)



Olafur Eliasson. *Your Rainbow Panorama*. 2011. On the top of AROs. Aarhus Art Museum. In the light of day.

one of his large-scale permanent projects in urban space, which hovers on top of the Aros Art Museum in Aarhus in Northern Denmark, one is confronted with a surprising visualisation of his interpretation of the body-mind relationship.

⁵ Shusterman, “Somaesthetics at the Limits”, *The Nordic Journal of Aesthetics*, no 35, 2008, p. 18.

⁶ Olafur Eliasson, *Art as Embodied and Interdisciplinary Experience: In Dialogue with Else Marie Bukdahl*, *Aesthetic Experience and Somaesthetics*, ed. by Richard Shusterman, Brill, Leiden/Boston, 2012, p.64.

His use of the word “your” indicates his desire to stimulate the viewers’ own experience and active participation while heightening their perceptual awareness and compelling them to become more connected to the space around them. It is through the relationship between colour and movement that the body becomes a dynamic, interactive and sensual consciousness. Or in his own words:

In *Your rainbow panorama* I was particularly interested in the interplay between colour and movement. I have put a ring of coloured glass around the visitors; a materialized spectrum of all the colours that make up daylight; a kind of rainbow or colour wheel. But there is also a different colour circle: the one you produce in your own eyes, which shifts in relation to the colours you walk through as you move within the work⁷

This work is also characterized by Olafur Eliasson’s interest in the relation between the self and other and between the self and its surroundings. Viewers can acknowledge the presence of one another and move in full view of their co-participants.



Olafur Eliasson. *Your Rainbow Panorama*. 2011. On the top of AroS. Aarhus Art Museum. At night. In his other large works he aims more specifically at sculpting new interfaces between humanity and nature, especially seen from an ecological point of view. This applies to a work like *Glacial rock flour garden* (2016),

⁷ “It’s Your Rainbow - An interview with Olafur Eliasson” by Marie Nipper (17 November 2010) in *Olafur Eliasson*, ARoS, 2011, p. 105.



which is a circular space in the middle of the Bosquet de la Colonnade in the park of Palace of Versailles.

He filled this space with a thick layer of moraine – granite from Greenland. It has been transformed into a fine grey powder over centuries by moving glaciers. This claylike material is placed in front of the sculpture of Pluto abducting Persephone, the goddess of fertility. It can be used to revitalise the impoverished soil in places like Africa because it is a rich source of the mineral nutrients that are beneficial for the cultivation of crops and other plants. This installation positions itself as an exchange between the actively engaged visitor and their individual experience and an altruistic involvement in agricultural utilities in the developing world.

In terms of the relationship between somaesthetics and design, the most nuanced results are achieved in the field of computer design, because a practical interaction design involving our bodies has been created.

The “Swedish design group” - Kristina Höök, Martin Jonsson, Anna Ståhl and Johanna Mercurio have been particularly successful with this, calling their new

contribution to interaction design *Somaesthetic Appreciation Design*.⁸ Through their design we can not only acquire “ a better understanding of our somaesthetic experience, but also “improve the quality of our bodily perception, performance, and presentation” and enrich our sensitivity to other people as well.

In his interactive design works Olafur Eliasson uses the experiences that he has gained during the creative processes of his large works. It is first and foremost the play of light - both natural light and the artificial light created by new technologies - that visualizes his interactive artistic, social and ecological objectives. His design contains parallels to some of the overall goals that somaesthetics sets for interactive design work and which are practiced by “the Swedish group”. Like them, he is “convinced that the experience is not just in the head, it is embodied” and that the awareness of the bodily experience also helps to promote wholeness in the person and a greater sensitivity to others. However, in his design works, he uses other technologies and there is a greater emphasis on design having what he terms “a real-world significance”. This is why he tries to improve people’s living conditions more directly and provides them with a happier life. To promote these general aims he created the a design work in collaboration with engineer Frederik Ottesen, *Little Sun*. It was launched at the Tate Modern in 2012 and is a product of a conviction that - as Olafur Eliasson and Frederik Ottesen describe it - “the power of sustainable energy transforms lives, especially for those 1.1 billion of us who live without access to energy”. Olafur Eliasson hopes to bring “the power of the sun to everyone”.⁹

⁸ Höök, Kristina, Jonsson, Martin, Stål, Anna, Mercurio, Johanna, ”Somaesthetic Appreciation Design”, <https://www.google.com/search?client=firefox-b-ab&q=Somaesthetic+Appreciation+Design>

⁹ ”Little Sun Global impact” 2017, file:///Users/elsemarie/Desktop/Impact%20-%20Little%20Sun.webarchive



Olafur Eliasson, *Little Sun*. Together with the artist. A solar-powered LED light. 2012

When designing the *Little Sun* he tried to give it both a beautiful appearance and tried to ensure that it created a bodily feeling of wellbeing as well as creating a new awareness of people and the environment around them, or in his own words:

Holding power in your hands is very liberating. It makes you feel resourceful, connected—whether you're a child or adult, on-grid or off-grid. This is something we all share.¹⁰

Little Sun is a sunflower-shaped LED light that provides associations to the sun - it shines and is stimulating. The light can be adjusted to different strengths and it is weather-resistant. It is also light, because it is intended to be hung around the neck by a lanyard and it is built so that the body can mostly move in a harmonic way.

