

HIDDEN WORLDS

Videoscreening curated by Marco Mancuso / Digicult

The *Hidden Worlds* exhibition celebrates one of the most fascinating yet obscure territories of artistic audiovisual contemporary research: the relation between art and science. The video screening produces works that induce into a critical reflection on the existing relation between audiovisual contemporary artistic research (as regards to cinema, video and digital experiences) and applied sciences.

This project, dealing with different artistic examples which investigate new expressive forms for the representation of the sound-image relation, deliberately avoids focusing on the existing common aesthetics among them, as well as on a possible expressive language. It rather suggests an overview on specific systems for sensorial perception, and emotional mechanisms of "saturation", achieved through the use of hybrid techniques, that today like never before expand the tradition of analog experimental cinema and digital audiovisals.

This video screening takes the spectators to wonderful "hidden worlds", illustrated by artists and scientists who more and more often collaborate and share experiences with one another on the research of new expressive potentialities within specific mathematical processes and physical, optical, chemical and electromagnetic phenomena.

By watching the audiovisual representation of the existing energetic and electromagnetic phenomena on the Sun's surface and of current interferences generated from interaction of electromagnetic fields between the Sun and Earth, as possible instrument of aestheticization of the space phenomena by the Semiconductor duo (in works such as *Black Rain and Brilliant Noise*), the passage to the audiovisual representation of chemical-physical-optical reactions of the Portable Palace duo (Evelina Domnitch & Dmitri Gelfand) is extraordinary short indeed. In their first work present in this exhibition, (*Camera Lucida*) they study the chemical-physical phenomena of "sonoluminescence", while in their second one (*10000 Peacock Feathers in Foaming Acid*) they analyze the potentialities of optical phenomena generated by investigating the laser light within the nanometric structures of foams. Moreover, if the work on "chemical grams" by the video maker Jurgen Reble (*Materia Obscura*) underlines the structures born out of a film's chemical corrosion, in the same way the first work by Thorsten Fliesch present in the exhibition (*Energie!*) shows the scorches on photographic paper produced by an high potential energy flow of an electron beam contained in a cathode ray tube.

The number is an ever present concept, being the fundamental element of every mathematical and algebraic formula which involves not only a single energy phenomenon present in nature, but also a series of disturbing/superimposition phenomena, such as interferences, beats, accumulations, harmonies and other optical event, like Moirè's (optical illusion created by geometrical sequences of interference phenomena), as shown by the purely glitch and software works by Carsten Nicolai (*Spray*) and Karl Kliem (*Vienna Concert !! Excerpts*).

The number, in its highest abstraction of key element for a fourth dimension representation, is still an important part of Thorsten Fleisch's video (*Gestalt*), a sort of recognition of the quaternion worlds (four-dimensional fractals) visualized in a three dimensional space through appropriate software. Yet maybe John Campbell's masterpiece (*LI: The Patterns of Nature*) is the work that mostly evidences the geometric structures spontaneously present in Nature, through a kind of magical and hypnotic audiovisual document, perfect sample of a deep critical conviction: contemporary audiovisual art, today more than in the past, has the technological instruments and the ethical duty to confront itself with the empirical world and the "natural" technologies within it. Technologies that should be collected, observed and manipulated by man, who has already given proof of his skill with light, sound, image and space.

Hidden Worlds - part 1

(total time 30.52)

- Semiconductor *Black Rain* (2009, GB)

col., sound, 3/02/, HD Format: 16:9 widescreen

Semiconductor (Ruth Jarman and Joe Gerhardt) is a duo of audiovisual artists whose aim is to use digital synthesis for the creation of works where the strong synchrony of sounds and images reveals natural and energy phenomena in constant evolution. *Black Rain* has been obtained after having collected a series of images from the satellites of the STEREO solar mission. Watching the video one can observe the HI (Heliospheric Imager) visual data, that explore the interplanetary space in search of solar winds and CME (coronal mass ejections) hitting and surrounding the Earth. Semiconductor, along with STEREO mission scientists, have worked with the daily collected data, lighting the way of the satellites from their start to the tracking of the Earth orbit around the Sun. Solar winds, CMEs and planets and comets orbiting the Sun may just be seen like stars on the background, while the Milky Way itself passes by and goes away. Just as they did in *Brilliant Noise*, their previous work, Semiconductor used raw mathematical data, which therefore were not cleaned and prepared for a public exhibition.

A Semiconductor film by Ruth Jarman and Joe Gerhardt. Data courtesy of the Heliospheric Imager on the NASA STEREO mission

- Evelina Domnitch & Dmitri Gelfand *Camera Lucida: Sonochemical Observatory* (2006 - Rus, Bel)

col., sound, 8'57"

Camera Lucida, an installation project by Evelina Domnitch & Dmitri Gelfand developed in collaboration with scientific laboratories in Japan, Germany, Russia and Belgium, is a three-dimensional sonic observatory capable of directly turning sound into light through the physical phenomenon known as "sonoluminescence": the ultrasounds, flowing within an inert liquid present in the *Camera*, create formations and implosions of micro-bubbles whose temperature is just as high as Sun's, and at the same time emit light as direct visualization of the sound waves. For all of 2009 the authors have been collaborating with a number of international sound artists in order to create a veritable chemical composition, constituting the material of the DVD the video was taken from.

