Towardless

Plant-based Electrical and Art Energy

A selection of solar cells and research material that originate from art_craft, art_science, scientific investigations and the questioning of light, energy, bodies, and matter. Seven solar cells are shown as photoprints, with photography by Anne Kinnunen (Aalto ARTS).

V2 gallery, Väre, Aalto University, Otaniementie 14, Espoo, Finland - 8 till 29 September, 2021

HANDOUTS

Left wall



1 – No title
Photoprint on Dibond (100 x 73 cm)73 cm)
Dimension: 10.5 x 10.5 cm

Photo by Anne Kinnunen (2021).

Backlit demonstration solar cells, Janne Halme. Cell with TKK logo; cell where electrolyte has dried during storage forming crystal of unknown composition (ca. 2003-2005). *For solar cell materials, see: 10 – Solar cells from the research archive of Janne Halme (2001-).*



2 – No title
Photoprint on Dibond (100 x 73 cm)
Dimension: 10 x 12 cm

Photo by Anne Kinnunen (2021).

Backlit research solar modules, Sannamari Pilpola (2015). *Red dye (N719), blue dye (SQ2), NIR dye (Silicon 2,3-naphthalocyanine dichloride). Dye degradation, electrolyte leakage. Other materials, see: 10 – Solar cells from the research archive of Janne Halme (2001-).*



3 – No title
Photoprint on Dibond (50 x 50 cm)
Dimension: 4 x 2 cm; 2 x 2 cm

Photo by Anne Kinnunen (2021).

Experimental dye sensitized solar cells, Bartaku and Christian Thornton (2013). Bore silicate glass, pomegranate sap, titanium dioxide (TiO2), iodine, tin oxide (TO), copper wire



4 – No title
Photoprint on Dibond (50 x 50 cm)
Dimension: 3 x 2 cm

Photo by Anne Kinnunen (2021).

Experimental dye sensitized solar cells, Bartaku and Christian Thornton (2013). Bore silicate glass, pomegranate sap, titanium dioxide (TiO2), iodine, tin oxide (TO), copper wire.

Vitrine

5 – Pile of e-waste, temporarily self-lit by its left-over solar energy

Dye-sensitized solar cells, discarded after use for scientific research. Various authors (Kati Miettunen, Ghufran Hashmi, et al.), New Energy Technologies group, Aalto University. *Other materials, see: 10 – Solar cells from the research archive of Janne Halme (2001-).*

Back wall



6 – Blck Vlvt
Solar glass cells (Aronia m. colorants, fluorine-doped tin oxide titanium dioxide, iodine, lithium iodide, 3-methoxypropionitrile, indium tin platinum thermoplastic polymer, aluminium, silver, copper wire with plastic coating; plywood
Dimension: 40 x 30 cm

Photo by Anne Kinnunen (2021).

Blck Vlvt is a hand-painted solar panel based upon a painting by JMW Turner. The colorants in the glass solar cells originate from leaves, fruits and stems from the *Aronia m.* plant. They are the main resource for the transforming of light into electrical energy.

Right wall



7 – No title
Photoprint on Dibond (73 x 100 cm)
Dimension: 4 x 2 cm

Photo by Anne Kinnunen (2021).

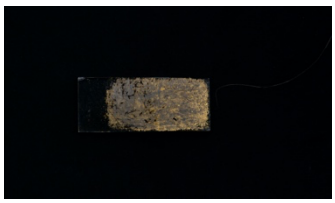
Experimental dye sensitized solar cell bottom plate (back-electrode), Bartaku and Christian Thornton (2011, 2012). Glass, silver, tin oxide, unidentified metal.



8 – No title
Photoprint on Dibond (73 x 100 cm)
Dimension: 4 x 2 cm

Photo by Anne Kinnunen (2021).

Experimental dye sensitized solar cell bottom plate (back-electrode), Bartaku and Christian Thornton (2011, 2012). Glass, silver, tin oxide, unidentified metal.



9 – No title
Photoprint on Dibond (100 x 73 cm)
Dimension: 2 x 4 cm

Photo by Anne Kinnunen (2021).

Experimental dye sensitized solar cell bottom plate (back-electrode), Bartaku and Christian Thornton (2011, 2012). Glass, silver, tin oxide, copper wire, unidentified metal.

Window

10 – Solar cells from the research archive of Janne Halme (2001-)
Photoprint on Dibond (100 x 73 cm)
Dimension: from 1.7 x 2.5 cm to 10 x 5.5 cm

Dye-sensitized solar cells of various sizes from the research archive of Janne Halme, Department of Applied Physics, Aalto University. Cells made by J.H. unless author mentioned. Quotes from the lab notebook of J.H. (translation).

Glass, fluorine-doped tin oxide, indium tin oxide, titanium dioxide, red dyes (N3, N719), blue dye (SQ2), NIR dye (Silicon 2,3-naphthalocyanine dichloride), platinum, graphite, carbon black, antimony-doped tin oxide, iodine electrolyte (iodine, potassium iodide, organic solvents, and additives), polymer sealant, glue, Cu and Al tape, silver paint and epoxy, electric wire.

Door

11 – Blck Vlvt (making detail)
Video
Duration: 3:02 min (loop)

Video production: Nina Pulkkis, Fotoni film (2020).

Video with a selection of parts of the making of Blck Vlvt.

Exhibition website

www.aalto.fi/en/events/towardless-plant-based-electrical-and-art-energy

Online related works

Nina Pulkkis (Fotonifilm) documented the process of making Blck Vlvt and interviewed the makers.

Hosts Bartaku and Janne Halme explore Blck Vlvt's making-of observations in conversation with guests.

Website: https://www.aalto.fi/en/podcasts/painting-energies-podcast

Listen to: https://soundcloud.com/painting-energies-podcast

1 - **Blck Vlvt** – making of documentary (15min)
Nina Pulkkis (Fotoni) documented the process of making Blck Vlvt and interviewed the makers.
https://youtu.be/r6PZ-1iJpAY

2 - **Painting Energies** Podcast
Hosts Bartaku and Janne Halme explore Blck Vlvt´s making-of observations in conversation with guests.
Website: https://www.aalto.fi/en/podcasts/painting-energies-podcast
Listen via: https://soundcloud.com/painting-energies-podcast
First episode released on September 8, 2021

3 - ***Baroa belaobara*: berryapple**

Background information about the research processes can be found in Bartaku´s recently published monograph. Limited edition for sale via Aalto ARTS bookshop
https://shop.aalto.fi/p/1558-baroa-belaobara-berryapple
or free downloadable as PDF:
https://aaltodoc.aalto.fi/handle/123456789/107574

Credits

Concept & realisation
Janne Halme and Bartaku

Blck Vlvt process and production
research group Aamo (Aronia art morphing) based upon an idea by *Bartaku_Baroa. b*. Aamo members: Janne Halme & Pyry Mäkinen (Aalto PHYS), Paulo Pinho (Aalto ELEC), Merja Penttilä (Aalto CHEM, VTT), Bartaku (Aalto ARTS).

Solar e-waste
New Energy Technologies Group, Aalto PHYS, various authors (Kati Miettunen, Ghufran Hashmi, et al.); Bartaku archives (selected cells all in co-creation with Christian Thornton, Xaquixe
Glass Innovation Studio (Oaxaca, Mex.).

Photography:
Anne Kinnunen, Aalto ARTS

Technical partners
Biofilia (Lab for Biological Arts) and Biogarage (Aalto University)

Photoprinting
Aalto Photography Workshop

Organized as part of the Designs for a Cooler Planet 2021 exhibition of Helsinki Design Week 2021.