¹⁰ Olafur Eliasson's *Little Sun*: "A work of Art that Works in Life", https://www.moma.org/explore/inside_out/2014/03/26/olafur-eliassons-little-sun-a-work-of-art-that-works-in-life/

There is no doubt that it provides optimal opportunities for people who do not have access to electricity, to be able to work in the evening. And it creates security for both children and adults outside after dark. It is a clean and cheap light source that reduces dependency on dangerous kerosene lanterns, which have both extensive health and environmental impacts.

Children, in particular, can with the aid of *Little Sun* study after dark, return home from school in the late evening, play and socialize.



Olafur Eliasson. *Solar School Program*. Rwanda.

Wild animals in Africa seem to be afraid of its light. And with the aid of *The Little Sun Foundation*, *Little Sun* provides light for schoolchildren and the tools and knowledge that will empower them to shape a sustainable future for themselves and for the planet. Eliasson and his colleagues have found that the sustainable light from *Little Sun* can positively impact the lives of people, regardless of whether they are at work or are engaged in leisure activities or travel.

On the back of *Little Sun* there is a solar panel, which - as Olafur remarks - has a high capacity and allows the strength of the light to be adjusted:

Featuring a dimmer, you can easily adjust the brightness of the lamp to what you need. Five hours of charging in the sun produces more than 50 hours of light at the dimmest setting or four hours at the brightest setting. *Little Sun* “captures the energy of the sun via a little solar panel, releasing it through a LED light.”¹¹



Olafur Eliasson. *Little Sun original*. 2012

Eliasson is convinced that:

Little Sun is a work of art that works in life (..) it is a wedge that opens up the urgent discussion about bringing sustainable energy to all from the perspective of art.”¹²

Little Sun is now a global art project, making life easier and happier for over a million people all over the world and this figure is rising all the time.

Its spread has been described by Olafur Eliasson and Frederik Ottesen as follows:

What started as a humble idea to create a small, portable lamp for people without electricity in Ethiopia is now a global project that has changed over a million lives through the awesome power of the sun. We strengthen communities from the inside by creating local jobs and generating local profits through our local partners and network of young, African entrepreneurs. Little Suns are sold at a higher price in areas of the world with electricity so that our products can be sold in off-grid areas a much lower, locally affordable prices.¹³

¹¹ Olafur Eliasson, “Little Sun: The Rise of Little Sun”, 19 July 2012, <https://www.tate.org.uk/context-comment/blogs/little-sun-rise-little-sun> .LED is “a light-emitting diode - a semiconduct device that emits visible light when an electric current - here created by solar energy - “Little Sun Charge - Solar Charge passes through it.

¹² “Olafur Eliasson’s Little Sun: ”A work of Art that Works in Life”, https://www.moma.org/explore/inside_out/2014/03/26/olafur-eliassons-little-sun-a-work-of-art-that-works-in-life/

¹³ “Little Sun Global impact” 2017, file:///Users/elsemarie/Desktop/Impact%20-%20Little%20Sun.webarchive



Olafur Eliasson. *Little Sun's* global Impact.

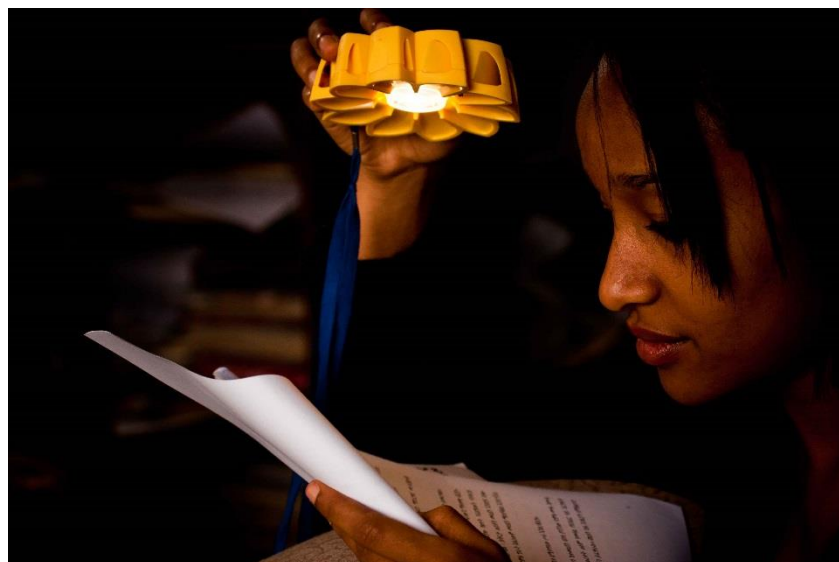
They have received vast numbers of letters and emails that show how great the impact of *Little Sun* has been in the daily lives of both children and adults:

My Little Sun goes with me everywhere, it's lighting my future

(Maywut, 16 years old, South Sudan)

Thanks to *Little Suns*, women can breastfeed their babies late at night without needing to light a kerosene lamp, which is dangerous because it has caused fires in the village.

Testaments of this kind show that *Little Sun* has the ability to change lives.



Olafur Eliasson. *Addis Abeba* with Little Sun. Ethiopia.