Taken from Line_030 (Dvd): *Camera Lucida* Dvd. Sound by Richard Chartier & Taylor Dupree

- Karl Kliem - *Vienna Concert: Excerpts* (2008 – Ger)

col., sound, 4'29"

Karl Kliem is one of the founders of Frankfurt lab Meso, the factory that produced the modular software for the creation of real time audiovisual generative objects, VVV. Better known with the alias of Dienststelle, Karl Kliem collaborated for many years to the realization of sound-reactive visual installations of many among the most important and appreciated international electronic musicians, such as Alva Noto, Ryoji Ikeda, Jan Jelinek and Ryuichi Sakamoto. The work he took at this exhibition has been extracted from the best moments of a concert performed together with musician Jan Jelinek at the 2008 K-Hyas Kino in Vienna. The *Vienna Concert: Excerpts* carries on this exhibition's reflection on the relation between sound, video and mathematics: in this case the key of audiovisual analysis are represented by Moirè's optical effects.

Music by Jan Jelinek. Album Tierbeobachtungen-Label Sacpe. Courtesy of the author

-Thorsten Fleisch *Energie!* (2007, Ger)

col., sound, 5'18"

Thorsten Fleisch is artistically born at the Stadelschule experimental school of cinema in Frankfurt, with Peter Kubelka as teacher. In his movies the artist used both digital and analog techniques, working several times on 16 mm films with natural material, such as crystal, fire, electricity and tissue. He is always searching for new visions and hidden worlds, and he thinks technology is the key to investigate them. He consider it a chance to offer a new perspective, a point of view that diverges from mere senses; his aim is to take it beyond its limits, in order to get a mix of technology and natural phenomena as a result. In fact, in some of his works nature slips away from control, provokes little and unpredictable disasters that sometimes even lead to the destruction of the used technology: it's been the case of *Friendly Fire*, where the fire burnt the film itself, or *Energie!*, one of his greatest international works, in which the electricity pierced the photographic paper. Technically speaking, the visual material takes its shape from a controlled electron beam emitted from a cathode ray tube. An high voltage bolt of about 30.000 volts is shot on the sheets of photographic paper, that are then temporally put together in order to create a global audiovisual sheet, whose result depends on the sound.

Sound by Jens Thiele. Courtesy of the author

- John N. Campbell *Li: The Patterns of Nature* (2007 – Usa)

col., sound 9'06", original format: 16mm

Through time shifts, animations and techniques for microscopic observation, *Li: The Patterns of Nature* explores the meaning of "Li", a Chinese word that refers to the underlying intelligence and order of nature as reflected in its organic forms and patterns. Director John N. Campbell analyzes in a poetical and non-narrative manner the melting-pot of patterns spontaneously created by our surrounding world, thus making the distinction among living and inanimate phenomena more and more complex. *Li: The Patterns of Nature* explains how the natural world itself, whose naturalness and energy is often due to reproductive, conservative and evolutionary processes, can create complex architectures and structures based on physical, chemical, electromagnetic and nanometric phenomena that man, despite his knowledge in science and technology, is not capable of with the same precision. The reason for this, as written in 1898 by biologist Hans Haecker in his *Kunst Formen der Nature*, is that nature is not only capable of spontaneously creating veritable "art forms", but also of establishing a direct connection between a certain generative aesthetics, starting from a fundamental unit/core and reaching a more complex entity, a consequent evolutionary practice of adaptation.

Courtesy of the author

Hidden Worlds - part 2

Total Time 34'07"

- Semiconductor *Brilliant Noise* (2006, USA)

col., sound, 5'55"

Semiconductor (Ruth Jarman and Joe Gerhardt) is a duo of audiovisual artists whose aim is to use digital synthesis for the creation of works where the strong synchrony of sounds and images reveals natural and energy phenomena in constant evolution. *Brilliant Noise* is a visualization project of data coming from recordings and images of the Sun's astronomical activity. Semiconductor worked on hundreds of thousands of files, contained within the archives of solar observatories scattered all around the world, such as Mount Wilson Observatory UCLA, Lasco/SOHO Naval Research Laboratory, TRACE/LMSAL, Big Bear Solar Observatory/NJIT, SST/Royal Swedish Academy of Sciences and Gong/National Solar Observatory/AURA/NSF. The visual material has been kept in its pure form, in order to individuate energy particles and solar winds in the guise of white noise rain, by reorganizing them in different spectral groups and creating time sequences through the use of digital software. The soundtrack instead emphasizes the hidden forces at stake on the Sun's surface, by directly translating radio frequencies and sound manipulations according with intensity variation in image brightness.

