

SEMICONDUCTOR

Semiconductor bring intangible data to human experience through sensory translation and physical embodiment, making manifest the world beyond our physical reach.

Semiconductor are British artists Ruth Jarman (born 1973) and Joe Gerhardt (born 1972) who, since 1997, have blended science, technology, philosophy and art to create large-scale installations derived from theoretical and abstract natural phenomena. Working with data sets, models and simulations, they create work that translates, amplifies and materializes the complexities of our world, from the invisible forces at the core of the earth to the immense energies at the edge of our universe.

Their works emerge from periods of intensive research, having collaborated with such notable institutions as the UC Berkeley Space Sciences Laboratory, the Charles Darwin Research Station in the Galápagos and CERN in Geneva. Immersed in the research, they utilize the tools of science to bring the intangible into the fields of human sensory perception. For example, data captured from the STEREO satellite tracking solar wind and coronal mass ejections¹ becomes *Black Rain* (2009), a large-scale projection revealing the artefacts and glitches of the image-capture technology while journeying past planets, stars and comets.

The imagery transports the viewer to outer space, though never quite leaving the interface of the technology. What is depicted is always mediated by the tools of observation. In *365 Days of Data* (2013), a series of carbon drawings represent environmental information collected over a year from instruments installed at the Alice Holt Research Forest.² Etched with a plotter, carbon-coated paper is scratched

away to reveal the pattern of seasonal change.

Over time the ambition and scale of Semiconductor's works has increased. In *Earthworks* (2016), the processes of land formation are projected onto a vast screen as colourful layers of shifting seismic activity. This immersive installation combines analogue modelling and computer simulation³ to reveal the shaping of landscapes over time through glacial, earthquake, volcanic and human activity. The data also feeds the synchronized soundtrack, revealing "the intricacies of the dynamics of our planet in motion".⁴

Following a three-month residency at CERN, Semiconductor created *Halo* (2018), a large-scale audiovisual installation that embodies the particle collisions produced within the ATLAS detector at CERN. The structure comprises a human-scale cylindrical form, inviting the viewer inside

to physically experience the physics. The walls of the cylinder are made up of 384 strings, struck by hammers to "play" the data, which is simultaneously projected onto the surrounding walls.

Their work celebrates the conceptual and technical ingenuity of science, yet at the same time critiques the very tools of its discoveries. By giving voice to equations and sculpting with raw data, the subjective experience of scientific enquiry is highlighted. Semiconductor are interested in what can be learned through observation and data acquisition, but they are equally concerned with the barriers to knowledge, the language of science and how scientists operate in the space of unknowns. This meta-critique "observes the work of the observers, drawing attention to the ways in which science mediates our experiences of nature".⁵



ABOVE: Semiconductor, *365 Days of Data: water Vapour*, 2013. One of a series of four carbon drawings representing environmental data, made at the Alice Holt Research Forest, UK.

OPPOSITE: Semiconductor, *Halo*, 2018. This large-scale immersive artwork embodies the particle-collision data captured by the ATLAS experiment at CERN, Geneva.



ABOVE: Semiconductor, *Earthworks*, 2016. A five-channel computer-generated animation with four-channel surround sound, transmitting seismic data in synchronous audiovisual simulation.



OPPOSITE: Semiconductor, *Black Rain*, 2009. Installation view at *Earth: Art of a Changing World*, Royal Academy, London.