On the eve of the 2017 *United Nations Climate Change Conference* ("COP23") in Bonn in 2017 and during the *Pathway to Paris concert* Olafur Eliasson created a performance, in which he gathered artists, musicians, innovators, academics and activists at Carnegie Hall in New York to fight for climate change. He even led a *Little Sunrise* at the Concert Hall inspiring the audience to hold up the *Little Suns* placed under their seats



Pathway to Paris concert, Olafur Eliasson led a Little Sunrise at the Carnegie Hall in New York. 2017.

and transformed the entire audience into an interactive artwork with 2,800 attendants. It resulted in what he called a “solar-powered sunrise.”, creating a new understanding of the *Sustainable Development Goal 7* which includes requirements for all countries to provide clean and affordable energy. This is written into the *United Nations Development Programme* (UNDP), which is the global development network of the United Nations, with headquarters in New York City.



Pathway to Paris. Vue over the audience in Carnegie Hall raising *Little Sun* in the air.

Olafur Eliasson is on the scene.

The second member of the *Little Sun* family is called *Little Sun Charge* (2016).



Olafur Eliason. *Little Sun Charge*. A solar charge and lamp. 2016.

This is a high-performance solar phone charger, shaped like a blue square, which is decorated with a relief of the sun with dark blue rays to emphasize the glowing crystal in the center. It combines a unique aesthetic shape with the latest solar technology and brings the power of the sun to your phone, MP3 player, camera, or e-reader – wherever you are, whenever you need it. Olafur Eliasson emphasises, that *Little Sun Charge* features “a powerful 4400 mAh battery and a robust inbuilt lamp that’s bright enough to light a whole kitchen or tent.” And it “is an essential item for your next camping trip, festival adventure or for hardworking professionals on the road.”¹⁴ Packing both power and style into one portable, easy-to-use unit, *Little Sun Charge* provides up to 155 hours of light or charges your smartphone or other small device after one day in the sun. It can easily be kept in your pocket and taken out when, e.g. your mobile has run out of battery and it creates a great deal of joy when the operation is a success.

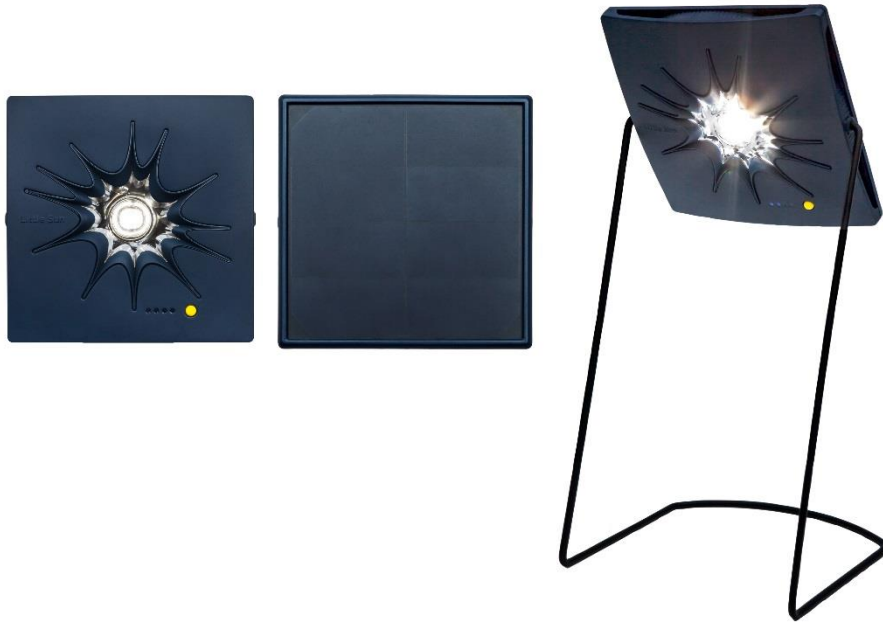


Olafur Eliasson. *Little Sun Charge. Happy user.* 2016

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“Little Sun Charge – Solar Charge”, <https://littlesun.com/product/little-sun-charge/>

With an optional accessory for the *Little Sun Charge*, one can make the most of one's charge by transforming it into a versatile lamp with the customised stand.



Olafur Eliasson. *Little Sun Charge with stand*. 2016.

Little Sun Charge is thus not only a high-performance solar charger but also a powerful solar light. If you use the custom-made stand, it can be used as a desk lamp, a reading lamp or another kind of lamp while charging your phone at the same time.



Olafur Eliasson. *Little Sun Charge with a sewer*

Little Sun Diamond



Olafur Eliasson. *Little Sun Diamond*. 2017.

is the third addition to the *Little Sun* family. Like *Little Sun Charge*, it is a lightweight, pocket-sized faceted lamp.

The front is inspired by the geometry of crystals. It resembles a shining diamond, which radiates a magical sparkling glow, that can be adjusted in strength. With its incorporated stand it becomes a great reading lamp.



Olafur Eliasson. *Little Sun Diamond* on Desk.

But the stand can also be exchanged with the lanyard and the *Little Sun Diamond* can be taken out with you. Five hours of charging in the sun provides five hours of bright light, fading to long-lasting soft light.