A Semiconductor film by Ruth Jarman and Joe Gerhardt made at the NASA Space Sciences Laboratory, UC Berkeley, California, USA. 2006

- Evelina Domnitch & Dmitry Gelfand *10000 Peacock Feathers in Foaming Acid* (2009 - Rus, Bel)

col., sound, 2'52"

A vacuum or a semi-vacuum contained within a gravity and temperature sensitive elastic skin: the background of an early universe, a soap bubble and later, that of a biological membrane. In *10000 Peacock Feathers in Foaming Acid*, Domnitch and Gelfand use laser lights for the analysis of the surfaces of the soap bubble clusters that nucleate and then dissipate. Unlike ordinary light, the laser beam is capable of piercing the micro and nano structures of the bubble's skin. When aimed at specific angles, such light generates a large-scale projection of molecular interactions as well as unimaginable phenomena of non-linear optics. Soap bubble behaviours observed in such closeness recalls the dynamics of living cells (whose lipid membranes are chemical descendants of soap films). At the Lebedev Physics Institute in Moscow, scientists Y. Stoilov and A. Startsev have recently discovered that a laser beam passing through a soap film can surprisingly split into more channels one micron thick (polariton/spatial solitons), which neither diverge from their trajectories nor interfere with one another upon an intersection. These optical trails, which act as antennae for the waves confining light, are shaped and lengthened by the laser beam. It is possible that the laser maximizes through dielectrophoresis the membrane's refractive index up to the convergence of the light within. The system behaves like "a high-performance optical computer provided with a gigantic parallel processor composed by billions of cells guiding the laser beam" (Stoilov; Phys.-Ups 47, 2004).

Courtesy of the artists

- Alva Noto *Spray* (2006, Ger)

col., sound, 8'

Spray was bound to be an audiovisual installation, based on a 8 minute in loop video showing the accumulation process of a particular visual (audiovisual) element, the pixel. Carsten Nicolai plays with this key aspect by recreating veritable fields of order and developing precise Moirè's patterns and models, up to the deconstruction of the graphical element created with accumulation in small pieces, particles and dissolved substances yet containing sufficient information in order to generate its original forms once again and thus starting a cycle of constant repetitions. If we take into consideration the definition of "Moirè effect", the direct connection between the audiovisual outcome and the numeric and mathematical element is very clear. The Moirè effect in fact indicates an interference figure, frequently found in nature, composed by two superimposed grids at a specific angle, or even by two parallel grids with distanced chains in slightly different ways. The Moirè effect is regulated by accurate and complex sinusoidal equation where at the

variation of parameters and variables correspond particular changes under the optical and visual point of view.

Audio by Varsten Nicolai. Courtesy of Eigen + Art gallery

- Thorsten Fleisch *Gestalt* (2003, Ger)

col., sound, 5'20"

Awarded with an honorary mention at the 2003 Festival Ars Electronica, *Gestalt* is Thorsten Fleisch's sole work created through the use of digital technologies. In *Gestalt*, the so-called "four dimensional quaternions" (discovered in 1843 by Irish mathematician William Roman Hamilton, who was searching for a way to extend complex number on a higher quantity of spatial dimensions), are visualized in a three-dimensional space. Through the use of specific software, the artist has therefore turned the mathematical formula of quaternion fractals ($x[n+1]=x[n]^p-c$) into more complex forms and audiovisual animations, by modifying from time to time its parameters. As stated by Thorsten Fleisch himself: "Given the fact that a film is the visualization of a mathematical element, it is theoretically possible to render it in as high a resolution as technically feasible it without losing any detail. The visual structures and the transformations observed within are less important representations when compared to the complex visual structures of a three dimensional space. It is theoretically possible and more true to the mathematical formula to show the visual transformations in process through three dimensional holograms, so that anybody may perceive different space and time perspectives."

Courtesy of the author

- Jurgen Reble *Materia Obscura* - part 5 (2009, Ger)

col., sound, 12'

The latest work of experimental movie-maker Jurgen Reble is actually based on a series of extracts from his previous film entitled *Instabile Materie* and realized in 1995. The starting material was composed by 16 mm film stripes, treated by hand through the use of chemical agents. The substances used in those so-called "chemical grams" were most of all salts recreating lots of geometrical forms. Fourteen years later, in 2009, Jurgen Reble digitalized a part of that film, photogram by photogram, in high resolution, and began slowing its reproduction speed through a computer, to better check the temporal succession of the events of degeneration. In doing so, a veritable morphology of film emulsion was revealed to him, along with a strange and bizarre audiovisual world filled with magic and out-of-control phenomena, which implied in any case the existence of geometrical forms and patterns, as if the energy combustion process too is based on a numeric matrix. During the 80s the artist began to develop his research in the field of films, performances and installations, focused on the erosion of the film through chemical and mechanical agents: since 1992 he's been collaborating with sound artist Thomas Koener.

Film, Chemistry, Editing and sound by Jurgen Reble, Courtesy of the author