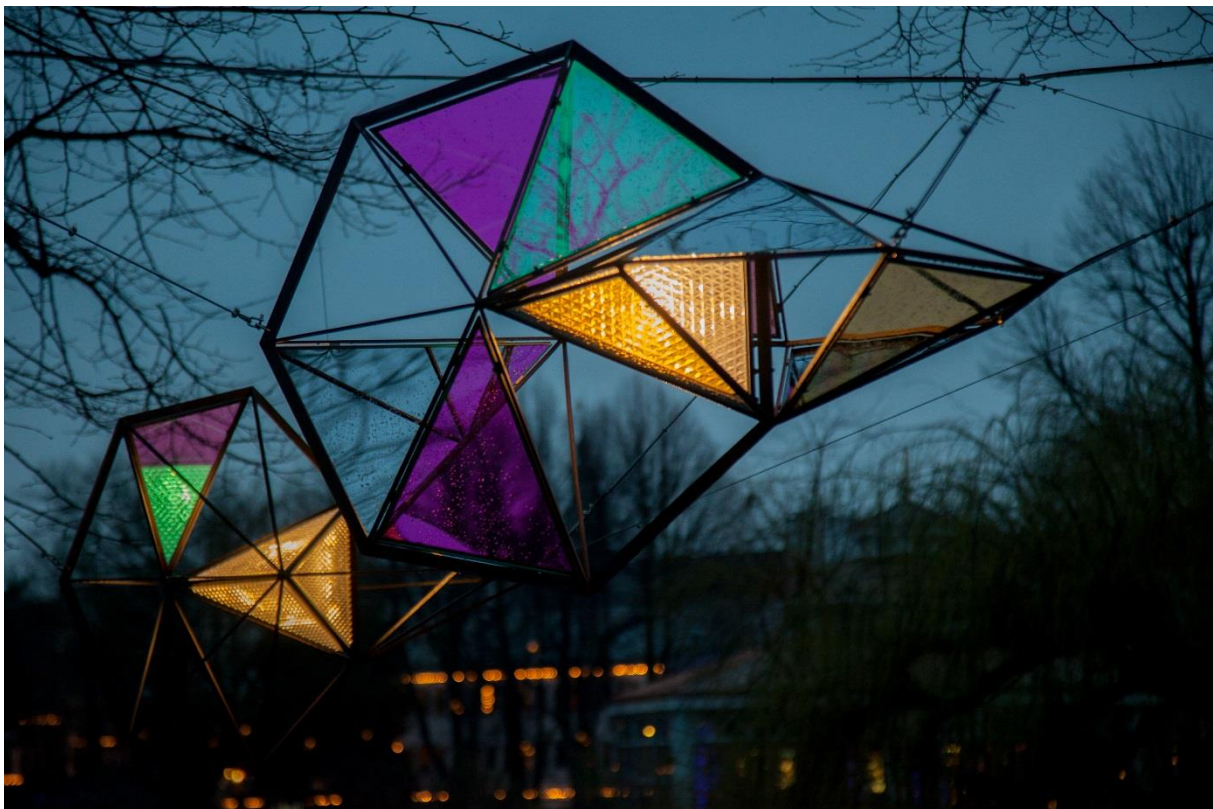
Olafur Eliasson's interest in how design can challenge human perception through light and colour has led to him create an extraordinary range of lamps. He always ensures that they are site-specific and he has managed to encourage people to both think and sense beyond the limits that they normally inhabit. The 33 lamps that he designed for Tivoli, the famous amusement park in Copenhagen - are very site-specific. They were designed to emphasize what he calls the site's "magical atmosphere, where dreams and reality blend". This atmosphere, which has always been created through light and has made Tivoli into a "glowing oasis", is intensified by the changing play of coloured light that he creates through the light in his lamps, which he calls "a kaleidoscopic light", because it changes from transparent to luminous. The lamps, which all bear the shapes seen in the old *Tivoli* tradition, are hung in the trees and produce an enchanted light.



Olafur Eliasson. *Little Sun Swarm* in the Tivoli gardens. 2017.

He describes the effect as "creating a link between the iconic park and greater Copenhagen, the lamps can also be seen by cyclists or pedestrians passing by on H. C. Andersen's Boulevard outside the park."¹⁵ Olafur Eliasson says that the fairytale-like light in the lamps is created using new and demanding technology. He has constructed "the thirty-three lamps from two identical intersecting geometric bronze frames around a tetrahedral core." The "panels of dichromatic glass and polished stainless steel mirrors" are "set into the frames in five different combinations". As guests to Tivoli move past and around the lamps, they see something amazing - the lights change colour even though only one type of glass has been used. Olafur Eliasson adds, that this effect is caused :

by the dichromatic glass, which filters some wavelengths and reflects others. A cluster of LEDs illuminate the lamps from within a faceted lens at the core, producing ambient lighting at night. Taken together, the lamps create a shimmering, multi-coloured swarm swaying gently in the breeze.



Olafur Eliasson. *Little Sun Swarm* in Tivoli. Detail. 2017.

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"New lamps for the Tivoli Gardens to be designed by Olafur Eliasson and Little Sun", June 13, 2016,

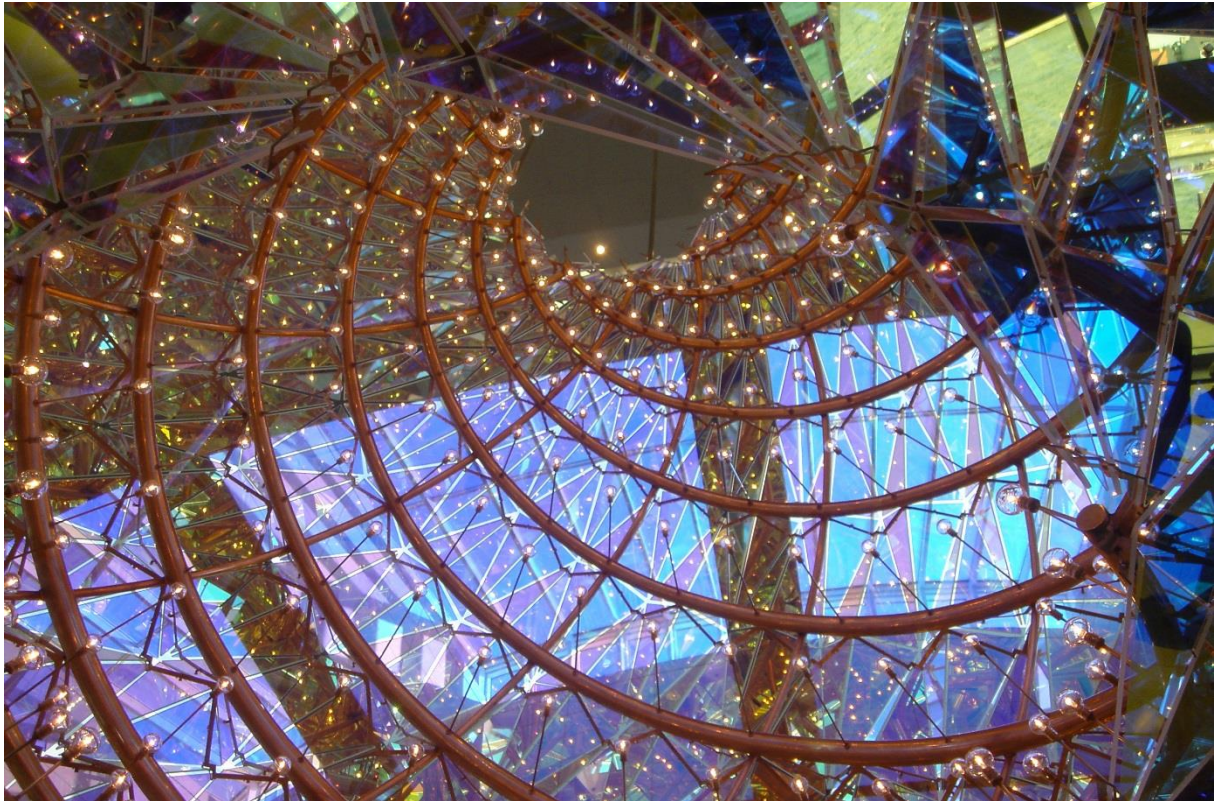
Olafur Eliasson has also designed lamps for the foyer of *The Opera House* in Copenhagen. They are shaped like large spheres with an incredible play of shifting light and they have been called chandeliers. The many waves of coloured light that the lamps send into space constantly create a fine contrast to the space's simple architecture, which is constructed from grey cement.



Olafur Eliasson. *Opera House Chandeliers*. 2004. Installation view. New National Opera Copenhagen.

In this instance too, this magical coloured light is created through the use of a complicated technique which Olafur Eliasson describes. The three identical chandeliers, which are hung in the foyer, consist of "two sets of overlapping spirals that wrap around the spherical surface of each work. The steel spirals are overlaid with a three-dimensional faceted diamond pattern." This consists of "triangular segments of colour-effect filter glass with dichromatic qualities."

And the guests in *The Opera House* will - like those visiting Tivoli - also see different colours appearing “depending on the position of the viewer, on the play of natural ambient light, and the artificial light from inside the chandeliers .”¹⁶



Olafur Eliasson. *Opera House Chandeliers*. 2004. Detail. New National Opera Copenhagen.

In both *Tivoli* and *The Opera House* the play of light in the lamps is constructed in a way that has an effect on the patterns of movement of the guests, strengthens their awareness of the environment and of others and thus also has an impact of some kind on their bodily experience. This effect is something that both Olafur Eliasson and Richard Shusterman emphasise in their aesthetic considerations.

Olafur Eliasson has also²¹ created projects that can support the integration of asylum seekers and refugees in society. Thus *Green Light* , which is a medium-sized geometric lamp made from wood, recycled plastic, nylon and LEDs. But it is not just the creation of the work that is important, but also that it is assembled by young refugees, members of the public and local students.

¹⁶ ”Opera House Chandeliers, 2004, <https://olafureliasson.net/archive/artwork/WEK100839/opera-house-chandeliers>



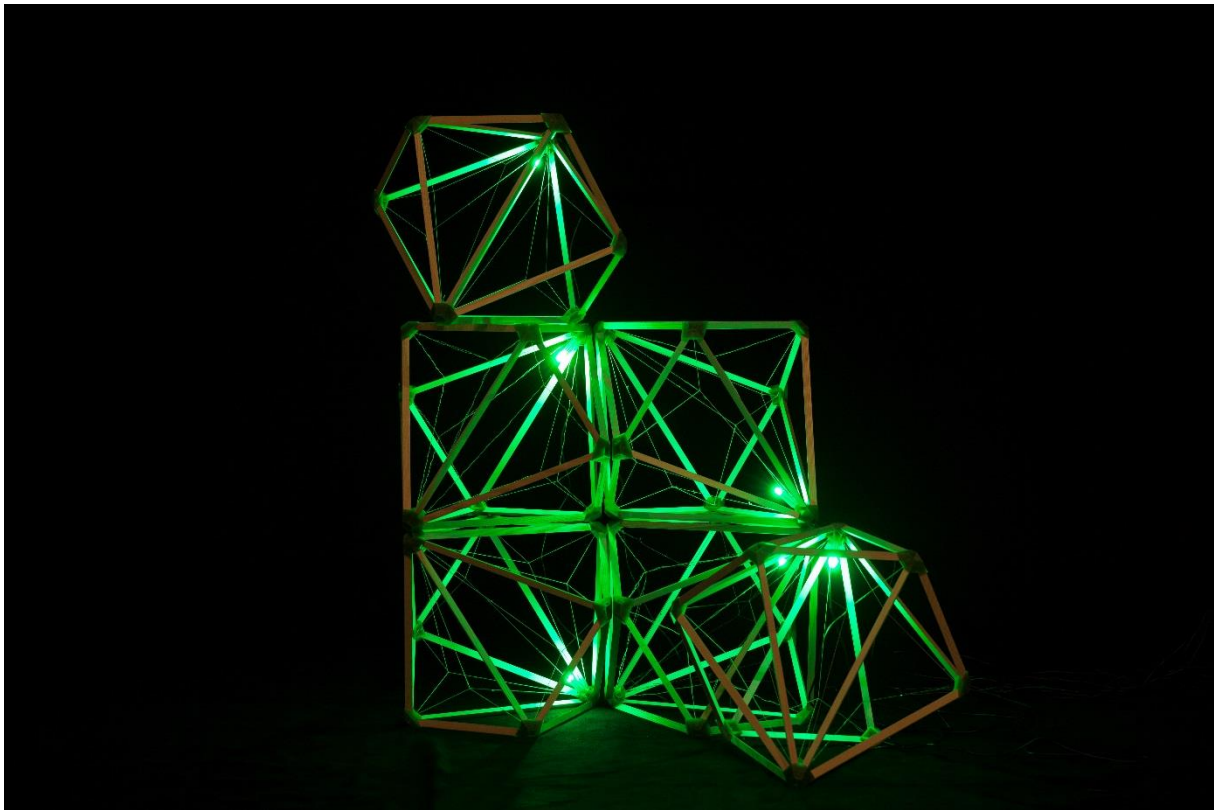
Olafur Eliasson. *Green light* – An artistic workshop. In collaboration with Thyssen-Bornemisza Art Contemporary. Olafur Eliasson. 57th Biennale di Venezia 2017.

This is a process that can strengthen the integration of refugees, and which Olafur Eliasson describes as follows:

This is no simple furnishings workshop. The three-month long programme, staged at the TBA21 contemporary art foundation in Vienna, sees the workers enrolled in a programme of talks and workshops, on everything from art to citizenship, solidarity to empowerment, all in the hope, that, the project will ease these recent arrivals' settlement. (..) It is my hope that *Green light* will shine light on some of the challenges and responsibilities arising from the current refugee crisis in Europe and throughout the world.¹⁷

In conclusion, Olafur Eliasson is convinced, that “there is no space in which art cannot work”. That is why he has - with his own words - “been pushing for art to act on its responsibility and for others to understand its potential.” And for him “art and culture are incredibly robust and have so much to offer, also outside the cultural sectors.”

¹⁷ “Olafur Eliasson gives Green Light to refugees”,
<https://uk.phaidon.com/agenda/art/articles/2016/march/22/olafur-eliasson-gives-a-green-light-to-refugees/>



Olafur Eliasson. *Greenlight*. 2016. Co-produced by Thyssen-Bornemisza Art Contemporary. 2016

He has nuanced this view as follows and also mentioned the works in the field of visual art and design in which he has tried to live up to these social and ethical demands.

I realised then that I had not been speaking to the world but to a privileged group. I asked myself, what now? What can I do to tear down the wall between me and those I didn't know that I didn't know about? How can we speak the language of culture while avoiding the blinding elitism that we have seemingly and involuntarily adopted? I, for my part, will keep thinking about future artworks through which to respond to these questions, projects like *Green light*—an artistic workshop, *Ice Watch*, *Riverbed* and *Little Sun*. Each of these takes art out of the comfort zone that is the art world to test its potential in broader conversations.¹⁸

Over the past 20 years a new kind of aesthetic has emerged in the worlds of art and science. It has been termed neuroaesthetics. The artworks that realise and develop its basic ideas combine the artistic creative processes with the new breakthroughs in neuroscience.

¹⁸ Eliasson, Olafur, "There is ultimately no space in which art cannot work", *The Art Newspaper*, 20th June 2017. https://www.tivoligardens.com/en/om/presse/pressemeddelelser/2016/tivoli_nyt+samarbejde+lampedesign
See also See <https://www.theartnewspaper.com/comment/olafur-eliasson-there-is-ultimately-no-space-in-which-art-cannot-work>

Various artists are particularly interested in electroencephalography - also known as EEG. This is an electrophysiological monitoring method of recording the electrical activity of the brain. It is a way of measuring brain activity that focuses on electrical signals. An improved electrode headset is provided for the acquisition of it. It provides not only an emotional response but also communicates meaning, which often comes from memories. The way it works is that it senses the fluctuations of voltage from the bioelectrical activity in the brain and how it reflects the skin, but the minor fluctuations of activity are already enough to measure the attention level of the wearer of the headset. EEG signals can provide new information about the dynamical co-operation between neuronal assemblies during the cognition of visual art. EEG technology can be used to obtain more knowledge about how people are affected when they experience and react to an exhibition.¹⁹

The young and already internationally renowned Chinese artist Liu Wa, has developed a new interpretation of aesthetic experience based on neuroaesthetics and it a humanistic goal. In 2017 she investigated the nature of human consciousness and connectivity in particular through the use of EEG in artistic forms. Working on her project installation *Still*, (2017), created via electroencephalogram (EEG) she became convinced that the relationship between art and science does not sideline the artistic processes, on the contrary, it "brings about more exciting possibilities". She is aware of the creative potential, but also the risks that the use of the new technologies - in this case EEG - holds. This is why she allows the artistic processes be the main ones.

¹⁹ The analysis of the EEG is done through the so called "Fieldtrip":

"FieldTrip, an open source software package that we developed for the analysis of MEG, EEG, and other electrophysiological data. The software is implemented as a MATLAB toolbox and includes a complete set of consistent and user-friendly high-level functions that allow experimental neuroscientists to analyze experimental data. It includes algorithms for simple and advanced analysis, such as time-frequency analysis using multitapers, source reconstruction using dipoles, distributed sources and beamformers, connectivity analysis, and nonparametric statistical permutation tests at the channel and source level. The implementation as toolbox allows the user to perform elaborate and structured analyses of large data sets using the MATLAB command line and batch scripting. Furthermore, users and developers can easily extend the functionality and implement new algorithms. The modular design facilitates the reuse in other software packages. See: <https://dl.acm.org/citation.cfm?id=1945411>."

Her next even more immersive project - *Glimpse: A Passing Look* (2018) - is also created through neurotechnology. Fitted with an electroencephalogram (EEG) headband, viewers enter the enclosed room in Sabsay Gallery - a gallery in Copenhagen - where they encounter a series of colour-coded paintings. While studying the paintings around them, their rising attention levels illuminate the room with blue, red, or green light.



Liu Wa. A spectator looking at her project *Glimpse: A Passing Look*. 2008. Production still in blue and red.



Liu Wa. Two spectators looking at her project *Glimpse: A Passing Look*. Production still in green.

The paintings thereby emerge successively, delivering contrasting impressions. When the viewer's state of mind changes, he or she will always experience the same paintings in new and often very different ways. And unexpected meanings emerge as well. The artist stresses that the paintings in the project are not created to be seen in natural light. They are to be seen in what she calls "the prism of colours", which is why the EEG equipment is an integral part of the artwork together with all the other artistic strategies (the film will be shown).

She has chosen to create her work through painterly strategies because, through painting, she "can basically create anything, unrestrained by physical limitations". The theme of her project is "ecological disasters and the refugee crisis, and issue of overwhelming garbage", in other words, a world of chaos.

To visualise this theme, she "searched for related images online and invited models to pose for her" and made sketches first on paper and then on small canvases, not on a computer or photo. "She created the painting of just red, green and blue, which are the primary colours of light. "

Since there are only a few pictures or sections of the large coherent installation that the viewers have the opportunity to grasp at a time, the relationship between the images becomes a mystery. The viewers are thus inspired to elaborate on the visual stories themselves. This work causes forgotten experiences and thoughts to surface. And Liu Wa adds: "As one viewer controls the colour of the environment through her brainwaves, others can also see what she sees, questioning the boundaries between reality and illusion as well as self and other". In a talk held at Sabsay Gallery on May 24th, neuroscientist Martin Skov aptly observed that "the truly important part is the colour changes, because that is what influences your experience. The fact that you think that you manipulate the colour changes is really the magic trick".

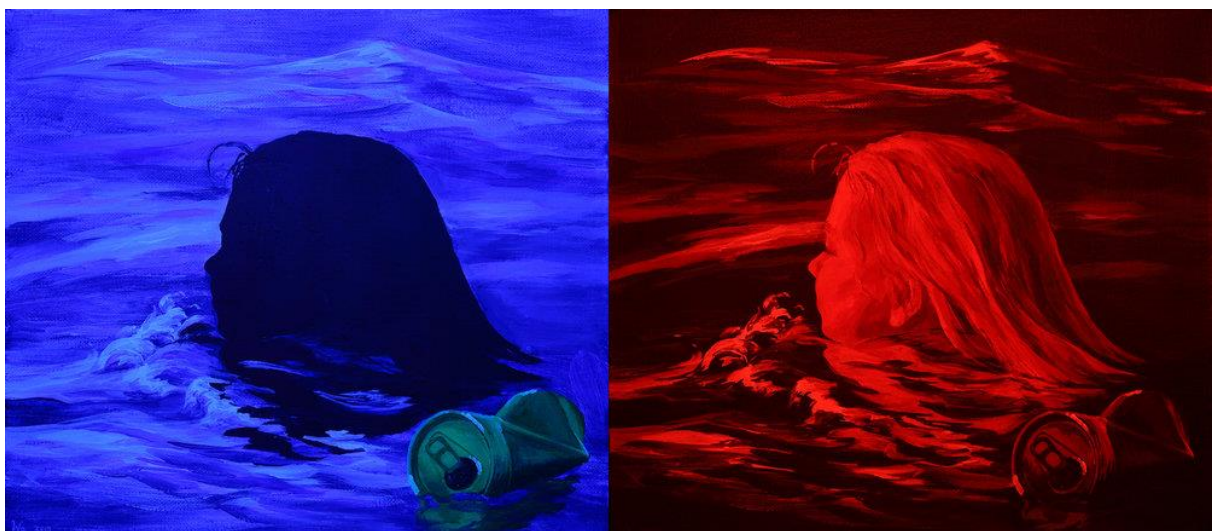
Liu Wa, as previously mentioned, has said that her project visualises various aspects of an ecological disaster, but in the abovementioned talk she notes that it is important for her to emphasise that the installation has a more general goal because it primarily "creates or represents a really extreme condition in which people will act so differently compared to one another". She is convinced that "it corresponds to how different viewers can see so many different aspects of the same thing. The colour is like a projection of the viewer's will and subjective view".

What do we experience when we wear EEG equipment, which has electrodes that actively tap into the part of our neural system that controls concentration and attention? What happens when the colour changes? The first section of the large painting we are confronted with is a little girl swimming in the sea.



Liu Wa. .*Glimpse: A Passing Look*. Still of several sections of the project in blue.

When the colour changes to a rather cold blue, she appears as a quite disturbing black silhouette. The viewer may think that she is struggling to survive. Will she escape from the disaster? The observer tries to continue the story. When the light turns to red, however, the girl's face appears more clearly and is strongly illuminated with beautiful and gentle features. Now it may be a story with a happy ending then the viewer begins to change the story she was about to create.



Liu Wa. Stills of two sections of *Glimpse: A Passing Look* respectively in blue and red.

As Liu Wa has says, this project shows that: "Each spectator is a performer. Each experience is a unique artwork, as the viewer shifts the role between viewer and performer." Throughout the encounter with this artwork, viewers are nudged to revive memories from their own lives. As the music intensifies the viewer's level of concentration, her memories will be more activated.

There are parallels between some of the basic themes and goals in somaesthetics and Liu Wa's "EEG-projects". She tries to challenge our somatic habits and contribution to the art of living by enhancing our bodily awareness and thus approximates one of the important aims in somaesthetic. And for her and for Shusterman the viewer's experience is not just an important part of the work; it is sometimes the actual meaning of the work. She also tries to focus on what Shusterman calls "evoking art's potential for real world improvement".²⁰ A deeper study in somaesthetics can also intensify and nuance these goals in her own and other artists' EEG works.

Other researchers and artists have suggested that the projects with EEG can also have a therapeutic effect, just as music has had for many years. And this is why they can achieve what Shusterman calls a "meliorist goal". But these projects require more thorough analyses of the relationship between the body, art and technology. Shusterman and his colleagues have - as mentioned previously - undertaken very thorough studies of this kind in the field on computer interactive design.²¹ A heightened somatic awareness and mastery of precisely this kind could have benefits for many fields. This also applies to art therapy that uses new technologies like EEG. This applies to strengthening self-regulation, relaxation, memory, visual processing, intelligence and creativity.

²⁰ See Shusterman's Documenta text "A House Divided", which is reprinted in C. Höller and R. Trockel, *A House of Pigs and People*, Köln 1997, pp. 31-31. See also "Embodied Creation and Perception in Olafur Eliasson's and Carsten Höller's Projects", by Else Marie Bukdahl in *Journal of Somaesthetics. Somaesthetics and Visual Art*, vol. 1. No 1, 2015, p. 175.

²¹ Höök, Kristina, Jonsson, Martin, Stål, Anna, Mercurio, Johanna, "Somaesthetic Appreciation Design", https://www.researchgate.net/publication/301935793_Somaesthetic_Appreciation_Design

The application of EEG methodology with art therapy may assist in assessing and refining clinical treatment. However there is not sufficient empirical evidence in this field at the moment. ²²

In their projects Olafur Eliasson and Liu Wa and have used the new technologies in artistically convincing ways, while remaining vigilant to the possible risks inherent in them. They have also focused on objectives that are either inspired by somaesthetics or can be seen as direct parallels to it. This is because they have, in their respective ways, aimed at stimulating an embodied interaction, enriching our sensitivities and focusing on meliorative or directly ecological objectives with their works.

²² Belkofer, Christopher M., Vaughan, Van Hecke, Amy Vaughan, Konopka, Lukasz , “Effects of Drawing on Alpha Activity: A Quantitative EEG Study with Implications for Art Therapy”, M, *Journal of the American Art Therapy Association*, vol. 31, 2014, pp. 61-68.

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